ENTOMOLOGY 2014

ESA 62ND ANNUAL MEETING
NOVEMBER 16–19, PORTLAND, OREGON
OREGON CONVENTION CENTER

Grand Challenges Beyond Our Horizons

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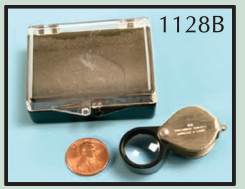

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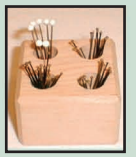

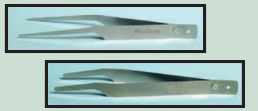

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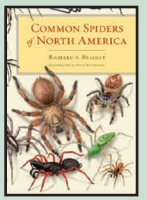
Mosquito Resting Trap



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ENTOMOLOGY 2014
62nd Annual Meeting of the
Entomological Society of America
November 16-19, 2014
Oregon Convention Center
Portland, Oregon

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Additional Copies will cost $20 on site.

PRESIDENT'S ENTOMOLOGY 2014 WELCOME MESSAGE

Frank Zalom

It is my honor and pleasure to welcome you to ENTOMOLOGY 2014, the 62nd Annual Meeting of the Entomological Society of America, and to our host city, Portland, Oregon. Portland is one of my very favorite places on the West Coast. Located along the Willamette and Columbia Rivers, Portland is a beautiful city with a culture that values conservation and diversity. Nearby are the Cascade Mountains that are punctuated by volcanoes, including Mount Hood and Mount St. Helens. The city is also close to the Pacific Ocean and the Willamette Valley, with its bountiful orchards and vineyards. Its airport, PDX, is convenient and easily accessible, with direct flights from 60 destinations in the United States as well as major airports in Asia. Its light rail system connects the airport to our major conference hotels and the Oregon Convention Center, the largest convention center in the Pacific Northwest and site of ENTOMOLOGY 2014. All meeting registrants will receive complimentary light rail passes allowing them to move easily throughout the city to visit its many notable local restaurants, breweries, and other attractions, including Powell's City of Books, the largest bookstore in the world. Optional events planned include tours of Portland and the surrounding area, and ESA's first Urban Adventure Run. This year's Student Reception at Portland's Punch Bowl Social promises to be a lively venue for fun, conversation, and meeting new friends.

Oregon and the Pacific Northwest, with its natural beauty and location at the edge of the Pacific Rim, is an ideal site to reflect on our ENTOMOLOGY 2014 theme: "Grand Challenges Beyond Our Horizons." The purpose of this effort is to maximize the contribution of entomology to improving the human condition by establishing a global grand challenge agenda for entomology that identifies the most important challenges to which all of us as entomologists can make the most significant contributions through our science, education, and policy efforts. Our intent is to begin a very broad discussion within the discipline this year, and work to narrow the focus over the next few years so that we may launch a Global Grand Challenge agenda for entomology in conjunction with the 2016 International Congress of Entomology (ICE). I hope the agenda will then guide ESA's activities forward beyond the ICE meeting in Orlando.

Establishing a Global Grand Challenge agenda for entomology is aligned with our Society's Strategic Principles, creating more opportunities for members to participate in the Society, increasing our Society's global partnerships by seeking solutions for global challenges in entomology, and increasing our influence by identifying challenges facing humans that entomologists are uniquely situated to address while aligning ESA goals, when appropriate, with those challenges identified by other institutions and scientific societies.

So I am challenging all of you to think of grand challenges and entomological opportunities for addressing them. Bring your ideas to Portland, and start now by beginning a community discussion at entomologychallenges.org. Let's commit ourselves and our discipline to addressing global grand challenges for entomology with dedication, and with innovations that may well be Beyond Our Horizons.

Building on the momentum of recent ESA annual meetings, ENTOMOLOGY 2014 promises to be another outstanding success. A successful meeting doesn't just happen; it requires the energy, creativity, and hard work of our friends and colleagues on the Program Committee, together with the professionals of our ESA Headquarters staff. The Program Co-Chairs for ENTOMOLOGY 2014 are Melody Keena and Sue Blodgett, and the program that they have assembled features more than 100 symposia and organized meetings with over 2,800 individual papers and posters, the most ever submitted for an ESA Annual Meeting. The Program Symposia and many of the Section and Member Symposia feature science and technologies that were truly beyond our horizons only a few short years ago, and address many human challenges with entomological expertise. The Committee made a conscious effort to feature symposia inclusive of early professionals, students, and our international members, and those that present alternative structures such as combining oral and poster presentations or including selected submissions. The ENTOMOLOGY 2014 program is truly fresh and exciting, and more of our members than ever will have the opportunity to share their science and innovations. There are more than 500 student paper competition submissions—also a record—so come help support our students as they present their research. Volunteers are always needed as judges for student papers and posters, so please help.

When you see members of the Program Committee, please thank them for their dedication and tireless efforts in planning ENTOMOLOGY 2014. Also remember to acknowledge the professionals from ESA Headquarters who work all year long to serve our members in so many different ways. They include David Gammel, Executive Director; Rosina Romano, Director of Meetings; Cindy Myers, Manager of Meetings and Exhibits; Debi Sutton, Director of Membership and Marketing; Katherine Matthews, Database Manager; Lisa Junker, Director of Publications; Richard Levine, Communications Program Manager; Neil Willoughby, Director of Finance; Alexis Lyons, Staff Accountant; Chris Stelzig, Director of Certification; and our newest staff members, Becky Anthony, Conference and Office Administrator and Carolina Olivieri, Manager of Marketing and Member Relations. Please introduce yourself if you haven't already met them, and thank them for their roles in a successful meeting and the success of your Society.

I became a 40-year ESA member this year, and look back on many fond memories of attending our annual meetings each year. For me, the ESA Annual Meeting has been a great opportunity to learn new things and share my work with other colleagues. It has also been an annual occasion to network, establish new collaborations, and socialize with old friends. ENTOMOLOGY 2014 provides all of these possibilities in a great venue and at an exciting location, Portland. I am sure this will be one of those memorable meetings you will be glad that you attended.

Thank you for giving me the opportunity to serve as ESA President this year.

Frank Zalom
2014 President
Entomological Society of America

PROGRAM COMMITTEE CO-CHAIRS' WELCOME

Welcome to ENTOMOLOGY 2014, the 62nd Annual Meeting of the Entomological Society of America. We are looking forward to having you join us in Portland, Oregon, this fall. The program team has worked hard to provide you with a diverse and inspiring four-day program that will spark your interest. This year will feature 94 symposia and an additional 1,750 papers and posters. To stay true to the local atmosphere, there will be many venues for networking, promoting collaborations, meeting new people, and renewing old friendships.

Sue Blodgett and Melody Keena

President Zalom's theme for the meeting is "Grand Challenges Beyond Our Horizons." One of Frank's goals is to initiate a dialog about the grand challenges that we face individually, professionally, and as a society. Arthropods play a critical role in global food security, as vectors of diseases, as predictors of climate change, and in maintaining healthy ecosystems, and are ideal models for promoting science literacy. President Zalom hopes to build on the momentum that previous ESA presidents have made in making our society more global, more diverse, and more engaged with the critical issues that we face now and in the future. With this year's agenda, Frank hopes for ESA to assume a leadership role among our sister societies around the world and for the Society to have a stronger influence on policy makers, creating a Global Grand Challenge agenda.

The 2014 Program Committee Co-Chairs solicited the general ESA membership for program symposia proposals that best exemplified the annual meeting's theme. The Program Committee received 55 proposals for program symposia, and we took extra care to reflect ESA's diversity in the topics, organizers, and speakers. The following seven program symposia were selected for ENTOMOLOGY 2014:

- **Agricultural Intensification and Insect Communities: Production Trade-Off Challenges with 9 Billion on the Horizon**
  Organizers: Anders S. Huseth and Jessica D. Petersen
- **Beyond the Horizon: Unraveling the Novel Complexity of Insect-Plant Interactions**
  Organizers: Gary Felton and Kelli Hoover
- **Ecoinformatics (Big Data) For Entomology: Pitfalls, Progress, and Promise**
  Organizers: Jay Rosenheim and Claudio Gratton
- **Novel Ecological Approaches to Vector Control**
  Organizers: Allison Gardner and Carla Caceres
- **Reaching Beyond Our Horizon: Social Media & Connecting with the World**
  Organizers: Derek Hennen and Morgan Jackson
- **Social Insects as Models for Biological Complexity: Lessons Learned and Challenges on the Horizon**
  Organizers: Simon Garnier and Zachary Shaffer
- **The Futures of Insect Genomics: A Grand Challenge of Entomology**
  Organizers: David O'Brochta, Angela E. Douglas, and Kristin Michel

Thirty-eight section symposia were selected by section leadership, and 47 member symposia were selected to complement this year's theme. We also introduced a new category this year, organized meetings. Similar to symposia, organized meetings allow for scientific presentations (both oral and poster), but they also include social opportunities and official meetings of sections or related groups. Organized meetings are groups that typically meet each year. These groups have maximum flexibility, and limitations on number of invited/presented talks do not apply. The member symposia and organized meetings add diversity and topics of current interest for members and attendees.

ESA limited members to one invited talk this year to increase speaker diversity and encourage young professionals to participate. We have also encouraged broadened symposia presentation types to include submitted talks or posters in addition to the invited talks. There are 17 symposia that feature submitted posters and 21 that accepted contributed talks. One of the seven program symposia and an additional six symposia will be using WebEx to allow speakers to present their talks remotely. All rooms will have wireless internet capability this year.

In total, there will be more than 1,000 symposium and organized meeting presentations. In addition, we are happy that we can also accommodate 10-minute paper presentations (1,080+) and posters (660+). It was a big task to evaluate, accept, and schedule this many outstanding symposia; we thank the members who obviously put a lot of effort into organizing interesting symposia. We think you will really enjoy the program and Portland venue this year. We invite you to attend the Social Hour with Poster Presenters in the poster area, Monday and Tuesday from 5:30 to 6:30 PM and Wednesday from 12:15 to 1:15 PM. Poster presenters are encouraged to attend their posters during assigned times. For further details, please refer to the Social Hour with Poster Presenters section later on in this program book.

Monday, the students are the special focus of the meeting.

- Student Competition for the President's Prize: Students will present 510+ 10-minute papers and 210+ posters.
- Student Debates: The student debate competition on Tuesday afternoon will include the following topics:
  1. The calls for the end of invasion biology are justified; this field should be replaced by the ecology of species distribution;
  2. Neonicotinoids are causing the death of bees essential for pollinating our food crops; the use of neonicotinoids should end; and
  3. What is the single best tool to reduce malaria cases throughout the world?
- Linnaean Games: Ten University teams will also be competing in the 31st Linnaean Games at the National Meeting. The preliminary round of the Games will be held Sunday. Come watch the

excitement of a great competition, and learn something while you're there.
- Student Mixer: To reward the students for their hard work and their importance to our Society, the ESA office, with our guidance, is planning an exciting off-site reception at Punch Bowl Social in downtown Portland. We hope that all students (both undergraduates and graduates) will be able to attend to make new friendships and celebrate their scientific accomplishments. Just remember, don't do anything that we would not have done as graduate students.
- Symposia: Students have organized program, section, and member symposia.

Other meeting features:
- Dr. Ernest Delfosse will lead a workshop titled, "Continuum for Research Integrity to Research Misconduct."
- Six Lunch and Learn session will feature a variety of topics that you won't want to miss.
- A child care grant program will supplement child care services for parents attending the meeting, in addition to the mother's room at the Convention Center.
- Attendees may take part in an Urban Adventure Run for a $15 fee. There will be no specific trail/map to follow; rather, there will be destinations around the city where the participants will pick up raffle tickets and other items to bring back to the Convention Center. Come out and explore the city.

Spending this past year as Program Co-chairs has been an amazing and humbling experience. Portland is a great meeting venue. The city is consistently ranked one of the best walking cities and has an excellent Light Rail/trolley system. Check out Powell's City of Books, which covers an entire city block and contains more than 1.5 million books. It's the largest new and used bookstore on Earth. Portland's also a "foodie" destination, with fantastic craft breweries, coffee shops, and tons of restaurants bursting with fresh, locally grown ingredients. With all of the walking you are doing, you won't mind stopping by Voodoo Doughnuts for a few extra calories; this venue is one of the city's most unusual and delicious doughnut shops, where you can find doughnuts topped with bacon, Captain Crunch, Oreos, and more.

Come see us at the meeting if you want our advice on other things to do or see. And make sure to share your great finds with us and other members via Twitter using the hashtag #entsoc14. Of course, if you want to get out of the city, we hope you will find the opportunity to visit some of the natural areas around Portland and beyond. To help you explore the area, ESA will be offering several day tour/activity options: Oregon's Birds, Bugs, and Bounty Experience; Mount Hood Snowshoeing Tour; Mount Hood Loop & Multnomah Falls Tour; Portland Sightseeing Tour; Multnomah and Columbia Gorge Waterfalls Tour; and Hike the Columbia River Gorge National Scenic Area.

We would never have been able to put together this exciting program or tours without the help of our wonderful ESA staff and the Annual Meeting Program Committee. Please take note of all these names and faces so that when you see them in Portland, you can thank them in person. Without the help of these willing individuals and the many other volunteers that serve on the various committees, the Annual Meeting would not be as informative, diverse, enjoyable, and connected. Thank you all. We wish you all a very successful Annual Meeting in Portland.

See you next year in Minneapolis!

Melody Keena and Sue Blodgett
2014 ESA Program Committee Co-Chairs

Pictured front row (from left to right): John Adamczyk, Sue Blodgett, Melody Keena, Tamra Reall Lincoln
Back row (from left to right): Jeffery Stuart, Frank Zalom, Marianne Alleyne, Jessica Ware, Luis Canas, Faith Oi, Wes Watson, Qisheng Song, Hojun Song
Not pictured: Sujaya Rao and Fred Musser

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ABOUT PORTLAND

Portland, Oregon

Portland, Oregon, host for ENTOMOLOGY 2014, offers limitless recreation, fabulous food and drink (including delicious microbrews), and a flourishing culture. Enjoy the arts, explore the distinctive neighborhoods and the variety of nightlife. Portland's modern transit system makes getting around easy. Stop in the famous Powell's City of Books, an independent bookstore that fills an entire city block with more than one million new, used, and out-of-print books; and grab a one-of-a-kind doughnut from the Voodoo Doughnut shop. Plan extra time around the meeting to explore the amazing wine country, Columbia River Gorge, Mount Hood, Oregon coastline, and other unique areas that are all within easy reach of Portland.

Join us Sunday, November 16, at 3 PM in D135 in the Oregon Convention Center for an introduction to the city of Portland and the surrounding area. Meet with local representatives and learn about the different areas to explore while you are in the Pacific Northwest.

Ground Transportation

MAX Light Rail

Eighty-four stations connect you from the airport to downtown Portland and the Oregon Convention Center. A single trip on the MAX Light Rail to any destination will be $2.50 per person. ENTOMOLOGY 2014 registered attendees will receive complimentary light rail passes to enjoy throughout the conference. Passes will be available for pickup at the ESA Registration and Information Center. Use the TRI MET trip planner at trimet.org. Some helpful tips when using the MAX Light Rail include the following:

- The Red line connects downtown Portland (City Center/Pioneer Square) to the Convention Center, the DoubleTree Hotel, and the airport.
- The Red, Blue, and Green lines connect many of the downtown hotels to the Convention Center and DoubleTree Hotel.
- Valid tickets are required for all riders on MAX Light Rail, and transit staff may request to view tickets during any trip. ESA recommends that you always have a valid ticket for riding MAX Light Rail.
- Several free mobile apps are available to download to your smartphone; for more information, visit trimet.org/apps/index.

How To Ride MAX

You must have a validated ticket, bus transfer receipt, or pass before boarding MAX. Ticket machines and validators are located at the station. There are no fare boxes onboard MAX. Keep your ticket until you have completed your trip.

Signs at the station indicate where to wait and when the next train is due. Signs on the front of each train identify the line (Blue, Green, Red, or Yellow) and destination.

MAX stops at every station so you don't need to signal the operator to get on or off. The station name is announced before each stop and appears on a reader board overhead.

On Sunday, November 16, MAX Light Rail will not operate to the airport. Riders from the airport should take an express shuttle from PDX to the Gateway Transit Center to continue on MAX towards the downtown hotels and convention center.

Blue Star Airport Shuttle

Blue Start Airport Shuttle provides daily airport shuttle service to/from the Portland downtown area. Shuttles are $14 one-way, $24 roundtrip. Be sure to book your trip in advance: bluestarbus.com/airport-shuttle.php. Shuttles can be located outside of baggage claim, via the walkway to the left on Island #2 under the "Scheduled Buses and Vans" pick-up area.

Taxi

Taxi service is located outside of baggage claim. The approximate cost for a taxi is $30 each way.

For additional taxi service while in Portland, contact the following:

Radio Cab Company
503-227-1212

Broadway Cab Company
503-227-1234

Green Cab
503-252-4422

New Rose City Cab
503-282-7707

Portland Taxi Company
503-256-5400

Parking

Parking rates vary at each hotel. Please check your reservation or hotel website for parking information.

The Oregon Convention Center provides on-site parking in its clean and secure underground parking garage; 800 spaces are available on the garage's two levels. The maximum daily rate to park is $10. Enter the garage via its First Avenue or Lloyd Boulevard entrances. Clearance on the P1 level is seven feet; clearance on the P2 level is nine feet. ***Overnight parking in the garage is prohibited.***

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Convention Center

The Oregon Convention Center is the largest convention center in the Pacific Northwest. Located in beautiful and lively downtown Portland, Oregon, the Oregon Convention Center is the preferred destination for many groups because of its world-class features and amenities, award-winning customer service, and leadership in sustainable practices.

Oregon Convention Center
777 NE Martin Luther King Jr. Boulevard
Portland, OR 97232
Phone: 503-235-7575

Hotels

DoubleTree by Hilton Portland (Headquarters Hotel)
1000 NE Multnomah Street
Portland, Oregon 97232
Phone: 503-281-6111
MAX Light Rail: Lloyd Center (Red, Blue, Green)

Hilton Portland & Executive Tower
921 SW 6th Avenue
Portland, OR 97204
Phone: 503-226-1611
MAX Light Rail: Pioneer Courthouse Square (Red, Blue, Green)

Courtyard Portland Downtown/Convention Center
435 NE Wasco Street
Portland, OR 97232
Phone: 503-234-3200
MAX Light Rail: Convention Center (Red, Blue, Green)

Crowne Plaza Portland Downtown Convention Center
1441 NE 2nd Avenue
Portland, OR 97232
Phone: 503-233-2401
MAX Light Rail: Convention Center (Red, Blue, Green)

Portland Marriott City Center
520 SW Broadway
Portland, OR 97205
Phone: 503-226-6300
MAX Light Rail: Pioneer Courthouse Square (Red, Blue, Green)

Quality Inn Downtown Convention Center
431 NE Multnomah Street
Portland, OR 97232
Phone: 503-233-7933
MAX Light Rail: Convention Center (Red, Blue, Green)

The Paramount Hotel
808 SW Taylor Street
Portland, OR 97205
Phone: 503-223-9900
MAX Light Rail: Library/SW 9th (Red, Blue)

University Place Hotel and Conference Center
310 SW Lincoln Street
Portland, OR 97201
Phone: 866-845-4647
MAX Light Rail: PSU (Green)

The Westin Portland
750 SW Alder Street
Portland, OR 97205
Phone: 503-294-9000
MAX Light Rail: Pioneer Courthouse Square (Red, Blue, Green)

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GENERAL INFORMATION

ESA Registration and Information Center

Registration will be held at the Oregon Convention Center, in the foyer in of Exhibit Hall C, during the following times:

Saturday, November 15, 2–6 PM
Sunday, November 16, 7 AM–9 PM
Monday, November 17, 7 AM–5 PM
Tuesday, November 18, 7 AM–5 PM
Wednesday, November 19, 8 AM–12 PM

Registration and Information Center phone number: 503-963-5710

Attendees can pick up their registration materials at the Registration Center. ESA staff are always available to answer your questions.

Cancellation and Refund Policy

ESA will honor cancellation refunds in full for its Annual Meeting until 5 PM EST, October 3, 2014. Partial refunds will be granted for requests submitted October 4–17, 2014 (20% service charge will apply). No refunds will be granted for cancellations received after October 17, 2014. Please submit cancellation requests via e-mail to nwilloughby@entsoc.org. Requests can also be faxed to 301-731-4538. All refunds will be processed after the Annual Meeting and no refunds will be made for on-site registrations.

Any tour reservation must be cancelled no later than October 3, 2014, to receive a refund. If insufficient tour enrollment causes a professional or destination tour to be cancelled, ESA will issue a full refund after the meeting closes.

Certificates of Presentation and Attendance

Presenters can download and print on-site certificates of presentation and attendance in the Presentation Preview Room (PPR) in C120-122 in the Oregon Convention Center after their presentation has taken place. For hours of operation of the Presentation Preview Room, please see page 21. Attendees who did not present during ENTOMOLOGY 2014 may request Certificates of Attendance at the ESA Registration and Information Center.

Certificates will also be available for download via Speaker's Corner after the conference ends for download once you return home.

Information Desk

The Information Desk is part of the ESA Registration Center and will be staffed the same hours as registration. Stop by and let us help you out! Phone number: 503-963-5710.

Business Center

The Business Center is located on the ballroom level, directly above Stir (a food & beverage outlet). Self-service copying, printing, and computer services are conveniently available for you to use throughout the conference.

Career Center

The Career Center will be set up in Exhibit Hall C in the Oregon Convention Center. Review current position openings and/or drop off your résumé. Operating hours are:

Sunday, November 16, 7:30–9:30 PM
Monday, November 17, 9 AM–5 PM
Tuesday, November 18, 9 AM–5 PM
Wednesday, November 19, 9 AM–2 PM

Coat/Bag Check

Attendees will be able to check their coats and bags at the Coat/Bag Check located in the Holladay Lobby, near the MAX Light Rail Entrance. ESA provides this complimentary service to you.

BASF The Chemical Company Cyber Café and Charging Station Sponsored by BASF

If you left your laptop at home, we still have you covered! Just head to the ESA Exhibit Hall (Hall C) during regular exhibit hours, where you can use the computer stations located in the Cyber Café to check your e-mail.

Need a quick charge for your phone, tablet or other mobile device? Two charging stations will be setup in the cyber café with power supply and a selection of popular chargers for you to stay connected while in Portland.

Daily Announcements and Messages

In addition to using the ENTO2014 mobile app, you may check last-minute announcements and messages on the bulletin board located outside the Preview Presentation Room (PPR), Oregon Convention Center, Meeting Room C120-122, as well as near the ESA Registration and Information Center, located outside of Exhibit Hall C.

ESA Central Exhibit Booth

Look for the "ESA Tower" in the center of the Exhibit Hall, and take time to stop in to learn about ESA programs and activities. Talk with ESA Headquarters staff, meet a colleague, rest your feet, and learn about the many benefits of ESA membership and the certification program. Renew your membership, purchase a publication, have your business card laminated into a luggage tag, or grab a bag of popcorn. Purchase an extra copy of the 2015 World of Insects calendar, and enter for your chance at winning a prize during the Passport Drawing. It's all here.

Check out ESA's blog (www.EntomologyToday.org) for the latest entomological news, jobs, research, discoveries, and events.

Drop by to learn more about the new ESA-Oxford University Press publishing agreement, which offers significant benefits for ESA members—including the elimination of journal page charges for ESA's print journals starting in January 2015. And chat with staff about ESA's newest open-access journal, the *Journal of Insect Science*.

Picture yourself in Orlando during ICE 2016! Grab some friends and have your photo taken in the ICE 2016 Photo Booth on Sunday evening during the Opening Reception, or Monday and Tuesday during the poster receptions.

Learn about the new ESA Science Policy Fellows program. Five ESA members have recently been selected to take part in this program to learn how science policy and science funding decisions are made at the federal level, and to engage with lawmakers and leaders in Washington, D.C.

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Take Note – Special Contests and Giveaways:
We have a special gift for the first 100 members who stop by the ESA Booth or Registration Desk to renew their membership or join for 2015! If you renew your membership at the ESA Registration Desk, please bring your receipt to the ESA Booth for your gift.

Attend the Student Debates, pick up a raffle ticket there, and have a chance to win a $50 AMEX gift card. You must be present to win. Stop by the Debates room for more information.

Be in the ESA Booth on Wednesday at 1 PM for the Passport Drawing, where you'll have the opportunity to win valuable prizes donated by our exhibitors. Drop your completed ticket in the prize hopper. You must be present on Wednesday to win. Good luck!

For a chance to win a FREE registration to next year's meeting in Minneapolis, Minnesota, attend the Closing Plenary Session on Wednesday afternoon and complete a ticket there to drop into the prize drum.

First Aid/Medical Emergencies

If first aid services are needed while in the Convention Center, please call 503-731-7849 (or from any house phone, dial 7849). Please have the following information ready: (1) your exact location, (2) the nature of the emergency, (3) whether the patient is conscious, and (4) whether there are life-threatening injuries, bleeding, etc. In a life-threatening emergency, dial 911.

Guest Hospitality

Registered guests are allowed access to the Exhibit Hall, Welcome Reception, Opening and Closing Plenary Sessions, the Linnaean Games, the Student Awards Program, and the presentation given by the primary registrant. For more information, please visit the ESA Registration and Information Center.

Internet Access

ESA is offering complimentary Wi-Fi throughout the convention center. Plenty of tables for networking will be positioned at various locations in the Convention Center, including the Cyber Café. Take advantage of free Wi-Fi to take a break with friends, network, check your e-mail, or Skype with the family back home.

Password login is not required at the Oregon Convention Center.

Lost and Found

Check in with the staff at the ESA Registration Center if you have lost something or have found a treasure and need to turn it in. We'll do our best to help you!

Mobile App Sponsored by BASF

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Enhance your experience at ENTOMOLOGY 2014 by downloading the ENTO2014 mobile app. Access the latest program information and schedules, stay organized with the show dashboard, create a personal schedule, link to exhibitors, connect with other attendees, join in the show chatter with the built-in Twitter feed, and keep up with the show news with RSS feeds—all from your smartphone. The app is fully integrated with the abstract management system so you will always have the latest information at your fingertips.

Downloading the app for ENTOMOLOGY 2014 is easy. For iPhone and Android, visit the App Store or Android Market on your phone and search for ENTOMOLOGY 2014.

All phone types, including those listed above, may simply point their mobile browser to m.core-apps.com/ento2014. The system will direct you to the proper app version for download to your device. Bookmark this page for easy access throughout ENTOMOLOGY 2014.

Mother's Room

ESA is offering a comfortable private place for nursing mothers within the Oregon Convention Center. Please stop by the ESA Registration Desk for room location and pick up a key to access the space on the third floor.

No Photographs Please

ESA requests that attendees not take photographs or videos during sessions because they are disruptive to the presenters. If you wish to take photographs of a presentation or poster, please contact the presenter for permission. ESA reserves the right to use photographs and videos taken and testimonials given during the ENTOMOLOGY 2014 meeting for informational and promotional purposes.

Press

The ESA Information Desk, located in the ESA Registration area, will serve as the press desk for the meeting. Members of the media who have preregistered can pick up their press passes there. Those who have not yet registered can request passes. However, proper media credentials must be presented upon arrival at ENTOMOLOGY 2014, and the credentials must show a direct affiliation with an accredited news organization (print, TV, or radio) or membership with the National Association of Science Writers. Public information officers from universities may also receive press passes with proper credentials and identification.

Freelance journalists who do not have media credentials and a professional affiliation will not receive press passes, but exceptions may be made on a case-by-case basis. Requests can be made by calling 301-602-8953.

Companies or organizations producing publications, videos, and/or other electronic media intended for marketing, advertising, financial analysis, or public relations purposes may not register as members of the media. ESA reserves the right to bar from this and future meetings any registered media personnel who, at the determination of the Executive Director of the ESA, misuse media privileges to engage in activities other than journalistic pursuits.

No members of the media will be permitted to record symposia, lectures, meetings, or other events without prior written permission from the ESA; and no film or videotape may be broadcast or rebroadcast without prior review and written permission from the ESA. The press contact for the ESA Annual Meeting is Richard Levine, rlevine@entsoc.org or 301-602-8953.

Refreshments and Concessions

Hungry or thirsty? Need that morning cup of coffee? For those early morning sessions, stop by one of the concession carts located throughout the Convention Center Sunday through Wednesday for a quick cup of coffee, juice, Danish, and more. Concessions will be available throughout the day, including for the Lunch and Learn sessions, and in Exhibit Hall C.

Social Media at ENTOMOLOGY 2014

Get connected to ENTOMOLOGY 2014 before you arrive in Portland. ESA is connected to you via social media in a variety of ways. Use the conference hashtag **#entsoc14** to share your ENTOMOLOY 2014 and Portland experiences with your fellow attendees.

Twitter: ESA staff and volunteers will be using Twitter for live updates, highlights from sessions, and more. Follow us by visiting twitter.com/EntsocAmerica. Twitter users can simply login and click "follow." View and participate in conversations about ENTOMOLOGY 2014 on Twitter by using the hashtag #entsoc14. Don't have a Twitter account? You can still view our updates and even bookmark the ESA Twitter webpage.

Synergy in Science:
Partnering for Solutions

ASA • CSSA • SSSA • ESA
2015 MEETING
November 15-18 | Minneapolis, MN

Connect with 8,000 leading scientists in academia, government, and industry who will share the latest research, industry advances, and product development related to entomology and the agricultural sciences. The American Society of Agronomy, the Crop Science Society of America, the Soil Science Society of America, and the Entomological Society of America will co-locate their annual meetings in the Midwest's cultural capital— Minneapolis, Minnesota.

This important event offers you valuable opportunities to gain exposure for your research, learn what's new and exciting, and make valuable one-on-one connections with the top scientists from all four societies.

- **Plan your presentation topics now**
- **Secure your travel funding early**
- **Prepare to share, learn, and make valuable connections!**

Mark your calendar for these important dates:

Symposia submission sites open	December 2014
Program symposia deadline	January 30
Section & member symposia deadline	February 27
Paper/poster submission site opens	April 15
Paper/poster submission deadline	June 12
Virtual poster deadline	July 31

Stay tuned to eNews and to ESA's website for program information.

www.entsoc.org/entomology2015

MINNEAPOLIS

Easily-accessible, with award-winning dining, favorite attractions, world-class museums, a plethora of options for shopping and theatre, and beautiful natural spaces— Minneapolis has it all— and is host to this exciting meeting. It's a center for culinary prowess, and boasts three James Beard award-winning restaurants for Best Chef in the Midwest. And with no sales tax on clothing, you'll save $$ when shopping at the Mall of America's 500+ stores.

Instagram: Join us on Instagram via the ENTOMOLOGY 2014 mobile app and post your best photos of your experiences in Portland using the hashtag #entsoc14.

LinkedIn and Facebook: ESA and the ESA Certification Corporation are on LinkedIn (entsoc.org/LinkedIn) and Facebook (entsoc.org/facebook). Join our groups to connect to colleagues, friends, and new contacts in advance of the conference and start making plans for Portland!

YouTube: View videos from previous conferences on our YouTube Channel (www.entsoc.org/youtube). View the ENTOMOLOGY 2014 videos as they are posted or hear the highlights planned for this year's conference!

Student volunteers will be shooting video throughout the meeting to upload to the ESA Channel on YouTube. Videographers also will be interviewing presenters and others during the meeting. You could be on ESA's YouTube channel!

Shipping Services

Global Experience Specialists (GES) is excited to offer new attendee shipping services to help get your materials home. Visit the GES services desk in the back of Exhibit Hall C to obtain a shipping label, and bring your prepackaged material to the desk to get it home quickly!

Smoking Policy

Smoking is not allowed in any of the public meeting spaces at the Oregon Convention Center. Check with the front desk of your hotel about the smoking policy in guest rooms.

Tours – ESA Sponsored

All tours are held rain or shine (unless otherwise noted) and require a minimum number of participants. Please stop by the ESA Registration and Information Center to check tour and workshop availability. Tours meet and leave from the Exhibit Hall C foyer near the ESA Registration and Information Center in the Oregon Convention Center (unless otherwise noted below). Please arrive a few minutes early to board the bus and have your tour ticket with you.

Join us Sunday, November 16, at 3 PM in D135 in the Oregon Convention Center for an introduction to the city of Portland and the surrounding area. Meet with local representatives and learn about the different areas to explore while you are in the Pacific Northwest.

Mount Hood Snowshoeing Tour

Date: Saturday, November 15, 2014
Time: 8 AM – 4 PM
Fee: $90 USD
This tour is weather permitting and may be subject to last-minute cancellation.
Location: Meet at the Registration and Information Center

Join us for a fully guided half-day snowshoe adventure in scenic Mount Hood. Guides will meet the group at Timberline Lodge, a national historic landmark. There are two options available, depending on the desired activity level: one utilizing part of the Pacific Crest Trail and the other heading up Mount Hood to Silcox Hut. Snowshoes and a boxed lunch are included with the tour. Participants should be prepared with cold weather gear and layers for outdoor activity.

Vino & Views Gorge Tour

Date: Saturday, November 15, 2014
Time: 8 AM–5 PM
Fee: $105 USD
Location: Meet at the Registration and Information Center

Drive through the beautiful Columbia River Gorge National Scenic Area with a first stop at the Vista House. Situated on a cliff with a panoramic view, the Vista House was built in 1916 as a memorial to Oregon pioneers and as a comfort station for those traveling on the Historic Columbia River Highway. The second stop will be at the memorable and magnificent Multnomah Falls. According to Native American lore, Multnomah Falls was created to win the heart of a young princess who wanted a hidden place to bathe. Next, bask in the fabulous new tasting room of Mount Hood Winery with gorgeous mountain and vineyard views. After a lovely lunch, you will have the opportunity to have a guided tasting of Mount Hood Winery's wonderful wines. If time allows, there may be a last stop at the engineering marvel, Bonneville Dam, to witness the power of water before returning to Portland. Lunch is included in the tour fee.

Oregon's Birds, Bugs, and Bounty Experience

Date: Thursday, November 20, 2014
Time: 9 AM – 3:30 PM
Fee: $130 USD
Location: Meet at the Registration and Information Center

Hike through Forest Park, an impressive reserve of more than eight miles (13 km) on the hillsides of Portland overlooking the Willamette River. Forest Park, one of the country's largest urban forest reserves and a major component of a regional system of parks and trails, covers more than 5,100 acres of mostly second-growth forest with a few patches of old growth. A guide will lead you through the park providing history of the trail, human impact on this habitat, and information on the various life forms that live throughout the park. Trails are often muddy in November and are steep in places. Participants should be prepared for the weather and a hike of moderately strenuous distance and terrain, but the pace will be such that you can take in the lush surroundings with questions and exploration. After taking in the flora and fauna of this beautiful urban park, you will settle in for lunch and a beer at a local brew pub! This outing will be a true "Portlander" type of day. Lunch is included in the tour fee.

Tours – America's Hub World Tours

ESA is proud to partner with America's Hub World Tours to provide several tour options for ENTOMOLOGY 2014 in Portland, Oregon. Working with America's Hub World Tours, ESA has selected discounted tour packages for ENTOMOLOGY 2014 attendees that will be offered daily throughout the conference. This offers you the most flexibility and cost savings when selecting additional activities while in Portland. We hope you enjoy your time as you get out and about to see the city!

Mount Hood Loop & Gorge Waterfalls Tour

Dates: Sunday, November 16; Tuesday, November 18; Thursday, November 20
Time: 9 AM–5:30 PM
Fee: $72 USD (sign up through www.entsoc.org/tours)

Spend the day seeing the best nature sites outside the city and enjoy spectacular views of Mount Hood. Standing at 11,245 feet, take in views of Mount Hood from the Timberline Lodge, a national historic landmark. Next we visit the Hood River area and the Colombia River Gorge waterfalls, including the second highest year-round waterfall in the United States, before returning to the Oregon Convention Center. Lunch is not included in the cost of the tour; however, time will be provided to stop for lunch along the way.

Hiking the Columbia River Gorge Waterfall Trails

Date: Daily (Saturday, November 15 – Thursday, November 20)
Time: 9 AM–1 PM
Fee: $60 USD (sign up through www.entsoc.org/tours)

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Because of our broad interest in entomological expertise and experience, at any given time we may be seeking individuals with newly earned Bachelor's MS, PhD degrees, PhDs with academic tenure, and anything in between.

We continue to look for talented scientists with the following expertise:

- Insect production and rearing
- Trait discovery and characterization
- Laboratory, greenhouse, and field efficacy testing
- Environmental impact and non-target testing
- Population ecology and genetics
- Insect Resistance Management
- Trait stewardship
- Project management
- Global pest control
- Regulatory affairs - to gain product approval from regulatory agencies
- Scientific affairs - to interact with the academic community
- Technology development and extension
- Marketing and sales

If you are an entomologist who wants to be challenged by important problems, and who wants to work for a company which values your efforts and insight, apply now:

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The National Scenic Area includes Oregon and Washington, and hikes may be on either side of the Columbia River. Your hike includes views of gorgeous waterfalls in the Columbia Gorge National Scenic Area, including the Pacific Northwest forest with old growth firs, cedars, canopied covered trails, and fern-lined paths along creeks. Fall hikes may view spawning salmon runs in the wild. The gorge is also host to a unique diversity of plant and animal life, including over 800 species of wildflowers, 15 of which exist nowhere else on earth. Lunch is not included in the tour fee.

Multnomah Falls & Gorge Waterfalls

Date: Daily (Saturday, November 15 – Thursday, November 20)
Time: 9 AM–12:45 PM
Fee: $48 USD (sign up through www.entsoc.org/tours)

Spend half the day seeing rushing water where every twist and turn brings new vistas, from majestic waterfalls such as Bridal Veil Falls, Latourell Falls, Wahkeena Falls, Multnomah Falls, Horse Tail Falls, and Crown Point Vista House (the most visited natural site in Oregon), to astounding views of the mountain ranges, forestry growth, and more. Lunch is not included in the tour fee.

Portland City Tour

Dates: Daily (Saturday, November 15 – Thursday, November 20)
Time: 9 AM–12:30 PM or 2–5:30 PM
Fee: $48 USD (sign up through www.entsoc.org/tours)

See more than just the downtown highlight and get introduced to the City of Portland history, culture, and current events. Travel through various parts of the city and visit all of the must-see attractions, including the Pearl District, Pittock Mansion, International Rose Gardens, Portland Arial Tram Ride, and more. All entry fees are included in the tour fee.

Trainings & Workshops

Responsible Conduct of Research (RCR) Training

Date: Sunday, November 16
Time: 1:30–4:30 PM
Fee: $20 (Advance registration is required through the ESA registration site)
Location: Meeting Room E147-148, Oregon Convention Center

Instructor: Dr. Ernest S. Delfosse, Professor
Michigan State University Department of Entomology

RCR training is an integral part of the preparation and long-term professional development of current and future generations of scientists and engineers. RCR is critical for excellence, as well as public trust, in science and engineering.

Ethical and responsible conduct of research is such an important element of preparation for a professional career in science that ESA recommends that RCR training be taken by all students, even if not currently supported by a grant. ESA RCR Training topics will cover Data Management, Conflict-of-Interest, Protection of Human Subjects, Animal Welfare, Research Misconduct, Publication and Authorship, Mentor-Trainee Responsibilities, Peer Review, Collaborative Science, Intellectual Property, Plagiarism, and Scientists as Responsible Members of Society—Environmental and Societal Impacts of Scientific Research.

RCR training is required for all postdoctoral researchers, graduate students, technicians, and undergraduate students who are supported on an NSF grant that was submitted on or after January 4, 2010.

A certificate of completion will be issued to each student who completes the training.

IMPORTANT: Students must check with their universities to ensure that ESA RCR Training will be accepted as meeting the requirements of the university.

Preregistration is required; space is limited. Stop by the ESA Registration and Information Center to check on-site availability and to register.

STEP Workshop—Challenges and Opportunities for Future Leaders: A Training Workshop for Student Transition and Early Professional Members of ESA

Date: Sunday, November 16,
Time: 1:15–5:15 PM
Location: Portland Ballroom 256, Oregon Convention Center

This half-day, three-part, interactive workshop will provide leadership training and skills for student transition and early professional members to help them prepare for the challenges in their careers and to support the development of the next generation of leaders in entomology. The workshop will cover emerging career opportunities in entomology, managing the early years of the next career step, and exercises related to becoming effective leaders and working in teams. Boxed lunch is provided. Limited to 50 participants; by advance registration only. Preregistration is required; space is limited. Stop by the ESA Registration and Information Center to check on-site availability and to register.

Moderator: Jennifer M. Tsuruda, Clemson University

Invited Speakers: Anne Nielson, Rutgers University; Tracy Leskey, USDA ARS; Toby Spanier, University of Minnesota; Mark Abney, University of Georgia; and Vaughn Walton, Oregon State University

Becoming Effective Leaders and Working in Teams: Tobias Spanier, University of Minnesota, Marshall, MN; Anne L. Nielsen, Rutgers, The State University of New Jersey, Bridgeton, NJ; and Jeffrey Bradshaw, University of Nebraska, Scottsbluff, NE

Managing the Early Years of the Next Career Step: Laura A. Campbell, Dow AgroSciences, Carbondale, IL; and Jennifer M. Tsuruda, Clemson University, Clemson, SC

Emerging Career Opportunities in Entomology: Wendy A. Johnson, Kansas State University, Manhattan, KS; and Ian M. Grettenberger, Pennsylvania State University, State College, PA

Insect Illustration Workshop Sponsored by BioQuip

Date: Wednesday, November 19
Time: 1:30–3:30 PM
Fee: $16 (Advanced registration is required through the ESA registration site)
Location: Meeting Room E146, Oregon Convention Center

Instructor: Stacey Thalden, Intersectus Design

This workshop will focus on the scientific illustration of beetles, butterflies, and other insects. The practice of drawing not only heightens the artist's observation, but also results in a work of art that can be used as a teaching tool, in scientific writing, or to beautify a living space. The emphasis in this workshop will be on conveying anatomical structure and creating aesthetically pleasing visual communication. Exercises will allow participants to practice drawing techniques as they work toward a finished piece. Instruction is geared to all levels, and all participants will receive individual assistance.

Please feel free to bring pinned insects, magnifiers, and any additional drawing materials you would like. Pens, pencils, and a sketchbook will be provided.

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University Entomology Clubs

Club representatives will be available to sell T-shirts and more in ESA's Exhibit Hall (Hall C) during normal exhibit hall hours. As of July 30, 2014, the list of clubs participating includes the following:

Entomology Graduate Student Association (EGSA) of Washington State University
Entomology Graduate Student Association (EGSA), The Ohio State University
Entomology Graduate Student Association of UW—Madison
Florida State University EERDG
Frenatae: University of Minnesota Entomology Student Organization
G.U.E.S.S.—Graduate and Undergraduate Entomological Student Society
H. Garmin Entomology Club
Isely-Baerg Entomology Club at the University of Arkansas
Louisiana State University
North Carolina State University Entomology Graduate Student Association
The University of Nebraska Bruner Entomology
Society of Overseas Nepalese Entomologist (SONE)
University of California Davis Entomology Graduate Student Association
University of Florida's Entomology and Nematology Student Organization (ENSO)
University of Illinois Entomology Graduate Student Association
University of Maryland's Entomology Student Organization
Utah State University Entomology Club
Virginia Tech—W.B. Alwood Entomological Society

Urban Adventure Run

Sunday, November 16, 10 AM–12 PM
Oregon Ballroom 201, Oregon Convention Center
Fee: $15 per person (weather permitting)

Join your fellow entomologists on our first Urban Adventure Run through the streets of downtown Portland! Just like a scavenger hunt, organizers will map several checkpoints around the city for participants to visit and pick up raffle tickets for prize drawings at the end of the run. At the start of the run, a large map will show all of the checkpoints around the city; download it to your smartphone and you are off to collect as many raffle tickets as you can in one hour.

Meet back at the starting point to enter your tickets for the prize drawing, cool down, and check out the gear from the event sponsor, FitRight NW.

Advance registration includes an ESA Urban Adventure Run T-shirt, post-run snacks and beverages, and automatic entry into the prize drawings.

Run as a group or as an individual to get out and see the city!

PROGRAM INFORMATION

Uploading Presentations

Upload your presentation at least 24 hours before your presentation.

Please be aware that if you want to upload your file on the day of your presentation, you can only do so in the presentation room itself, before the start of the session or during the short break (if one is scheduled). It is not the responsibility of the ESA Program Committee nor the moderator if there is not enough time available to upload the talk. If you are unable to upload your talk (even just a draft) the day prior to your assigned time, it would be considerate to contact the moderator to explain your delay and your intent for when to upload the file. **If using video files or unusual file-types embedded in your presentation, you must stop by the PPR room (C120-122) to test the presentation within our system**. Confex employees will be available in case you run into problems and need advice. It is always a good idea to bring a backup copy of your presentation on a flash drive.

The Presentation Preview Room (PPR Room) is located in C120-122 of the Oregon Convention Center. Operating hours:

Saturday, November 15, 2–6 PM
Sunday, November 16, 6:30 AM–6 PM
Monday, November 17, 6:30 AM–6 PM
Tuesday, November 18, 6:30 AM–6 PM
Wednesday, November 19, 6:30 AM–12 PM

Moderator Training

Moderators for symposia, student competition sessions, and 10-minute paper sessions must attend one of the moderator training sessions. Here you will receive details on equipment operation, light controls, and other responsibilities. The audiovisual and Confex representatives will be available to answer your questions. Moderators must keep the program on schedule and **not move up talks if one is withdrawn**. In case of tardy file uploads by presenters, the moderators have the right to refuse a presentation to be given.

All moderator training sessions will be held in C123 in the Oregon Convention Center. Following are the dates and times for the training sessions:

Sunday, November 16, 7–7:30 AM or 12–12:30 PM
Monday, November 17, 7–7:30 AM or 12–12:30 PM
Tuesday, November 18, 7–7:30 AM or 12–12:30 PM
Wednesday, November 19, 7–7:30 AM

Judges' Training

Judges for the student competitions must attend one of the judges' training sessions. Here you will receive details regarding the judging process and criteria.

All judges' trainings will be held in D132 in the Oregon Convention Center. The dates and times for the training sessions are as follows:

Sunday, November 16, 1:30–2 PM or 4:45–5:15 PM
Monday, November 17, 7–7:30 AM

Lunch and Learn Sessions

You have a great opportunity to get together with friends and colleagues after the morning sessions, have lunch together, and learn something new all at the same time. Concession options will be available near the Lunch and Learn meeting rooms, so you can quickly purchase your lunch and enjoy it during the presentation.

There will be six Lunch and Learn sessions this year:

Science Policy: A View from Washington

Sunday, November 16, 12:15–1 PM
Portland Ballroom 254, Oregon Convention Center

Scientists can and should play a role in ensuring that lawmakers and federal agency officials understand the ramifications of their decisions on the scientific enterprise. Additionally, it is important for scientists to understand how policy and funding decisions can impact their work. This program will review the federal science landscape, forecast the outlook for next year based on the 2014 election outcome, and provide information about ESA's involvement in science advocacy.

Facilitators: Karen Mowrer and Alison Thompson, Lewis-Burke Associates

Career vs. Job – What Can You Do with Your Entomology Degree Besides Looking at Bugs?

Sponsored by BASF Corporation

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Monday, November 17, 12:45–1:45 PM
Portland Ballroom 254, Oregon Convention Center

This Lunch and Learn session is designed for all students to learn from others on positions in entomology and public health that do not have a primary function of controlling or measuring insects. Come learn from ESA members about a variety of career opportunities and what you can do now to prepare for life after college. This session can help you decide what other electives you might want to take or internships to look for to help you find a position helping others with their IPM programs, vector management, public health management, and much more. Boxed lunches will be provided to the first 50 students attending the lunch and learn.

Facilitator: Janet A. Hurley, Texas A&M University
Panel: Robert Davis, BASF Corporation; John Carlson, Tulane University and Allie Taisey, Northeast IPM Center

Eat, Drink, and Be Merry for Tomorrow We Die: Odyssey in Amber

Monday, November 17, 12:45–1:45 PM
Portland Ballroom 255, Oregon Convention Center

Being the insect trap that it is, amber contains various invertebrates that are feeding, mating, ovipositing, and dying from parasites and diseases. Examples of these life processes are depicted in a range of insects in amber from around the world. These fossils provide a glimpse of insect behavior in communities that no longer exist. The session will provide initial background about insects in amber and then open up for discussion. Stereomicroscopes will be available for a closer look at diverse bugs in amber. Bring your jewelry/collections and share your amber experiences!

Facilitator: George Poinar, Emeritus Professor, Department of Integrative Biology, Oregon State University

"Don't Bury the Lede": How To Unlearn All the Terrible Writing Habits You Developed in Academia

Tuesday, November 18, 12:15–1:15 PM
Portland Ballroom 252, Oregon Convention Center

The way that we write in academic journals just doesn't work for science communication for general audiences. Scientists like to start with a broad overview, provide lots of details, and then, eventually at the end, finally tell you what actually happened. That doesn't work at for nonscience audiences. This workshop will be a brief overview of structuring stories for the popular press, and helpful tips for your writing workflow, including WIFM, lede writing, and finding your unique voice.

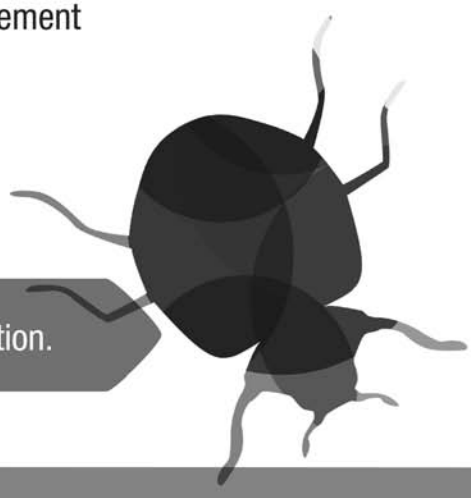
Facilitator: Gwen Pearson, Get Your Nature Geek On

Proudly announcing

a new partnership between ESA and Oxford University Press

Starting in 2015, OUP will publish ESA's 8 periodicals.

Annals of the ESA
Arthropod Management Tests *moving to open access*
Journal of Insect Science *new to ESA*
Journal of Integrated Pest Management
Journal of Economic Entomology
Journal of Medical Entomology
Environmental Entomology
American Entomologist



Visit **www.insectscience.org** for more information.

OUP booth #102-104

While you're at Entomology 2014...

OUP wants to know what makes entomology The Most Interesting Profession in the World?

Stop by the OUP booth (#102-104) during exhibit hours and tell us why you think entomology is great! We will conduct quick video interviews to share with our online followers - spreading the word about entomology, ESA, and ESA's publications.

Follow **@OxfordJournals** and **#EntSoc14** on Twitter for details!

ENTOMOLOGICAL SOCIETY OF AMERICA

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ICE 2016: Networking Internationally To Maximize Your Professional Connections

Tuesday, November 18, 12:15–1:15 PM
Portland Ballroom 255, Oregon Convention Center

This engaging panel discussion will include a brief history on the ICE Congresses, benefits of participating in ICE 2016, and advice for how to plan and prepare in order to maximize the value of the event. There will be plenty of time for Q&A. A limited number of sponsored lunches will be provided.

Facilitator: Debi Sutton, ESA Director of Membership & Marketing
Panel: Dr. David Denlinger, Ohio State University; Dr. George Hamilton, Rutgers University; and Dr. Murray Isman, University of British Columbia

Outreach in Unusual Places: Making Push-Pull Marketing Work for You

Wednesday, November 19, 12:15–1:15 PM
Portland Ballroom 252, Oregon Convention Center

A perennial discussion is about scientists "doing" outreach, with lots of opinions about who's doing it, who's fault it is that so few do it, and what the roadblocks to doing it are. Rather than yet another tiresome round of the blame game (e.g., "Entomologists should do more outreach!" "Scientists suck at outreach!"), the goal of this track is to help entomologists by sharing marketing strategies and brainstorming about potential partners for large outreach projects. Examples of successful entomology outreach at sci-fi cons, NASCAR races, bars, and music festivals will be case-studied as examples of reaching nontraditional audiences with minimal effort.

Facilitator: Gwen Pearson, Get Your Nature Geek On

Opening Plenary Session & Founders' Memorial Lecture

Sunday, November 16, 5:30–7:30 PM
Oregon Ballroom, Oregon Convention Center

Call to Order, Welcome, Introductions, Remembrance
Frank Zalom, *President*

State of the Society/Presidential Address
Frank Zalom, *President*

ESA Executive Director's Report
C. David Gammel, CAE, *Executive Director*

Entomological Foundation Report
Tom Green, *Entomological Foundation President*

Update on International Congress for 2016 in Orlando, Florida
Walter Leal and Alvin Simmons, *Co-Chairs of ICE 2016*

ESA Professional Awards Program
Frank Zalom, *President*, and Phil Mulder, *Vice President*

Entomological Foundation Medal of Honor
Tom Green, *Entomological Foundation President*

Annual Founders' Memorial Lecture
Dr. Fred Gould, William Neal Reynolds Distinguished Professor of Entomology at North Carolina State University (NCSU), will deliver the Founders' Memorial Award lecture and honor Dr. Robert L. Rabb.

Dr. Rabb was a professor of entomology at NCSU and a pioneer and visionary in developing ecologically sound approaches to insect pest management, well before the IPM paradigm was formulated. Dr. Gould worked as a postdoc with Dr. Rabb, and he has carried Rabb's values and philosophies into the era of genetic engineering.

Closing Remarks
Frank Zalom, *President*

Adjourn to the Welcome Reception, Exhibit Hall C, Oregon Convention Center

Closing Plenary Session and Old Masters Linnaean Games

Wednesday, November 19, 5:30 – 7:30 PM
Oregon Ballroom, Oregon Convention Center

Join President Zalom as he acknowledges his 2014 team and passes the gavel to Vice President Phil Mulder, who will announce his theme and thoughts for Entomology 2015, a collocated meeting with the American Society of Agronomy (ASA), Crop Science Society of America (CSSA), and the Soil Science Society of America (SSSA). Stay and enjoy a final round of the Linnaean Games, where the student winners of the National Linnaean Games and the Old Masters team will battle it out for being the sharpest in the science. Make sure your name is in the prize drum for a chance to win a free registration to ENTOMOLOGY 2015 in Minneapolis, Minnesota. You must be present to win!

POSTER PRESENTATIONS

Printed Posters

The Program Committee has scheduled three sessions of poster presentations for the Annual Meeting. Posters are numbered sequentially in the program book and, where possible, grouped according to ESA Section and subject matter. Authors must display their posters on the board bearing the same number as that indicated in the program book for each poster.

Poster Size: Each poster must be contained within the 46 × 46 inch (117 × 117 cm) space provided. Two posters will be displayed on each side of a single board (four posters per board). The poster must NOT exceed the size limit. Please be considerate of the person with whom you are sharing a display space.

Set Up: Your poster must be placed in the assigned space in the exhibit hall the night before your poster is scheduled, i.e., Sunday, Monday, and Tuesday, 8–9:30 PM. Bring your own Velcro strips (push pins are not allowed in the exhibit hall) to secure your display to the poster board. The poster board is covered with felt cloth, and the frame is aluminum. Please do not attach anything to the metal frame.

Poster Presentation Times: Because the Exhibit Hall becomes quite congested during presentation hours, presenters of posters with odd and even numbers are assigned specific times to be present at their posters. Presenters are expected to be available at their displays during the "Presenters Present" time slot for questions and discussion. A cash bar reception area will be set up within the posterdisplay area during presentation times. Below is the schedule of author availability:

Monday, November 17, Student Competition Posters:
Set up: Sunday, 7:30–9:30 PM
Viewing: Monday, 8 AM–6:30 PM
Authors Present: Posters with odd numbers: 5:30–6 PM
Posters with even numbers: 6–6:30 PM
Take down: Monday, 6:30–7:30 PM

Tuesday, November 18, Scientific Posters:
Set up: Monday, 8–9:30 PM
Viewing: Tuesday, 8 AM–6:30 PM
Authors Present: Posters with odd numbers: 5:30–6 PM
Posters with even numbers: 6–6:30 PM
Take down: Tuesday, 6:30–7:30 PM

Wednesday, November 19, Scientific Posters:
Set up: Tuesday, 8–9:30 PM
Viewing: Wednesday, 8 AM–2:30 PM
Authors Present: Posters with odd numbers: 12:15–12:45 PM
Posters with even numbers: 12:45–1:15 PM
Take down: Wednesday, 2:30–3:30 PM

Poster Removal: Posters should be removed promptly between 6:30 and 7:30 PM on Monday and Tuesday, and between 2:30–3:30 PM on Wednesday. Do not remove poster numbers when removing posters from boards.

Virtual Posters

Virtual Posters are back again this year. These electronic posters provide a unique opportunity to view the research of entomologists from outside of the United States who cannot attend the ESA Annual Meeting in person. Virtual posters will be positioned in the Exhibit Hall this year near the printed posters on large, on flat-screen monitors. Attendees will be able to scroll through the virtual posters throughout the day to view the variety of research taking place around the world.

SOCIAL ACTIVITIES & MIXERS

New Member Meet & Greet Reception

Sunday, November 16, 4:30–5:15 PM
Room D133, Oregon Convention Center

If you are a new ESA member this year, you are invited to our New Member Meet & Greet Reception. Mingle with other new members, ESA leaders, and staff. Learn about the benefits of ESA membership and important details of the ENTOMOLOGY 2014 Annual Meeting. Light refreshments will be served. New members should have received a special invitation to the reception in the mail—bring it and exchange it for a special ESA welcome gift!

Welcome Reception

Sunday, November 16, 7:30–9:30 PM
Exhibit Hall C, Oregon Convention Center

You are cordially invited to attend the Welcome Reception on Sunday evening in ESA's Exhibit Hall (Exhibit Hall C) immediately following the Opening Plenary Session (Oregon Ballroom). This is a great opportunity to have time with the exhibitors and colleagues and learn about the latest resources and tools available to entomologists. Grab some light refreshments and a drink, network with colleagues and friends, and check out the displays.

National Insect Photo Salon

Tuesday, November 18, 12:15–1:15 PM
F151, Oregon Convention Center

Some of the most beautiful insect photos will be presented this year in the Insect Photo Salon. Plan to join the Photographic Society of America and fellow ESA members and guests for the Insect Photo Salon. You'll witness a terrific show of insects, spiders, and other arthropods.

Social Events

See the complete schedule of social functions on page 62. Everyone has the opportunity to network at numerous receptions throughout the week. Monday night is the traditional time for receptions, with no scientific sessions scheduled for the evening.

Social Hour with Poster Presenters

Join us for our Social Hour with Poster Presenters on Monday, Tuesday, and Wednesday during poster presentation hours in the ESA Exhibit Hall (Exhibit Hall C, Oregon Convention Center). A cash bar will be set up during the three sets of presentation times:

Monday, November 17: 5:30–6:30 PM, Student Competition Poster Presentations
Tuesday, November 18: 5:30–6:30 PM, Poster Presentations
Wednesday, November 19: 12:15–1:15 PM, Poster Presentations

For more information on poster presentation set-up and presentation hours, see page 23.

Women in Entomology Breakfast Sponsored by Dow AgroSciences

Monday, November 17, 6:15–8:00 AM
Holladay, DoubleTree Portland
Cost: $18 per person, inclusive of tax and gratuity

Join us for the Women in Entomology Breakfast, a feature of the ESA Annual meeting for over 20 years. This event aims to encourage networking, mentoring, and collegiality among established entomologists and students or young professionals just beginning their career. This is a great opportunity to meet with other women at all points in their careers as well as representatives of the Society leadership.

The first 100 student attendees will receive complimentary access and breakfast courtesy of Dow AgroSciences.

STUDENT ACTIVITIES

Linnaean Games

Preliminary Round: Sunday, November 16, 2–5 PM
Oregon Ballroom, Oregon Convention Center

Final Round: Tuesday, November 18, 5:30–6:45 PM
Oregon Ballroom, Oregon Convention Center, followed immediately by the Student Awards Session and Student Reception.

Be sure to check out the Linnaean Games (entsoc.org/linnaeangames), a "College Bowl"-type competition that is one of the more spirited sessions of our annual meetings. Stop in and cheer on your favorite team! Winners and runners-up will be recognized at the Student Awards Session immediately following the Linnaean Games Finals on Tuesday evening.

Student Competition for the President's Prize Sponsored by Monsanto

Monday, November 16, 7:55 AM–12:30 PM and 5:30–6:30 PM Oregon Convention Center, various locations

To support ESA's student members and encourage them to become more involved in the world of entomology, Monday morning is dedicated to student paper competition. There are 33 sessions containing graduate and undergraduate student oral presentations, student posters, and virtual posters. Stop by and show your support for ESA's students! This year's first-place winners will receive a $175 cash award, second place will receive a $50 cash award. ESA would like to thank Monsanto for their sponsorship of the Student Competition for the President's Prize.

Student Debates

Tuesday, November 18, 1:30–4:30 PM
Portland Ballroom 252, Oregon Convention Center

The 2014 Student Debates topic is "Management Strategies: Solutions to Grand Challenges." Keeping with President Zalom's theme, all topics focus on grand challenges in entomology. Two student

teams chose what they believed to be a single best solution to help reduce malaria infections. The solutions to this issue are complex, and the best solution is highly contested. The remaining four teams were assigned traditional "pro/con" stances on two topics: (1) banning the use of neonicotinoids and (2) species redistribution ecology replacing the field of invasion biology. All three debates should be interesting, informative, and highly entertaining. Support your favorite team as they compete for bragging rights and a nice cash prize!

Also, attend the Student Debates and pick up a raffle ticket for a chance to win a $50 AMEX gift card. You must be present to win. Stop by the Debates room for more information.

Student Awards

Tuesday, November 18, 6:45–8:30 PM
Oregon Ballroom, Oregon Convention Center

The winners of the President's Prize, ESA Student Awards, Student Debates and the Linnaean Games will be recognized.

Student Reception Sponsored by DuPont

Tuesday, November 16, 9 – 11:30 PM
Punch Bowl Social
340 SW Morrison Street
Portland, OR 97204

Located in the heart of downtown Portland, the Punch Bowl Social is the perfect venue to host ESA's annual Student Reception. Don't miss out on this great event that is a must-attend for all students! This is a fantastic opportunity to see old friends and to meet new ones while bowling, playing pool, darts, and ping-pong, or singing in one of the private karaoke rooms. All registered students are invited to attend and dance the night away—please be sure to have your ID and name badge as proof of registration. ESA graciously thanks DuPont for the sponsorship of the Student Reception. Make sure to be one of the first 500 to arrive to receive your giveaways!

Student Volunteers

Volunteers can pick up their volunteer T-shirt from the volunteer coordinator in the Presentation Preview Room (PPR), meeting room C120-122 in the Oregon Convention Center, prior to the start of their first shift. All volunteers should report to their designated assignments 15 minutes before the start of their shift. Needed materials will be provided by ESA. If you cannot make it to your assignment or you need additional information, please see the volunteer coordinator located in the PPR, meeting room C120-122, Oregon Convention Center.

AWARDS & HONORS

All award recipients are profiled on page 45 of the program book.

Honorary Membership

Dr. Fred Baxendale has been elected as an Honorary Member this year. The purpose of Honorary Membership is to acknowledge those who have served the ESA for at least 20 years through significant involvement in the affairs of the Society that has reached an extraordinary level. The newly elected Honorary Members will be honored at the ESA Plenary, Founders' Memorial Lecture Awards Session, Sunday, November 16, 5:30 PM–7:30 PM, Oregon Ballroom, Oregon Convention Center.

Fellows of the ESA

The designation of ESA Fellow recognizes individuals who have made outstanding contributions to entomology. The 2014 Fellows will be honored at the Opening Plenary Session, Sunday, November 16, 5:30–7:30 PM, Oregon Ballroom, Oregon Convention Center.

The 2014 ESA Fellows are:
Dr. Nilsa A. Bosque-Pérez
Dr. Gary W. Felton
Dr. Murray B. Isman
Col. Phillip G. Lawyer
Dr. Tong-Xian Liu
Dr. Nancy A. Moran
Dr. Subba Reddy Palli
Dr. Hari C. Sharma
Dr. Kun Yan Zhu
Dr. Myron P. Zalucki

Founders' Memorial Award

Dr. Fred Gould

Fred Gould received a BA in Biology from Queens College, City University of New York, and a PhD in Ecology and Evolution from the State University of New York at Stony Brook. He was awarded an NSF postdoctoral research fellowship and worked with R.L. Rabb at NC State from 1977 to 1979. He then joined the faculty in the Department of Entomology at NCSU with responsibilities for research and teaching in insect ecology. He is currently a University Distinguished Professor of Entomology and an associate member of the Genetics Faculty at NCSU. He is director of the NSF-sponsored Graduate Program in Genetic Engineering and Society: The Case of Transgenic Pests. This program brings together graduate students in disciplines as diverse as molecular genetics, biomathematics, anthropology, and rhetoric to focus their studies on pest systems that are targeted for management using transgenic pest strains. Fred Gould is author/co-author of more than 200 refereed papers, which in total have been cited over 5,000 times.

Through his seminal research, his writings, and his service on numerous EPA, USDA, NRC, and OTA scientific advisory panels, Gould has been an internationally recognized leader in shaping the regulatory framework for the deployment of Bt crops in the United States and globally. More recently, Gould has shifted the focus of his research to developing and examining approaches for using genetically engineered insect pests to suppress insect-vectored human diseases and for control of agricultural pests. In recognition of the quality of his research and service and their impact on society, Fred Gould has received numerous major awards including, among others, the Alexander von Humboldt Award, the 2012 O. Max Gardner Award (awarded to the faculty member of the 16-campus University of North Carolina System who made the greatest contribution to human welfare), and election to the U.S. National Academy of Sciences.

Dr. Robert L. Rabb

Robert Lamar Rabb was born and raised in the mountains of North Carolina, where he developed a love of nature and the keen observational skills and insight that are the hallmarks of a true naturalist. After military service during World War II, he enrolled at North Carolina State College (now NC State University) where he earned BS, MS, and PhD degrees. He joined the faculty at NCSU as an assistant professor of entomology in 1953, where he rose through the ranks and in 1981 was named Wm. Neal Reynolds Distinguished Professor in recognition of his contributions to the theory and practice of Integrated Pest Management (IPM) and his leadership and outstanding scholarship at NCSU. He retired from NCSU in 1983 to spend time with his family and friends. R.L. Rabb passed away on July 31, 2006.

Rabb's early research focused on enhancing the biological control potential of Polistes wasps and on insect control and management on tobacco, his principal area of responsibility. His concerns about the growing over-reliance of agriculture on chemical control during the 1950s led him to develop the elements of an integrated control program for tobacco, which formed the basis of one of the initial Extension IPM programs in the United States in the early 1970s. Rabb was author/co-author of 73 research papers dealing with the biology, ecology, and management of insects and fundamental concepts of IPM, to which he contributed enormously. Much of Rabb's later work focused on understanding the roles of agroecosystem temporal and spatial heterogeneity and insect dispersal and migration in explaining the differential diversity of insects in cropping systems and in defining

the life systems and pest status of agricultural pests. This work has proven fundamental to understanding the complex life systems of *Helicoverpa zea* and other highly mobile pest species and to their sustainable management. For his outstanding contributions to entomology, R.L. Rabb was awarded the Geigy Award and the Founder's Memorial Award by the Entomological Society of America.

ESA Professional Awards

The 2014 ESA Professional Awards will be presented at the Opening Plenary Session, Sunday, November 16, 5:30–7:30 PM, Oregon Ballroom, Oregon Convention Center.

The following ESA award winners will be honored:

Mr. Robert B. Caine, ACE, ACE Professional Award
Dr. Peter C. Ellsworth, Award for Excellence in Integrated Pest Management (sponsored by Syngenta Crop Protection, Inc.)
Dr. John C. Palumbo, Distinguished Achievement Award in Extension
Dr. Daniel A. Herms, Distinguished Achievement Award in Horticultural Entomology
Dr. Diane E. Ullman, Distinguished Achievement Award in Teaching
Dr. Claudia Heinsohn, BCE, Distinguished Service Award to the Certification Program
Dr. Mary M. Gardiner, Early Career Innovation Award (sponsored by BASF)
Dr. Sarah E. Jandricic, Henry and Sylvia Richardson Research Grant
Dr. Luke S. Alphey, Nan-Yao Su Award for Innovation and Creativity in Entomology
Dr. James F. Campbell, Recognition Award in Entomology (sponsored by Syngenta Crop Protection, Inc.)
Dr. Sarjeet S. Gill, Recognition Award in Insect Physiology, Biochemistry, and Toxicology (sponsored by Apex Bait Technologies, Inc.)
Dr. Nancy C. Hinkle, Recognition Award in Urban Entomology (sponsored by S.C. Johnson & Son, Inc.)
Dr. Bryan N. Danforth, Thomas Say Award

Entomological Foundation Medal of Honor

The 2014 Entomological Foundation Medal of Honor will be presented at the Opening Plenary Session, Sunday, November 16, 5:30–7:30 PM, Oregon Ballroom, Oregon Convention Center.

The 2014 Medal of Honor awardee is Dr. May Berenbaum, selected for her distinguished service in fulfilling the Foundation's mission of exciting young people about science through insects. Dr. Berenbaum has been on the faculty of the Department of Entomology at the University of Illinois at Urbana-Champaign since 1980, serving as head since 1992 and as Swanlund Chair of Entomology since 1996. Devoted to teaching and fostering scientific literacy through formal and informal education, she has authored numerous magazine articles and six books about insects for the general public, in addition to over 230 refereed scientific publications and 35 book chapters. A member of the National Academy of Sciences, she has chaired two National Research Council committees, the Committee on the Future of Pesticides in U.S. Agriculture (2000), and the Committee on the Status of Pollinators in North America (2007). She graduated summa cum laude with a BS degree and honors in biology from Yale University in 1975, and received a PhD in ecology and evolutionary biology from Cornell University in 1980. The Medal of Honor is the Foundation's highest award, initiated in 2007. For more information about the Foundation, visit www.entsoc.org

ESA Student Awards

The winners of the President's Prize, ESA Student Awards, and the Linnaean Games will be recognized Tuesday, November 18, 6:45–8:30 PM, Oregon Ballroom, Oregon Convention Center.

The following student award winners will be honored:

John Henry Comstock Graduate Student Awards:
Mr. Eric Bohnenblust, Eastern Branch
Ms. Rebecca Dew, International Branch
Mr. Michael T. McCarville, North Central Branch
Dr. Kelly Hamby, Pacific Branch
Dr. Amber D. Tripodi, Southeastern Branch
Dr. Nathan Lord, Southwestern Branch

ESA Student Awards:
Ms. Alix Whitener, ESA Student Certification Award (sponsored by PestWest Environmental Science)
Mr. Zachary DeVries, The Larry Larson Graduate Student Award for Leadership in Applied Entomology
Ms. Holly Holt, Lillian & Alex Feir Graduate Student Travel Award in Insect Physiology, Biochemistry, or Molecular Biology
Ms. Rebecca Schmidt, Student Activity Award (sponsored by Monsanto Company)

Monsanto Research Grant Award:
Ms. Flor E. Acevedo
Ms. Carrie A. Deans
Mr. Zachary DeVries
Ms. Amy C. Morey
Ms. Brittany Peterson

Monsanto Student Travel Award:
Mr. Dominic Evangelista
Dr. Erica J. Kistner
Ms. Meaghan Pimsler
Mrs. Erika Machtinger
Ms. Qian Sun

USDA AFRI Student Travel Grant Award:
Ms. Heather Connelly
Mr. Adam Dale
Ms. Carrie Deans
Mr. Michael Garvey
Ms. April Hamblin
Mr. Freddy Ibanez
Ms. Erin McMahan
Mrs. Patricia Pinheiro
Ms. Ariel Rivers
Mr. Anthony D. Vaudo

Stinger Awards

The Stinger Awards are given to the winners of the YouTube Your Entomology video contest. This contest gives ESA members the opportunity to showcase their talents and creativity through video. Winning videos will be showcased throughout the Annual Meeting on video monitors in the Oregon Convention Center. Winners will be determined from the following finalists in each of the four categories: Outreach (extension-based); Discovery (research-based); Instruction (teaching-based); and Open (anything goes, for the creative entomologist).

Award Sponsors

ESA would like to thank the following list of sponsors for their continued support of the Awards Program:

Apex Bait Technologies
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ENTOMOLOGICAL FOUNDATION

Exciting Young People About Science Through Insects and Building a Future for Entomology!

Entomological Foundation Teacher Workshop

Saturday, November 15, 8:30 AM–1 PM
C123, Oregon Convention Center

The Foundation will offer a teacher workshop with three separate sessions developed for educators K-12. Educators are invited to come and learn from experts how to use insects in the classroom to educate young people about science and get them excited about entomology! The cost is free to attend and includes a complimentary breakfast and lunch; educators are able to attend all three sessions, and professional development units are available. Help spread the word to Portland area educators you know! Pre-registration required by Saturday, November 1; educators who would like to participate should email name, address, school, and grade(s) taught to msnyder@ipminstitute.org.

Entomological Foundation Silent Auction & Raffle

Booth 418 & 519
Exhibit Hall C, Oregon Convention Center

Sunday, November 16, 7:30–9:30 PM (ESA Welcome Reception)|
Monday, November 17, 9 AM–5 PM
Tuesday, November 18, 9 AM–5 PM (final bids due at 3 PM)
Wednesday, November 19, 9 AM–11 AM

Meet the Entomological Foundation's volunteers and participate in the Entomological Foundation's Raffle and Silent Auction to support programs that ***educate and excite young people about science through insects***. The Raffle and Auction will commence on Sunday and close with final bids placed by 3 PM on Tuesday. Winners may pick up items any time before 5 PM on Tuesday and between 9 AM and 11 AM on Wednesday.

Entomological Foundation Board of Directors

Monday, November 17, 8–9:30 AM (Board of Directors only)
Ross Island, DoubleTree Portland

Entomological Foundation Board of Counselors Meeting

Tuesday, November 18, 12–1 PM
Broadway, DoubleTree Portland

Lunch provided. Interested in learning more about the Foundation or becoming a counselor? Come join us! RSVP to msnyder@ipminstitute.org by Saturday, November 8.

Donor Appreciation

(August 2013 to July 2014)

ENTOMOLOGICAL FOUNDATION ENHANCEMENT FUNDING PARTNERS (listed by total pledge)
$100 to $499. Joel Coats, Dawn Gouge, Gene Reagan
$500 to $999. Elaine Backus, John Hildebrand, Bonnie Pendleton, Evan Preisser
$1,000 to $4,999. Ricardo Bessin, Thomas Green and Erin Mackesey, John Reese, Lynn Riddiford, Tom and Chris Turpin
$5,000 to $9,999. Thomas Anderson, Paul Borth, Thomas Payne
$10,000 and up. Bruce and Becky Monke, Nan-Yao Su, Brad Vinson, Sharron Quisenberry

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All of our silent auction bidders!

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(August 2013 to July 2014)

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Kathy Murray
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Monica Ramirez
Juliana Rangel-Posada
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Warren Sconiers
Kate Seideman-Barclay
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Christina Silliman
Christen Steele
Donald C. Steinkraus
Amanda Tinder
Jennifer Tsuruda
Tom Turpin
Joshua Villarreal
Andrea Walker
Lauren Ward
Stephanie L. White

ADDITIONAL VOLUNTEERS
Juli Gould, 2014 Eastern Branch ESA Silent Auction
Erin Hodgson, 2014 North Central Branch ESA 6K Hexapod Scamper
Bonnie and Michael Pendleton, 2014 Southwestern ESA Silent Auction
Don Weber, 2013 Awards Review

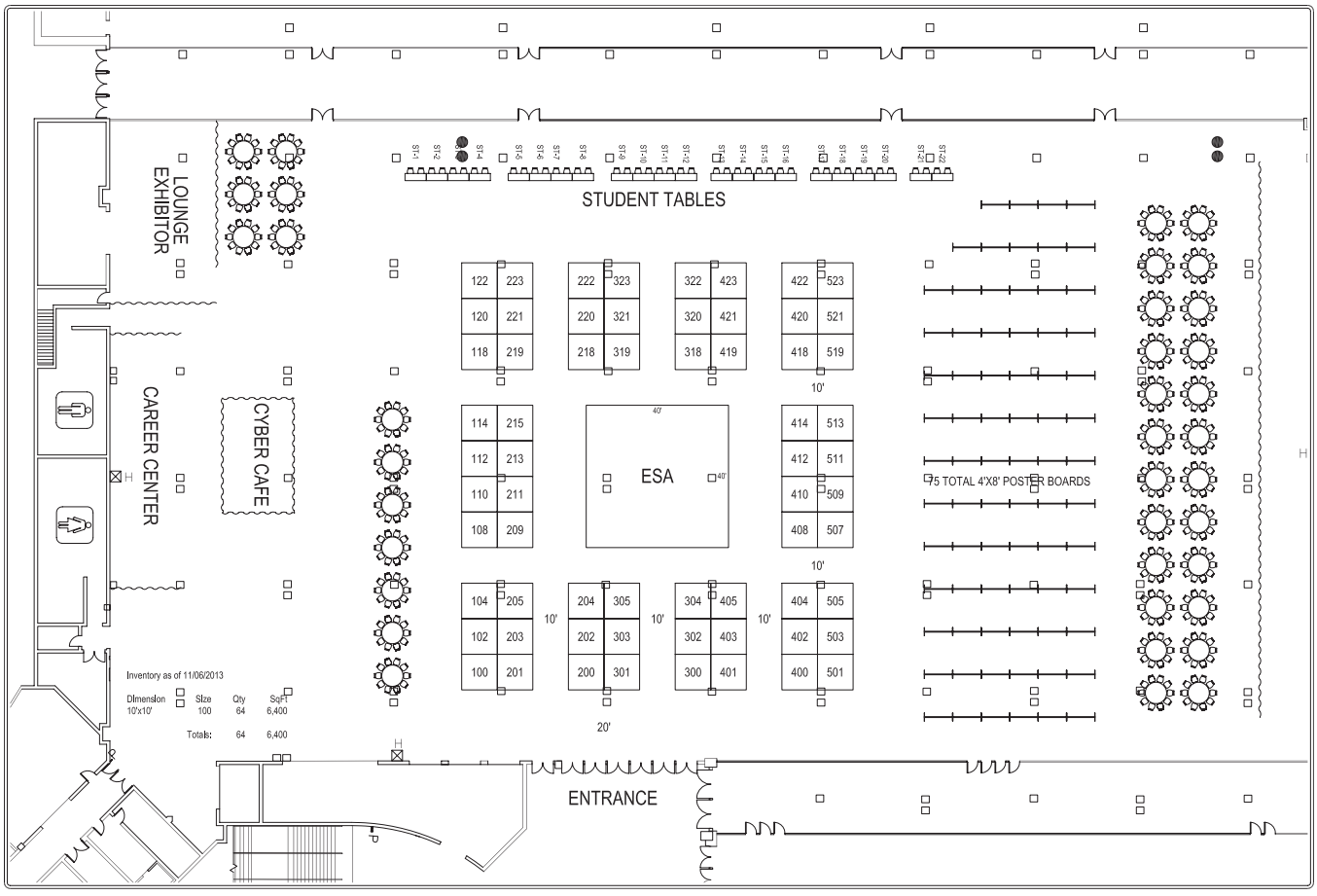

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Exhibit Hall

Please plan to visit the exhibits, poster presentations, and more in Exhibit Hall C in the Oregon Convention Center, near the ESA Registration and Information Center. See the latest in entomological equipment, supplies, gifts, and reference materials.

Exhibit hours:
Sunday, November 16, 7:30–9:30 PM (Welcome Reception)
Monday, November 17, 9 AM–5 PM
Tuesday, November 18, 9 AM–5 PM
Wednesday, November 19, 9 AM–2 PM

Exhibitors

The following exhibitors are participating in ENTOMOLOGY 2014 as of August 1, 2014.

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Email: bstoneman@biopesticideindustryalliance.org
Website: www.biopesticideindustryalliance.org
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The Coleopterists Society **Booth: 511**
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Phone: 225-578-1838; **Email:** vbayless@agcenter.lsu.edu
Website: www.coleopsoc.org
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Mariel Snyder, Madison, WI 53705
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Website: www.entfdn.org
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Entomological Society of America (center of Exhibit Hall)
Debi Sutton, 3 Park Place, Suite 307, Annapolis, MD 21401
Phone: 301-731-4535 ext. 3021; **Email:** dsutton@entsoc.org
Website: www.entsoc.org
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Michigan State University **Booth: 221**
Heather Lenartson-Kluge, East Lansing, MI 48824
Phone: 517-355-4665; **Email:** lenartso@msu.edu
Website: www.ent.msu.edu
Michigan State University's Department of Entomology offers BS, MS, and PhD degrees, with degrees in a vast number of areas such as integrated pest management, medical entomology, ecology and ecosystems management, molecular entomology, forensic entomology, apiculture, and specialty crop entomology and nematology. The department's display provides program information, as does its website: www.ent.msu.edu.

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National Pest Management Association **Booth: 509**
Jim Fredericks, Fairfax, VA 22030
Phone: 703-352-6762; **Email:** jfredericks@pestworld.org
Website: www.npmapestworld.org
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Website: www.aphis.usda.gov
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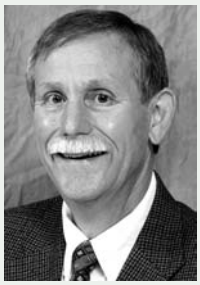
Each year the Entomological Society of America, Entomological Society of America Certification Corporation and the Entomological Foundation provide annual honors and awards to recognize scientists, educators, and students, who have distinguished themselves through their contributions to entomology. Consider nominating a friend or colleague today!

For more information on the ESA, ESA Certification Corporation, and Entomological Foundation awards visit www.entsoc.org/awards

The Entomological Society of America is pleased to announce the winners of its 2014 awards. The awards will be presented at Entomology 2014, ESA's 62nd Annual Meeting in Portland, OR from November 16-19, 2014.

ESA HONORARY MEMBER

Honorary Membership acknowledges those who have served ESA for at least 20 years through significant involvement in the affairs of the Society that has reached an extraordinary level. Candidates for this honor are selected by the ESA Governing Board and then voted on by the ESA membership.



DR. FRED BAXENDALE is an entomology professor and director of the Forensic Science program at the University of Nebraska-Lincoln (UNL). He joined the entomology faculty at UNL in 1984 as an assistant professor. He received his BS in entomology from Cornell University, and his MS and PhD in entomology from Texas A&M University.

His research and extension programs have promoted effective and environmentally responsible Integrated Pest Management strategies for insect and mite pests affecting turfgrasses, landscapes, and other horticultural plantings. His current emphasis is on identifying the insects and mites associated with buffalograss and zoysiagrass; investigating their biology, ecology, distribution and injury potential; and developing management alternatives for potential pests. He has published more than 56 refereed journal articles, and more than 200 extension publications and trade journal articles, and is frequently an invited speaker at programs throughout the region and nation.

One of the great strengths he brings to his extension programs is the enthusiasm for the subject, which he is able to convey to his audience. He has mentored numerous undergraduate and graduate students who have received competitive scholarships and fellowships and ESA awards, and have gone on to successful careers in the public and private sectors. He has contributed to entomology through many administrative roles at UNL, including extension entomology coordinator, interim department head and as currently director of the Forensic Science program. In all of these roles he has brought a high level of dedication, enthusiasm, and effort to contribute to the success of the unit.

Dr. Baxendale has frequently provided service and leadership to ESA including serving as President of ESA's North Central Branch. His accomplishments have been recognized by a variety of professional groups, and he has been honored with the ESA Distinguished Achievement Award in Extension, the NCB Distinguished Achievement Award in Extension, the Excellence in Extension Award - North Central Region, the ESA Recognition Award in Urban Entomology, the Extension Award of Merit, and many others.

ESA FELLOWS

The designation of ESA Fellow recognizes individuals who have made outstanding contributions to entomology.

DR. NILSA A. BOSQUE-PÉREZ is a professor with the Department of Plant, Soil and Entomological Sciences at the University of Idaho (UI). She is internationally known for her research on insect-host plant interactions, insect vectors of plant viruses, and host plant resistance to insects and pathogens. She is additionally recognized for her distinguished contributions to interdisciplinary graduate education.

Bosque-Pérez was born in San Sebastián, Puerto Rico in 1957 and spent her early years living at the University of Puerto Rico (UPR) Agricultural Experiment Station in Adjuntas, where her father served as agronomist and director. Following in her father's footsteps, she obtained a B.S. in agricultural sciences from UPR Mayagüez (1979). She then attended the University of California, Davis, where she received her M.S. (1981) and Ph.D. (1985) in entomology. In 1985, she joined the International Institute of Tropical Agriculture in Ibadan, Nigeria, where she worked for 11 years as a member of a multidisciplinary team of scientists working to increase food production, productivity, and sustainability in sub-Saharan Africa. Bosque-Pérez joined the UI faculty in 1997 and attained the rank of full professor in 2006. She served as interim dean of the UI College of Graduate Studies from 2010 to 2011.

Bosque-Pérez has contributed to fundamental discoveries in the field of host plant-virus-vector interactions, including demonstrating that transgenic virus resistance can influence vector life history and production of plant volatiles to which vectors respond. Additionally, her lab group was the first to demonstrate that plant viruses can directly alter host plant selection behavior by vectors, indicating that plant viruses can manipulate vectors to enhance their spread. These findings open new doors for the study of host plant-virus-vector interactions as well as disease and vector management. Her research group also studies the impact of management practices and landscape elements on arthropod biodiversity in temperate and tropical regions. She has published over 155 scientific papers and book chapters. A devoted student mentor, she has guided 14 graduate students as a major professor and 37 as a graduate committee member. She has served as project director and student mentor of two NSF Integrative Graduate Education and Research Traineeship (IGERT) projects that created unique educational and research infrastructures to facilitate interdisciplinary team research by doctoral students.

Bosque-Pérez has been an invited speaker at conferences and scientific venues around the world, and has authored or co-authored 110 invited and more than 260 contributed presentations. She is a fellow of the American Association for the Advancement of Science, and her many awards include the ESA Recognition Award in Entomology (2006), the University of Idaho Award for Excellence in Interdisciplinary or Collaborative Efforts (2011), and the ESA Pacific Branch Award for Distinction in Student Mentoring (2012). She has served ESA as a member of the *Journal of Medical Entomology* Editorial Board (1999-2003), as a subject editor for the *Journal of Economic Entomology* (2010-2011), and as a member of the International Affairs Committee (2000-2002) and the Pacific Branch Executive Committee (2007-2009). She also served as guest editor of *Virus Research* (2011, 2013-2014). She is the proud aunt of 13 nephews and nieces and two grandnieces, and she enjoys traveling and birdwatching.

DR. GARY W. FELTON is a professor and head of the Department of Entomology at Penn State University. He is internationally recognized for his research on insect-plant interactions, and in particular for his research which focuses on the role of herbivore saliva in evading plant defenses.

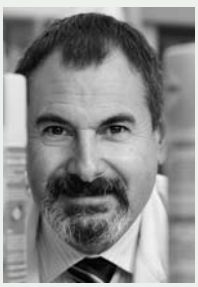
Felton was born in Norfolk, VA in 1953, but soon moved to California where he grew up. He completed his B.S. in biology in 1975 at the University of California, Irvine, where he was inspired to study insect physiology by the late Howard Schneiderman. After taking several years off from his education to start a family, Felton completed his M.S. in entomology in 1983 at the University of Kentucky, where he studied under Douglas Dahlman. He then moved to the University of California, Davis, where he completed his Ph.D. in 1988 with the late Sean Duffey. He completed a short postdoctoral study with Sean, and then in 1990 he accepted the position of assistant professor in the Department of Entomology at the University of Arkansas. He attained the rank of full professor in 1998 and then accepted the position as professor and head of Entomology at Penn State University in 2000.

Felton's research focuses on mechanisms of plant defense and the adaptations that herbivorous insects use to avoid them. This research has uncovered unique ways in which insect herbivores use salivary secretions to suppress the induced responses of their host plants and has been published in journals such as *Nature* and the *Proceedings of the National Academy of Science.* He has published more than 100 refereed papers, including numerous review articles for book chapters and journals such as *Plant Physiology, Current Opinion in Plant Biology,* and *Annual Plant Reviews.*

Felton has been an invited speaker for numerous national and international professional meetings. He is a recipient of distinguished alumni awards from the Departments of Entomology at UC Davis and the University of Kentucky.

In his role as head of Entomology at Penn State, Felton has seen the department grow to a staff of more than 170, including 24 tenure-track faculty, more than 50 graduate students, and more than 40 additional Ph.D. level scientists. The department is known for its strengths in chemical ecology, pollinator health, vectors of infectious disease, and pest management and ecology.

Felton has served the ESA and his profession in numerous roles, including as subject editor for *Environmental Entomology, Arthropod Plant Interactions,* and the *Archives of Insect Physiology, and Biochemistry.* He has organized multiple symposia and conferences for ESA annual meetings. In addition to service as a panel member for USDA and NSF programs, he has served twice as panel manager for the USDA NRI/AFRI program. He has two children, Derek and Jessica, and is married to Dawn Luthe. He loves to travel, to sample new foods, to listen to music (blues is the best), and to experience art of all styles.



DR. MURRAY B. ISMAN is a professor of entomology and toxicology at the University of British Columbia, Vancouver. He is internationally recognized for his research on the discovery and development of botanical insecticides and antifeedants, and in the areas of insect-plant chemical interactions and insect chemical ecology.

Isman was born in Vancouver, Canada on June 14, 1953. He attended the University of British Columbia, receiving his B.S. degree in 1975 and his M.S. degree in 1977. He then went on to the University of California, Davis, earning a Ph.D. in entomology in 1981, followed by a postdoctoral position in insect toxicology at the University of California, Irvine. In 1983 he accepted a position as assistant professor in the Department of Plant Science at UBC, attaining the rank of professor in 1994. He later served as dean of the faculty of Land and Food Systems at UBC from 2005 to 2014.

Early in his career he became known for his thorough studies on neem insecticides and azadirachtin, helping to bring some clarity to a field of investigation that had been characterized by research of variable quality, dubious claims, and highly redundant work. More recently he worked with a team of investigators that provided the R&D support for EcoSMART Technologies Inc., propelling the company to become the world leader in pesticides based on plant essential oils. Along the way, Isman became an authority on the development of pesticides based on these natural products, but he has always maintained some basic research on insects, leading to some fascinating observations on insect feeding and oviposition behavior, insect memory, and the metabolism of plant toxins by insects.

Isman has published more than 180 scientific papers, reviews, and book chapters. His review of botanical insecticides, published in 2006 in the *Annual Review of Entomology,* has the highest citation rate of all papers published in that periodical. He has presented more than 50 invited symposium papers and 40 invited lectures covering every continent. Isman is a subject editor for the *Journal of Economic Entomology* and the *Journal of Pest Science,* and serves on three other editorial boards. In 31 years at UBC, he has supervised 22 graduate students, 13 postdoctoral fellows, and 16 visiting scientists. He was awarded the Entomological Society of Canada's Gold Medal in 2011 for outstanding achievement in Canadian entomology, having previously been awarded their C. Gordon Hewitt Award (1991) for outstanding achievement by an entomologist under the age of 40. He received the PheroTech Award of Excellence from the Professional Pest Management Association of British Columbia in 1996, and their Lifetime Achievement Award in 2014. In 2010 he delivered the Thomas and Nina Leigh Distinguished Alumni Lecture at the University of California, Davis.

He has presided over the International Society of Chemical Ecology (2002), the Phytochemical Society of North America (1993; he remains the only entomologist to have done so), and the Entomological Society of British Columbia twice (1988 and 1999). He also organized and chaired two conferences in Vancouver – the 14th Annual Meeting of the International Society of Chemical Ecology (1997) and the Fourth World Neem Conference (1999).

Isman is married to Susie, and they have a daughter, Carly, and son, Adam. His hobbies include ice hockey (he and Adam are both goaltenders), motorsports, contemporary and native art, and fine wine.

DR. PHILLIP G. LAWYER recently retired as core staff scientist/medical entomologist at the Laboratory of Parasitic Diseases, NIAID, NIH, from which he also served the Division of Entomology at the Walter Reed Army Institute of Research (WRAIR). He is recognized internationally for research on sand flies and associated diseases, with special emphasis on sand fly biology and vector-parasite interactions (*Leishmania* and *Bartonella*).

Dr. Lawyer was born in Wenatchee, WA, on May 10, 1945, and spent his childhood and adolescent years in Washington, Alaska, and Utah. He earned a B.S. in 1970 and an M.S. in medical entomology in 1971, both from the University of Utah, and a Ph.D. in medical entomology in 1984 from the University of Florida.

His professional experience spans over 43 years in operational and extension entomology, teaching, and research, including 30 years in the U.S. Army. He was the last military entomologist deployed to the Republic of Vietnam, where he conducted malaria control operations, plague surveillance, and supervised retrograde cargo inspections. At the U.S. Army Environmental Hygiene Agency, he conducted pest-management surveillance at military installations in 18 midwestern and northeastern states. He served two years as pest-management instructor at the Army's Academy of Health Sciences at Fort Sam Houston in San Antonio, TX. He was selected for an Army educational fellowship at the University of Florida to earn a Ph.D., and upon graduation was assigned to the WRAIR Department of Entomology as head of the Leishmaniasis Vector Research Section, followed by four years in Kenya researching the epidemiology of leishmaniasis in the Great Rift Valley. After returning from Kenya, assignments included: chief of the WRAIR Department of Entomology; chief, Defense Pest Management Information Analysis Center, Armed Forces Pest Management Board; entomology consultant to the Army Surgeon General; and associate professor of Medical Zoology, Division of Preventive Medicine and Biometrics, Uniformed Services University of the Health Sciences (USUHS). Upon retiring from the Army in 2001, Colonel Lawyer joined the Laboratory of Parasitic Diseases, NIAID, where he oversaw the establishment and maintenance of 17+ sand fly colonies used in leishmaniasis and bartonellosis research. His sand fly mass-rearing procedures are used in laboratories throughout the world.

Dr. Lawyer's international experience includes numerous research projects in Central and South America, the Middle East, Africa, and Asia. He has authored or co-authored more than 70 refereed publications and four book chapters. He served seven years as sand fly subject matter editor for the *Journal of Medical Entomology* and has organized several sand fly symposia for ESA Annual Meetings. He has served on the Scientific Program Committee for the International Symposium on Phlebotomine Sand Flies since 1991. Awards include the Bronze Star Medal (Vietnam); "A" Designator (Army equivalent of full professor); and various Outstanding Mentor awards for working with students too numerous to count but too amazing to forget. Dr. Lawyer is married with six children and 19 grandchildren. Hobbies include gardening and painting.

DR. TONG-XIAN LIU, known as "T.-X.," is a national distinguished professor of entomology at Northwest A&F University (Yangling, Shaanxi, China). He is internationally recognized for his research in biological control and tritrophic interactions of host plants, whiteflies, and aphids, and their natural enemies.

Born in Qingdao, Shandong, China in October 1955, T.-X. obtained his B.S. degree in plant protection from Shandong Agricultural University (Tai'an, Shandong, China). He enrolled at the Department of Entomology of Virginia Tech University as a graduate student in 1986 and obtained his M.S. degree in 1987. He then enrolled at the Department of Entomology of the University of Georgia and received his Ph.D. degree in 1992. He spent four years as a postdoc research associate at the University of Florida. He joined Texas AgriLife Research in 1997 as an assistant professor of entomology, working on vegetable IPM. He was promoted to associate professor in 2001 and full professor in 2005. In 2009 the Chinese government recruited and appointed him as a national distinguished professor of entomology, the most prestigious faculty position in China. Later, he was appointed as dean of the College of Plant Protection, Northwest A&F University (2010), special adviser to the president (2009), director of the Key Laboratory of Applied Entomology (2009), and director of the Key Laboratory of Crop Pest Management in the Northwest Loess Areas of the Ministry of Agriculture of China (2012).

T.-X.'s research focuses on biological control of pest insects in vegetables and field crops, insect behavior, host plant-herbivore-natural enemy tritrophic interactions, and chemical ecology. T.-X. has been a prolific author, and has published 220 refereed journal articles in various journals, including the *Annual Review of Entomology, BioControl, Biological Control* and various ESA journals. He has also published more than 200 educational, popular, and extension articles, and has edited four books and 18 book chapters. He has been an invited speaker by many national and international institutions around the world and at numerous professional conferences.

T.-X. has received numerous awards in various institutions and societies. In his more than 30-year career at three universities, Dr. Liu has been very active in teaching and student training. He taught general entomology, horticultural entomology, biological control, and IPM. Currently, he teaches an introductory entomology class in China. He has supervised 85 graduate students, postdoctoral research associates, and visiting scientists.

T.-X. has been an ESA member since late the 1990s, and served in several capacities, including as President of the International Branch in 2013. He has co-organized more than 20 symposia worldwide and assumed approximately 20 roles in various scientific societies worldwide. He has served as editor, associate editor, and editorial board member of more than ten journals, including *Biological Control, Journal of Insect Science, Insect Science,* and several others. T.-X. is married to Yong-Mei Zhang and has a son, Mike. His hobbies include Chinese calligraphy, wine, food, and travel.

DR. NANCY A. MORAN is a professor at the University of Texas. She is internationally recognized for her research on symbiosis between insects and bacteria.

Moran was born December 21, 1954 in Dallas, Texas, where she lived until beginning college at the University of Texas in Austin where she received a B.A. in the Plan II honors program in 1976. She then attended graduate school at the University of Michigan, where she obtained a Ph.D. in zoology in 1982. She was an NSF postdoctoral fellow from 1984-1986, based at Northern Arizona University. In 1986 she accepted a position as assistant professor of entomology at the University of Arizona. She remained at Arizona for 24 years, later joining the Department of Ecology and Evolutionary Biology, in which she was promoted to regents' professor. In 2010, she moved to Yale University as the William H. Fleming Professor of Biology. She started her current position at the University of Texas in August, 2013.

During her graduate and postdoctoral work, Moran studied the evolution of life cycles and host plant utilization, especially in aphids. In 1990, she began work on bacterial symbioses in aphids and other insects. She has shown that intimate symbiotic associations date to the origins of major groups of insects, millions of years in the past. She has used genomic and experimental work to show that these associations provide hosts with essential molecules and defenses. She also has made contributions involving general principles of bacterial genomics and evolution, specifically showing that strictly clonal replication of symbionts leads to loss of genes and genome reduction. Currently, she investigates heritable bacterial symbionts in sap-feeding insects and also the bacterial gut symbionts living in honey bees and bumble bees. She has published more than 200 peer-reviewed scientific papers.

Moran has been the mentor to more than 30 graduate students and postdoctoral researchers. Almost all of these are now established as independent researchers, mostly focusing on insect symbioses and insect evolution. She has sponsored more than 100 undergraduate researchers and has taught evolutionary biology to hundreds of undergraduate and graduate students. In Arizona, she established

a high school research laboratory and course in which students conduct research on local insects. She has served as president of the Society for the Study of Evolution and as an editor for several journals, including *Proceedings of the National Academy of Science, PLOS Biology, PLOS Genetics*and *Genome Biology and Evolution.*

Moran has been elected to membership in the U.S. National Academy of Sciences, the American Academy of Arts and Sciences, and the American Academy of Microbiology. At Arizona, she was elected as a Galileo Fellow, and a regents' professor, and she received the Alumni Association Extraordinary Faculty Award. In 2010, she received the International Prize for Biology from the Japanese Society for the Promotion of Science, and in 2014 the James Tiedje Award for Lifetime Contribution in Microbial Ecology.

DR. SUBBA REDDY PALLI, a professor of entomology at the University of Kentucky, is internationally recognized for his research on hormonal regulation of molting, metamorphosis and reproduction, development of ecdysone receptor-based gene switches, and RNAi-based pest management methods.

Palli was born in a small village in India and attended Andhra Pradesh Agricultural University at Bapatla, receiving a B.S. in agriculture in 1981. He attended the Indian Agricultural Research Institute and received an M.S. in 1983. Palli then moved to Canada and received his doctorate from the University of Western Ontario in 1988. He was also trained as a postdoctoral fellow at the University of Washington.

Upon graduation, Palli worked as a research scientist at the Canadian Forest Service's Great Lakes Forestry Centre, and later at Rohm and Hass Company as the senior research scientist and group leader. Palli played a key role in the development of ecdysone receptor based gene switch technology that is being tested in clinical trials for regulation of anticancer genes in humans and production of bioplastics in plants. Palli joined the University of Kentucky's Department of Entomology as an assistant professor in 2002 and was promoted to associate professor and professor in 2005 and 2008, respectively.

Palli's research focuses on hormonal regulation of gene expression in insects with a goal to identify proteins that play key roles in signal transduction of ecdysteroids, juvenile hormones, and other hormones, and to use them for developing novel, environmentally-safe pest management methods. He has published 150 peer-reviewed journal articles and book chapters and co-edited a book. He is also a co-inventor on 28 patents. Recent research from Palli's laboratory helped to develop RNA interference technology based methods for controlling insect pests and to fight insecticide resistance in beetles and bed bugs.

Palli has received several prestigious awards at the University of Kentucky, including a University Research Professorship, Fulbright Award, the Thomas Poe Cooper Research Award, the Bobby Pass Excellence in Grantsmanship Award, the High Impact Research/Extension Award, the High Impact Paper Award, and the Wethington Award. Palli is also the recipient of the ESA Recognition Award in Insect Physiology, Biochemistry and Toxicology. He has organized and chaired several symposia at ESA Annual Meetings and at international conferences. Palli also served as President of the ESA's Physiology, Biochemistry, and Toxicology Section. He currently serves on the editorial boards of ten journals and served on grant review panels of the NSF, the USDA's National Research Initiative, and the National Institutes of Health. He also serves as the co-director of the Center for Arthropod Management Technologies, a recently established National Science Foundation Industry and University Cooperative Research Center. Palli is married to Usha Rekha and has two sons, Rohith and Roshan. His hobbies include gardening, travel, cooking, and sports.

DR. HARI C. SHARMA is a principal scientist at the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Patancheru, Telangana, India. Dr. Sharma was born in Behra, Himachal Pradesh, India, on June 15, 1954. He attended Dr. YS Parmar University of Horticulture & Forestry, where he received his B.S. degree in 1974 and M.S. degree in 1976. He joined the Ph.D. program in entomology at the Indian Agricultural Research Institute (IARI), and earned his Ph.D. in 1979. He joined the Central Institute for Cotton Research in 1979 as a cotton entomologist, and six months later he accepted an entomologist position at ICRISAT, becoming a principal scientist in 1994. He has been working at ICRISAT for the past 35 years. He was also a visiting scientist at the University of Wisconsin in 1987, and the Queensland Department of Primary Industries in 1996.

Dr. Sharma's major contributions are in the areas of insect bioecology, host-plant resistance, transgenics and molecular markers for insect resistance, biosafety of transgenic crops to nontarget organisms, and IPM. He has published more than 250 research papers, 150 book chapters, 10 research/information bulletins, and six books. Dr. Sharma has been instrumental in developing artificial diets for insect rearing, resistance screening techniques and mechanisms, inheritance of resistance to insects, and biosafety of transgenic plants to nontarget organisms. The insect-resistant varieties identified/developed by Dr. Sharma have been released for cultivation in Asia and Africa, and/or used in crop improvement in Asia, Africa, the USA, and Australia. His contributions in developing pest-resistant cultivars and IPM systems in cotton, cereals, and grain legumes will not only help reduce the huge losses by insect pests, but will also curtail pesticide use, thus minimizing environmental pollution. His work has also demonstrated that elimination of gut microflora makes *Helicoverpa* resistant to *Bt* toxins, and that variation in gut microflora may lead to the development of insect resistance to *Bt* transgenic crops.

Dr. Sharma's work has been recognized by various national and international organizations, including seven Gold Medals, the Hari Om Trust Award of the Indian Council of Agricultural Research, the Excellence in Science Award of the Consultative Group on International Agricultural Research, and the International Plant Protection Award of the International Association of Plant Protection Sciences (IAPPS). He is a fellow of seven academic societies, including the Indian National Academy of Agricultural Sciences, and he is a Life Fellow of the Entomological Society of India. Dr. Sharma is a governing board Member of IAPPS, and is president of the Council of International Congresses of Entomology. Many of his graduate students have gone on to successful careers in academia, industry, and government. Dr. Sharma is married to Veena, and has two daughters, Dr. Anu Sharma (a cancer immunologist) and Ankita Sharma (an IT professional). His hobbies include gardening, walking, playing flute, and folksongs.

DR. MYRON P. ZALUCKI, a professor at the University of Queensland (UQ), is internationally recognized for his research on basic and applied aspects of insect-plant interactions, primarily in the Lepidoptera, and particularly on monarch butterflies and pest heliothines.

Zalucki was born in Canberra on May 26, 1954, where he spent his first 22 years. He attended the Australian National University (ANU), receiving his B.S. in 1974, and completed his honors in zoology (first class) at ANU in 1976. He then entered the doctoral program in ecology at Griffith University, earning a Ph.D. in 1982. He took a short-term temporary position at UQ in 1981, and within one year he accepted a position as a lecturer (equivalent to assistant

professor) in the Department of Entomology, attaining the rank of full professor in 2001 in the School of Biological Sciences.

To date, Zalucki has mentored more than 80 students that have successfully completed honors, master's, or Ph.D.s, with more in the wings. His laboratory focuses on understanding the ecology of insects using field and laboratory experiments to reveal underlying mechanisms, founded on a clear understanding of their natural histories. Over the years, this research has been published in more than 300 refereed papers, books, book chapters, and conference proceedings. Apart from fundamental aspects of oviposition behavior of adult Lepidoptera and foraging behavior of caterpillars, the work includes their migration, population dynamics, modeling distribution and abundance, and the application of this understanding to the management of some of the world's key pests, including *Helicoverpa armigera* and *Plutella xylostella*. In 1996, he was awarded the Ian MacKerras Medal by the Australian Entomological Society for outstanding contributions to entomology.

Zalucki has made significant contributions to the promotion and advancement of entomology in Australia, and internationally, through research collaboration with students and colleagues from Bangladesh, Cambodia, Canada, China, North Korea, Fiji, France, Germany, India, Indonesia, Iran, Japan, Mexico, Myanmar, New Zealand, Nigeria, Oman, Pakistan, Papua New Guinea, the Philippines, Samoa, Singapore, Spain, the Solomon Islands, Sri Lanka, Gambia, Tonga, Uganda, the USA, and Vietnam. He has served as vice president and president of the Australian Entomological Society, and chaired several conference organizing committees, including the widely acclaimed XXII International Congress of Entomology (ICE) in Brisbane. He is active on a number of editorial boards, including the Annual Review of Entomology, the Journal of Economic Entomology, Insect Science, the International Journal of Pest Management, and, until recently, the Journal of Pest Science. He is on the ICE council and was the inaugural International Branch Representative on the ESA Governing Board.

These endeavors would not be possible without the support of Jacinta, the lady that has put up with him since 1979, and four great offspring: Yaramah, Nadia, Katrusha, and Oressia. These folk, and a passion for cooking, have kept his feet on the ground.

DR. KUN YAN ZHU, a professor of entomology at Kansas State University (KSU), is internationally recognized for his research on insect molecular toxicology. Zhu was born in Zhejiang Province, China, in 1955 and attended Zhejiang Agricultural University (presently Zhejiang University), where he received his B.S. in plant protection with specialization in entomology in 1982. After he taught and conducted research in entomology at Zhejiang Agricultural University for five years, he joined Dr. William A. Brindley's laboratory at Utah State University as a graduate student in 1987. He earned his M.S. and Ph.D. degrees in biology in 1989 and 1992, respectively. He then worked with Dr. John M. Clark as a postdoctoral research associate and later as a research faculty member at the University of Massachusetts-Amherst from 1992-1995. He accepted a position as assistant professor in the Department of Entomology at KSU in 1995, and was promoted to associate professor in 2002 and full professor in 2007.

Zhu's research focuses on insect resistance to chemical insecticides and *Bacillus thuringiensis* toxins; insect acetylcholinesterase (AChE); management of stored product pests; chitin biosynthesis, metabolism, and inhibition; and RNA interference (RNAi). His laboratory first documented the AChE paralogous gene in the greenbug, which led to the discoveries of the paralogous gene in many other insects and the mutations associated with this gene in insecticide-resistant insects by other researchers. His laboratory developed a feeding-based, double-stranded RNA (dsRNA) delivery technique by using chitosan/dsRNA nanoparticles for mosquito larvae. He has authored or co-authored 135 peer-reviewed papers and reviews, 12 book chapters, and 325 presentations (114 invited) delivered at international, national, regional, and local professional meetings. He has served as a major or co-major professor for 19 graduate students (15 graduated), and as a supervisory committee member for an additional 30 graduate students in various academic disciplines. He has hosted 27 professors, Fulbright scholars, and other visiting scholars from Brazil, China, Egypt, Germany, India, and Togo.

Zhu has served as subject editor of *Journal of Economic Entomology,* academic editor of *PLOS ONE,* associate editor of *Pest Management Science,* and editorial board member of eight other scientific journals, including A*cta Entomologica Sinica, Archives of Insect Biochemistry and Physiology, Conference Papers in Biology, Insect Science, Journal of Integrative Agriculture, Pesticide Biochemistry and Physiology, Scientific Reports,* and *Psyche: A Journal of Entomology.* He served as a guest editor for a special issue on insect RNA interference and for a special section on insect chitin metabolism, both published in Insect Science in 2013, and he has peer reviewed more than 330 manuscripts for approximately 60 scientific journals.

Zhu was awarded the Summer Faculty Fellowship by the National Research Council in 2004, and the C.V. Riley Achievement Award (2009) and the Recognition Award in Entomology (2011) from the ESA North Central Branch. He was elected as a fellow of the American Association for the Advancement of Science in 2012. Zhu is married to Xiaoli Wu, and has a son, Jeffery, and daughter, Lisa.

ESA PROFESSIONAL AWARDS

Distinguished Achievement Award in Extension

This annual award recognizes outstanding contributions to extension entomology.

Dr. John C. Palumbo is a professor and extension specialist in the Department of Entomology at the University of Arizona. John is an Arizona native and received his BS in agricultural science (1982), and MS in entomology (1985) from the University of Arizona, and a PhD degree in entomology from Oklahoma State University (1989). He joined the department in 1990 as a faculty member at the Yuma Agricultural Center, where he has developed an internationally recognized extension and research program in IPM for desert vegetable crops. He has previously served as the state IPM coordinator, and is presently the Arizona state liaison to the USDA IR-4 Program.

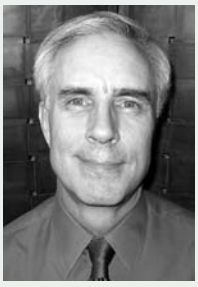
Dr. Palumbo's translational research and outreach program provides the Arizona vegetable and melon industries with innovative insect management solutions designed to reduce their reliance on broadly-toxic insecticides without sacrificing yield and quality. Over the past 24 years, he and his colleagues have collaboratively developed pest management alternatives and educational programs for several invasive species in the western U.S., including *Bemisia tabaci,Nasonovia ribisnigri,* and most recently *Bagrada hilaris.*These efforts have resulted in numerous refereed publications, book chapters, and extension publications, including nearly 200 papers in the ESA's *Arthropod ManagementTests*. He has delivered more than 500 presentations to growers and agricultural consultants on a wide range of topics on vegetable IPM and reduced-risk pesticides.

John's accomplishments in extension have been recognized by stakeholders in Arizona and California, where he has received the Distinguished Service to Agriculture Award (Arizona Farm Bureau),

the Distinguished Service Award (Yuma Fresh Vegetables Association), and the Outstanding Contribution to Agriculture Award (California Association of Pest Control Advisors, Desert Chapter). He was recently recognized as the University of Arizona, CALS Faculty Member of the Year by the Arizona Agriculture 100 Council.

Award for Excellence in Integrated Pest Management

This award, which is sponsored by Syngenta Crop Protection, is based on outstanding contributions which have a direct relation to integrated pest management (IPM).



Dr. Peter C. Ellsworth is an IPM specialist and professor at the University of Arizona Department of Entomology, and the director of the Arizona Pest Management Center. He received degrees in entomology from the University of New Hampshire (BS), the University of Missouri (MS), and North Carolina State University (PhD). He established the Arizona Pest Management Center (APMC) in 2003 as a multidisciplinary consortium of pest management scientists focused on research, outreach, and implementation of IPM in Arizona, which in 2012 was awarded the US-EPA's PESP Gold Tier Shining Star Award. He serves as director of the APMC, state IPM coordinator, state pesticide coordinator, and co-director of the Western IPM Center.

Dr. Ellsworth develops science-based solutions for IPM through applied ecological investigations and organized outreach programs of cooperative extension, with principal focus on the cotton agroecosystem. He has special interests in the integration of chemical and biological controls, and landscape processes that govern pest and beneficial insect distributions. He is located at the University of Arizona's largest experiment station, the Maricopa Agricultural Center in Maricopa, a 2,100-acre laboratory, research, and demonstration farm complex.

Dr. Ellsworth has studied cotton IPM for over 23 years and has authored the successful US-EPA Section 18 Emergency Exemption that made two strategic insect growth regulators, pyriproxyfen and buprofezin, available to Arizona cotton growers for the control of whiteflies in 1996. Together with many other cotton pest management advances, it is estimated that the Arizona cotton industry saved over $388,000,000 (1996–2011) by pracicing the IPM programs that Dr. Ellsworth helped to develop. In collaboration with many others, he has helped implement innovative, cross-commodity whitefly management programs that have helped producers of cotton, melons, and vegetables to stabilize their IPM systems in Arizona.

Distinguished Achievement Award in Horticultural Entomology

This award honors any ESA member who has contributed to the American horticulture industry.

Dr. Daniel A. Herms is professor, state extension specialist, and chair in the Department of Entomology at The Ohio State University (OSU), where he has been a member of the faculty since 1997. He received his BS in landscape horticulture from OSU in 1982, his MS in both horticulture and entomology from OSU in 1984, and a PhD from Michigan State University in entomology with a specialization in ecology and evolutionary biology in 1991. From 1984-1996, he was also employed by the Dow Gardens, a public horticultural display garden in Midland, Michigan, where he directed the pest management program.

His research and extension programs address the ecology and management of insect pests in forests, urban forests, ornamental landscapes, nurseries, and Christmas tree plantations, with foci on chemical ecology of plant-insect interactions, phenological modeling, ecological impacts of invasive insects, and biologically-based pest management. He has published more than 200 research and extension papers, including more than 70 peer-reviewed journal articles, and has been invited to present more than 450 research and extension presentations.

He teaches or co-teaches Forest and Shade Tree Entomology and Pathology, Insect Ecology and Evolutionary Processes, and the Nature and Practice of Science. He has served on the USDA Emerald Ash Borer Science Advisory Panel and the Asian Longhorned Beetle Technical Working Group, he chairs the International Union of Forest Research Organizations Working Group on Tree Resistance to Insects, and he is a subject editor for *Environmental Entomology*.

Distinguished Achievement Award in Teaching

This award is presented annually to the member of the Society deemed to be the most outstanding teacher of the year.

Dr. Diane E. Ullman received a BS in horticulture from the University of Arizona (1976) and a PhD in entomology from the University of California, Davis (1985). She began her career at the University of Hawaii-Manoa (1987), relocating in 1995 to the University of California, Davis, where she is a faculty member in the Department of Entomology and Nematology, and the Department of Plant Pathology.

Dr. Ullman chaired the Department of Entomology at UC Davis (2004-2005), after which she was named associate dean for undergraduate academic programs in the College of Agricultural and Environmental Sciences (2005-2014). There she led curriculum and program development, student recruitment and outreach, and she administrated all undergraduate academic activities.

Dr. Ullman is known for innovative, multidisciplinary teaching strategies that connect science and art programs that mentor the next generation of scientists and help undergraduates succeed. Key examples are the Art/Science Fusion Program (using experiential learning to enhance scientific literacy), the Career Discovery Group Program (training mentors to help students explore careers and select majors), and the national Thrips-Tospovirus Educational Network (training graduate students and postdoctoral scholars to mentor new scientists).

Ullman's research revolves around insects that transmit plant pathogens, in particular plant viruses. She is best known for advancing international knowledge of interactions between thrips and tospoviruses and aphids and citrus tristeza virus. Her contributions have played a fundamental role in developing novel strategies for management of insects and plant viruses. She leads a $3.75 million Coordinated Agricultural Project, and has authored more than 100 refereed publications (cited 3,660 times, h-index of 32). Ullman is an ESA Fellow (2011) and the recipient of numerous awards, including the USDA Higher Education Western Regional Award for Excellence in College and University Teaching (1993), the UC Davis Chancellor's Achievement Award for Diversity and Community (2008), and the 2014 Distinguished Award in Teaching from ESA's Pacific Branch.

Early Career Innovation Award

This award, which is sponsored by BASF, honors young professionals working within the field of entomology who have demonstrated innovation through contributions within any area of specialization (research, teaching, extension, product development, public service, etc.).

Dr. Mary Gardiner is an associate professor in the Department of Entomology at The Ohio State University. She received her MS from the University of Idaho in 2004 and her in PhD from Michigan State University in 2008.

She currently advises eight graduate students and two research scientists who work in a diversity of agricultural and urban ecosystems. Much of this research takes place within an urban ecosystem that encompasses 20,000 vacant lots in Cleveland, Ohio that were formerly residential and commercial space. Here, her laboratory is focused on how redesigning vacant land to restore native plant communities, improving storm-water infiltration, and providing access to locally-produced food can influence arthropod communities and their contributions to ecosystem functions and services.

To fund her research, Dr. Gardiner has generated over $4 million in grant dollars as a lead or co-principal investigator, including a prestigious NSF Faculty Early Career Award. She has published 22 peer-reviewed publications, two book chapters, and eight extension publications in her career. She also has a book due out in February, 2015 titled *Good Garden Bugs: Everything You Need to Know About Beneficial Predatory Insects,* published by Quarry Books.

Mary is actively engaged in extension activities related to enhancing home landscapes, urban green spaces, and small-scale farms as habitats for beneficial arthropods. She co-teaches two graduate courses: Insect Ecology and Evolutionary Processes, and Presentation Skills for Scientists.

Henry & Sylvia Richardson Research Grant

This grant provides research funds to postdoctoral ESA members who have at least one year of promising work experience, are undertaking research in selected areas, and have demonstrated a high level of scholarship.

Sarah Jandricic grew up thinking she was going to be a zoologist, a marine biologist, and an environmental lawyer. At age 22, she decided she should settle on just one profession. After falling in love with insects at the University of Guelph, she began studying entomology and toxicology. Under the guidance of Drs. Cynthia Scott-Dupree and Bruce Broadbent, she earned a joint MS in both fields in 2005.

After graduating, Sarah worked for two years as the director for research for Eco Habitat Agri-Services, a company offering pest management consulting for the greenhouse industry. Realizing she had so much more to learn about insects and their control, she returned to academia in 2007, receiving her PhD from Cornell University in 2013 with Dr. John Sanderson. Her project investigated oviposition decisions of an aphidophagous predator (*Aphidoletes aphidimyza*) in multi-prey environments, as well as the biology of a serious and emerging greenhouse pest, the foxglove aphid.

Sarah is now actively avoiding interacting with snow and cold by working as a postdoctoral researcher in the lab of Dr. Steven Frank at North Carolina State University, where she is investigating non-consumptive predator effects on the behavior and fitness of western flower thrips, as well as other avenues for improving integrated pest management of these pests. Over her career, Sarah has received several prestigious awards, including funding from the Natural Sciences and Engineering Research Council of Canada, a North East SARE grant, and the John Henry Comstock Award from ESA's Eastern Branch. She hopes to continue in a career studying predator-prey interactions and the optimization of IPM programs in agriculture.

Nan-Yao Su Award for Innovation and Creativity in Entomology

Each year this award is given to an ESA member who is able to demonstrate through his/her projects or accomplishments an ability to identify problems and develop creative, alternative solutions that significantly impact entomology.

Dr. Luke Alphey is a leader in the emerging field of genetic pest management, focusing particularly on mosquitoes. He is a non-executive director of Oxitec Ltd, a spin-out company from Oxford University that he co-founded in 2002 (he was the research director from 2002-2014).

Oxitec is developing innovative technology known as RIDL (Release of Insects carrying a Dominant Lethal) to control insect pests, based on the use of engineered sterile males of the pest insect species. These insects carry a simple genetic system imparting conditional (repressible) lethality. In the lab or factory, provision of tetracycline allows the insects to thrive. On release into the wild, the males mate with wild female insects, which lay eggs that are unable to develop into adults, due to inheritance of the control circuit and the absence of the repressor "antidote."

In 2006, Oxitec and the USDA led the first open field releases of a genetically-modified insect. In 2009 and 2010, in collaboration with government of the Cayman Islands, the first outdoor GM mosquito experiments were conducted, showing that RIDL male mosquitoes could indeed find, mate with, and suppress a wild mosquito population. Further open trials in Malaysia and Brazil have subsequently been successfully completed, indicating that the engineered mosquitoes can perform well across a broad range of ecological and social settings.

Prof Alphey's earlier career focused on basic science, using *Drosophila*as a model system. After 11 years at Oxitec, he moved to the Pirbright Institute in Feb, 2014. Dr. Alphey has published extensively on insect genetic engineering and contributed to regulatory frameworks. He and Oxitec have won several awards for this pioneering green technology.

Recognition Award in Entomology

This award, which is sponsored by Syngenta Crop Protection, recognizes entomologists who are making significant contributions to agriculture.

Dr. James F. Campbell is a research entomologist with the USDA-ARS Center for Grain and Animal Health Research in Manhattan, Kansas. Dr. Campbell received a BS and an MS in entomology from Rutgers University, and a PhD in entomology from the University of California, Davis. He joined USDA-ARS in 1999 and has since then conducted research focused on the spatial distribution and movement patterns of stored-product insects in food facility

landscapes, improving the implementation and interpretation of insect monitoring programs, and determining the impact of different management tactics on pest populations within commercial food facilities.

Dr. Campbell is an adjunct professor in the Department of Entomology at Kansas State University, where he has co-supervised eight graduate students and served on many other graduate student committees. He has written more than 110 peer-reviewed journal articles and more than 35 book chapters, proceedings papers, and technical articles. He has also given more than 150 invited presentations, and has been a part of collaborative research teams that have obtained more than $9 million in extramural funding.

Dr. Campbell serves as the secretary/treasurer for the Permanent Committee of the International Working Conference on Stored Product Protection and is on the editorial board of the *Journal of Stored Products Research*. He has served ESA as Secretary, Vice-Chair and Chair of the former Section Cd. Dr. Campbell has received the USDA-ARS-NPA Early Career Research Scientist of the Year Award and the ESA NCB Award for Excellence in Integrated Pest Management and the Recognition Award in Entomology.

Recognition Award in Insect Physiology, Biochemistry, & Toxicology

This award, which is sponsored by Apex Bait Technologies, Inc., recognizes and encourages innovative research in the areas of insect physiology, biochemistry, and toxicology in the broad sense.

Dr. Sarjeet Gill is a professor of cell biology and neuroscience and an entomologist in the Agricultural Experiment Station at the University of California, Riverside. He received his doctorate in insecticide toxicology from UC Berkeley and joined the Department of Entomology at UC Riverside in 1983. He helped established the Department of Cell Biology and Neuroscience and the Graduate Program of Environmental Toxicology, and served as chair of the department and director of the program. Professor Gill is currently the editor of *Insect Biochemistry and Molecular Biology*, a premier journal in entomology, and he co-edited the series *Comprehensive Molecular Insect Science*.

Professor Gill's laboratory has two principal research foci. The first area is to elucidate the mode of action of insecticidal toxins derived from the bacteria *Bacillus thuringiensis*. These toxins are active against agricultural pests and vectors of human diseases. More recently, his work involves another Gram positive bacteria, *Clostridium bifermantans*, which is mosquitocidal. The aim of the research in Professor Gill's lab is to gain a molecular understanding of the toxins involved, and how these toxins interact with cellular targets, thereby causing a disruption of ion regulation and lethality. A second area of research focuses on understanding mosquito midgut and Malpighian tubules function, in particular ion and nutrient transport, and changes that occur following a blood meal and how toxins affect these functions. Prof. Gill is a fellow of the AAAS, and has served on numerous grant review panels at the NIH and USDA.

Recognition Award in Urban Entomology

This award recognizes and encourages outstanding extension, research, and teaching contributions in urban entomology.

Dr. Nancy Hinkle moves easily between agricultural and urban entomology, dealing with significant pests in both areas. Most of her research has involved flies—not only on flies around the home, but the origins and their impact on animal agriculture as well. Discoveries from field studies on avian mites inform her work with delusory parasitosis (and debunk many of the claims made on www.birdmites.org). Because fleas are both significant ectoparasites and household pests, she investigates on-host control as well as environmental suppression. She has studied the distribution of brown recluse spiders in Georgia, seasonality of tick activity in north Georgia, and the role darkling beetles play in *Salmonella* transmission in poultry.

After completing her bachelor's and master's degrees at Auburn University, Nancy worked in veterinary entomology at UGA's Coastal Plain Experiment Station in Tifton. She then went back to school and received a PhD in urban entomology (working on fleas) from the University of Florida. For nine years she taught at the University of California, Riverside before returning to the University of Georgia (Athens) in 2001.

Nancy served ESA on the Governing Board (2010-13), as chair of the Medical, Urban, and Veterinary Entomology Section (2005), and she is currently President-Elect of ESA's Southeastern Branch. In 2009 she served as president of the Society for Vector Ecology. She coached the UCR Linnaean Games team to the 1998 national championship, and the UGA Linnaean Games team to the national championship in 2012. In 2012 she received the Lifetime Achievement Award in Veterinary Entomology, and she was awarded ESA's Distinguished Achievement Award in Extension in 2001.

Thomas Say Award

This ESA award acknowledges significant and outstanding work in the fields of insect systematics, morphology, or evolution.

Dr. Bryan N. Danforth, a professor in the Department of Entomology at Cornell University, is internationally recognized for his research on the biodiversity, natural history, and evolution of bees and their closely-related wasp relatives.

Danforth, a native of Oyster Bay, NY, received his BS in zoology from Duke University, and his MS and PhD degrees in entomology from the University of Kansas. He was a postdoctoral associate with George Eickwort at Cornell before he joined the faculty in the Department of Entomology in 1996.

Danforth's work spans a range of topics, including the origins of bees, the higher-level phylogeny of bees, the evolutionary history of bee social behavior, the antiquity of bees based both on hard fossil evidence as well as fossil-calibrated molecular phylogenies, the historical biogeography of bees, the evolution of cleptoparasitism, and, most recently, the role of native bees in agricultural pollination. Danforth has conducted field work on bees in Australia, Africa, Madagascar, Europe, and North America. He has published nearly 80 peer-reviewed papers and has played a significant role in the careers of graduate students, postdocs, and visiting scholars.

Danforth teaches a number of courses at Cornell, including Alien Empire: Bizarre Biology of Bugs; Insect Diversity and Evolution; and Tropical Field Entomology. He is also a regular contributor to the Bee Course, an annual workshop on all aspects of bee biology and systematics that takes place at the Southwestern Research Station in Portal, AZ.

Danforth holds additional appointments at the American Museum of Natural History, the Cornell University Insect Collection, the Atkinson Center for a Sustainable Future, and the Cornell Center for Comparative and Population Genomics.

ESA STUDENT AWARDS

John Henry Comstock Graduate Student Awards

These six awards are given to one graduate student from each ESA Branch to promote interest in entomology and to stimulate interest in attending the ESA Annual Meeting.

Eric Bohnenblust (Eastern Branch) graduated with a BS in biology from Gettysburg College. After graduation, Eric worked as a research technician at the Penn State Fruit Research and Extension Center for a year under the guidance of Drs. Larry Hull and Greg Krawczyk on the Area-Wide Sex Pheromone Mating Disruption Program for codling moth and oriental fruit moth in tree fruits. Eric then pursued a master's degree in entomology at Penn State, continuing to work under Drs. Hull and Krawczyk. During his master's, Eric's work focused on mating disruption of codling moth and oriental fruit moth, including mating disruption efficacy trials, and effective monitoring of codling moth and oriental fruit moth. For his PhD, Eric worked with Dr. John Tooker at Penn State University. His doctoral work assessed the efficacy and value of transgenic insect-resistant *Bt* field corn hybrids for controlling European corn borer and corn earworm. Eric also received a US Environmental Protection Agency Science to Achieve Results Fellowship to pursue research investigating the effects of the herbicide dicamba on several non-target plant and insect species as part of his doctoral research.

Rebecca Dew (International Branch) is currently in her second year of her PhD at the Flinders University of South Australia. Rebecca's research is focused on the evolution of social behavior with climate in the allodapine bee tribe and, in particular, the arid adapted genus *Exoneurella.*

Rebecca have always been interested with animal behavior, particularly social behavior, and this genus of bee is a fascinating group to study due to the presence of *Exoneurella tridentata*, which demonstrates eusociality, the most extreme form of social behavior. The occurrence of eusociality in this group is of particular interest as the three other members of this genus are only weakly social. Rebecca has been studying the *Exoneurella* since 2010 when she undertook a three-year undergraduate research project under her current supervisor, Associate Professor Michael Schwarz. After receiving her bachelor's degree, she took a year off to travel before deciding to return to Flinders to complete her Honors in 2012. This led straight into her PhD project, which expands on her previous work. She is employing behavioral studies, haplotype networks and phylogenetic reconstructions to explore changes in social behavior within and between species, and how these may have been influenced by climate. Outside of her PhD work, she is also the editor for the monthly email newsletter for the Society of Australian Systematic Biologists.

Michael McCarville (North Central Branch) will complete his PhD in entomology with a plant pathology minor this spring at Iowa State University (ISU). He completed his BS at Briar Cliff University in 2008 and his MS in 2011 at ISU. He is advised by Dr. Matthew O'Neal. Michael's research focuses on integrating soybean aphid and soybean cyst nematode management through host-plant resistance. Michael has always been intrigued by how insects, nematodes, and pathogens manipulate host-plant defenses and primary metabolism. He realizes that multiple herbivores and stressors attack plants simultaneously, and this can lead to plant-mediated interactions between herbivores and pathogens. Integrated pest management, therefore, should not be limited to using multiple tactics to manage a single pest, but should include combining tactics to efficiently manage multiple pests at once.

Michael's dissertation is divided into two parts. The first evaluates the compatibility of a resistance pyramid with other tactics for managing both soybean aphid population densities and virulence allele frequencies. The second explores the ability of host-plant resistance to manipulate pest population densities and subsequently alter soybean aphid-soybean cyst nematode interactions. Michael has authored six peer-reviewed journal articles, nine extension publications, and has co-authored a grant to fund his all of his PhD research. He has given 16 scientific presentations, five extension talks, and eight posters. Michael has taught courses at ISU in insect biology and pest management, serving as a lab instructor for six semesters. He has been active in the ESA's North Central Branch, serving on the Student Affairs Committee for two years.

Dr. Kelly Hamby (Pacific Branch) received her PhD in entomology in March, 2014 under the direction of Professor Frank Zalom at the University of California, Davis with a focus on sustainable integrated pest management strategies for various insect pests. Her dissertation research, titled "Biology and pesticide resistance management of *Drosophila suzukii* in coastal California berries," covered monitoring, yeast associations, chronobiology, chronotoxicity of insecticides, and the implications of this work to managing a recent invader, the spotted wing drosophila. Kelly also received a National Science Foundation Graduate Research Fellowship to study molecular mechanisms of target site resistance to insecticides in this system. In 2011, she was awarded the Lillian and Alex Feir Graduate Student Travel Award in Insect Physiology, Biochemistry, or Molecular Biology from the ESA Pacific Branch. She has recently joined the faculty of the University of Maryland as an Assistant Professor.

Dr. Amber Dawn Tripodi (Southeastern Branch) earned her BS in biology with a minor in entomology from the University of Arkansas, with undergraduate projects in termite phylogeography and sexual selection in cactophilic *Drosophila*. She obtained her MS in environmental sciences from the University of Colorado, studying the effect of nitrogen deposition on the growth of high-altitude trees, before returning to the University of Arkansas for a PhD while working on native bees. Her dissertation combined community ecology, population genetics, and phylogeography to provide insights into the distributions and conservation status of bumble bees and carpenter bees. She is currently a postdoctoral researcher at the USDA-Logan Bee Laboratory, where she investigates bumble bee pathogens.

Dr. Nathan Lord (Southwestern Branch) is an insect systematist specializing in the order Coleoptera. He is broadly interested in alpha- and beta-level taxonomy, reconstructing phylogenies utilizing both morphological and molecular data, and exploring interesting evolutionary scenarios within Coleoptera. Nathan received his BSES in entomology in 2006 and his MS in entomology in 2008 from the University of Georgia under the direction of Dr. Joseph McHugh. His MS thesis was a molecular phylogeny of the minute brown scavenger beetles (Coleoptera: Latridiidae), a description of a new beetle family (Akalyptoischiidae), and a taxonomic revision of the genus *Deretaphrus* Newman (Coleoptera: Bothrideridae). He received his PhD in biology in 2013 from the University of New Mexico under the direction of Dr. Kelly Miller, where his research focused on phylogenetic reconstruction and taxonomic revisionary work within the beetle family Zopheridae, with an emphasis on the biogeography of the southern hemisphere through the use of zopherids as a model taxon. In addition, he has conducted several descriptive and revisionary projects within Zopheridae and Bothrideridae, where numerous new taxa have been described. Nathan has also produced several interactive, digital tools (e.g. Lucid keys). He has authored a book chapter and nine peer-reviewed papers/taxonomic tools, and is the recipient of numerous academic awards. Nathan is currently a postdoctoral fellow at Brigham Young University under the advisement of Dr. Seth Bybee, where his research involves applying NGS methods to investigate the evolution of visual systems within the beetle family Buprestidae and across the order Odonata.

Larry Larson Graduate Student Award for Leadership in Applied Entomology

This award, which is sponsored by Dow Agro Sciences, recognizes Dr. Larry Larson's role as a leader and pioneer in insect management and carries that legacy to the next generation of leaders in applied entomology.

Zachary DeVries was born in Columbus, Ohio, but raised in Auburn, Alabama. As an undergraduate at Auburn University, Zach jumped right in to field work, exploring his interests in biology by working in both a fish ecology lab and a herpetology lab. Zach later began conducting research with Dr. Ray Henry (Dept. of Biological Sciences, Auburn University), studying the physiology and behavior of giant aquatic salamanders. Zach completed his BS degree in zoology with a minor in statistics in 2011. Upon completion of his BS, Zach began pursuing his master's degree in entomology at Auburn University, working with Dr. Art Appel. His research focused on the physiology of urban pests, such as silverfish, firebrats, and bed bugs. His work has led to some interesting discoveries about the metabolism of these species as well as numerous collaborations with other departments and universities. Zach completed his master's degree in 2013.

Zach is currently a PhD student at North Carolina State University, where he is studying the physiology, behavior, and management of urban pests under the direction of Dr. Coby Schal. Zach's dissertation research integrates two important areas of urban entomology: German cockroach allergen mitigation, and bed bug chemical ecology and behavior. Through his work, Zach hopes to improve the management of both of these pests by acquiring both basic and applied knowledge. Zach would like to thank both the Entomological Society of America and Dow AgroSciences. This opportunity will be invaluable to his career development.

Lillian & Alex Feir Graduate Student Travel Award in Insect Physiology, Biochemistry, or Molecular Biology

This award aims to encourage graduate students working with insects or other arthropods in the broad areas of physiology, biochemistry, and molecular biology to affiliate with ESA's Physiology, Biochemistry, and Toxicology Section and to attend the ESA Annual Meeting or an International Congress of Entomology.

Holly Holt is a graduate student in Dr. Christina Grozinger's laboratory at Penn State University. Her PhD research focuses on two fungal pathogens of honey bees, *Nosema apis* and *Nosema ceranae*. Infection with either pathogen species is energetically costly for honey bee workers and can lead to numerous aberrations in worker physiology and behavior, culminating in premature death. Using a whole-genome approach, Holly and collaborators (Drs. Kate Aronstein and Christina Grozinger) identified molecular factors with intersecting nutritional, hormonal, and metabolic roles that likely drive the physiological and behavioral symptoms of infection in worker honey bees. Holly is currently characterizing molecular, physiological, and behavioral symptoms of infection in male honey bees and directly comparing drone disease management strategies to worker responses. She hopes that by contributing to our basic understanding of *Nosema* pathology in honey bees, we can find effective, long-term treatments for these damaging pathogens. Holly also enjoys outreach, mentoring, and policy activities, and she appreciates opportunities to engage with the general public, beekeepers, and scientists.

Student Activity Award

Sponsored by Monsanto Company, this award is presented annually to recognize a student for outstanding contributions to the Society, his/her academic department, and the community, while still achieving academic excellence.

Rebecca Schmidt-Jeffris received her BS in biology from Washburn University in Topeka, KS. With her research advisor, Dr. Lee Boyd, she completed an independent research project investigating prey preferences and kin selection in praying mantids. She is currently in the final year of her doctoral studies in the Department of Entomology at Washington State University. Her dissertation research, under her major advisor Dr. Elizabeth H. Beers, focuses on the biological control of mite pests by phytoseiid mites in apple orchards. Aspects of this work include phytoseiid releases, diversity surveys, and behavioral and pesticide bioassays.

Rebecca enjoys actively participating in both ESA and her department. She has served in several offices for the WSU Entomology Graduate Student Association, including representative to the graduate senate, secretary, and two terms as president. In this capacity, she coordinated several department events, including visits by guest speakers and the annual Insect Expo. She also volunteers as a teaching assistant and guest lecturer for the department. At the Branch level, Rebecca has enjoyed chairing the Student Symposium and Text-Messaging Competition.

She is currently the Vice Chair and Pacific Branch Representative of the ESA Student Affairs Committee and will begin her term as the Chair at the end of this year. One of her favorite activities to

organize is the annual Student Debates. She was excited to be appointed as a Co-Chair of the Student Affairs Committee for the 2016 International Congress of Entomology and is currently working to plan student activities for this meeting. After completing her degree, Rebecca hopes to find a postdoctoral or professorship position working in integrated pest management, and would love to continue studying predatory mites.

Monsanto Research Grant Awards

Monsanto Research Grant Awards fund outstanding ESA student members who are undertaking research projects. The funds may be used for salaries, equipment, supplies, or travel to initiate, accelerate, augment, or expand a research project.

Flor Edith Acevedo is a PhD candidate at the Pennsylvania State University. Her dissertation research focuses on the study of the adaptive mechanisms used by polyphagous insects to exploit different host plants. She has been working in entomology for the last 10 years. For her undergraduate thesis research, she developed DNA molecular markers in the coffee berry borer to study the dispersion of this insect in field conditions. After receiving her bachelor's degree in 2006 from Universidad de Caldas (Colombia), she joined the entomology team of the Colombian Center for Coffee Research (Cenicafé), where she studied the genetic variability of the coffee berry borer in Colombia. In 2010, she started her PhD studies at Penn State, partially sponsored by a Fulbright scholarship.

Flor has been captivated by research in the field of insect-plant interactions. She is interested in understanding how insects evolved the ability to feed on plants and how this influences insect diversification. Further avenues that she would like to explore are related to the factors driving insect-plant specialization and its relation to speciation. She is also interested in studying the evolution of neuroethological adaptations mediating host finding in plant feeding insects.

Carrie Deans grew up in rural Minnesota in a small town called Jackson. For her undergraduate degree, she attended the University of St. Thomas in St. Paul, MN, where she worked with Adam Kay and Kyle Zimmer on several projects focused on the nutritional ecology of aquatic insects. In 2005, she graduated with a BA in biology and in environmental studies. Afterwards, she took some time away from academia and worked several jobs in the natural resources field, including a term of service with the Minnesota Conservation Corps and work at Willow River State Park in Wisconsin. She then went back to school to obtain an MS in ecology and natural resources at St. Cloud State University in Minnesota, where she worked in Neal Voelz's stream ecology lab. Her master's project was largely an extension of her undergraduate work in the field of ecological stoichiometry, a sub-field of nutritional ecology that focuses on the balance of elements in consumer-resource interactions. For her doctorate, she wanted to focus more on organismal biology and physiology as a means to understand the mechanisms driving the phenomena that she had observed in her stoichiometric work, which led her to join the labs of Spencer Behmer and Gregory Sword at Texas A&M University. Their combined expertise in the fields of insect physiology and nutritional ecology has helped her to develop a highly interdisciplinary dissertation project that focuses on how nutrition impacts stress response in insects, a topic that fits in well within her more general interests in gene-by-environment interactions and plasticity.

Zachary DeVries was born in Columbus, Ohio, but raised in Auburn, Alabama. As an undergraduate at Auburn University, Zach jumped right in to field work, exploring his interests in biology by working in both a fish ecology lab and a herpetology lab. Zach later began conducting research with Dr. Ray Henry (Dept. of Biological Sciences, Auburn University), studying the physiology and behavior of giant aquatic salamanders. Zach completed his B.S. degree in Zoology with a minor in Statistics in 2011. Upon completion of his B.S., Zach began pursuing his master's degree in Entomology at Auburn University working with Dr. Art Appel. His research focused on the physiology of urban pests, such as silverfish, firebrats, and bed bugs. His work has led to some interesting discoveries about the metabolism of these species as well as numerous collaborations with other departments and universities. Zach completed his Master's in 2013.

Zach is currently a Ph.D. student at North Carolina State University where he is studying the physiology, behavior, and management of urban pests under the direction of Dr. Coby Schal. Zach's dissertation research integrates two important areas of urban entomology: German cockroach allergen mitigation and bed bug chemical ecology and behavior. Through his work, Zach hopes to improve the management of both of these pests by acquiring both basic and applied knowledge. Finally, Zach would like to thank both the Entomological Society of America and Monsanto; this funding will be extremely valuable in allowing him to pursue his research goals.

Amy Morey is a PhD candidate in entomology at the University of Minnesota, working with Drs. Rob Venette and Bill Hutchison. Amy's research is designed to help entomologists and ecologists make better forecasts of risks posed by invasive insect species. By examining cold hardiness phenotypes, she examines the underlying cold hardiness mechanisms of an insect, which, if understood better, would improve spatially-explicit strategies to predict and prevent the spread of invasive insect species. Her research integrates fundamental entomological research with societal factors to improve the scientific basis for pest risk analysis and public policy related to control the light brown apple moth (*Epiphyas postvittana*) and other invasive insects. In addition to her current PhD program, Amy was awarded a two-year NSF-Integrative Graduate Education and Research Traineeship and will be receiving a minor in the risk analysis of invasive species and genotypes. Amy received a BA in biology from Luther College, and then went on to complete an MS in entomology from the University of Minnesota, where she researched the cold hardiness and integrated pest management of *Helicoverpa zea* in sweetcorn.

Amy is an active member of ESA, presenting numerous presentations and posters at both the national and North Central Branch meetings, and serving on the NCB Student Affairs Committee. She co-teaches an undergraduate course on integrated pest management, and is regularly involved with entomological outreach events with local schools and organizations, and departmental events.

Brittany F. Peterson is a PhD candidate in the Department of Entomology and the Interdisciplinary Life Science Program at Purdue University, working with Professor Michael Scharf. She holds both a BS (2008) in microbiology and an MS (2011) in biology from Western Illinois University. Her master's work focused on symbiont-mediated virus vectoring potential in whiteflies. She is currently working to understand the physiological collaborations of

Reticulitermes flavipes and its 4,000+ symbiont species, specifically focusing on digestion and immunity. Using integrative approaches from entomology, microbiology, molecular biology and biochemistry, Brittany aims to elucidate the contributions of various symbiotic groups (prokaryotic and eukaryotic) to termite nutritional immunity. In addition to this award, she has received funding for this project through the Indiana Academy of Science's Senior Research Grant.

In addition to being a researcher, Brittany is an advocate for the advancement of women in STEM fields and for science literacy. She is a member of the Association for Women in Science and a team leader for the Purdue Graduate Women in Science Program. She is also involved in community outreach activities in the greater Lafayette, Indiana area. Mentoring is a passion of Brittany's. She has served as a peer mentor for other graduate students in her program, and has mentored undergraduate students in the laboratory. Upon completion of her degree, she plans to continue researching host-symbiont coevolution and physiological interactions.

Monsanto Student Travel Awards

The Monsanto Student Travel Awards were created to promote interest in entomology at the graduate level and to stimulate interest in attending ESA's Annual Meeting.

Dominic Evangelista is one of the few cockroach systematists in the U.S., and is the only person to extensively research the cockroaches of the Guiana Shield in the last 20 years. His research focuses on origins and patterns of diversity of Blattodea in this region. This includes exploring the relationship between dispersal ability and the evolution of geographic ranges (regional scale), the effect of species delimitation on estimates of species richness within a community of cockroaches (local/community scale), and the effect of specific landscape features on limiting migration and genetic divergence (local/species scale). In addition to this, Dominic has described new taxa, contributed to the barcode of life project, and identified a pest cockroach species recently introduced into New York City.

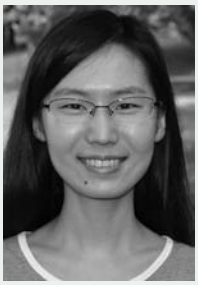
Erica Kistner is originally from Maple Valley, Washington, where she spent many an hour exploring the local woods as a child. By high school, she knew she wanted to be biologist. She obtained a BS in biology from the University of Portland in 2006. After graduating, she joined Mark Dybdahl's lab at Washington State University (WSU) as an MS student. Her MS research examined adaptation in the shell morphology of the invasive New Zealand mud snail and yielded two first author publications. In 2009, she left WSU with an MS in zoology, and she began a PhD program at the University of Notre Dame under Gary Belovsky. She spent five years studying fungal pathogen regulation of the grasshopper pest, *Camnula pellucida* in western Montana. This work has been published in multiple journals, including *Ecology*. She successfully defended her dissertation in May, 2014. Thanks to a posting on the ESA job board, she joined Mark Hoddle's lab at UC-Riverside as a postdoctoral scholar in Jul, 2014. Dr. Kistner is currently working on the ongoing biological control of the Asian citiris psyllid in southern California. Her research utilizes both empirical techniques, including laboratory and field experimentation, and theoretical approaches (both mathematical and statistical) to provide a comprehensive understanding of biological systems.

Meaghan L. Pimsler is a PhD candidate in the Department of Entomology at Texas A&M University, where she uses de novo transcriptomics to investigate sexual dimorphism and behavioral ecology in an invasive blow fly with a unique and poorly understood sex determination mechanism. She received her BS in entomology from Cornell University in 2007, and subsequently spent three years in Okinawa, Japan working at two high schools as an English teacher. After recuperating sufficiently from the rigors of her undergraduate education, she began her postgraduate journey with Dr. Jeffery K. Tomberlin and Dr. Aaron M. Tarone in 2010.

Meaghan has had a deep and abiding love of arthropods her entire life, and determined at the age of four that she would be an entomologist. She helped found entomology clubs in both high school and college, and has helped organize many entomology themed outreach and enrichment events, including working with the Smithsonian Museum of Natural History on their BugFest, and with Cornell University's Entomology Department on their Open House. Meaghan is primarily interested in forensic entomology, and this has led to a certification in Crime Scene Investigation with Texas Engineering and Extension Services; teaching at workshops for federal, state, and local law enforcement groups; and the opportunity to coordinate symposia on "Youthful Perspectives in Forensic Entomology" with Ms. Charity Owings at the 2013 and 2014 ESA Annual Meetings. She was also a member of TAMU's graduate student Linnaean Games Team for two years, the captain of the debate team for the 2013 ESA Student Debates, and she enjoys baking, science fiction movies, and training in mixed martial arts.

Erika Machtinger is a PhD candidate at the University of Florida. She received her BS from the University of Delaware in Wildlife Conservation and her MS in entomology from the University of Florida. Erika was raised in Blue Hill, Maine, just down the road from Acadia National Park. The natural areas surrounding the coast of Maine fostered Erika's love of the environment and wildlife. Erika has worked at the USDA and also as a wildlife biologist and environmental scientist. She has been an avid equestrian for over 26 years and has competed on national and international levels. Because of involvement in the equestrian community and interest in insects and biological control, Erika has been focusing her research on biological control of filth flies on equine properties in Florida.

Erika was awarded the best MS Thesis and Outstanding MS Student Scholarship by the University of Florida Department of Entomology and Nematology for her pioneering work with filth fly management on small equine farms. With the support of Dr. Leppla and Dr. Chris Geden as co-chairs, she is continuing her work by focusing on the olfactory stimuli associated with host location by pteromalid pupal parasitoids of filth flies. Erika has received seven research grants for her work and has received several first-place honors for paper and poster presentations at regional and national ESA meetings. She has published 15 papers in refereed scientific journals. Erika is an also an active member of ESA, serving as a Co-Chair of the Student Affairs Committee for the Southeastern Branch, and most recently as a member of the ESA Student Affairs Committee. She is also the Supervisory TA for the Principles of Entomology laboratory offered through the University of Florida.



Qian "Karen" Sun graduated with a BS in 2008 from the Honors Program in Life Science at China Agricultural University in Beijing, where she continued with a, MS program studying biodiversity and molecular phylogeography of earthworms. Being attracted by the fascinating social organization of insect groups, in 2010 Qian began a PhD program in entomology at the University of Kentucky, working on termites with Dr. Xuguo "Joe" Zhou. Her dissertation research aims to understand the chemical and genetic mechanisms of undertaking behavior in termites, by integrating behavioral study with chemical ecology and functional genomics. Undertaking behavior, the disposal of the dead, is an essential part of collective immune defenses that enables social colonies to mitigate disease hazard posed by corpses. Qian's research demonstrated differential responses in termite workers toward corpses with different origins and postmortems times, and discovered chemical cues from corpses influencing the behavioral response. She is currently investigating genes and gene networks involved in the behavioral process.

Qian received four fellowships to support her graduate studies at the University of Kentucky. During her PhD studies, she published a review article on corpse management in social insects in the *International Journal of Biological Sciences*, and a research article in *Scientific Reports*. Additionally, she has presented actively at the Branch and national meetings of ESA, the national meeting of ISCE, and other academic meetings. She has won the first-place award in the Ten-Minute Paper Competition (SysEB) at the 2014 North Central Branch Meeting. While working with termites, Qian found the study of eusociality to be enormously exciting. Upon graduation in 2015, she will be seeking a postdoctoral position and continue exploring the evolution of eusociality in the animal kingdom.

USDA-AFRI Student Travel Grants

This travel grant award is funded by USDA-NIFA's Agriculture and Food Research Initiative Program on Plant-Associated Insects and Nematodes. It was created to provide financial support to graduate students for new networking, presentation, and research opportunities at Entomology 2014.

Heather Connelly is a fourth-year PhD candidate in the Department of Entomology at Cornell University. Her research approach integrates large-scale field studies with new molecular techniques in order to develop integrated management strategies that promote synergy between the conservation of ecosystem services and improve agricultural productivity. Her dissertation project investigates the influences of landscape simplification due to agriculture on pollination and biological control services provided by wild insects to strawberry production in NY. Specifically, her work focuses on understanding how farm-level diversification and incorporation of wildflower strips may potentially buffer the negative impact of simplified landscape contexts. Prior to graduate school, she studied how land management practices impact white-footed mice populations and the prevalence of Lyme's disease while working on her BS at Ursinus College. Heather has been particularly active in advocating for native pollinators and other ecosystem service providers by giving talks based on her dissertation research at more than 35 venues, including both grower extension services and public science outreach. In her free time, Heather runs a small organic farm with her husband producing vegetables and raising chickens, ducks, and dairy goats.

Adam Dale grew up just outside of Greensboro, NC. He attended NC State University, where he got his bachelor's degree in biological sciences. He always had an interest in science, but never considered entomology as a career. While an undergrad, Adam worked as an assistant in an entomology lab for three years. This sparked a genuine interest in entomology and ecology. After graduation, he began graduate school at NC State, where he is currently working on his PhD with Dr. Steve Frank. His research focuses on urban ecology and the effects of urban habitats on street trees and arthropod herbivores. Primarily, he studies red maple (*Acer rubrum*) street trees and their most important insect pest in the southeastern U.S., the gloomy scale (*Melanaspis tenebricosa*). Cities create unique habitats that many herbivorous pests thrive in, but the reasons behind this are not well understood. He hopes to uncover mechanisms behind increased pest abundance in cities so that management strategies can be developed. As urbanization and climate change progress, we must adapt management practices to sustain urban forests and maximize their contribution of services to humans and the environment.

Carrie Deans grew up in rural Minnesota in a small town called Jackson. For her undergraduate degree, she attended the University of St. Thomas in St. Paul, MN, where she worked with Adam Kay and Kyle Zimmer on several projects focused on the nutritional ecology of aquatic insects. In 2005, she graduated with a BA in biology and in environmental studies. Afterwards, she took some time away from academia and worked several jobs in the natural resources field, including a term of service with the Minnesota Conservation Corps and work at Willow River State Park in Wisconsin. She then went back to school to obtain an MS in ecology and natural resources at St. Cloud State University in Minnesota, where she worked in Neal Voelz's stream ecology lab. Her master's project was largely an extension of her undergraduate work in the field of ecological stoichiometry, a sub-field of nutritional ecology that focuses on the balance of elements in consumer-resource interactions. For her doctorate, she wanted to focus more on organismal biology and physiology as a means to understand the mechanisms driving the phenomena that she had observed in her stoichiometric work, which led her to join the labs of Spencer Behmer and Gregory Sword at Texas A&M University. Their combined expertise in the fields of insect physiology and nutritional ecology has helped her to develop a highly interdisciplinary dissertation project that focuses on how nutrition impacts stress response in insects, a topic that fits in well within her more general interests in gene-by-environment interactions and plasticity.

Michael Garvey is originally from Stroudsburg, Pennsylvania, located at the southern part of the Pocono Mountains. He completed his BS in entomology, cum laude with distinction in research, in 2012 at Cornell University. During his undergraduate career at Cornell, he assisted with research pertaining to insect pathology, specifically focusing on how to apply insect pathogens to facilitate biological control of Asian longhorned beetles (*Anoplophora glabripennis*), gypsy moths, and *Sirex noctilio* in the laboratory of Dr. Ann Hajek for three years. He then conducted independent research on immune activity in fruit flies with and without their gut microbiota, and on the pea aphid under Dr. Angela Douglas, which culminated in an undergraduate thesis. Currently, he is pursuing a PhD at Purdue University as part of Dr. Ian Kaplan's laboratory group. His research interests include plant-insect and host-parasite interactions. His dissertation focuses on examining

tritrophic interactions and biological control in solanaceous crops using the tobacco hornworm and its specialist parasitic wasp, *Cotesia congregata*. Specifically, he has a keen interest in plant-mediated effects on the immune response, and he aims to elucidate how food plant toxins influence susceptibility to parasites from an ecological and immunological perspective. He was recently awarded a National Science Foundation Graduate Research Fellowship. After receiving his doctorate, he hopes to continue doing research in academia focusing on parasitoid biological control and how altered nutritional hosts' states affect the immune response to parasitoids.

April Hamblin received her BS in environmental sciences from the Richard Stockton College of New Jersey. In order to continue addressing issues involved with conserving pollinators, she enrolled at North Carolina State University (NCSU), where she works in Dr. Steven Frank's lab studying urban native bees. As climate change and urbanization continue to increase at unprecedented levels, it is important to understand how temperature and urban landscape changes influence native bees on an individual and community level. To broaden our knowledge on this topic, April studies native bee communities in urban areas, such as backyards and parks, that reside on a temperature gradient. April also experiments with bees to explore their thermal tolerances as individuals. Along with her research, April participates in NCSU's Entomological Graduate Student Association (EGSA) as treasurer and fundraising chair. She enjoys conducting educational outreach with EGSA to spread knowledge of native bees and insects in general to those who might otherwise never come in contact with entomology.

Freddy Ibanez is a second-year PhD student in entomology at Texas A&M University. Freddy received his BS in biochemistry at the University of Santiago in 2006, where he served as secretary of the Biochemist Undergraduate Student Organization. Freddy's interest in insect biology started years ago when he was working as a research assistant in the laboratory of Dr. Veronica Cambiazzo at the Institute of Nutrition and Food Technology (INTA, Chile) on genes associated with gastrulation during the development of *Drosophila melanogaster*. He joined Texas A&M University as a research assistant in the Department of Horticultural Sciences in 2010. During a seminar about plant-pathogen-vector interactions, Freddy met Dr. Cecilia Tamborindeguy and asked about joining her research group to learn and understand how the pathogen *Candidatus* Liberibacter solanacearum and its vector *Bactericera cockerelli* colonize and induce serious diseases – particularly Zebra chip, which is associated with significant economic losses – in solanaceous crops. In August, 2013, Freddy started to pursue a PhD degree in entomology in Dr. Tamborindeguy's group, where he is dedicated to studying *Bactericera cockerelli* reproduction, determining the effects of *Candidatus* Liberibacter solanacearum on insect fecundity, and identifying novel targets to control psyllid populations.

Erin McMahan is an MS candidate at the University of Wisconsin-Madison, working under the guidance of Dr. Christelle Guédot. Although she had a passion for insects from an early age, her path towards entomology was a circuitous one. Erin attended Whitman College for her undergraduate education, where she received a BA in environmental studies and politics and gained firsthand experience in the interaction between agriculture and conservation. After working a range of jobs in water management policy, political campaigning, and land restoration, her interests in conservation and sustainable agriculture led her to pursue a research project in integrated pest management. Erin's research examines host-plant resistance in cranberry by assessing the performance and field population densities of the three main insect pests in Wisconsin cranberry – blackheaded fireworm (*Rhopobota naevana*), sparganothis fruitworm (*Sparganothis sulfureana*), and cranberry fruitworm (*Acrobasis vaccinii*) – on different cranberry varieties. The study strives to identify more resistant varieties with the hopes of reducing the use of pesticides to combat these lepidopteran pests. Erin's other research interests include the conservation of beneficial insects and pollination biology. In the future, she hopes to continue working with IPM and to engage in more outreach promoting insect appreciation and understanding of conservation needs.

Patricia Pinheiro has worked as an entomologist for 12 years at the Brazilian Institute for Agricultural Research (EMBRAPA). In 2010, she was offered a position as a researcher at EMBRAPA's Rice and Beans Research Station. To better accomplish her goals as a researcher, she decided to pursue her PhD at Cornell University, where she is currently a third-year PhD candidate. She is interested in plant-virus-insect interactions, focusing on the basis and evolution of the vectoring ability of aphids, and her research involves the use of genetics and proteomics tools.

Ariel Rivers is currently a dual-title doctoral candidate at Pennsylvania State University, studying entomology and international agriculture and development. Ariel holds a BS in soil and water science (2004, University of California, Davis) and an MS in environmental studies (2009, San José State University), and has always been broadly interested in sustainable resource management in developing country agriculture. As she started to study different agricultural practices that could be implemented to conserve abiotic resources (e.g., soil and water), she became interested in conserving the biotic resources as well. It was her MS research, for which she studied pasture productivity and arthropod diversity below dispersed trees in cattle pastures of Nicaragua, that stimulated her interest in arthropods. Ariel now applies her interdisciplinary background to her research in central Pennsylvania and central Mexico, to study the ground-dwelling arthropod community in diverse, reduced-tillage cropping systems. She hopes that understanding the populations at the soil surface will help inform the impacts of different agricultural practices on biocontrol. In addition to her brief time as an entomologist, she has also served as a soil conservationist with the USDA's Natural Resources Conservation Service, and worked with Clark County Public Health to develop a food garden education program to assist low-income families. Upon graduation, Ariel hopes to continue to work internationally, and to look at the nexus between low-input cropping systems, their environmental benefits, and impacts on local food security.

Anthony Vaudo's enthusiasm for naturalism and for using nature as inspiration for expression through music, poetry, and photography stimulated his original interest in exploring entomology as a career path. His experiences while living and conducting scientific research in Costa Rica and South Africa further allowed him to fully experience the complexity of nature and embrace the value of sustainable agricultural and conservation practices. Networking abroad with academics, farmers, workers, and nature enthusiasts sensitized him to conflicts at the intersection of nature conservation and agriculture. In his MS research, based in South Africa, he studied the effects of land use on the health and population density of wild honey bee colonies.

He developed novel methodologies, using beelines to estimate colony density and using colony strength parameters as an indicator of ecosystem health. His PhD research focuses on nutritional ecology of pollinators, using bumble bees as a model system. Pollinator nutritional ecology may drive patterns of floral visitation, define what floral resources bees require in the landscape to maintain healthy populations, and shed insight into the evolution of plant-pollinator mutualisms. His career goal is to become a skilled university-based biologist who employs a multidisciplinary approach to develop ecologically relevant conservation initiatives that harmonize habitat preservation with human needs. This will include pursuing research opportunities internationally, driven by his incessant interest in tropical ecosystems and cultures. Furthermore, he plans to use his research as a springboard for nature films and artistic audio and visual expressions of scientific data, which will expose broad audiences to natural wonders and scientific findings.

THE STINGER AWARDS (2014 Finalist)

These awards are given to the winners of the YouTube Your Entomology video contest. This contest gives ESA members the opportunity to showcase their talents and creativity through video.

The winners will be announced during the Opening Plenary Session and will be determined from the following finalists in each of the four categories. Make sure to stop by the Stinger Awards Booth in the Exhibit Hall in booth 219 where the videos will be featured.

Instruction Category:

"Hyperparasitoid Activity"
By Justin Bredlau, Jessica Bray, and Megan Ayers
Virginia Commonwealth University

"Of bees and mites: A model for the behavioural response of bees to Varroa destructor"
By Marta Guarna and Katia Truong
University of British Columbia

Discovery Category:

"Carrot and Stick: Luring the Brown Marmorated Stink Bug to an Early Demise"
By Rob Morrison
USDA-ARS

Outreach Category:

"Can We Save Ash Trees from the Emerald Ash Borer?"
By David Showalter and Michael Falk
The Ohio State University

"How to ID Two Common Hornworms"
By Aurora Toennisson and Hannah Burrack
North Carolina State University

"Blueberry Pollination in Maine"
By Michael Wilson, John Skinner, Jenny Moore, Frank Drummond, and Philip Moore
University of Tennessee and University of Maine

Open Category:

"Catch, with me, BMSB"
By Rob Morrison and Emily Fraser
USDA-ARS

"Termite Hunter - trap-jaw ants and termites"
By Adrian Smith, Clint Penick, and Martin Hoogeboom
University of Illinois at Urbana-Champaign

"Collecting Rootworm Beetles from a Tall Tower"
By Joseph L. Spencer
University of Illinois at Urbana-Champaign

ENTOMOLOGICAL SOCIETY OF AMERICA CERTIFICATION CORPORATION AWARDS

ACE Professional Award

This award recognizes the superior contributions of an Associate Certified Entomologist (ACE) in the field of structural pest management.

Robert B. Caine, ACE was always curious about insects and reptiles as a young child in Miami, Florida. When he was eight years old, a monthly exterminating service treated his family's home. He was fascinated with the shiny can Ted the serviceman carried with him and asked many questions about the bugs he was spraying.

Little did he realize that 22 years later he would meet Ted again, and all those questions he asked would propel him into a new career in the pest control industry. After graduating high school, he attended college for a semester and then joined the U.S. Air Force. His enlistment lasted 4.5 years, with 2.5 of them spent in southeast Asia.

After leaving the service, he eventually went into chemical and equipment sales, calling on golf courses and pest control companies. He sold everything from insecticides to fertilizers and equipment. After two years of living out of a suitcase and a different hotel room every night, Bob needed a change. He answered an ad for a national pest control company in Miami and was fortunate to be hired as a sales rep.

After six months, he enjoyed it so much that he decided to learn as much as he could about the business and the industry. He enrolled in the pest control degree program at Broward College and passed the state exams after graduating. He then started his own business in 1979. Shortly thereafter, he joined the Florida Pest Control Association and in 1993 was elected its president. In 2009 he became an Associate Certified Entomologist and to this day continues to promote the program to others.

Distinguished Service Award to the Certification Program

This award encourages, recognizes, and rewards outstanding contributions to the ESA Certification Program and the professionalism of entomology.

Dr. Kathy Heinsohn, a native of Folly Beach, SC, worked with Gary Bennett to receive her PhD in 1998 from Purdue University's Entomology Department, where she researched German cockroach reproductive behavior and morphology. She also holds an MS in zoology from Clemson University (1989), and she was a Fulbright scholar at UniversitŠt Gšttingen in Germany (1985).

After seven years working with Western Pest Services, she became staff entomologist for the National Pest Management Association's Technical Department. Dr. Heinsohn authored two book chapters and many trade journal and association news articles on IPM-related issues, and she gave multiple speeches and developed technician training materials.

In 2010, Dr. Heinsohn joined AmericanPest, a Copesan Pest Solutions Partner. Her primary responsibility is contract entomologist for the Animal Care IPM Program at the National Institutes of Health. She also works with the State Department contract, and has traveled to the U.S. embassy in Tunisia to conduct IPM programs.

An ESA member since 1991, she became board certified in 2001 and is a member of the ACE Certification Committee. She co-organized two Sectional symposia at ESA Annual Meetings (bees and wasps in 2001, and the first on bed bugs in 2005.) She enjoys mentoring technicians and students of entomology, and has recruited many to the pest management field and to the ESA Certification Programs.

She currently sits on both the Copesan and NPMA Technical Committees, and she has been active in organizations such as Sigma Xi (1988-present), Pi Chi Omega (recording secretary, 1999-2002), the *Pest Control Magazine* Editorial Advisory Board (2002-2009), the Purdue Department of Entomology Development Council (2009-present).

Kathy is a beekeeper in western Maryland, and enjoys walks with her friend Dr. Walt Bell and with Clifford, a Saint Bernard mix. She takes her honey to local markets, sings in her church choir, and volunteers for the food bank. She also maintains a bee blog at http://drkathysbees.blogspot.com.

Student Certification Award

Sponsored by PestWest Environmental Science, this award recognizes and encourages outstanding entomology graduate students with interest in the mission of the ESA certification program, and to promote the understanding and importance of the program.

Alix Whitener received her BS in biology-anthropology and a minor in women's studies at Western Washington University, where she was a coxswain for the women's rowing team. She is beginning her second year as a PhD student at Washington State University under advisor Elizabeth H. Beers.

Alix's research project focuses on the behavior and control of spotted wing drosophila in sweet cherries. This research is an extension of work she began as an undergraduate technician in Dr. Beers' laboratory. At Washington State University, Alix serves as a graduate student representative to the Academic Affairs Committee and to the Bi-University Graduate Speaker Series Committee, and she is this year's WSU Entomology Graduate Student Association President. Earlier this year, Alix was on the second-place Pacific Branch Linnaean Games team, and she's excited to compete at the National Meeting. Alix co-chaired her Branch's Career Fair and is looking forward to improving the event for next year's meeting. She was also an invited speaker in the Student Symposium, where she described important invasive insect species and trends in their arrival and invasion of the Pacific Branch states. This year at Entomology 2014, Alix will present a paper in the Student Competition, an unbiased introduction in the Student Debates, and a poster in the Student Symposium. One of her goals as an entomologist is to contribute to improving tree fruit IPM as an extension agent.

ENTOMOLOGICAL FOUNDATION PROFESSIONAL AWARD

Entomological Foundation Medal of Honor

This award is the highest award presented by the Foundation and is given only to those who have attained preeminence in the field throughout outstanding contributions.

Dr. May Berenbaum was selected for her distinguished service in fulfilling the Foundation's mission of exciting young people about science through insects. Dr. Berenbaum has been on the faculty of the Department of Entomology at the University of Illinois at Urbana-Champaign since 1980, serving as head since 1992 and as Swanlund Chair of Entomology since 1996. Devoted to teaching and fostering scientific literacy through formal and informal education, she has authored numerous magazine articles and six books about insects for the general public, in addition to over 230 refereed scientific publications and 35 book chapters. A member of the National Academy of Sciences, she has chaired two National Research Council committees, the Committee on the Future of Pesticides in U.S. Agriculture (2000), and the Committee on the Status of Pollinators in North America (2007). She graduated summa cum laude with a BS degree and honors in biology from Yale University in 1975, and received a PhD in ecology and evolutionary biology from Cornell University in 1980.

DAILY SCHEDULE OF MEETINGS AND FUNCTIONS

FRIDAY, NOVEMBER 14		
Meeting/Function	**Time**	**Location**
Annual Review of Entomology Editorial Committee Meeting	8:00 AM - 5:00 PM	C123, Oregon Convention Center
SATURDAY, NOVEMBER 15		
Meeting/Function	**Time**	**Location**
Entomological Collections Network	7:00 AM - 5:00 PM	Holladay, Doubletree Portland
ESA Governing Board Meeting I	7:30 AM - 2:30 PM	Roosevelt, Doubletree Portland
Pioneer Hi-Bred 6th Annual Academic Forum	8:00 AM - 5:00 PM	A105, Oregon Convention Center
Entomological Foundation Teacher Workshop	8:30 AM - 1:00 PM	C123, Oregon Convention Center
Microbial Control Working Group	8:30 AM - 5:30 PM	A103-104, Oregon Convention Center
ESA Registration and Information Center	2:00 PM - 6:00 PM	Exhibit Hall C Foyer, Oregon Convention Center
Presentation Preview Room (PPR)	2:00 PM - 6:00 PM	C120-122, Oregon Convention Center
ESA Certification Corporation Governing Board Meeting	2:30 PM - 3:00 PM	Roosevelt, Doubletree Portland
Council of Entomological Department Administrators Meeting	3:00 PM - 6:00 PM	Weidler/Halsey, Doubletree Portland
P-IE Governing Council Working Session	4:00 PM - 6:00 PM	Hamilton, Doubletree Portland
Entomological Collections Network	6:00 PM - 9:00 PM	Multnomah, Doubletree Portland
SUNDAY, NOVEMBER 16		
Meeting/Function	**Time**	**Location**
Presentation Preview Room (PPR)	6:30 AM - 6:00 PM	C120-122, Oregon Convention Center
Moderator Training	7:00 AM - 7:30 AM	C123, Oregon Convention Center
Entomological Collections Network	7:00 AM - 12:00 PM	Holladay, Doubletree Portland
ESA Registration and Information Center	7:00 AM - 9:00 PM	Exhibit Hall C Foyer, Oregon Convention Center
Environmental Entomology Editorial Board Meeting	8:00 AM - 10:00 AM	Morrison, Doubletree Portland
2014 Annual Meeting Program Committee Meeting	9:00 AM - 10:00 AM	D131, Oregon Convention Center
Annals of the ESA Editorial Board Meeting	10:00 AM - 12:00 PM	Morrison, Doubletree Portland
ESA Urban Adventure Run	10:00 AM - 12:00 PM	Oregon Ballroom, Oregon Convention Center
Yearly Meeting of the Society for Regulatory Entomology	12:15 PM - 1:15 PM	E145, Oregon Convention Center
Journal of Economic Entomology Editorial Board Meeting	1:00 PM - 3:00 PM	Morrison, Doubletree Portland
ARM Software Workshop	1:00 PM - 4:00 PM	Oregon, Doubletree Portland
Judges Training	1:30 PM - 2:00 PM	D132, Oregon Convention Center
Science Policy Capability Committee	1:30 PM - 2:30 PM	D135, Oregon Convention Center
Fire Ant eXtension Network Meeting	2:00 PM - 3:30 PM	D131, Oregon Convention Center
Certification Board Meeting	2:00 PM - 5:00 PM	Roosevelt, Doubletree Portland
Linnaean Games - Preliminary Rounds	2:00 PM - 5:00 PM	Oregon Ballroom, Oregon Convention Center
ICE Council Meeting	2:30 PM - 3:30 PM	D132, Oregon Convention Center
Welcome to Portland	3:00 PM - 4:00 PM	D135, Oregon Convention Center
Journal of Medical Entomology Editorial Board Meeting	3:00 PM - 5:00 PM	Morrison, Doubletree Portland
ICE 2016 Organizing Committee Meeting	3:30 PM - 4:30 PM	F149, Oregon Convention Center
School and Urban IPM eXtension Network Meeting	3:30 PM - 5:00 PM	D131, Oregon Convention Center
New Member Reception	4:30 PM - 5:15 PM	D133-134, Oregon Convention Center
Judges Training	4:45 PM - 5:15 PM	D132, Oregon Convention Center
Exhibit Hall	7:30 PM - 9:30 PM	Exhibit Hall C, Oregon Convention Center
Welcome Reception	7:30 PM - 9:30 PM	Exhibit Hall C, Oregon Convention Center

MONDAY, NOVEMBER 17		
Meeting/Function	**Time**	**Location**
Women in Entomology Breakfast	6:15 AM - 8:00 AM	Holladay, Doubletree Portland
Presentation Preview Room (PPR)	6:30 AM - 6:00 PM	C120-122, Oregon Convention Center
Moderator Training	7:00 AM - 7:30 AM	C123, Oregon Convention Center
Judges Training	7:00 AM - 7:30 AM	D132, Oregon Convention Center
The Coleopterists Society Executive Council Meeting	7:00 AM - 1:30 PM	Alaska, Doubletree Portland
ESA Registration and Information Center	7:00 AM - 5:00 PM	Exhibit Hall C Foyer, Oregon Convention Center
Entomological Foundation Board of Directors Annual Meeting	8:00 AM - 9:30 AM	Ross Island, Doubletree Portland
ACE Support Committee Meeting	8:00 AM - 10:00 AM	Broadway, Doubletree Portland
Arthropod Management Tests Editorial Board Meeting	8:00 AM - 10:00 AM	Morrison, Doubletree Portland
IRAC-US Meeting	8:00 AM - 1:00 PM	Oregon, Doubletree Portland
Science Policy Fellows Workshop	8:30 AM - 12:30 PM	Hawthorne, Doubletree Portland
Presidential Committee on Grand Challenges	9:00 AM - 10:00 AM	Multnomah, Doubletree Portland
Solitary Bee Nutrition	9:00 AM - 10:30 AM	Weidler, Doubletree Portland
Exhibit Hall	9:00 AM - 5:00 PM	Exhibit Hall C, Oregon Convention Center
Journal of Insect Science Editorial Board Meeting	10:00 AM - 12:00 PM	Morrison, Doubletree Portland
Committee on Ethics and Rules	11:00 AM - 12:00 PM	Broadway, Doubletree Portland
Moderator Training	12:00 PM - 12:30 PM	C123, Oregon Convention Center
Governing Board Nearctic Regional Section, International Organization for Biocontrol	1:00 PM - 3:30 PM	Broadway, Doubletree Portland
ACE Turf and Ornamental Exploratory Committee Meeting	2:00 PM - 4:00 PM	Weidler, Doubletree Portland
American Entomologist Editorial Board Meeting	3:00 PM - 5:00 PM	Morrison, Doubletree Portland
BCE - MedVet Specialty Exam Writing Committee	4:00 PM - 6:00 PM	Weidler, Doubletree Portland
University of Illinois Mixer	6:00 PM - 7:30 PM	Broadway, Doubletree Portland
Colorado State University, Kansas State University, and University of Nebraska-Lincoln Mixer	6:30 PM - 8:30 PM	Oregon/Alaska/Idaho, Doubletree Portland
Iowa State University Alumni Mixer	6:30 PM - 8:30 PM	Halsey, Doubletree Portland
Michigan State University and The Ohio State University Mixer	6:30 PM - 8:30 PM	Holladay, Doubletree Portland
Purdue Mixer	6:30 PM - 8:30 PM	Weidler, Doubletree Portland
University of Florida Alumni Mixer	6:30 PM - 8:30 PM	Multnomah, Doubletree Portland
Mizzou Mixer	7:00 PM - 9:00 PM	Skyline II, Hilton Portland (Downtown)
North Carolina State University Mixer	7:00 PM - 9:00 PM	Ross Island/Morrison, Doubletree Portland
Northwest Mixer (UI, MSU, OSU,WSU)	7:00 PM - 9:00 PM	Broadway III/IV, Hilton Portland (Downtown)
Southwestern Branch Mixer	7:00 PM - 9:00 PM	Galleria II/III, Hilton Portland (Downtown)
University of Arkansas, Auburn University, Clemson University, University of Kentucky, and University of Tennessee Reception	7:00 PM - 9:00 PM	Pavilion West, Hilton Portland (Downtown)
The University of Georgia Entomology Mixer	7:00 PM - 9:00 PM	Pavilion East, Hilton Portland (Downtown)
University of California Alumni and Friends Mixer	7:00 PM - 9:00 PM	Mt. Hood/Mt. St. Helens, Doubletree Portland
University of Maryland, Rutgers University, University of Delaware and Penn State University Mixer	7:00 PM - 9:00 PM	3 Sisters/Mt. Bachelor, Doubletree Portland
Cornell University Entomology Mixer - Reception	8:00 PM - 10:00 PM	Broadway I/II, Hilton Portland (Downtown)
University of Minnesota Mixer	8:30 PM - 10:00 PM	Hawthorne/Sellwood, Doubletree Portland

TUESDAY, NOVEMBER 18		
Meeting/Function	**Time**	**Location**
Southwestern Branch Executive Committee & Program Planning Meeting	6:30 AM - 8:00 AM	D131, Oregon Convention Center
Presentation Preview Room (PPR)	6:30 AM - 6:00 PM	C120-122, Oregon Convention Center
Moderator Training	7:00 AM - 7:30 AM	C123, Oregon Convention Center
ARS Scientists' Meeting	7:00 AM - 8:00 AM	F151, Oregon Convention Center
Past Presidents Breakfast	7:00 AM - 8:00 AM	Broadway, Doubletree Portland
ESA Registration and Information Center	7:00 AM - 5:00 PM	Exhibit Hall C Foyer, Oregon Convention Center
Committee on Awards and Honors Meeting	8:00 AM - 9:00 AM	Halsey, Doubletree Portland
New Governing Board Member Orientation	8:00 AM - 9:00 AM	Hawthorne, Doubletree Portland
Journal of Integrated Pest Management Editorial Board Meeting	8:00 AM - 10:00 AM	Morrison, Doubletree Portland
Exhibit Hall	9:00 AM - 5:00 PM	Exhibit Hall C, Oregon Convention Center
Committee on Membership Meeting	9:30 AM - 10:30 AM	Hawthorne, Doubletree Portland
Thomas Say Books Editorial Board Meeting	10:00 AM - 11:00 AM	Morrison, Doubletree Portland
Common Names Committee Meeting	11:00 AM - 11:45 AM	Morrison, Doubletree Portland
Section Leaders Meeting	11:00 AM - 12:00 PM	Halsey, Doubletree Portland
Certification Business Meeting	11:00 AM - 1:00 PM	F149, Oregon Convention Center
Moderator Training	12:00 PM - 12:30 PM	C123, Oregon Convention Center
Entomological Foundation Board of Counselors Meeting	12:00 PM - 1:30 PM	Broadway, Doubletree Portland
NCB-ESA Executive Committee Meeting	12:00 PM - 1:30 PM	D131, Oregon Convention Center
International Branch Meeting	12:15 PM - 1:15 PM	Portland Ballroom 254, Oregon Convention Center
National Insect Photo Salon	12:15 PM - 1:15 PM	F151, Oregon Convention Center
Student Transition and Early Professionals Committee Meeting	1:00 PM - 2:00 PM	Halsey, Doubletree Portland
Publications Council Meeting	1:00 PM - 4:00 PM	Morrison, Doubletree Portland
Branch Leaders Meeting	2:00 PM - 3:00 PM	D132, Oregon Convention Center
Informal Weevil Conference	2:00 PM - 4:00 PM	D131, Oregon Convention Center
Branch Treasurers Meeting	3:00 PM - 3:30 PM	D132, Oregon Convention Center
Committee on Education and Outreach Meeting	3:00 PM - 5:00 PM	Sellwood, Doubletree Portland
Section Treasurers Meeting	3:30 PM - 4:00 PM	D132, Oregon Convention Center
AIENA Annual Meeting	4:00 PM - 5:30 PM	F152, Oregon Convention Center
Linnaean Games - Finals	5:30 PM - 6:45 PM	Oregon Ballroom, Oregon Convention Center
WERA1021: Spotted Wing Drosophila	6:00 PM - 9:00 PM	E147-148, Oregon Convention Center
Life Table Software Sharing and Consulting	7:00 PM - 8:00 PM	Idaho, Doubletree Portland
IUSSI North American Section Business Meeting	7:30 PM - 8:30 PM	Oregon, Doubletree Portland
ESA Editors Reception	8:00 PM - 9:00 PM	Weidler/Halsey, Doubletree Portland
International Leadership Reception	8:00 PM - 9:00 PM	Broadway, Doubletree Portland
ESA Governing Board Reception	9:00 PM - 10:00 PM	Multnomah, Doubletree Portland
Korean Young Entomologists (KYE) Mixer	9:00 PM - 11:00 PM	B115-116, Oregon Convention Center
Student Reception	9:00 PM - 11:30 PM	Punchbowl Social (Downtown)

WEDNESDAY, NOVEMBER 19		
Meeting/Function	**Time**	**Location**
Presentation Preview Room (PPR)	6:30 AM - 12:00 PM	C120-122, Oregon Convention Center
PBT Final Business Meeting	6:45 AM - 7:45 AM	C124, Oregon Convention Center
Moderator Training	7:00 AM - 7:30 AM	C123, Oregon Convention Center
MUVE Final Business Meeting with Breakfast	7:00 AM - 8:15 AM	A103-104, Oregon Convention Center
ESA Governing Board Meeting II	8:00 AM - 11:30 AM	Roosevelt, Doubletree Portland
ESA Registration and Information Center	8:00 AM - 12:00 PM	Exhibit Hall C Foyer, Oregon Convention Center
Exhibit Hall	9:00 AM - 2:00 PM	Exhibit Hall C, Oregon Convention Center
Student Affairs Committee Meeting	11:30 AM - 12:30 PM	Halsey, Doubletree Portland
Meeting of Chrysomelid Specialists	12:15 PM - 1:30 PM	D132, Oregon Convention Center
2015 Annual Meeting Program Committee Meeting	12:30 PM - 2:30 PM	D131, Oregon Convention Center
SysEB Final Business Meeting	2:30 PM - 3:30 PM	A107-109, Oregon Convention Center
Open P-IE Section Governing Council and Member Feedback Session	4:00 PM - 5:00 PM	F152, Oregon Convention Center

DAILY SCHEDULE BY DATE AND TIME

FRIDAY, NOVEMBER 14		
Time	**Session/Function**	**Location**
8:00 AM - 5:00 PM	Annual Review of Entomology Editorial Committee Meeting	C123, Oregon Convention Center
SATURDAY, NOVEMBER 15		
Time	**Session/Function**	**Location**
7:00 AM - 5:00 PM	Entomological Collections Network	Holladay, Doubletree Portland
7:30 AM - 2:30 PM	ESA Governing Board Meeting I	Roosevelt, Doubletree Portland
8:00 AM - 5:00 PM	Pioneer Hi-Bred 6th Annual Academic Forum	A105, Oregon Convention Center
8:30 AM - 1:00 PM	Entomological Foundation Teacher Workshop	C123, Oregon Convention Center
8:30 AM - 5:30 PM	Microbial Control Working Group	A103-104, Oregon Convention Center
2:00 PM - 6:00 PM	ESA Registration and Information Center	Exhibit Hall C Foyer, Oregon Convention Center
2:00 PM - 6:00 PM	Presentation Preview Room (PPR)	C120-122, Oregon Convention Center
2:30 PM - 3:00 PM	ESA Certification Corporation Governing Board Meeting	Roosevelt, Doubletree Portland
3:00 PM - 6:00 PM	Council of Entomological Department Administrators Meeting	Weidler, Doubletree Portland
4:00 PM - 6:00 PM	P-IE Governing Council Working Session	Hamilton, Doubletree Portland
6:00 PM - 9:00 PM	Entomological Collections Network	Multnomah, Doubletree Portland
SUNDAY, NOVEMBER 16		
Time	**Session/Function**	**Location**
6:30 AM - 6:00 PM	Presentation Preview Room (PPR)	C120-122, Oregon Convention Center
7:00 AM - 7:30 AM	Moderator Training	C123, Oregon Convention Center
7:00 AM - 12:00 PM	Entomological Collections Network	Holladay, Doubletree Portland
7:00 AM - 9:00 PM	ESA Registration and Information Center	Exhibit Hall C Foyer, Oregon Convention Center
8:00 AM - 10:00 AM	Environmental Entomology Editorial Board Meeting	Morrison, Doubletree Portland
8:00 AM - 12:00 PM	Program Symposium: Agricultural Intensification and Insect Communities: Production Trade-Off Challenges with 9 Billion on the Horizon	Portland Ballroom 251, Oregon Convention Center
10:00 AM - 12:00 PM	MUVE Section Symposium: Reproductive Strategies Across Hematophagous Arthropods	Portland Ballroom 252, Oregon Convention Center
8:00 AM - 10:00 AM	Member Symposium: Sexually Dimorphic Chemosensory Behavior in *Drosophila*	Portland Ballroom 253, Oregon Convention Center
8:00 AM - 12:00 PM	Member Symposium: Answering Tomorrow's Challenges to Manage Insects in Greenhouses with Today's Research	Portland Ballroom 254, Oregon Convention Center
8:00 AM - 12:00 PM	P-IE Section Symposium: Challenges in Managing the Emerald Ash Borer (*Agrilus planipennis*) and Similar Invasive Woodborers on the Horizon	Portland Ballroom 255, Oregon Convention Center
8:00 AM - 12:00 PM	PBT Section Symposium: Buzz-kills: The Genomics and Ecology of Stress in Pollinators	Portland Ballroom 256, Oregon Convention Center
8:00 AM - 12:00 PM	Late-Breaking Symposium: Classical Biological Control of the Brown Marmorated Stink Bug, *Halyomorpha halys* (Stål)	D136, Oregon Convention Center
8:00 AM - 12:00 PM	Member Symposium: The Importance of Chemical Ecology for IPM in the Tropics	D139-140, Oregon Convention Center
8:00 AM - 12:00 PM	P-IE Section Symposium: Pesticides, Parasites and Pests: The Impacts of Environmental Stressors on Beneficial Insects	E141-142, Oregon Convention Center
8:00 AM - 11:00 AM	Member Symposium: Design and Management of Agroecosystems for Functional Biodiversity	E143-144, Oregon Convention Center
8:00 AM - 12:00 PM	Member Symposium: Fall Armyworm: Current Challenges and Future Directions for Its Management	F150, Oregon Convention Center

8:00 AM - 12:00 PM	Member Symposium: Finding the Best Fit for You: Career Opportunities for Entomologists in Industry, Academia, Military, and Government	B113-114, Oregon Convention Center
8:00 AM - 12:00 PM	Member Symposium: The Challenges and Significant Contributions of Insect Repellents to Vector Control	B115-116, Oregon Convention Center
8:00 AM - 12:00 PM	Organized Meeting: Current Advances in Acarology	B110-112, Oregon Convention Center
9:00 AM - 12:00 PM	Ten-Minute Papers, SysEB Section: Conservation	A106, Oregon Convention Center
9:30 AM - 12:00 PM	Ten-Minute Papers, SysEB Section: Invasive Arthropods in Systematics	A105, Oregon Convention Center
8:00 AM - 12:00 PM	Ten-Minute Papers, MUVE Section: Stored Products Pests	B117-119, Oregon Convention Center
8:00 AM - 12:00 PM	Ten-Minute Papers, PBT Section: Physiology and Immunology	C124, Oregon Convention Center
8:00 AM - 12:00 PM	Ten-Minute Papers, PBT Section: Chemical Ecology and Biotic Interactions	C123, Oregon Convention Center
8:00 AM - 12:00 PM	Ten-Minute Papers, P-IE Section: Pollinators	D137-138, Oregon Convention Center
8:00 AM - 12:00 PM	Ten-Minute Papers, P-IE Section: Forest and Arboreal Entomology	E145, Oregon Convention Center
8:00 AM - 12:00 PM	Ten-Minute Papers, P-IE Section: Plant and Insect Interactions	E146, Oregon Convention Center
8:00 AM - 12:00 PM	Ten-Minute Papers, P-IE Section: Transgenic Host Plants	F151, Oregon Convention Center
8:00 AM - 12:00 PM	Ten-Minute Papers, P-IE Section: Crop Protection - Horticulture and Vegetable Production	F152, Oregon Convention Center
9:00 AM - 10:00 AM	2014 Annual Meeting Program Committee Meeting	D131, Oregon Convention Center
10:00 AM - 12:00 PM	Annals of the ESA Editorial Board Meeting	Morrison, Doubletree Portland
10:00 AM - 12:00 PM	ESA Urban Adventure Run	Oregon Ballroom, Oregon Convention Center
12:15 PM - 1:00 PM	Lunch and Learn: Science Policy: A View from Washington	Portland Ballroom 254, Oregon Convention Center
12:15 PM - 1:15 PM	Yearly Meeting of the Society for Regulatory Entomology	E145, Oregon Convention Center
1:00 PM - 3:00 PM	Journal of Economic Entomology Editorial Board Meeting	Morrison, Doubletree Portland
1:00 PM - 4:00 PM	ARM Software Workshop	Oregon, Doubletree Portland
1:15 PM - 5:15 PM	Challenges and Opportunities for Future Leaders: A Training Workshop for Student Transition and Early Professional Members of ESA	Portland Ballroom 256, Oregon Convention Center
1:15 PM - 5:15 PM	Program Symposium: The Futures of Insect Genomics: A Grand Challenge of Entomology	Portland Ballroom 251, Oregon Convention Center
1:15 PM - 5:15 PM	P-IE/MUVE Section Symposium: Celebrating the 100th Anniversary of the Entomologist in the Cooperative Extension Service	Portland Ballroom 253, Oregon Convention Center
1:15 PM - 5:15 PM	P-IE Section Symposium: Biological Insect Control - Ready for a Breakthrough?	Portland Ballroom 255, Oregon Convention Center
1:15 PM - 5:15 PM	Member Symposium: Horizons in the Field of Symbiosis	Portland Ballroom 252, Oregon Convention Center
1:15 PM - 5:15 PM	2014 Symposium of the Society of Regulatory Entomology. Alternatives to Rulemaking: Non-regulatory Solutions for Regulatory Problems	E145, Oregon Convention Center
1:15 PM - 5:15 PM	P-IE Section Symposium: Bt Resistance Monitoring: Strengths, Limitations, and Challenges	E146, Oregon Convention Center
1:15 PM - 5:15 PM	P-IE Section Symposium: Global Grand Challenges and Opportunities in Grassland Entomology	D137-138, Oregon Convention Center
1:15 PM - 5:15 PM	Member Symposium: Nutrition and the Health and Behavior of Wild and Managed Bees	D139-140, Oregon Convention Center
1:15 PM - 5:15 PM	Member Symposium: Advances in Pest Management for Turfgrass and Ornamentals	E143-144, Oregon Convention Center
1:15 PM - 5:15 PM	Member Symposium: Wireworms: The Resurgence of a Key Pest of North American Cropland	F150, Oregon Convention Center
1:15 PM - 5:15 PM	Member Symposium: Biological Control in Acarology: Present and Future Challenges	B110-112, Oregon Convention Center

1:15 PM - 5:15 PM	Member Symposium: Grand Challenges in Keeping and Fostering Women in Entomology: Working Toward a Brighter Future on Our Horizon	B113-114, Oregon Convention Center
1:15 PM - 5:15 PM	Member Symposium: Contributions of Mosquito Research to Science & Society	B115-116, Oregon Convention Center
1:15 PM - 5:15 PM	MUVE Section Symposium: Triatominae from Genes to Populations: The Road to New Insights and Challenges on the Horizon of Vector Ecology	C124, Oregon Convention Center
1:15 PM - 5:15 PM	PBT Section Symposium: Chemical Communication in Longhorned Beetles	C123, Oregon Convention Center
1:15 PM - 5:15 PM	Organized Meeting: International Association of Black Entomologists: Embracing Diversity Through Global Education and Collaboration in Entomology	Portland Ballroom 254, Oregon Convention Center
1:15 PM - 5:15 PM	Organized Meeting: SOLA Scarab Workers	A103-104, Oregon Convention Center
1:15 PM - 5:15 PM	Organized Meeting: Americas Neuropterists Meeting	A105, Oregon Convention Center
1:15 PM - 5:15 PM	Organized Meeting: Heteropterist Symposium	A106, Oregon Convention Center
1:15 PM - 5:15 PM	Organized Meeting: International Society of Hymenopterists	A107-109, Oregon Convention Center
1:15 PM - 5:15 PM	Ten-Minute Papers, MUVE Section: Tick and Tick Borne Disease	B117-119, Oregon Convention Center
1:15 PM - 5:15 PM	Ten-Minute Papers, P-IE Section: Invasive Species	D136, Oregon Convention Center
1:15 PM - 5:15 PM	Ten-Minute Papers, P-IE Section: Crop Protection - Row Crops	E141-142, Oregon Convention Center
1:15 PM - 5:15 PM	Ten-Minute Papers, P-IE Section: Crop Protection - Fruit Trees and Vines	F151, Oregon Convention Center
1:15 PM - 5:15 PM	Ten-Minute Papers, P-IE Section: Host Plant Resistance	F152, Oregon Convention Center
1:30 PM - 4:00 PM	Responsible Conduct of Research (RCR) Training Workshop	E147-148, Oregon Convention Center
1:30 PM - 2:00 PM	Judges Training	D132, Oregon Convention Center
1:30 PM - 2:30 PM	Science Policy Capability Committee	D135, Oregon Convention Center
2:00 PM - 5:00 PM	Certification Board Meeting	Roosevelt, Doubletree Portland
2:00 PM - 5:00 PM	Linnaean Games - Preliminary Rounds	Oregon Ballroom, Oregon Convention Center
2:00 PM - 3:30 PM	Fire Ant eXtension Network Meeting	D131, Oregon Convention Center
2:30 PM - 3:30 PM	ICE Council Meeting	D132, Oregon Convention Center
3:00 PM - 5:00 PM	Journal of Medical Entomology Editorial Board Meeting	Morrison, Doubletree Portland
3:00 PM - 4:00 PM	Welcome to Portland	D135, Oregon Convention Center
3:30 PM - 5:00 PM	School and Urban IPM eXtension Network Meeting	D131, Oregon Convention Center
3:30 PM - 4:30 PM	ICE 2016 Organizing Committee Meeting	F149, Oregon Convention Center
4:30 PM - 5:15 PM	New Member Reception	D133-134, Oregon Convention Center
4:45 PM - 5:15 PM	Judges Training	D132, Oregon Convention Center
5:30 PM - 7:30 PM	Opening Plenary Session and Founders' Memorial Lecture	Oregon Ballroom, Oregon Convention Center
7:30 PM - 9:30 PM	Exhibit Hall	Exhibit Hall C, Oregon Convention Center
7:30 PM - 9:30 PM	Welcome Reception	Exhibit Hall C, Oregon Convention Center
MONDAY, NOVEMBER 17		
Time	**Session/Function**	**Location**
6:15 AM - 8:00 AM	Women in Entomology Breakfast	Holladay, Doubletree Portland
6:30 AM - 6:00 PM	Presentation Preview Room (PPR)	C120-122, Oregon Convention Center
7:00 AM - 7:30 AM	Moderator Training	C123, Oregon Convention Center
7:00 AM - 7:30 AM	Judges Training	D132, Oregon Convention Center
7:00 AM - 1:30 PM	The Coleopterists Society Executive Council Meeting	Alaska, Doubletree Portland
8:00 AM - 9:30 AM	Entomological Foundation Board of Directors Annual Meeting	Ross Island, Doubletree Portland
8:00 AM - 10:00 AM	ACE Support Committee Meeting	Broadway, Doubletree Portland
8:00 AM - 10:00 AM	Arthropod Management Tests Editorial Board Meeting	Morrison, Doubletree Portland

7:00 AM - 5:00 PM	ESA Registration and Information Center	Exhibit Hall C Foyer, Oregon Convention Center
8:00 AM - 1:00 PM	IRAC-US Meeting	Oregon, Doubletree Portland
8:45 AM - 12:30 PM	01 - Undergraduate Student Ten-Minute Paper Competition: MUVE, SysEB	F149, Oregon Convention Center
8:45 AM - 12:30 PM	02 - Undergraduate Student Ten-Minute Paper Competition: PBT, P-IE	D131, Oregon Convention Center
8:45 AM - 12:30 PM	03 - Undergraduate Student Ten-Minute Paper Competition: P-IE	D132, Oregon Convention Center
8:20 AM - 12:30 PM	04 - Graduate Student Ten-Minute Paper Competition: MUVE	B110-112, Oregon Convention Center
8:20 AM - 12:30 PM	05 - Graduate Student Ten-Minute Paper Competition: MUVE	B113-114, Oregon Convention Center
8:20 AM - 12:30 PM	06 - Graduate Student Ten-Minute Paper Competition: MUVE	B115-116, Oregon Convention Center
8:20 AM - 12:30 PM	07 - Graduate Student Ten-Minute Paper Competition: MUVE	B117-119, Oregon Convention Center
8:20 AM - 12:30 PM	08 - Graduate Student Ten-Minute Paper Competition: PBT	A103-104, Oregon Convention Center
8:20 AM - 12:30 PM	09 - Graduate Student Ten-Minute Paper Competition: PBT	A105, Oregon Convention Center
8:20 AM - 12:30 PM	10 - Graduate Student Ten-Minute Paper Competition: PBT	A106, Oregon Convention Center
8:20 AM - 12:30 PM	11 - Graduate Student Ten-Minute Paper Competition: PBT	A107-109, Oregon Convention Center
8:20 AM - 12:00 PM	12 - Graduate Student Ten-Minute Paper Competition: P-IE	C123, Oregon Convention Center
8:20 AM - 12:30 PM	13 - Graduate Student Ten-Minute Paper Competition: P-IE	C124, Oregon Convention Center
7:55 AM - 12:30 PM	14 - Graduate Student Ten-Minute Paper Competition: P-IE	D133-134, Oregon Convention Center
7:55 AM - 12:30 PM	15 - Graduate Student Ten-Minute Paper Competition: P-IE	D135, Oregon Convention Center
7:55 AM - 12:30 PM	16 - Graduate Student Ten-Minute Paper Competition: P-IE	D136, Oregon Convention Center
7:55 AM - 12:30 PM	17 - Graduate Student Ten-Minute Paper Competition: P-IE	D137-138, Oregon Convention Center
7:55 AM - 12:30 PM	18 - Graduate Student Ten-Minute Paper Competition: P-IE	D139-140, Oregon Convention Center
7:55 AM - 12:30 PM	19 - Graduate Student Ten-Minute Paper Competition: P-IE	E141-142, Oregon Convention Center
7:55 AM - 12:30 PM	20 - Graduate Student Ten-Minute Paper Competition: P-IE	E143-144, Oregon Convention Center
7:55 AM - 12:30 PM	21 - Graduate Student Ten-Minute Paper Competition: P-IE	E145, Oregon Convention Center
7:55 AM - 12:30 PM	22 - Graduate Student Ten-Minute Paper Competition: P-IE	E146, Oregon Convention Center
7:55 AM - 12:30 PM	23 - Graduate Student Ten-Minute Paper Competition: P-IE	E147-148, Oregon Convention Center
8:20 AM - 12:30 PM	24 - Graduate Student Ten-Minute Paper Competition: P-IE	Oregon Ballroom, Oregon Convention Center
7:55 AM - 12:30 PM	25 - Graduate Student Ten-Minute Paper Competition: P-IE	F150, Oregon Convention Center
7:55 AM - 12:30 PM	26 - Graduate Student Ten-Minute Paper Competition: P-IE	F151, Oregon Convention Center
7:55 AM - 12:30 PM	27 - Graduate Student Ten-Minute Paper Competition: P-IE	F152, Oregon Convention Center
8:45 AM - 12:30 PM	28 - Graduate Student Ten-Minute Paper Competition: SysEB	Portland Ballroom 251, Oregon Convention Center
8:45 AM - 12:30 PM	29 - Graduate Student Ten-Minute Paper Competition: SysEB	Portland Ballroom 256, Oregon Convention Center
8:45 AM - 12:30 PM	30 - Graduate Student Ten-Minute Paper Competition: SysEB	Portland Ballroom 252, Oregon Convention Center
8:45 AM - 12:30 PM	31 - Graduate Student Ten-Minute Paper Competition: SysEB	Portland Ballroom 253, Oregon Convention Center
8:45 AM - 12:30 PM	32 - Graduate Student Ten-Minute Paper Competition: SysEB	Portland Ballroom 254, Oregon Convention Center
8:45 AM - 12:30 PM	33 - Graduate Student Ten-Minute Paper Competition: SysEB	Portland Ballroom 255, Oregon Convention Center
8:30 AM - 12:30 PM	Science Policy Fellows Workshop	Hawthorne, Doubletree Portland
9:00 AM - 10:00 AM	Presidential Committee on Grand Challenges	Multnomah, Doubletree Portland
9:00 AM - 10:30 AM	Solitary Bee Nutrition	Weidler, Doubletree Portland
9:00 AM - 5:00 PM	Exhibit Hall	Exhibit Hall C, Oregon Convention Center
10:00 AM - 12:00 PM	Journal of Insect Science Editorial Board Meeting	Morrison, Doubletree Portland
11:00 AM - 12:00 PM	Committee on Ethics and Rules	Broadway, Doubletree Portland

12:00 PM - 12:30 PM	Moderator Training	C123, Oregon Convention Center
12:45 PM - 1:45 PM	Lunch and Learn: Career Vs. Job – What Can You Do with Your Entomology Degree Besides Looking at Bugs?	Portland Ballroom 254, Oregon Convention Center
12:45 PM - 1:45 PM	Lunch and Learn: Eat, Drink and be Merry for Tomorrow We Die: Odyssey in Amber	Portland Ballroom 255, Oregon Convention Center
1:00 PM - 3:30 PM	Governing Board Nearctic Regional Section, International Organization for Biocontrol	Broadway, Doubletree Portland
2:00 PM - 5:50 PM	Organized Meeting: Plant-Insect Ecosystem (P-IE) Section Networking and Business Session	Portland Ballroom 251, Oregon Convention Center
1:30 PM - 5:30 PM	Organized Meeting: PBT Networking Section	Portland Ballroom 252, Oregon Convention Center
1:30 PM - 5:45 PM	Organized Meeting: SysEB Section Meeting	Portland Ballroom 253, Oregon Convention Center
1:30 PM - 6:00 PM	Organized Meeting: Highlights of Medical, Urban and Veterinary Entomology in 2014	Portland Ballroom 256, Oregon Convention Center
2:00 PM - 4:00 PM	ACE Turf and Ornamental Exploratory Committee Meeting	Weidler, Doubletree Portland
3:00 PM - 5:00 PM	American Entomologist Editorial Board Meeting	Morrison, Doubletree Portland
4:00 PM - 6:00 PM	BCE - MedVet Specialty Exam Writing Committee	Weidler, Doubletree Portland
5:30 PM - 6:30 PM	Student Competition Social Hour with Poster Presenters	Exhibit Hall C, Oregon Convention Center
6:00 PM - 7:30 PM	University of Illinois Mixer	Broadway, Doubletree Portland
6:30 PM - 8:30 PM	Colorado State University, Kansas State University, and University of Nebraska-Lincoln Mixer	Oregon, Doubletree Portland
6:30 PM - 8:30 PM	Iowa State University Alumni Mixer	Halsey, Doubletree Portland
6:30 PM - 8:30 PM	Michigan State University and The Ohio State University Mixer	Holladay, Doubletree Portland
6:30 PM - 8:30 PM	Purdue Mixer	Weidler, Doubletree Portland
6:30 PM - 8:30 PM	University of Florida Alumni Mixer	Multnomah, Doubletree Portland
7:00 PM - 9:00 PM	Mizzou Mixer	Skyline II, Hilton Portland (Downtown)
7:00 PM - 9:00 PM	North Carolina State University Mixer	Ross Island, Doubletree Portland
7:00 PM - 9:00 PM	Northwest Mixer (UI, MSU, OSU,WSU)	Broadway III/IV, Hilton Portland (Downtown)
7:00 PM - 9:00 PM	Southwestern Branch Mixer	Galleria II/III, Hilton Portland (Downtown)
7:00 PM - 9:00 PM	The University of Georgia Entomology Mixer	Pavilion East, Hilton Portland (Downtown)
7:00 PM - 9:00 PM	University of Arkansas, Auburn University, Clemson University, University of Kentucky, and University of Tennessee Reception	Pavilion West, Hilton Portland (Downtown)
7:00 PM - 9:00 PM	University of California Alumni and Friends Mixer	Mt. Hood/Mt. St. Helens, Doubletree Portland
7:00 PM - 9:00 PM	University of Maryland, Rutgers University, University of Delaware and Penn State University Mixer	3 Sisters/Mt. Bachelor, Doubletree Portland
8:00 PM - 10:00 PM	Cornell University Entomology Mixer - Reception	Broadway I/II, Hilton Portland (Downtown)
8:30 PM - 10:00 PM	University of Minnesota Mixer	Hawthorne, Doubletree Portland
8:00 AM - 6:30 PM	01 - Undergraduate Student Poster Competition: MUVE/PBT	Exhibit Hall C, Oregon Convention Center
8:00 AM - 6:30 PM	02 - Undergraduate Student Poster Competition: P-IE	Exhibit Hall C, Oregon Convention Center
8:00 AM - 6:30 PM	03 - Undergraduate Student Poster Competition: SysEB	Exhibit Hall C, Oregon Convention Center
8:00 AM - 6:30 PM	04 - Graduate Student Poster Competition: MUVE	Exhibit Hall C, Oregon Convention Center
8:00 AM - 6:30 PM	05 - Graduate Student Poster Competition: MUVE	Exhibit Hall C, Oregon Convention Center
8:00 AM - 6:30 PM	06 - Graduate Student Poster Competition: PBT	Exhibit Hall C, Oregon Convention Center
8:00 AM - 6:30 PM	07 - Graduate Student Poster Competition: PBT	Exhibit Hall C, Oregon Convention Center
8:00 AM - 6:30 PM	08 - Graduate Student Poster Competition: PBT	Exhibit Hall C, Oregon Convention Center
8:00 AM - 6:30 PM	09 - Graduate Student Poster Competition: P-IE	Exhibit Hall C, Oregon Convention Center
8:00 AM - 6:30 PM	10 - Graduate Student Poster Competition: P-IE	Exhibit Hall C, Oregon Convention Center
8:00 AM - 6:30 PM	11 - Graduate Student Poster Competition: P-IE	Exhibit Hall C, Oregon Convention Center
8:00 AM - 6:30 PM	12 - Graduate Student Poster Competition: P-IE	Exhibit Hall C, Oregon Convention Center
8:00 AM - 6:30 PM	13 - Graduate Student Poster Competition: P-IE	Exhibit Hall C, Oregon Convention Center

8:00 AM - 6:30 PM	14 - Graduate Student Poster Competition: P-IE	Exhibit Hall C, Oregon Convention Center
8:00 AM - 6:30 PM	15 - Graduate Student Poster Competition: P-IE	Exhibit Hall C, Oregon Convention Center
8:00 AM - 6:30 PM	16 - Graduate Student Poster Competition: P-IE	Exhibit Hall C, Oregon Convention Center
8:00 AM - 6:30 PM	17 - Graduate Student Poster Competition: SysEB	Exhibit Hall C, Oregon Convention Center
8:00 AM - 6:30 PM	18 - Graduate Student Poster Competition: SysEB	Exhibit Hall C, Oregon Convention Center
8:00 AM - 6:30 PM	19 - Graduate Student Poster Competition: SysEB	Exhibit Hall C, Oregon Convention Center
8:00 AM - 6:30 PM	Student Virtual Poster Competition: Graduate	Exhibit Hall C, Oregon Convention Center
8:00 AM - 6:30 PM	Student Virtual Poster Competition: Undergraduate	Exhibit Hall C, Oregon Convention Center

TUESDAY, NOVEMBER 18

Time	Session/Function	Location
6:30 AM - 8:00 AM	Southwestern Branch Executive Committee & Program Planning Meeting	D131, Oregon Convention Center
6:30 AM - 6:00 PM	Presentation Preview Room (PPR)	C120-122, Oregon Convention Center
7:00 AM - 7:30 AM	Moderator Training	C123, Oregon Convention Center
7:00 AM - 8:00 AM	ARS Scientists' Meeting	F151, Oregon Convention Center
7:00 AM - 8:00 AM	Past Presidents Breakfast	Broadway, Doubletree Portland
7:00 AM - 5:00 PM	ESA Registration and Information Center	Exhibit Hall C Foyer, Oregon Convention Center
8:00 AM - 12:00 PM	Program Symposium: Beyond the Horizon: Unraveling the Novel Complexity of Insect-Plant Interactions	Portland Ballroom 251, Oregon Convention Center
8:00 AM - 12:00 PM	SysEB Section Symposium: Out of the Field and Into the Lab: The State of the Art in Sorting Biodiversity Samples and Processing to Publication	Portland Ballroom 256, Oregon Convention Center
8:00 AM - 12:00 PM	Member Symposium: Insect Life Tables: Theory, Data Analysis, and Application	Portland Ballroom 253, Oregon Convention Center
8:00 AM - 12:00 PM	Member Symposium: Control and Eradication of Invasive Social Hymenoptera	Portland Ballroom 254, Oregon Convention Center
8:00 AM - 12:00 PM	P-IE Section Symposium: Entomology-A Foundational Discipline for Integrated Plant Health Training	Portland Ballroom 252, Oregon Convention Center
8:00 AM - 12:00 PM	P-IE Section Symposium: The Return of the American Bollworm: A Grand Challenge to the New World on the Horizon and Beyond	Portland Ballroom 255, Oregon Convention Center
8:00 AM - 12:00 PM	P-IE Section Symposium: Exploring Complex Interactions among Non-Native Bark and Ambrosia Beetles (Coleoptera: Scolytinae), their Associated Fungi, and Naïve Hosts	D133-134, Oregon Convention Center
8:00 AM - 12:00 PM	P-IE Section Symposium: The Larry L. Larson Symposium: The Grand Challenge of Exploration and Use of Advanced Technologies Beyond the Horizon for Insect Management and Control	D137-138, Oregon Convention Center
8:00 AM - 12:00 PM	Member Symposium: Stored Product Entomology: Making Significant Contributions to Clarify and Solve Important Challenges	D139-140, Oregon Convention Center
8:00 AM - 12:00 PM	P-IE Section Symposium: Broadening the Horizons for Pollination of U.S. Specialty Crops	E141-142, Oregon Convention Center
8:00 AM - 12:00 PM	Member Symposium: Human-Mediated Spread of Invasive Alien Insects: New Assessment Approaches and Data Needs	E145, Oregon Convention Center
8:00 AM - 12:00 PM	Member Symposium: Challenges of Emerging and Resilient Insect Pests for IPM Implementation	F150, Oregon Convention Center
8:00 AM - 12:00 PM	Member Symposium: Merging the Ecological and Systematic Knowledge of Carabid Beetles	B110-112, Oregon Convention Center
8:00 AM - 12:00 PM	SysEB Section Symposium: Genetic and Behavioral Mechanisms of Social Complexity: Current Challenges and Future Horizons	B113-114, Oregon Convention Center
8:00 AM - 12:00 PM	MUVE Section Symposium: Beyond Pesticides: The Conundrum of Bed Bugs	B115-116, Oregon Convention Center

8:00 AM - 12:00 PM	Member Symposium: Meeting the Challenge: New Horizons in Entomology Engagement	B117-119, Oregon Convention Center
8:00 AM - 12:00 PM	Ten-Minute Papers, MUVE Section: Sand Flies and Gnats	A105, Oregon Convention Center
8:00 AM - 12:00 PM	Ten-Minute Papers, MUVE Section: Ants and Termites	A106, Oregon Convention Center
8:00 AM - 12:00 PM	Ten-Minute Papers, SysEB Section: Endosymbionts and Gut Flora/Fauna	A103-104, Oregon Convention Center
8:00 AM - 12:00 PM	Ten-Minute Papers, SysEB Section: Systematics and Evolutionary Biology	A107-109, Oregon Convention Center
8:00 AM - 12:00 PM	Ten-Minute Papers, PBT Section: Genetics, Genomics and Molecular Biology	C124, Oregon Convention Center
8:00 AM - 12:00 PM	Ten-Minute Papers, PBT Section: Toxicology	C123, Oregon Convention Center
8:00 AM - 12:00 PM	Ten-Minute Papers, P-IE Section: Semiochemicals	D135, Oregon Convention Center
8:00 AM - 12:00 PM	Ten-Minute Papers, P-IE Section: Environmental Entomology A	E146, Oregon Convention Center
8:00 AM - 9:00 AM	Committee on Awards and Honors Meeting	Halsey, Doubletree Portland
8:00 AM - 9:00 AM	New Governing Board Member Orientation	Hawthorne, Doubletree Portland
8:00 AM - 10:00 AM	Journal of Integrated Pest Management Editorial Board Meeting	Morrison, Doubletree Portland
9:00 AM - 5:00 PM	Exhibit Hall	Exhibit Hall C, Oregon Convention Center
9:30 AM - 10:30 AM	Committee on Membership Meeting	Hawthorne, Doubletree Portland
10:00 AM - 11:00 AM	Thomas Say Books Editorial Board Meeting	Morrison, Doubletree Portland
11:00 AM - 11:45 AM	Common Names Committee Meeting	Morrison, Doubletree Portland
11:00 AM - 12:00 PM	Section Leaders Meeting	Halsey, Doubletree Portland
11:00 AM - 1:00 PM	Certification Business Meeting	F149, Oregon Convention Center
12:00 PM - 12:30 PM	Moderator Training	C123, Oregon Convention Center
12:00 PM - 1:30 PM	NCB-ESA Executive Committee Meeting	D131, Oregon Convention Center
12:00 PM - 1:30 PM	Entomological Foundation Board of Counselors Meeting	Broadway, Doubletree Portland
12:15 PM - 1:15 PM	Lunch and Learn: ICE 2016: Networking Internationally to Maximize Your Professional Connections	Portland Ballroom 255, Oregon Convention Center
12:15 PM - 1:15 PM	Lunch and Learn: "Don't Bury the Lede:" How to Unlearn All the Terrible Writing Habits you Developed in Academia	Portland Ballroom 252, Oregon Convention Center
12:15 PM - 1:15 PM	International Branch Meeting	Portland Ballroom 254, Oregon Convention Center
12:15 PM - 1:15 PM	National Insect Photo Salon	F151, Oregon Convention Center
1:00 PM - 2:00 PM	Student Transition and Early Professionals Committee Meeting	Halsey, Doubletree Portland
1:00 PM - 4:00 PM	Publications Council Meeting	Morrison, Doubletree Portland
1:30 PM - 5:30 PM	Program Symposium: Social Insects as Models for Biological Complexity: Lessons Learned and Challenges on the Horizon	Portland Ballroom 251, Oregon Convention Center
1:30 PM - 5:30 PM	Member Symposium: Honoring the Career and Contributions of Veterinary Entomologist Donald A. Rutz	Portland Ballroom 253, Oregon Convention Center
1:30 PM - 5:30 PM	PBT Section Symposium: Highlighting a Career of Defining and Meeting Grand Challenges in Entomology: A Symposium in Honor of David L. Denlinger	Portland Ballroom 256, Oregon Convention Center
1:30 PM - 5:30 PM	Member Symposium: IPM: An International Organic Farming Strategy on Invasive Insect Species	Portland Ballroom 254, Oregon Convention Center
1:30 PM - 5:30 PM	P-IE Section Symposium: Roles of Biotic Interactions in Invasion Biology	Portland Ballroom 255, Oregon Convention Center
1:30 PM - 5:30 PM	P-IE Section Symposium: Forest Entomology: Beyond Saving Trees	D133-134, Oregon Convention Center
1:30 PM - 5:30 PM	Member Symposium: Thinking Outside the Box: Entomopathogens in IPM Programs	D136, Oregon Convention Center
1:30 PM - 5:30 PM	P-IE Section Symposium: Classical Biological Control of Invasive Plants: Complex Challenges, Semiochemical Solutions	D137-138, Oregon Convention Center

1:30 PM - 5:30 PM	Member Symposium: Practical Implementation of Conservation Biological Control	D139-140, Oregon Convention Center
1:30 PM - 3:30 PM	P-IE Section Symposium: New Frontiers in Honey Bee Health Economics: Incorporating Entomological Research and Knowledge into Economic Assessments	E141-142, Oregon Convention Center
3:30 PM - 5:30 PM	Senior Member Symposium and Challenges Beyond the Horizon: Hops, Breweries, Pest Management and Native Bee Pollinators in the Pacific Northwest	E141-142, Oregon Convention Center
1:30 PM - 5:30 PM	P-IE Section Symposium: Managing Arthropod Resistance in a Changing Landscape, IRAC US Symposium Series: No. 10	E143-144, Oregon Convention Center
1:30 PM - 5:15 PM	Organized Meeting: Spotted Wing Drosophila: Developing Solutions for a Challenging Pest	E147-148, Oregon Convention Center
1:30 PM - 5:30 PM	Member Symposium: Tree Fruit IPM from a Dream to Its Realization: Honoring the Career of Jay Brunner	F150, Oregon Convention Center
1:30 PM - 5:30 PM	Member Symposium: Utilizing Orthopteroid Insects to Overcome Grand Challenges in an Ever-Evolving World	B113-114, Oregon Convention Center
1:30 PM - 5:30 PM	Member Symposium: Board Certified Entomologist's (BCE) Symposium: Bed Bugs, *Cimex lectularius*, Fighting a Nuclear War with Bows and Arrows	B115-116, Oregon Convention Center
1:30 PM - 5:30 PM	Member Symposium: Six Legs, Many Panels: Entomological Comics and Their Importance in Education and Culture	C123, Oregon Convention Center
1:30 PM - 5:30 PM	Member Symposium: Common Challenges and Learning Opportunities for Latin American and U.S. Entomologists: 2nd Latin American/Hispanic Symposium	C124, Oregon Convention Center
1:30 PM - 4:30 PM	Student Debates	Portland Ballroom 252, Oregon Convention Center
1:30 PM - 5:30 PM	Ten-Minute Papers, SysEB Section: Insect Ecology	A103-104, Oregon Convention Center
1:30 PM - 5:30 PM	Ten-Minute Papers, SysEB Section: Species Delimitation and Biogeography	A105, Oregon Convention Center
1:30 PM - 5:30 PM	Ten-Minute Papers, SysEB Section: Phylogenetic and Phylogenomic Methodology	A107-109, Oregon Convention Center
1:30 PM - 5:30 PM	Ten-Minute Papers, MUVE Section: Mosquitoes	A106, Oregon Convention Center
1:30 PM - 5:30 PM	Ten-Minute Papers, MUVE Section: Bed Bugs and Other True Bugs	B117-119, Oregon Convention Center
1:30 PM - 5:30 PM	Ten-Minute Papers, P-IE Section: Biology and Ecology	D135, Oregon Convention Center
1:30 PM - 5:30 PM	Ten-Minute Papers, P-IE Section: Environmental Entomology B	E146, Oregon Convention Center
2:00 PM - 3:00 PM	Branch Leaders Meeting	D132, Oregon Convention Center
2:00 PM - 4:00 PM	Informal Weevil Conference	D131, Oregon Convention Center
3:00 PM - 3:30 PM	Branch Treasurers Meeting	D132, Oregon Convention Center
3:00 PM - 5:00 PM	Committee on Education and Outreach Meeting	Sellwood, Doubletree Portland
3:30 PM - 4:00 PM	Section Treasurers Meeting	D132, Oregon Convention Center
4:00 PM - 5:30 PM	AIENA Annual Meeting	F152, Oregon Convention Center
5:30 PM - 6:30 PM	Social Hour with Poster Presenters	Exhibit Hall C, Oregon Convention Center
5:30 PM - 6:45 PM	Linnaean Games - Finals	Oregon Ballroom, Oregon Convention Center
5:30 PM - 7:30 PM	Organized Meeting: Annual Meeting of the Nearctic Regional Section, International Organization for Biocontrol	D139-140, Oregon Convention Center
6:00 PM - 9:00 PM	Organized Meeting: Society of Overseas Nepalese Entomologists' Symposium: Linking the World through Entomological Works	Portland Ballroom 252, Oregon Convention Center
6:00 PM - 10:00 PM	Organized Meeting: Overseas Chinese Entomologists Association (OCEA): Global Challenges Bring Global Collaborations in Entomology	B110-112, Oregon Convention Center
6:00 PM - 10:00 PM	Organized Meeting: Korean Young Entomologists (KYE)	B115-116, Oregon Convention Center
6:00 PM - 9:00 PM	WERA1021: Spotted Wing Drosophila	E147-148, Oregon Convention Center
6:45 PM - 8:30 PM	ESA Student Awards Ceremony	Oregon Ballroom, Oregon Convention Center

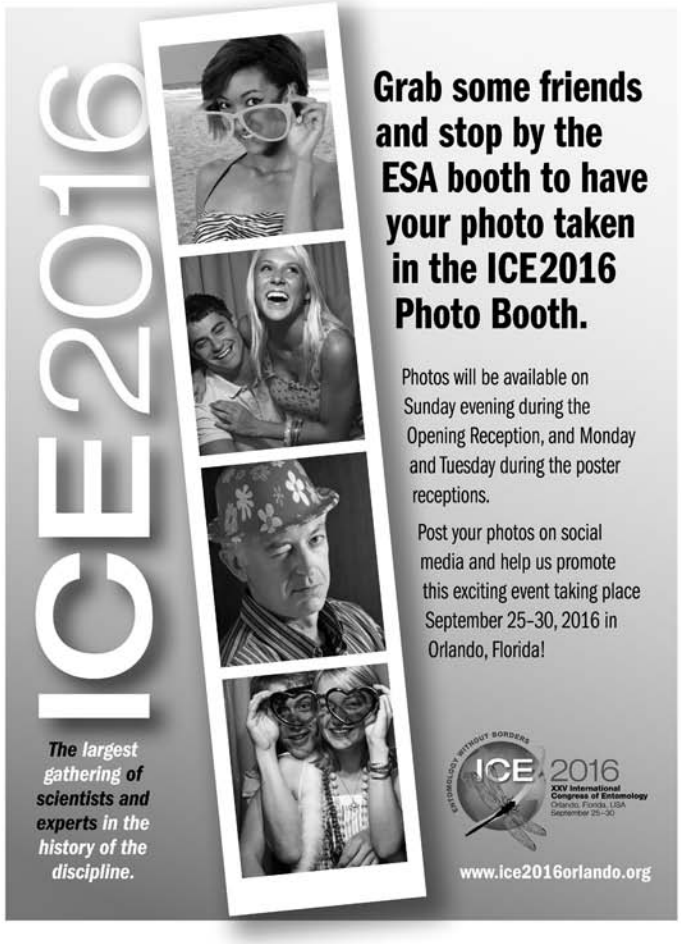
7:00 PM - 8:00 PM	Life Table Software Sharing and Consulting	Idaho, Doubletree Portland
7:30 PM - 10:00 PM	Organized Meeting: The Coleopterist's Society Annual Meeting	A107-109, Oregon Convention Center
7:30 PM - 8:30 PM	IUSSI North American Section Business Meeting	Oregon, Doubletree Portland
8:00 PM - 9:00 PM	International Leadership Reception	Broadway, Doubletree Portland
8:00 PM - 9:00 PM	ESA Editors Reception	Weidler, Doubletree Portland
9:00 PM - 11:30 PM	Student Reception	Punchbowl Social (Downtown)
9:00 PM - 10:00 PM	ESA Governing Board Reception	Multnomah, Doubletree Portland
9:00 PM - 11:00 PM	Korean Young Entomologists (KYE) Mixer	B115-116, Oregon Convention Center
8:00 AM - 6:30 PM	Poster Session 1: MUVE	Exhibit Hall C, Oregon Convention Center
8:00 AM - 6:30 PM	Poster Session 1: P-IE	Exhibit Hall C, Oregon Convention Center
8:00 AM - 6:30 PM	Poster Session 1: PBT	Exhibit Hall C, Oregon Convention Center
8:00 AM - 6:30 PM	Poster Session 1: SysEB	Exhibit Hall C, Oregon Convention Center
8:00 AM - 6:30 PM	Virtual Poster Session	Exhibit Hall C, Oregon Convention Center

WEDNESDAY, NOVEMBER 19

Time	Session/Function	Location
6:30 AM - 12:00 PM	Presentation Preview Room (PPR)	C120-122, Oregon Convention Center
6:45 AM - 7:45 AM	PBT Final Business Meeting	C124, Oregon Convention Center
7:00 AM - 7:30 AM	Moderator Training	C123, Oregon Convention Center
7:00 AM - 8:15 AM	MUVE Final Business Meeting with Breakfast	A103-104, Oregon Convention Center
8:00 AM - 11:30 AM	ESA Governing Board Meeting II	Roosevelt, Doubletree Portland
8:00 AM - 12:00 PM	ESA Registration and Information Center	Exhibit Hall C Foyer, Oregon Convention Center
8:00 AM - 12:00 PM	Program Symposium: Reaching Beyond Our Horizon: Social Media & Connecting with the World	Portland Ballroom 252, Oregon Convention Center
8:00 AM - 12:00 PM	Program Symposium: Ecoinformatics (Big Data) for Entomology: Pitfalls, Progress, And Promise	Portland Ballroom 251, Oregon Convention Center
8:00 AM - 12:00 PM	Member Symposium: Insects as Sustainable and Innovative Sources of Food and Feed Production	Portland Ballroom 253, Oregon Convention Center
10:00 AM - 12:00 PM	Member Symposium: Cotton IPM: Texas Style	Portland Ballroom 254, Oregon Convention Center
8:00 AM - 12:00 PM	P-IE Section Symposium: Functional Characterization of Insect Chemoreceptors: On Receptivity Range and Expression	Portland Ballroom 255, Oregon Convention Center
8:00 AM - 12:00 PM	PBT Section Symposium: RNAi: Emerging Technology to Overcome Grand Challenges in Entomology	Portland Ballroom 256, Oregon Convention Center
8:00 AM - 12:00 PM	P-IE Section Symposium: Novel Plant-Insect Associations: Implications of the Lack of Coevolution	D136, Oregon Convention Center
8:30 AM - 12:00 PM	P-IE Section Symposium: Non-Lethal Effects of Predators in Arthropod Food Webs: Ecological Patterns, Behavioral Mechanisms, and Agricultural Applications	D137-138, Oregon Convention Center
8:00 AM - 12:00 PM	Member Symposium: The role of diversity in pollinator conservation	E143-144, Oregon Convention Center
8:00 AM - 12:00 PM	Member Symposium: Expanding Spotted Wing Drosophila (*Drosophila suzukii*) Research to New Horizons	E145, Oregon Convention Center
8:00 AM - 12:00 PM	P-IE Section Symposium: Basic Approaches to Grand Challenges: Applying Insect Ecology to Improve Agricultural Sustainability and Food Security	B117-119, Oregon Convention Center
8:00 AM - 12:00 PM	SysEB Section Symposium: How the Fossil Record Can Contribute to Our Understanding of Insect Ecology and Evolution	B110-112, Oregon Convention Center
8:00 AM - 12:00 PM	SysEB Section Symposium: A hitchhiker's Guide to the Microcosmos: The Challenges of Dispersal	B113-114, Oregon Convention Center

8:00 AM - 12:00 PM	Member Symposium: Youthful Perspectives in Forensic Entomology, Part Deux: The Road Less Traveled	B115-116, Oregon Convention Center
8:00 AM - 12:00 PM	Member Symposium: Underlying Aspects of Insect Reproduction: What We Know and What Needs to be Done	C123, Oregon Convention Center
8:00 AM - 12:00 PM	MUVE Section Symposium: One Health: Linking Entomologists to Aid in the Pursuit of Improved Health for Humans, Animals, and Our Ecosystems	A107-109, Oregon Convention Center
8:00 AM - 9:00 AM	Ten-Minute Papers, MUVE Section: Social Media and Digital Information	A103-104, Oregon Convention Center
8:00 AM - 12:00 PM	Ten-Minute Papers, SysEB Section: Coleoptera Systematics	A105, Oregon Convention Center
8:00 AM - 12:00 PM	Ten-Minute Papers, SysEB Section: Ant Systematics	A106, Oregon Convention Center
8:00 AM - 12:00 PM	Ten-Minute Papers, P-IE Section: Biological Control A	F151, Oregon Convention Center
8:00 AM - 12:00 PM	Ten-Minute Papers, P-IE Section: Population Monitoring and Modeling A	F149, Oregon Convention Center
9:00 AM - 12:00 PM	Ten-Minute Papers, MUVE Section: Forensic and Veterinary Entomology	A103-104, Oregon Convention Center
9:00 AM - 2:00 PM	Exhibit Hall	Exhibit Hall C, Oregon Convention Center
11:30 AM - 12:30 PM	Student Affairs Committee Meeting	Halsey, Doubletree Portland
12:15 PM - 1:15 PM	Lunch and Learn: Outreach in Unusual Places: Making Push-Pull Marketing Work for You	Portland Ballroom 252, Oregon Convention Center
12:15 PM - 1:15 PM	Social Hour with Poster Presenters	Exhibit Hall C, Oregon Convention Center
12:15 PM - 1:30 PM	Meeting of Chrysomelid Specialists	D132, Oregon Convention Center
12:30 PM - 2:30 PM	2015 Annual Meeting Program Committee Meeting	D131, Oregon Convention Center
1:30 PM - 3:30 PM	Insect Illustration Workshop	E146, Oregon Convention Center
1:30 PM - 5:30 PM	Program Symposium: Novel Ecological Approaches to Vector Control	Portland Ballroom 251, Oregon Convention Center
1:30 PM - 5:30 PM	MUVE Section Symposium: Beyond Drinking the Worm: Linking Concept with Action to Save the World with Entomophagy	Portland Ballroom 253, Oregon Convention Center
1:30 PM - 5:30 PM	Member Symposium: Predatory Lady Beetles: Global Opportunities for Biological Control and Challenges As Invasive Species	Portland Ballroom 254, Oregon Convention Center
1:30 PM - 5:30 PM	Member Symposium: Transgenic Insect Resistant Soybeans	Portland Ballroom 252, Oregon Convention Center
1:30 PM - 5:30 PM	P-IE Section Symposium: Recovering Monarch Butterfly Populations in North America: A Looming Challenge for Science, the Public, Industry and Legislators	Portland Ballroom 256, Oregon Convention Center
1:30 PM - 5:30 PM	Member Symposium: Grand Challenge: Effective Science Education with Communication	Portland Ballroom 255, Oregon Convention Center
1:30 PM - 4:15 PM	Member Symposium: Biogeography and Evolution of Mesoamerican Arthropods	B110-112, Oregon Convention Center
1:30 PM - 3:30 PM	Member Symposium: Cockroaches, Asthma and Children's Environmental Health	B115-116, Oregon Convention Center
1:30 PM - 5:30 PM	P-IE Section Symposium: Entomology's Role in Sustaining Ecosystem Services in Agroecosystems	B113-114, Oregon Convention Center
1:30 PM - 5:30 PM	P-IE Section Symposium: New Perspectives on Changing Landscapes Offered by Big Data Approaches	B117-119, Oregon Convention Center
1:30 PM - 5:30 PM	Member Symposium: How Cool is Entomology?	D139-140, Oregon Convention Center
1:30 PM - 5:30 PM	P-IE Section Symposium: Effects of Cropping System Landscapes on the Ecology and Management of Insect Vectors and Transmitted Pathogens	E141-142, Oregon Convention Center
1:30 PM - 5:30 PM	Member Symposium: New Horizons in Ornamental IPM	E143-144, Oregon Convention Center
1:30 PM - 5:30 PM	Member Symposium: Meeting the Challenge of Fruit Fly Pests from Beyond the Horizon: Advances in Detection, Eradication, and Management of Invasive Fruit Fly Species	E145, Oregon Convention Center

1:30 PM - 3:30 PM	Member Symposium: Landscape and Entomology: Geospatial Research in a Changing World	F150, Oregon Convention Center
1:30 PM - 5:30 PM	Ten-Minute Papers, P-IE Section: Population Monitoring and Modeling B	F149, Oregon Convention Center
1:30 PM - 5:30 PM	Ten Minute Papers, P-IE Section: Biological Control B	F151, Oregon Convention Center
1:30 PM - 5:30 PM	Ten-Minute Papers, SysEB Section: Behavior and Life History	A106, Oregon Convention Center
1:30 PM - 5:30 PM	Ten-Minute Papers, SysEB Section: Biodiversity	A105, Oregon Convention Center
1:30 PM - 5:30 PM	Ten-Minute Papers, PBT Section: Physiology in Pest Management	C124, Oregon Convention Center
2:30 PM - 3:30 PM	SysEB Final Business Meeting	A107-109, Oregon Convention Center
4:00 PM - 5:00 PM	Open P-IE Section Governing Council and Member Feedback Session	F152, Oregon Convention Center
5:30 PM - 7:30 PM	Closing Plenary Session and Old Masters Linnaean Games	Oregon Ballroom, Oregon Convention Center
8:00 AM - 2:00 PM	Poster Session 2: MUVE	Exhibit Hall C, Oregon Convention Center
8:00 AM - 2:00 PM	Poster Session 2: P-IE	Exhibit Hall C, Oregon Convention Center
8:00 AM - 2:00 PM	Poster Session 2: PBT	Exhibit Hall C, Oregon Convention Center
8:00 AM - 2:00 PM	Poster Session 2: SysEB	Exhibit Hall C, Oregon Convention Center



DAILY SCHEDULE BY SCIENTIFIC PROGRAM

SUNDAY, NOVEMBER 16		
Session	**Time**	**Location**
Program Symposia		
Program Symposium: Agricultural Intensification and Insect Communities: Production Trade-Off Challenges with 9 Billion on the Horizon	8:00 AM - 12:00 PM	Portland Ballroom 251, Oregon Convention Center
Program Symposium: The Futures of Insect Genomics: A Grand Challenge of Entomology	1:15 PM - 5:15 PM	Portland Ballroom 251, Oregon Convention Center
Section Symposia		
P-IE Section Symposium: Challenges in Managing the Emerald Ash Borer (*Agrilus planipennis*) and Similar Invasive Woodborers on the Horizon	8:00 AM - 12:00 PM	Portland Ballroom 255, Oregon Convention Center
PBT Section Symposium: Buzz-kills: The Genomics and Ecology of Stress in Pollinators	8:00 AM - 12:00 PM	Portland Ballroom 256, Oregon Convention Center
P-IE Section Symposium: Pesticides, Parasites and Pests: The Impacts of Environmental Stressors on Beneficial Insects	8:00 AM - 12:00 PM	E141-142, Oregon Convention Center
MUVE Section Symposium: Reproductive Strategies Across Hematophagous Arthropods	10:00 AM - 12:00 PM	Portland Ballroom 252, Oregon Convention Center
P-IE/MUVE Section Symposium: Celebrating the 100th Anniversary of the Entomologist in the Cooperative Extension Service	1:15 PM - 5:15 PM	Portland Ballroom 253, Oregon Convention Center
P-IE Section Symposium: Biological Insect Control - Ready for a Breakthrough?	1:15 PM - 5:15 PM	Portland Ballroom 255, Oregon Convention Center
PBT Section Symposium: Chemical Communication in Longhorned Beetles	1:15 PM - 5:15 PM	C123, Oregon Convention Center
MUVE Section Symposium: Triatominae from Genes to Populations: The Road to New Insights and Challenges on the Horizon of Vector Ecology	1:15 PM - 5:15 PM	C124, Oregon Convention Center
P-IE Section Symposium: Global Grand Challenges and Opportunities in Grassland Entomology	1:15 PM - 5:15 PM	D137-138, Oregon Convention Center
2014 Symposium of the Society of Regulatory Entomology. Alternatives to Rulemaking: Non-regulatory Solutions for Regulatory Problems	1:15 PM - 5:15 PM	E145, Oregon Convention Center
P-IE Section Symposium: Bt Resistance Monitoring: Strengths, Limitations, and Challenges	1:15 PM - 5:15 PM	E146, Oregon Convention Center
Member Symposia		
Member Symposium: Sexually Dimorphic Chemosensory Behavior in *Drosophila*	8:00 AM - 10:00 AM	Portland Ballroom 253, Oregon Convention Center
Member Symposium: Answering Tomorrow's Challenges to Manage Insects in Greenhouses with Today's Research	8:00 AM - 12:00 PM	Portland Ballroom 254, Oregon Convention Center
Member Symposium: Finding the Best Fit for You: Career Opportunities for Entomologists in Industry, Academia, Military, and Government	8:00 AM - 12:00 PM	B113-114, Oregon Convention Center
Member Symposium: The Challenges and Significant Contributions of Insect Repellents to Vector Control	8:00 AM - 12:00 PM	B115-116, Oregon Convention Center
Late-Breaking Symposium: Classical Biological Control of the Brown Marmorated Stink Bug, *Halyomorpha halys* (Stål)	8:00 AM - 12:00 PM	D136, Oregon Convention Center
Member Symposium: The Importance of Chemical Ecology for IPM in the Tropics	8:00 AM - 12:00 PM	D139-140, Oregon Convention Center
Member Symposium: Design and Management of Agroecosystems for Functional Biodiversity	8:00 AM - 11:00 AM	E143-144, Oregon Convention Center
Member Symposium: Fall Armyworm: Current Challenges and Future Directions for Its Management	8:00 AM - 12:00 PM	F150, Oregon Convention Center

Member Symposium: Horizons in the Field of Symbiosis	1:15 PM - 5:15 PM	Portland Ballroom 252, Oregon Convention Center
Member Symposium: Biological Control in Acarology: Present and Future Challenges	1:15 PM - 5:15 PM	B110-112, Oregon Convention Center
Member Symposium: Grand Challenges in Keeping and Fostering Women in Entomology: Working Toward a Brighter Future on Our Horizon	1:15 PM - 5:15 PM	B113-114, Oregon Convention Center
Member Symposium: Contributions of Mosquito Research to Science & Society	1:15 PM - 5:15 PM	B115-116, Oregon Convention Center
Member Symposium: Nutrition and the Health and Behavior of Wild and Managed Bees	1:15 PM - 5:15 PM	D139-140, Oregon Convention Center
Member Symposium: Advances in Pest Management for Turfgrass and Ornamentals	1:15 PM - 5:15 PM	E143-144, Oregon Convention Center
Member Symposium: Wireworms: The Resurgence of a Key Pest of North American Cropland	1:15 PM - 5:15 PM	F150, Oregon Convention Center
Ten Minute Paper (TMP) Oral		
Ten-Minute Papers, MUVE Section: Stored Products Pests	8:00 AM - 12:00 PM	B117-119, Oregon Convention Center
Ten-Minute Papers, PBT Section: Chemical Ecology and Biotic Interactions	8:00 AM - 12:00 PM	C123, Oregon Convention Center
Ten-Minute Papers, PBT Section: Physiology and Immunology	8:00 AM - 12:00 PM	C124, Oregon Convention Center
Ten-Minute Papers, P-IE Section: Pollinators	8:00 AM - 12:00 PM	D137-138, Oregon Convention Center
Ten-Minute Papers, P-IE Section: Forest and Arboreal Entomology	8:00 AM - 12:00 PM	E145, Oregon Convention Center
Ten-Minute Papers, P-IE Section: Plant and Insect Interactions	8:00 AM - 12:00 PM	E146, Oregon Convention Center
Ten-Minute Papers, P-IE Section: Transgenic Host Plants	8:00 AM - 12:00 PM	F151, Oregon Convention Center
Ten-Minute Papers, P-IE Section: Crop Protection - Horticulture and Vegetable Production	8:00 AM - 12:00 PM	F152, Oregon Convention Center
Ten-Minute Papers, SysEB Section: Conservation	9:00 AM - 12:00 PM	A106, Oregon Convention Center
Ten-Minute Papers, SysEB Section: Invasive Arthropods in Systematics	9:30 AM - 12:00 PM	A105, Oregon Convention Center
Ten-Minute Papers, MUVE Section: Tick and Tick Borne Disease	1:15 PM - 5:15 PM	B117-119, Oregon Convention Center
Ten-Minute Papers, P-IE Section: Invasive Species	1:15 PM - 5:15 PM	D136, Oregon Convention Center
Ten-Minute Papers, P-IE Section: Crop Protection - Row Crops	1:15 PM - 5:15 PM	E141-142, Oregon Convention Center
Ten-Minute Papers, P-IE Section: Crop Protection - Fruit Trees and Vines	1:15 PM - 5:15 PM	F151, Oregon Convention Center
Ten-Minute Papers, P-IE Section: Host Plant Resistance	1:15 PM - 5:15 PM	F152, Oregon Convention Center
MONDAY, NOVEMBER 17		
Session	**Time**	**Location**
Student Poster Competition		
01 - Undergraduate Student Poster Competition: MUVE/PBT	8:00 AM - 6:30 PM	Exhibit Hall C, Oregon Convention Center
02 - Undergraduate Student Poster Competition: P-IE	8:00 AM - 6:30 PM	Exhibit Hall C, Oregon Convention Center
03 - Undergraduate Student Poster Competition: SysEB	8:00 AM - 6:30 PM	Exhibit Hall C, Oregon Convention Center
04 - Graduate Student Poster Competition: MUVE	8:00 AM - 6:30 PM	Exhibit Hall C, Oregon Convention Center
05 - Graduate Student Poster Competition: MUVE	8:00 AM - 6:30 PM	Exhibit Hall C, Oregon Convention Center
06 - Graduate Student Poster Competition: PBT	8:00 AM - 6:30 PM	Exhibit Hall C, Oregon Convention Center
07 - Graduate Student Poster Competition: PBT	8:00 AM - 6:30 PM	Exhibit Hall C, Oregon Convention Center
08 - Graduate Student Poster Competition: PBT	8:00 AM - 6:30 PM	Exhibit Hall C, Oregon Convention Center
09 - Graduate Student Poster Competition: P-IE	8:00 AM - 6:30 PM	Exhibit Hall C, Oregon Convention Center
10 - Graduate Student Poster Competition: P-IE	8:00 AM - 6:30 PM	Exhibit Hall C, Oregon Convention Center
11 - Graduate Student Poster Competition: P-IE	8:00 AM - 6:30 PM	Exhibit Hall C, Oregon Convention Center
12 - Graduate Student Poster Competition: P-IE	8:00 AM - 6:30 PM	Exhibit Hall C, Oregon Convention Center

13 - Graduate Student Poster Competition: P-IE	8:00 AM - 6:30 PM	Exhibit Hall C, Oregon Convention Center
14 - Graduate Student Poster Competition: P-IE	8:00 AM - 6:30 PM	Exhibit Hall C, Oregon Convention Center
15 - Graduate Student Poster Competition: P-IE	8:00 AM - 6:30 PM	Exhibit Hall C, Oregon Convention Center
16 - Graduate Student Poster Competition: P-IE	8:00 AM - 6:30 PM	Exhibit Hall C, Oregon Convention Center
17 - Graduate Student Poster Competition: SysEB	8:00 AM - 6:30 PM	Exhibit Hall C, Oregon Convention Center
18 - Graduate Student Poster Competition: SysEB	8:00 AM - 6:30 PM	Exhibit Hall C, Oregon Convention Center
19 - Graduate Student Poster Competition: SysEB	8:00 AM - 6:30 PM	Exhibit Hall C, Oregon Convention Center
Student TMP Competition		
01 - Undergraduate Student Ten-Minute Paper Competition: MUVE, SysEB	8:45 AM - 12:30 PM	F149, Oregon Convention Center
02 - Undergraduate Student Ten-Minute Paper Competition: PBT, P-IE	8:45 AM - 12:30 PM	D131, Oregon Convention Center
03 - Undergraduate Student Ten-Minute Paper Competition: P-IE	8:45 AM - 12:30 PM	D132, Oregon Convention Center
04 - Graduate Student Ten-Minute Paper Competition: MUVE	8:20 AM - 12:30 PM	B110-112, Oregon Convention Center
05 - Graduate Student Ten-Minute Paper Competition: MUVE	8:20 AM - 12:30 PM	B113-114, Oregon Convention Center
06 - Graduate Student Ten-Minute Paper Competition: MUVE	8:20 AM - 12:30 PM	B115-116, Oregon Convention Center
07 - Graduate Student Ten-Minute Paper Competition: MUVE	8:20 AM - 12:30 PM	B117-119, Oregon Convention Center
08 - Graduate Student Ten-Minute Paper Competition: PBT	8:20 AM - 12:30 PM	A103-104, Oregon Convention Center
09 - Graduate Student Ten-Minute Paper Competition: PBT	8:20 AM - 12:30 PM	A105, Oregon Convention Center
10 - Graduate Student Ten-Minute Paper Competition: PBT	8:20 AM - 12:30 PM	A106, Oregon Convention Center
11 - Graduate Student Ten-Minute Paper Competition: PBT	8:20 AM - 12:30 PM	A107-109, Oregon Convention Center
12 - Graduate Student Ten-Minute Paper Competition: P-IE	8:20 AM - 12:00 PM	C123, Oregon Convention Center
13 - Graduate Student Ten-Minute Paper Competition: P-IE	8:20 AM - 12:30 PM	C124, Oregon Convention Center
14 - Graduate Student Ten-Minute Paper Competition: P-IE	7:55 AM - 12:30 PM	D133-134, Oregon Convention Center
15 - Graduate Student Ten-Minute Paper Competition: P-IE	7:55 AM - 12:30 PM	D135, Oregon Convention Center
16 - Graduate Student Ten-Minute Paper Competition: P-IE	7:55 AM - 12:30 PM	D136, Oregon Convention Center
17 - Graduate Student Ten-Minute Paper Competition: P-IE	7:55 AM - 12:30 PM	D137-138, Oregon Convention Center
18 - Graduate Student Ten-Minute Paper Competition: P-IE	7:55 AM - 12:30 PM	D139-140, Oregon Convention Center
19 - Graduate Student Ten-Minute Paper Competition: P-IE	7:55 AM - 12:30 PM	E141-142, Oregon Convention Center
20 - Graduate Student Ten-Minute Paper Competition: P-IE	7:55 AM - 12:30 PM	E143-144, Oregon Convention Center
21 - Graduate Student Ten-Minute Paper Competition: P-IE	7:55 AM - 12:30 PM	E145, Oregon Convention Center
22 - Graduate Student Ten-Minute Paper Competition: P-IE	7:55 AM - 12:30 PM	E146, Oregon Convention Center
23 - Graduate Student Ten-Minute Paper Competition: P-IE	7:55 AM - 12:30 PM	E147-148, Oregon Convention Center
24 - Graduate Student Ten-Minute Paper Competition: P-IE	8:20 AM - 12:30 PM	Oregon Ballroom, Oregon Convention Center
25 - Graduate Student Ten-Minute Paper Competition: P-IE	7:55 AM - 12:30 PM	F150, Oregon Convention Center
26 - Graduate Student Ten-Minute Paper Competition: P-IE	7:55 AM - 12:30 PM	F151, Oregon Convention Center
27 - Graduate Student Ten-Minute Paper Competition: P-IE	7:55 AM - 12:30 PM	F152, Oregon Convention Center
28 - Graduate Student Ten-Minute Paper Competition: SysEB	8:45 AM - 12:30 PM	Portland Ballroom 251, Oregon Convention Center
29 - Graduate Student Ten-Minute Paper Competition: SysEB	8:45 AM - 12:30 PM	Portland Ballroom 256, Oregon Convention Center
30 - Graduate Student Ten-Minute Paper Competition: SysEB	8:45 AM - 12:30 PM	Portland Ballroom 252, Oregon Convention Center
31 - Graduate Student Ten-Minute Paper Competition: SysEB	8:45 AM - 12:30 PM	Portland Ballroom 253, Oregon Convention Center
32 - Graduate Student Ten-Minute Paper Competition: SysEB	8:45 AM - 12:30 PM	Portland Ballroom 254, Oregon Convention Center
33 - Graduate Student Ten-Minute Paper Competition: SysEB	8:45 AM - 12:30 PM	Portland Ballroom 255, Oregon Convention Center

TUESDAY, NOVEMBER 18		
Session	**Time**	**Location**
Program Symposia		
Program Symposium: Beyond the Horizon: Unraveling the Novel Complexity of Insect-Plant Interactions	8:00 AM - 12:00 PM	Portland Ballroom 251, Oregon Convention Center
Program Symposium: Social Insects as Models for Biological Complexity: Lessons Learned and Challenges on the Horizon	1:30 PM - 5:30 PM	Portland Ballroom 251, Oregon Convention Center
Section Symposia		
P-IE Section Symposium: Entomology-A Foundational Discipline for Integrated Plant Health Training	8:00 AM - 12:00 PM	Portland Ballroom 252, Oregon Convention Center
P-IE Section Symposium: The Return of the American Bollworm: A Grand Challenge to the New World on the Horizon and Beyond	8:00 AM - 12:00 PM	Portland Ballroom 255, Oregon Convention Center
SysEB Section Symposium: Out of the Field and Into the Lab: The State of the Art in Sorting Biodiversity Samples and Processing to Publication	8:00 AM - 12:00 PM	Portland Ballroom 256, Oregon Convention Center
SysEB Section Symposium: Genetic and Behavioral Mechanisms of Social Complexity: Current Challenges and Future Horizons	8:00 AM - 12:00 PM	B113-114, Oregon Convention Center
MUVE Section Symposium: Beyond Pesticides: The Conundrum of Bed Bugs	8:00 AM - 12:00 PM	B115-116, Oregon Convention Center
P-IE Section Symposium: Exploring Complex Interactions among Non-Native Bark and Ambrosia Beetles (Coleoptera: Scolytinae), their Associated Fungi, and Naïve Hosts	8:00 AM - 12:00 PM	D133-134, Oregon Convention Center
P-IE Section Symposium: The Larry L. Larson Symposium: The Grand Challenge of Exploration and Use of Advanced Technologies Beyond the Horizon for Insect Management and Control	8:00 AM - 12:00 PM	D137-138, Oregon Convention Center
P-IE Section Symposium: Broadening the Horizons for Pollination of U.S. Specialty Crops	8:00 AM - 12:00 PM	E141-142, Oregon Convention Center
P-IE Section Symposium: Roles of Biotic Interactions in Invasion Biology	1:30 PM - 5:30 PM	Portland Ballroom 255, Oregon Convention Center
PBT Section Symposium: Highlighting a Career of Defining and Meeting Grand Challenges in Entomology: A Symposium in Honor of David L. Denlinger	1:30 PM - 5:30 PM	Portland Ballroom 256, Oregon Convention Center
P-IE Section Symposium: Forest Entomology: Beyond Saving Trees	1:30 PM - 5:30 PM	D133-134, Oregon Convention Center
P-IE Section Symposium: Classical Biological Control of Invasive Plants: Complex Challenges, Semiochemical Solutions	1:30 PM - 5:30 PM	D137-138, Oregon Convention Center
P-IE Section Symposium: New Frontiers in Honey Bee Health Economics: Incorporating Entomological Research and Knowledge into Economic Assessments	1:30 PM - 3:30 PM	E141-142, Oregon Convention Center
P-IE Section Symposium: Managing Arthropod Resistance in a Changing Landscape, IRAC US Symposium Series: No. 10	1:30 PM - 5:30 PM	E143-144, Oregon Convention Center
Member Symposia		
Member Symposium: Insect Life Tables: Theory, Data Analysis, and Application	8:00 AM - 12:00 PM	Portland Ballroom 253, Oregon Convention Center
Member Symposium: Control and Eradication of Invasive Social Hymenoptera	8:00 AM - 12:00 PM	Portland Ballroom 254, Oregon Convention Center
Member Symposium: Merging the Ecological and Systematic Knowledge of Carabid Beetles	8:00 AM - 12:00 PM	B110-112, Oregon Convention Center
Member Symposium: Meeting the Challenge: New Horizons in Entomology Engagement	8:00 AM - 12:00 PM	B117-119, Oregon Convention Center
Member Symposium: Stored Product Entomology: Making Significant Contributions to Clarify and Solve Important Challenges	8:00 AM - 12:00 PM	D139-140, Oregon Convention Center
Member Symposium: Human-Mediated Spread of Invasive Alien Insects: New Assessment Approaches and Data Needs	8:00 AM - 12:00 PM	E145, Oregon Convention Center

Member Symposium: Challenges of Emerging and Resilient Insect Pests for IPM Implementation	8:00 AM - 12:00 PM	F150, Oregon Convention Center
Member Symposium: Honoring the Career and Contributions of Veterinary Entomologist Donald A. Rutz	1:30 PM - 5:30 PM	Portland Ballroom 253, Oregon Convention Center
Member Symposium: IPM: An International Organic Farming Strategy on Invasive Insect Species	1:30 PM - 5:30 PM	Portland Ballroom 254, Oregon Convention Center
Member Symposium: Utilizing Orthopteroid Insects to Overcome Grand Challenges in an Ever-Evolving World	1:30 PM - 5:30 PM	B113-114, Oregon Convention Center
Member Symposium: Board Certified Entomologist's (BCE) Symposium: Bed Bugs, *Cimex lectularius*, Fighting a Nuclear War with Bows and Arrows	1:30 PM - 5:30 PM	B115-116, Oregon Convention Center
Member Symposium: Six Legs, Many Panels: Entomological Comics and Their Importance in Education and Culture	1:30 PM - 5:30 PM	C123, Oregon Convention Center
Member Symposium: Common Challenges and Learning Opportunities for Latin American and U.S. Entomologists: 2nd Latin American/Hispanic Symposium	1:30 PM - 5:30 PM	C124, Oregon Convention Center
Member Symposium: Thinking Outside the Box: Entomopathogens in IPM Programs	1:30 PM - 5:30 PM	D136, Oregon Convention Center
Member Symposium: Practical Implementation of Conservation Biological Control	1:30 PM - 5:30 PM	D139-140, Oregon Convention Center
Member Symposium: Tree Fruit IPM from a Dream to Its Realization: Honoring the Career of Jay Brunner	1:30 PM - 5:30 PM	F150, Oregon Convention Center
Senior Member Symposium and Challenges Beyond the Horizon: Hops, Breweries, Pest Management and Native Bee Pollinators in the Pacific Northwest	3:30 PM - 5:30 PM	E141-142, Oregon Convention Center
Poster		
Poster Session 1: MUVE	8:00 AM - 6:30 PM	Exhibit Hall C, Oregon Convention Center
Poster Session 1: P-IE	8:00 AM - 6:30 PM	Exhibit Hall C, Oregon Convention Center
Poster Session 1: PBT	8:00 AM - 6:30 PM	Exhibit Hall C, Oregon Convention Center
Poster Session 1: SysEB	8:00 AM - 6:30 PM	Exhibit Hall C, Oregon Convention Center
Ten Minute Paper (TMP) Oral		
Ten-Minute Papers, SysEB Section: Endosymbionts and Gut Flora/ Fauna	8:00 AM - 12:00 PM	A103-104, Oregon Convention Center
Ten-Minute Papers, SysEB Section: Systematics and Evolutionary Biology	8:00 AM - 12:00 PM	A107-109, Oregon Convention Center
Ten-Minute Papers, MUVE Section: Ants and Termites	8:00 AM - 12:00 PM	A106, Oregon Convention Center
Ten-Minute Papers, MUVE Section: Sand Flies and Gnats	8:00 AM - 12:00 PM	A105, Oregon Convention Center
Ten-Minute Papers, PBT Section: Toxicology	8:00 AM - 12:00 PM	C123, Oregon Convention Center
Ten-Minute Papers, PBT Section: Genetics, Genomics and Molecular Biology	8:00 AM - 12:00 PM	C124, Oregon Convention Center
Ten-Minute Papers, P-IE Section: Semiochemicals	8:00 AM - 12:00 PM	D135, Oregon Convention Center
Ten-Minute Papers, P-IE Section: Environmental Entomology A	8:00 AM - 12:00 PM	E146, Oregon Convention Center
Ten-Minute Papers, SysEB Section: Insect Ecology	1:30 PM - 5:30 PM	A103-104, Oregon Convention Center
Ten-Minute Papers, SysEB Section: Species Delimitation and Biogeography	1:30 PM - 5:30 PM	A105, Oregon Convention Center
Ten-Minute Papers, SysEB Section: Phylogenetic and Phylogenomic Methodology	1:30 PM - 5:30 PM	A107-109, Oregon Convention Center
Ten-Minute Papers, MUVE Section: Mosquitoes	1:30 PM - 5:30 PM	A106, Oregon Convention Center
Ten-Minute Papers, MUVE Section: Bed Bugs and Other True Bugs	1:30 PM - 5:30 PM	B117-119, Oregon Convention Center
Ten-Minute Papers, P-IE Section: Biology and Ecology	1:30 PM - 5:30 PM	D135, Oregon Convention Center
Ten-Minute Papers, P-IE Section: Environmental Entomology B	1:30 PM - 5:30 PM	E146, Oregon Convention Center

WEDNESDAY, NOVEMBER 19		
Session	**Time**	**Location**
Program Symposia		
Program Symposium: Ecoinformatics (Big Data) for Entomology: Pitfalls, Progress, And Promise	8:00 AM - 12:00 PM	Portland Ballroom 251, Oregon Convention Center
Program Symposium: Reaching Beyond Our Horizon: Social Media & Connecting with the World	8:00 AM - 12:00 PM	Portland Ballroom 252, Oregon Convention Center
Program Symposium: Novel Ecological Approaches to Vector Control	1:30 PM - 5:30 PM	Portland Ballroom 251, Oregon Convention Center
Section Symposia		
P-IE Section Symposium: Functional Characterization of Insect Chemoreceptors: On Receptivity Range and Expression	8:00 AM - 12:00 PM	Portland Ballroom 255, Oregon Convention Center
PBT Section Symposium: RNAi: Emerging Technology to Overcome Grand Challenges in Entomology	8:00 AM - 12:00 PM	Portland Ballroom 256, Oregon Convention Center
MUVE Section Symposium: One Health: Linking Entomologists to Aid in the Pursuit of Improved Health for Humans, Animals, and Our Ecosystems	8:00 AM - 12:00 PM	A107-109, Oregon Convention Center
SysEB Section Symposium: A hitchhiker's Guide to the Microcosmos: The Challenges of Dispersal	8:00 AM - 12:00 PM	B113-114, Oregon Convention Center
SysEB Section Symposium: How the Fossil Record Can Contribute to Our Understanding of Insect Ecology and Evolution	8:00 AM - 12:00 PM	B110-112, Oregon Convention Center
P-IE Section Symposium: Basic Approaches to Grand Challenges: Applying Insect Ecology to Improve Agricultural Sustainability and Food Security	8:00 AM - 12:00 PM	B117-119, Oregon Convention Center
P-IE Section Symposium: Novel Plant-Insect Associations: Implications of the Lack of Coevolution	8:00 AM - 12:00 PM	D136, Oregon Convention Center
P-IE Section Symposium: Non-Lethal Effects of Predators in Arthropod Food Webs: Ecological Patterns, Behavioral Mechanisms, and Agricultural Applications	8:30 AM - 12:00 PM	D137-138, Oregon Convention Center
MUVE Section Symposium: Beyond Drinking the Worm: Linking Concept with Action to Save the World with Entomophagy	1:30 PM - 5:30 PM	Portland Ballroom 253, Oregon Convention Center
P-IE Section Symposium: Recovering Monarch Butterfly Populations in North America: A Looming Challenge for Science, the Public, Industry and Legislators	1:30 PM - 5:30 PM	Portland Ballroom 256, Oregon Convention Center
P-IE Section Symposium: Entomology's Role in Sustaining Ecosystem Services in Agroecosystems	1:30 PM - 5:30 PM	B113-114, Oregon Convention Center
P-IE Section Symposium: New Perspectives on Changing Landscapes Offered by Big Data Approaches	1:30 PM - 5:30 PM	B117-119, Oregon Convention Center
P-IE Section Symposium: Effects of Cropping System Landscapes on the Ecology and Management of Insect Vectors and Transmitted Pathogens	1:30 PM - 5:30 PM	E141-142, Oregon Convention Center
Member Symposia		
Member Symposium: Insects as Sustainable and Innovative Sources of Food and Feed Production	8:00 AM - 12:00 PM	Portland Ballroom 253, Oregon Convention Center
Member Symposium: Youthful Perspectives in Forensic Entomology, Part Deux: The Road Less Traveled	8:00 AM - 12:00 PM	B115-116, Oregon Convention Center
Member Symposium: Underlying Aspects of Insect Reproduction: What We Know and What Needs to be Done	8:00 AM - 12:00 PM	C123, Oregon Convention Center
Member Symposium: The role of diversity in pollinator conservation	8:00 AM - 12:00 PM	E143-144, Oregon Convention Center
Member Symposium: Expanding Spotted Wing Drosophila (*Drosophila suzukii*) Research to New Horizons	8:00 AM - 12:00 PM	E145, Oregon Convention Center
Member Symposium: Cotton IPM: Texas Style	10:00 AM - 12:00 PM	Portland Ballroom 254, Oregon Convention Center
Member Symposium: Transgenic Insect Resistant Soybeans	1:30 PM - 5:30 PM	Portland Ballroom 252, Oregon Convention Center

Member Symposium: Predatory Lady Beetles: Global Opportunities for Biological Control and Challenges As Invasive Species	1:30 PM - 5:30 PM	Portland Ballroom 254, Oregon Convention Center
Member Symposium: Grand Challenge: Effective Science Education with Communication	1:30 PM - 5:30 PM	Portland Ballroom 255, Oregon Convention Center
Member Symposium: Biogeography and Evolution of Mesoamerican Arthropods	1:30 PM - 4:15 PM	B110-112, Oregon Convention Center
Member Symposium: Cockroaches, Asthma and Children's Environmental Health	1:30 PM - 3:30 PM	B115-116, Oregon Convention Center
Member Symposium: How Cool is Entomology?	1:30 PM - 5:30 PM	D139-140, Oregon Convention Center
Member Symposium: New Horizons in Ornamental IPM	1:30 PM - 5:30 PM	E143-144, Oregon Convention Center
Member Symposium: Meeting the Challenge of Fruit Fly Pests from Beyond the Horizon: Advances in Detection, Eradication, and Management of Invasive Fruit Fly Species	1:30 PM - 5:30 PM	E145, Oregon Convention Center
Member Symposium: Landscape and Entomology: Geospatial Research in a Changing World	1:30 PM - 3:30 PM	F150, Oregon Convention Center
Poster		
Poster Session 2: MUVE	8:00 AM - 2:00 PM	Exhibit Hall C, Oregon Convention Center
Poster Session 2: P-IE	8:00 AM - 2:00 PM	Exhibit Hall C, Oregon Convention Center
Poster Session 2: PBT	8:00 AM - 2:00 PM	Exhibit Hall C, Oregon Convention Center
Poster Session 2: SysEB	8:00 AM - 2:00 PM	Exhibit Hall C, Oregon Convention Center
Ten Minute Paper (TMP) Oral		
Ten-Minute Papers, MUVE Section: Social Media and Digital Information	8:00 AM - 9:00 AM	A103-104, Oregon Convention Center
Ten-Minute Papers, SysEB Section: Coleoptera Systematics	8:00 AM - 12:00 PM	A105, Oregon Convention Center
Ten-Minute Papers, SysEB Section: Ant Systematics	8:00 AM - 12:00 PM	A106, Oregon Convention Center
Ten-Minute Papers, P-IE Section: Population Monitoring and Modeling A	8:00 AM - 12:00 PM	F149, Oregon Convention Center
Ten-Minute Papers, P-IE Section: Biological Control A	8:00 AM - 12:00 PM	F151, Oregon Convention Center
Ten-Minute Papers, MUVE Section: Forensic and Veterinary Entomology	9:00 AM - 12:00 PM	A103-104, Oregon Convention Center
Ten-Minute Papers, SysEB Section: Biodiversity	1:30 PM - 5:30 PM	A105, Oregon Convention Center
Ten-Minute Papers, SysEB Section: Behavior and Life History	1:30 PM - 5:30 PM	A106, Oregon Convention Center
Ten-Minute Papers, PBT Section: Physiology in Pest Management	1:30 PM - 5:30 PM	C124, Oregon Convention Center
Ten-Minute Papers, P-IE Section: Population Monitoring and Modeling B	1:30 PM - 5:30 PM	F149, Oregon Convention Center
Ten Minute Papers, P-IE Section: Biological Control B	1:30 PM - 5:30 PM	F151, Oregon Convention Center

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- ***Paper & Poster submissions open November 2014 close February 1, 2016***
- ***Symposia submissions close March 2, 2015***

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SUNDAY, NOVEMBER 16, 2014, MORNING

Program Symposium: Agricultural Intensification and Insect Communities: Production Trade-Off Challenges with 9 Billion on the Horizon

Portland Ballroom 251 (Oregon Convention Center)

Moderators and Organizers: Anders S. Huseth[1] and Jessica D. Petersen[2], [1]Cornell Univ., Geneva, NY, [2]Cornell Univ., Salem, VA

8:00 Introductory Remarks

8:05 0001 Restoring beneficial insect communities in biodiverse agroecosystems while feeding 9 billion people. Miguel Altieri, **Houston Wilson**, houston@berkeley.edu, Univ. of California, Berkeley, CA

8:30 0002 The role of landscape design in mitigating agricultural intensification. **Douglas A. Landis**, landisd@msu.edu, Michigan State Univ., East Lansing, MI

8:55 0003 Pollination services versus biodiversity conservation in agroecosystems: Compatible or conflicting objectives? **Daniel Cariveau**, dancariveau@gmail.com, Molly MacLeod, Faye E. Benjamin and Rachael Winfree, Rutgers, The State Univ. of New Jersey, New Brunswick, NJ

9:20 Break

9:30 0004 Agricultural intensification and its effect on local management practices. **Katja Poveda**, kap235@cornell.edu[1], and Maria Diaz[2], [1]Cornell Univ., Ithaca, NY, [2]Universidad Nacional de Colombia, Bogota, Colombia

9:55 0005 Insecticide resistance in a specialist herbivore shows a hidden cost of agricultural intensification. **Anders Huseth**, ash268@cornell.edu[1], Jessica D. Petersen[2], Katja Poveda[3], Zsofia Szendrei[4], Brian Nault[1], George G. Kennedy[5] and Russell L. Groves[6], [1]Cornell Univ., Geneva, NY, [2]Cornell Univ., Salem, VA, [3]Cornell Univ., Ithaca, NY, [4]Michigan State Univ., East Lansing, MI, [5]North Carolina State Univ., Raleigh, NC, [6]Univ. of Wisconsin, Madison, WI

10:20 0006 Does landscape simplification consistently drive insecticide use? **Ashley E. Larsen**, larsen.ashley@gmail.com, Steven Gaines and Olivier Deschênes, Univ. of California, Santa Barbara, CA

10:45 Break 2

10:55 0007 Tradeoffs between agricultural intensification and insect-transmitted disease. **David Crowder**, dcrowder@wsu.edu[1], Elizabeth Dysktra[2] and Jeb Owen[1], [1]Washington State Univ., Pullman, WA, [2]Washington State Dept. of Health, WA

11:20 0008 Agricultural ecosystem health and intensification, economy of scale or economy of scope? **Casey Hoy**, hoy.1@osu.edu, Ben Kerrick and Elizabeth Kolbe, The Ohio State Univ., Wooster, OH

11:45 Discussion

MUVE Section Symposium: Reproductive Strategies Across Hematophagous Arthropods

Portland Ballroom 252 (Oregon Convention Center)

Moderators and Organizers: Yvonne Matos and Alexis M. Barbarin, North Carolina State Univ., Raleigh, NC

10:00 Introductory Remarks

10:05 0009 The effect of trypanosome infection on the reproduction of kissing bugs. **Marcelo Lorenzo**, marcelo@cpqrr.fiocruz.br, Oswaldo Cruz Foundation, Belo Horizonte-MG, Brazil

10:25 0010 Oviposition dynamics in *Culex* complex. **Zainulabeuddin Syed**, Zainulabeuddin.Syed.5@nd.edu, Univ. of Notre Dame, Notre Dame, IN

10:45 0011 Bloodmeal size defines ejaculate production and impacts on male mating behaviour in *Cimex lectularius*. **Oliver Otti**, oliver.otti@uni-bayreuth.de and Bettina Kaldun, Univ. of Bayreuth, Bayreuth, Germany

11:05 0012 Odorant Receptor Mediated Activation of Mosquito Sperm. **Laurence J. Zwiebel**, l.zwiebel@vanderbilt.edu, Vanderbilt Univ., Nashville, TN

11:25 0013 Symbiont-generated vitamin B6 is required to maintain proline homeostasis and fecundity in the tsetse fly. **Joshua B. Benoit**, joshua.benoit@yale.edu[1], Veronika Michalkova[2], Brian Weiss[3], Geoffrey M. Attardo[3] and Serap Aksoy[3], [1]Univ. of Cincinnati, Cincinnati, OH, [2]Slovak Academy of Sciences, Bratislava, Slovakia, [3]Yale Univ., New Haven, CT

11:37 Concluding Remarks

PBT Section Symposium: Buzz-kills: The Genomics and Ecology of Stress in Pollinators

Portland Ballroom 256 (Oregon Convention Center)

Moderators and Organizers: Christina M. Grozinger[1], Jay D. Evans[2], and Holly Holt[1], [1]Pennsylvania State Univ., Univ. Park, PA, [2]USDA - ARS, Beltsville, MD

8:00 Welcoming Remarks

8:05 0014 Biotic stress and honey bee health. Jay D. Evans and **Yanping (Judy) Chen**, judy.chen@ars.usda.gov, USDA – ARS, Beltsville, MD

8:20 0015 Sex differences in honey bees' response to parasite infection. **Holly Holt**, hlh192@psu.edu, Pennsylvania State Univ., Univ. Park, PA

8:35 0016 Killer combinations: which pesticide mixtures are problematic for pollinators? **Reed Johnson**, johnson.5005@osu.edu, The Ohio State Univ., Wooster, OH

8:50 0017 Immune responses of the honey bee to pathogen infection: a synthesis of transcriptome studies. **Vincent Doublet**, vincent.doublet@zoologie.uni-halle.de, Univ. of Leipzig, Leipzig, Germany

9:05 Poster Session 1/Break 1

SD0018 Temperature-dependent development of *Chaetodactylus krombeini* (Acari: Chaetodactylidae) associated with *Osmia* spp. (Hymenoptera: Megachilidae). **Youngsoo Son**, youngsoo.son@cdfa.ca.gov[1], JeongJoon Ahn[2] and Yong-Lak Park[2], [1]California Dept. of Food & Agriculture, Arvin, CA, [2]West Virginia Univ., Morgantown, WV

SD0019 HB Dynamics: A new stage structured model of honey bee (*Apis mellifera*) colony dynamics. **James Frazier**, jfrazier@psu.edu, Pennsylvania State Univ., State College, PA

SD0020 The identification of miticide resistance in *Varroa* mites and the development of novel *Varroa* control strategies for

improving honey bee health. **Daniel R. Schmehl**, danielrschmehl@ufl.edu and James D. Ellis, Univ. of Florida, Gainesville, FL

SD0021 Assessing honey bee (*Apis mellifera*) health in conventional and organically-kept apiaries for the development of sustainable beekeeping practices. **Lambert H. B. Kanga**, lambert.kanga@famu.edu, Shalom Siebert and Mehboob Sheikh, Florida A&M Univ., Tallahassee, FL

SD0022 Impacts of sublethal pesticide exposure upon viral infections in adult honey bees, *Apis mellifera*. **Diana Cox-Foster**, dxc12@psu.edu[1], Saundra A. Wheeler[2], Maryann Frazier[2], James Frazier[1] and Chris Mullin[1], [1]Pennsylvania State Univ., State College, PA, [2]Pennsylvania State Univ., Univ. Park, PA

SD0023 Genomic characteristics and comparative genomics analysis of microsporidian parasites *Nosema ceranae* and *N. apis* reveal novel insights into host-parasite interactions in honey bees, *Apis mellifera*. **Yanping (Judy) Chen**, judy.chen@ars.usda.gov[1], Scott Cornman[2], Jeffrey Pettis[1], Yan Zhao[3], Xinyue Liu[4], Luke Tallon[4], Lisa Sadzewicz[4], Renhua Li[5], Huoguing Zheng[6], Shaokang Huang[7], Xuan Zhang[8], Michele Hamilton[1], Stephen Pernal[9], Andony P. Melathopoulos[10], Xianghe Yan[11] and Jay Evans[1], [1]Bee Research Laboratory, Beltsville, MD, [2]Leetown Science Center, Kearneysville, WV, [3]Molecular Plant Pathology Laboratory, Beltsville, MD, [4]The Institute for Genome Sciences, Baltimore, MD, [5]Windber Research Institute, Windber, PA, [6]Zhejiang Univ., Hangzhou, China, [7]Fujian Agriculture and Forestry Univ., Fuzhou, China, [8]Yunnan Agricultural Univ., Yunnan, China, [9]Agriculture & Agri-Food Canada, Beaverlodge, AB, Canada, [10]Agriculture & Agri-Food Canada, Beaverlodge, AB, Canada, [11]Eastern Regional Research Center (ERRC), Wyndmoor, PA

9:40 0024 Interaction of dietary protein and neonicotinoids on the survival and nutrient balancing of the buff-tailed bumblebee, *Bombus terrestris*. **Geraldine Wright**, jeri.wright@newcastle.ac.uk, Newcastle Univ., Newcastle Upon Tyne, United Kingdom

9:55 0025 The impacts of pesticides on bumblebees: from individual behaviour to colony function. **Nigel E. Raine**, nraine@uoguelph.ca, Univ. of Guelph, Guelph, ON, Canada

10:10 SP0026 Toxic house; pesticide exposure and impacts on honey bee (*Apis mellifera*) colonies used for commercial pollination. **Maryann Frazier**, maryann.frazier15@gmail.com[1], James Frazier[2] and Chris Mullin[2], [1]Pennsylvania State Univ., Univ. Park, PA, [2]Pennsylvania State Univ., State College, PA

10:22 Poster Session 2/Break 2

10:57 SP0027 Presentation Withdrawn

11:09 0028 Role of floral traits mediating pathogen transmission and establishment in pollinators. **Lynn S. Adler**, Univ. of Massachusetts, Amherst, MA

11:24 0029 On an economic treadmill of agriculture: efforts to resolve pollinator decline. **Sainath Suryanarayanan**, Univ. of Wisconsin, Madison, WI

11:39 0030 Engaging stakeholders in a coordinated federal response to pollinator protection: moving beyond the label. **Reuben Baris**, baris.reuben@epa.gov, U.S. Environmental Protection Agency, Washington, DC

11:54 Concluding Remarks

Member Symposium: Sexually Dimorphic Chemosensory Behavior in *Drosophila*

Portland Ballroom 253 (Oregon Convention Center)

Moderator and Organizer: Sebastien Lebreton, Swedish Univ. of Agricultural Sciences, Alnarp, Sweden

8:00 Welcoming Remarks

8:10 0031 Regulation of fly foraging behavior by nutritional and chemosensory cues. **Liming Wang**, lmwang@caltech.edu, Zhejiang Univ., Hangzhou, China

8:32 0032 Time Flies: Social environment and time affect sexually selected CHCs in *Drosophila serrata*. **Susan Gershman**, gershman.6@osu.edu, The Ohio State Univ., Marion, OH

8:54 0033 Cuticular hydrocarbons of *Drosophila montana*. **Jackson Jennings**, jjenning@uark.edu, Univ. of Arkansas, Fayetteville, AR

9:16 0034 Sexually dimorphic effect of starvation on pheromone perception in *Drosophila*. **Sebastien Lebreton**, sebastien.lebreton@slu.se, Swedish Univ. of Agricultural Sciences, Alnarp, Sweden

Member Symposium: Answering Tomorrow's Challenges to Manage Insects in Greenhouses with Today's Research

Portland Ballroom 254 (Oregon Convention Center)

Moderators and Organizers: Sarah Jandricic[1] and Luis A. Cañas[2], [1]North Carolina State Univ., Raleigh, NC, [2]The Ohio State Univ., Wooster, OH

8:00 Welcoming Remarks

8:05 0035 Scared half-to-death: Non-consumptive effects of predators improve biological control of western flower thrips. **Sarah Jandricic**, sejandri@ncsu.edu and Steven D. Frank, North Carolina State Univ., Raleigh, NC

8:21 0036 Compatibility of Spirotetramat and biological control in greenhouses. **Carlos Bogran**, cbogran@ohp.com, OHP Inc., College Station, TX

8:37 0037 Life history and control of the European pepper moth, *Duponchelia fovealis*, a new pest in greenhouse production. James A. Bethke[1], Bryan Vander Mey[1] and **Rebeccah A. Waterworth**, rebeccah.waterworth@ucr.edu[2], [1]Univ. of California, San Marcos, CA, [2]Univ. of California, Riverside, CA

8:53 0038 Evaluating entomopathogenic nematodes for use against greenhouse pests. **John P. Sanderson**, jps3@cornell.edu, Elson J. Shields, Antonio Testa and Liza White, Cornell Univ., Ithaca, NY

9:09 0039 Biocontrol in the real world. **Rose Buitenhuis**, Rose.Buitenhuis@vinelandresearch.com, Alexandra Grygorczyk and Michael Brownbridge, Vineland Research and Innovation Centre, Vineland Station, ON, Canada

9:25 0040 Efficacy of a XXpire™ WG insecticide on ornamental greenhouse pests. **James Breuninger**, jbreuninger@dow.com[1], Anita Alexander[2], Daniel Loughner[3], and Vanelle Peterson[4], [1]Dow AgroSciences, Indianapolis, IN, [2]Dow AgroSciences, Lawrenceville, GA, [3]DowAgroSciences, Lawrenceville, NJ, [4]Dow AgroSciences, Mulino, OR

9:41 Break

10:16 0041 Pesticide compatibility with natural enemies: Face or fallacy? **Michael P. Parrella**, mpparrella@ucdavis.edu, Univ. of California, Davis, CA

10:32 0042 Better banker plants for aphid control and how best to use them. **Travis McClure**, tjmcclur@ncsu.edu, Sarah Jandricic, Adam Dale and Steven D. Frank, North Carolina State Univ., Raleigh, NC

10:48 0043 Presentation withdrawn

11:04 0044 *Delphastus catalinae:* Intra-plant predation pattern and its implications for whitefly management in greenhouse tomato. **Diego F. Rincon**, rincon-rueda.1@osu.edu and Luis A. Cañas, The Ohio State Univ., Wooster, OH

11:20 0045 Host plant and temperature effects on whiteflies: Is this information relevant to implement whitefly management? **Alfredo Rios**, rios.43@osu.edu and Luis A. Cañas, The Ohio State Univ., Wooster, OH

11:36 0046 "Suck-it-up": Are systemic insecticides really effective against mealybugs? **Amy Raudenbush**, awillmot@k-state.edu and Raymond Cloyd, Kansas State Univ., Manhattan, KS

11:52 Concluding Remarks

P-IE Section Symposium: Challenges in Managing the Emerald Ash Borer (*Agrilus planipennis*) and Similar Invasive Woodborers on the Horizon

Portland Ballroom 255 (Oregon Convention Center)

Moderators and Organizers: Therese Poland[1] and Leah S. Bauer[2], [1]USDA - Forest Service, East Lansing, MI, [2]USDA - Forest Service, Lansing, MI

8:00 Introductory Remarks

8:05 SP0047 Emerald ash borer: then and now. **Deborah G. McCullough**, mccullo6@msu.edu, Michigan State Univ., East Lansing, MI

8:17 0048 Emerald ash borer chemical ecology and development of traps and lures for detection. **Therese Poland**, tpoland@fs.fed.us[1], Deborah McCullough[2], Damon J. Crook[3] and Joseph A. Francese[3], [1]USDA - Forest Service, Lansing, MI, [2]Michigan State Univ., East Lansing, MI, [3]USDA - APHIS - PPQ - CPHST, Buzzards Bay, MA

8:32 0049 Toward a remote detection trap for *Agrilus* species using visual decoys. **Michael Domingue**, mjd29@psu.edu and Thomas Baker, Pennsylvania State Univ., Univ. Park, PA

8:47 0050 Biocontrol: management of emerald ash borer in forested ecosystems. **Leah S. Bauer**, lbauer@fs.fed.us[1], Juli Gould[2], Jian J. Duan[3], Kristopher J Abell[4] and Roy Van Driesche[4], [1]USDA - Forest Service, Lansing, MI, [2]USDA - APHIS - PPQ - CPHST, Buzzards Bay, MA, [3]USDA - ARS, Newark, DE, [4]Univ. of Massachusetts, Amherst, MA

9:02 0051 Impacts of natural enemies on population dynamics of the invasive emerald ash borer in Michigan: a life table analysis. **Jian J. Duan**, jian.duan@ars.usda.gov[1], Leah S. Bauer[2], Kristopher J Abell[3] and Roy Van Driesche[3], [1]USDA - ARS, Newark, DE, [2]USDA - Forest Service, Lansing, MI, [3]Univ. of Massachusetts, Amherst, MA

9:17 0052 Semiochemicals in support of the detection of natural enemies for the emerald ash borer. **Allard Cossé**, allard.cosse@ars.usda.gov[1], Bruce W. Zilkowski[1], Jonathan Lelito[2], Miriam Cooperband[3], Ashley Hartness[3], Leah S. Bauer[4] and Therese Poland[4], [1]USDA - ARS, Peoria, IL, [2]USDA - APHIS - PPQ, Brighton, MI, [3]USDA - APHIS - PPQ - CPHST, Buzzards Bay, MA, [4]USDA - Forest Service, Lansing, MI

9:32 Poster Viewing and Discussion

SD0053 Emerald ash borer parasitoids: differentiating native from exotic *Oobius* (Encyrtidae), *Spathius* (Braconidae), and *Tetrastichus* (Eulophidae). **Michael Gates**, michael.gates@ars.usda.gov and Robert Kula, USDA - ARS, Washington, DC

SD0054 Methods for testing host ranges of woodborer parasitoids. **Juli Gould**, Juli.R.Gould@aphis.usda.gov[1], Leah S. Bauer[2], and Jian J. Duan[3], [1]USDA - APHIS - PPQ - CPHST, Buzzards Bay, MA, [2]USDA - Forest Service, Lansing, MI, [3]USDA - ARS, Newark, DE

SD0055 Rearing and release methods for emerald ash borer and parasitoids. **Jonathan Lelito**, jonathan.lelito@aphis.usda.gov[1], Scott Whitehead[1] and Jian J. Duan[2], [1]USDA - APHIS - PPQ, Brighton, MI, [2]USDA - ARS, Newark, DE

SD0056 Laboratory rearing of emerald ash borer using evergreen ash (*Fraxinus uhdei*) for the purpose of parasitoid production. **Tim Watt**, tjwatt@UDel.Edu[1], Jian J. Duan[2], Kristi Larson[1], Jackie Hoban[1] and Jonathan Schmude[2], [1]Univ. of Delaware, Newark, DE, [2]USDA - ARS, Newark, DE

SD0057 Impact of the introduced egg parasitoid, *Oobius agrili* (Hymenoptera: Encyrtidae), on emerald ash borer (Coleoptera: Buprestidae) in Michigan. **Kristopher J Abell**, kabell@psis.umass.edu[1], Leah S. Bauer[2], Jian J. Duan[3] and Roy G. Van Driesche[1], [1]Univ. of Massachusetts, Amherst, MA, [2]USDA - Forest Service, Lansing, MI, [3]USDA - ARS, Newark, DE

SD0058 Host suitability of emerald ash borer (*Agrilus planipennis*) in green (*Fraxinus pennsylvanica*) and blue ash (*F. quadrangulata*) for *Tetrastichus planipennisi*: a field and lab experiment. **Donnie Peterson**, peter207@purdue.edu[1], John Stephen Yaninek[1], Jian J. Duan[2] and Clifford S. Sadof[1], [1]Purdue Univ., West Lafayette, IN, [2]USDA - ARS, Newark, DE

SD0059 Extrinsic competition between *Tetrastichus planipennisi* and *Spathius galinae*, two larval parasitoids of emerald ash borer: implications for biological control. Xiao-yi Wang[1], **Jian J. Duan**, jian.duan@ars.usda.gov[2], Jonathan Schmude[2], Kristi Larson[3] and Jackie Hoban[3], [1]Chinese Academy of Forestry, Beijing, China, [2]USDA - ARS, Newark, DE, [3]Univ. of Delaware, Newark, DE

SD0060 Responses of two parasitoids, the exotic *Spathius agrili* Yang and the native *Spathius floridanus* Ashmead, to volatile cues associated with the emerald ash borer, *Agrilus planipennis* Fairmaire. **Todd Johnson**, sttdj01@gmail.com[1], Jonathan Lelito[2], and Kenneth Raffa[3], [1]Univ. of Illinois, Urbana, IL, [2]USDA - APHIS - PPQ, Brighton, MI, [3]Univ. of Wisconsin, Madison, WI

SD0061 Effects of woodpecker predation on emerald ash borer population dynamics: implications for biocontrol. **David E. Jennings**, david.e.jennings@gmail.com[1], Juli Gould[2], John D. Vandenberg[3], Jian J. Duan[4] and Paula M. Shrewsbury[1], [1]Univ. of Maryland, College Park, MD, [2]USDA - APHIS - PPQ - CPHST, Buzzards Bay, MA, [3]USDA - ARS, Ithaca, NY, [4]USDA - ARS, Newark, DE

SD0062 Buying time: the potential role of biocontrol in the recovery of native vegetation after a pest invasion. **Elan Margulies**, elan.margulies@gmail.com[1], Ines Ibanez[1], Leah S. Bauer[2] and Jian J. Duan[3], [1]Univ. of Michigan, Ann Arbor, MI, [2]USDA - Forest Service, Lansing, MI, [3]USDA - ARS, Newark, DE

SD0063 Emerald ash borer biocontrol efforts in New York State. **John D. Vandenberg**, jdv3@cornell.edu[1], Juli Gould[2], and Melissa

K. Fierke[3], [1]USDA - ARS, Ithaca, NY[2]USDA - APHIS - PPQ - CPHST, Buzzards Bay, MA, [3]State Univ. of New York, ESF, Syracuse, NY

SD0064 Evaluation of emerald ash borer parasitoid recovery methods in New York. **Michael Parisio**, mparisio@syr.edu[1], Juli Gould[2], John D. Vandenberg[3], Leah S. Bauer[4], Allard Cossé[5] and Melissa K. Fierke[1], [1]State Univ. of New York, ESF, Syracuse, NY, [2]USDA - APHIS - PPQ - CPHST, Buzzards Bay, MA, [3]USDA - ARS, Ithaca, NY, [4]USDA - Forest Service, Lansing, MI, [5]USDA - ARS, Peoria, IL

SD0065 Nutrient resources associated with establishment of emerald ash borer parasitoids in New York forests. **Molly Hassett**, mrhasset@syr.edu, Melissa K. Fierke and Greg McGee, State Univ. of New York, ESF, Syracuse, NY

SD0066 Factors influencing spread of emerald ash borer in an urban forest: a case study in Syracuse, New York. **Michael Jones**, mijone01@syr.edu, Sadie Ryan and Melissa K. Fierke, State Univ. of New York, ESF, Syracuse, NY

SD0067 Predicting high quality sites of black ash (*Fraxinus nigra*) across Maine and northern New York: an approach to prioritizing preparedness and management of emerald ash borer. **Kara Costanza**, kara.lorion@gmail.com[1], William Livingston[1], John Daigle[1], Robert Lilieholm[1], Darren Ranco[1] and Nathan Siegert[2], [1]Univ. of Maine, Orono, ME, [2]USDA - Forest Service, Durham, NH

SD0068 Towards developing ash varieties resistant to emerald ash borer: influence of Asian rootstocks on leaf volatiles of grafted North American ash species. **Lindsay Kolich**, lkolich@purdue.edu and Matthew Ginzel, Purdue Univ., West Lafayette, IN

SD0069 Implications of host tree removal for the population dynamics of emerald ash borer in the Twin Cities, MN. **Samuel J. Fahrner**, fahr0051@umn.edu[1], Mark Abrahamson[2], Robert Venette[3] and Brian Aukema[1], [1]Univ. of Minnesota, Saint Paul, MN, [2]Minnesota Dept. of Agriculture, St. Paul, MN, [3]USDA - Forest Service, St. Paul, MN

SD0070 Emerald ash borer mortality after the 2013-2014 winter in Minnesota. **Robert Venette**, rvenette@fs.fed.us[1], John Osthus[2] and Mark Abrahamson[2], [1]USDA - Forest Service, St. Paul, MN, [2]Minnesota Dept. of Agriculture, St. Paul, MN

SD0071 Developing an integrated pest management program for the invasive goldspotted oak borer *Agrilus auroguttatus* (Coleoptera: Buprestidae), in southern California. **Tom W. Coleman**, twcoleman@fs.fed.us[1], Mary Louise Flint[2], Sheri L. Smith[3], Robert Venette[4], and Steven J. Seybold[5], [1]USDA - Forest Service, San Bernardino, CA, [2]Univ. of California, Davis, CA, [3]USDA - Forest Service, Susanville, CA, [4]USDA - Forest Service, St. Paul, MN, [5]USDA - Forest Service, Davis, CA

SD0072 Investigations of the chemical ecology of the goldspotted oak borer, *Agrilus auroguttatus* (Coleoptera: Buprestidae): The search for a lure for flight trapping. Steven J. Seybold[1], Yigen Chen[2], Tom W. Coleman[3], Damon Crook[4], **Lori J. Nelson**, lnelson@fs.fed.us[1] and Mary Louise Flint[2], [1]USDA - Forest Service, Davis, CA, [2]Univ. of California, Davis, CA, [3]USDA - Forest Service, San Bernardino, CA, [4]USDA - APHIS - PPQ - CPHST, Buzzards Bay, MA

SD0073 A comparison of nutritional ecology of two invasive *Agrilus* forest pests and their respective hardwood hosts. **Yigen Chen**, ygchen2007@gmail.com[1], Therese Poland[2], Tom W. Coleman[3], Michael I. Jones[1] and Steven J. Seybold[4], [1]Univ. of California, Davis, CA, [2]USDA - Forest Service, Lansing, MI, [3]USDA - Forest Service, San Bernardino, CA, [4]USDA - Forest Service, Davis, CA

SD0074 Biocontrol of goldspotted oak borer: a native invasive. **Vanessa Lopez**, vlope006@ucr.edu[1], Paul Rugman-Jones[1], Tom W. Coleman[2], Richard Stouthamer[1] and Mark S. Hoddle[1], [1]Univ. of California, Riverside, CA, [2]USDA - Forest Service, San Bernardino, CA

10:27 0075 Estimating the local spread of the emerald ash borer, *Agrilus planipennis*: implications for managing recently detected infestations. **Rodrigo J. Mercader**, rjmercader@gmail.com[1], and Deborah G. McCullough[2], [1]Washburn Univ., Topeka, KS, [2]Michigan State Univ., East Lansing, MI

10:42 0076 Identification and characterization of putative defense mechanisms of ash to emerald ash borer and insect physiological responses. **Chad M. Rigsby**, rigsby.7@wright.edu[1], David Showalter[2], Caterina Villari[2], Amy Hill[2], Daniel A. Herms[3], Pierluigi Bonello[2] and Don Cipollini[1], [1]Wright State Univ., Dayton, OH, [2]The Ohio State Univ., Columbus, OH, [3]The Ohio State Univ., Wooster, OH

10:57 0077 Selection and breeding for increased resistance to the emerald ash borer. **Jennifer Koch**, jkoch@fs.fed.us[1], Kathleen S. Knight[1], Therese Poland[2], David Carey[1], Mary E. Mason[3] and Daniel A. Herms[3], [1]USDA - Forest Service, Delaware, OH, [2]USDA - Forest Service, Lansing, MI, [3]The Ohio State Univ., Wooster, OH

11:12 0078 Unraveling the ecological impacts of emerald ash borer-induced ash dieback in eastern U.S. forests. **Kamal J.K. Gandhi**, kgandhi@warnell.uga.edu[1], Annemarie Smith[2] and Daniel A. Herms[2], [1]Univ. of Georgia, Athens, GA, [2]The Ohio State Univ., Wooster, OH

11:27 0079 Tools to stimulate a proactive community response to emerald ash borer: a case study approach. **Clifford S. Sadof**, csadof@purdue.edu and Adam Witte, Purdue Univ., West Lafayette, IN

11:42 0080 Integrated management of emerald ash borer. **Andrew J. Storer**, storer@mtu.edu, Tara Bal and Michael D. Hyslop, Michigan Technological Univ., Houghton, MI

Late-Breaking Symposium: Classical Biological Control of the Brown Marmorated Stink Bug, *Halyomorpha halys* (Stål)

D136 (Oregon Convention Center)

Moderators and Organizers: Ernest Delfosse[1] and Kim A. Hoelmer[2], [1]Michigan State Univ., East Lansing, MI, [2]USDA - ARS, Newark, DE

8:00 Welcoming Remarks

8:05 SP0081 Systematics and biological control: Past meets present in Project *Trissolcus*. Part I. **Matthew L. Buffington**, matt.buffington@ars.usda.gov[1], Elijah Talamas[1], Kim A. Hoelmer[2], Christine Dieckhoff[3] and Norman Johnson[4], [1]USDA - ARS, Washington, DC, [2]USDA - ARS, Newark, DE, [3]Univ. of Delaware, Newark, DE, [4]The Ohio State Univ., Columbus, OH

8:17 0082 *Trissolcus* as biological control agents of brown marmorated stink bug: II. Species-level taxonomy. **Elijah Talamas**, elijah.talamas@ars.usda.gov[1], Matthew Buffington[1] and Norman Johnson[2], [1]USDA - ARS, Washington, DC, [2]The Ohio State Univ., Columbus, OH

8:37 0083 *Trissolcus* spp. as biological control agents of *Halyomorpha halys*: III. Molecular-based species delineation. **Marie-Claude Bon**, mcbon@ars-ebcl.org[1], Elijah Talamas[2], Matthew Buffington[2], Kim A. Hoelmer[1] and Tim Haye[3], [1]USDA - ARS, Montferrier, France, [2]USDA - ARS, Washington, DC, [3]CABI, Delémont, Switzerland

8:57 0084 *Trissolcus* as biological control agents of brown marmorated stink bug: IV. Behavioral aspects of host choice.

Christine Dieckhoff, christine.dieckhoff@ars.usda.gov[1], and Kim A. Hoelmer[2], [1]Univ. of Delaware, Newark, DE, [2]USDA - ARS, Newark, DE

9:17 Break

9:37 0085 Seasonal field parasitism of *Halyomorpha halys* and co-occurring non-target species in China. **Tim Haye**, t.haye@cabi.org[1], Tara Gariepy[2], Dave R. Gillespie[3], Peter Mason[4], and Jinping Zhang[5], [1]CABI, Delémont, Switzerland, [2]Agriculture & Agri-Food Canada, London, ON, Canada, [3]Agriculture & Agri-Food Canada, Agassiz, BC, Canada, [4]Agriculture & Agri-Food Canada, Ottawa, ON, Canada, [5]CABI, Beijing, China

9:57 0086 Host range testing for *Trissolcus japonicus* (Hymenoptera: Platygastridae): A potential biological control agent for the brown marmorated stink bug. **Barry Bai**, bbai@oda.state.or.us, Christopher Hedstrom and Helmuth W. Rogg, Oregon Dept. of Agriculture, Salem, OR

10:17 0087 Laboratory rearing of Pentatomoidea for host-specificity testing. **Patricia Samota**, samotapa@msu.edu and Ernest Delfosse, Michigan State Univ., East Lansing, MI

10:37 0088 Does arena size and habitat complexity affect the host range of *Trissolcus japonicus* (Hymenoptera: Platygastridae) in quarantine for potential classical biological control of brown marmorated stink bug? **Paul Botch**, botchpau@msu.edu and Ernest Delfosse, Michigan State Univ., East Lansing, MI

10:57 0089 Who cares about stink bugs? Results from physiological host-specificity testing of *Trissolcus japonicus* (Hymenoptera: Platygastridae), a potential biological control agent for the brown marmorated stink bug. **Ernest Delfosse**, delfosse@msu.edu, Michigan State Univ., East Lansing, MI

11:17 Concluding Remarks

Member Symposium: The Importance of Chemical Ecology for IPM in the Tropics

D139-140 (Oregon Convention Center)

Moderator and Organizer: Christian Borgemeister, Center for Development Research (ZEF), Univ. of Bonn, Bonn, Germany

8:00 Welcoming Remarks

8:10 0090 Exploiting chemical ecology for crop protection for smallholder cereal farmers in Africa. **Zeyaur Khan**, zkhan@icipe.org[1], Charles Midega[1], Toby Bruce[2], Michael Birkett[2] and John A. Pickett[2], [1]International Centre of Insect Physiology and Ecology, Nairobi, Kenya, [2]Rothamsted Research, Harpenden, Hertfordshire, United Kingdom

8:40 Discussion 1

8:50 0091 Identification of the *Thrips palmi* aggregation pheromone and its possible role in mass trapping. **Gordon Hamilton**, j.g.c.hamilton@keele.ac.uk, William D. J. Kirk and Clare Sampson, Keele Univ., Keele, Staffordshire, United Kingdom

9:10 Discussion 2

9:20 0092 Mutualistic affairs between biopesticides and semiochemicals against insect pests in horticulture. **Jean Nguya Kalemba Maniania**, nmaniania@icipe.org, S. Subramanian, S. Dimbi, L.N. Migiro, S. Niassy, K.D. Mfuti and Sunday Ekesi, International Centre of Insect Physiology and Ecology, Nairobi, Kenya

9:40 Discussion 3

9:50 0093 Aromas associated with root-knot nematode (*Meloidogyne* sp.): Host plant interactions. **Baldwyn Torto**, btorto@icipe.org[1], Lucy Kananu[1], Danny Coyne[2] and Peter E. A. Teal[3], [1]International Centre of Insect Physiology and Ecology, Nairobi, Kenya, [2]International Institute of Tropical Agriculture (IITA), Ibadan, Oyo State, Nigeria, [3]USDA - ARS, Gainesville, FL

10:10 Discussion 4

10:20 Break

10:40 0094 Behavioral manipulation methods for sustainable management of Asian citrus psyllid in citrus groves. **Mamoudou Setamou**, mamoudou.setamou@tamuk.edu[1], Joseph Patt[2], and Kris Godfrey[3], [1]Texas A&M Univ., Weslaco, TX, [2]USDA - ARS, Ft. Pierce, FL, [3]Univ. of California, Davis, CA

11:00 Discussion 5

11:10 0095 Mass trapping of the coffee berry borer: Pipedream or realistic future scenario? Juliana Jaramillo[1], Trizah Nyambura[2], Baldwyn Torto[1], **Christian Borgemeister**, cb@uni-bonn.de[3], Hans-Michael Poehling[4] and Wittko Francke[5], [1]International Centre of Insect Physiology and Ecology, Nairobi, Kenya, [2]Jomo Kenyatta Univ. of Agriculture and Technology, Nairobi, Kenya, [3]Center for Development Research (ZEF), Univ. of Bonn, Bonn, Germany, [4]Leibniz Univ. Hannover, Hannover, Germany, [5]Univ. of Hamburg, Hamburg, Germany

11:30 General Discussion & Wrap Up

P-IE Section Symposium: Pesticides, Parasites and Pests: The Impacts of Environmental Stressors on Beneficial Insects

E141-142 (Oregon Convention Center)

Moderators and Organizers: Fabio Manfredini[1] and Dara Stanley[2], [1]Pennsylvania State Univ., Univ. Park, PA, [2]Royal Holloway, Univ. of London, Egham, United Kingdom

8:00 Welcoming Remarks

8:03 0096 The effects of pesticides on queen health in the honey bee, *Apis mellifera*. **Jeff Pettis**, Jeff.pettis@ars.usda.gov, Bee Research Laboratory, Beltsville, MD

8:21 0097 Investigating sub lethal impacts of a neonicotinoid pesticide on bumblebee behaviour. **Dara Stanley**, stanleyd@tcd.ie, Royal Holloway, Univ. of London, Egham, United Kingdom

8:39 SP0098 Bugonia: an online platform for gathering data from citizen science projects addressing important research questions pertaining to honey bee (*Apis mellifera*) health. **Deborah A. Delaney**, dadelane@udel.edu[1], Elizabeth Hill[2], Ashleigh Smythe[3], and Maryann Frazier[4], [1]Univ. of Delaware, Newark, DE, [2]Center for Urban Bee Research, Washington, DC, [3]Virginia Military Institute, Lexington, VA, [4]Pennsylvania State Univ., Univ. Park, PA

8:51 SP0099 Complexities of determining total effects of pesticides on biological controls: the LC50 is not enough. **John Stark**, starkj@wsu.edu[1], Roger Vargas[1], and John Banks[1], [1]Washington State Univ., Puyallup, WA, [1]USDA - ARS, Hilo, HI, [1]Univ. of Washington, Tacoma, WA

9:03 SP0100 Metal pollutants and their impact on honey bees (*Apis mellifera* L.): Examining behavior, survival, and ecology. **Kristen Hladun**, kristen.hladun@email.ucr.edu[1], David R. Parker[1], Brian

Smith[2] and John T. Trumble[1], [1]Univ. of California, Riverside, CA, [2]Arizona State Univ., Tempe, AZ

9:15 0101 A mutualism disrupted: Invasive big-headed ants threaten a widespread ant-plant symbiosis in East Africa. **Todd Palmer**, tmp@ufl.edu[1], Corinna Reginos[2], Megan Karande[3] and Daniel Rubenstein[3], [1]University of Florida, Gainesville, FL, [2]Teton Science School, Jackson, WY, [3]Princeton University, Princeton, NJ

9:33 SP0102 Exploration of the chemical ecology of the Argentine ant (*Linepithema humile*) for pest management. **Kevin Welzel**, kwelz001@ucr.edu and Dong-Hwan Choe, Univ. of California, Riverside, CA

9:45 Break

10:10 SP0103 Lethal and sub-lethal effects of colony-relevant doses of pesticides on *in vitro*-reared honey bees (*Apis mellifera* L.). Hudson V. V. Tomé[1], **Daniel R. Schmehl**, danielrschmehl@ufl.edu[2], Gustavo F. Martins[1] and James D. Ellis[2], [1]Universidade Federal de Viçosa, Viçosa, Brazil, [2]Univ. of Florida, Gainesville, FL

10:22 0104 Gene expression in honey bee workers is dramatically altered by DWV but not by Nosema. **Elina L. Niño**, elnino@psu.edu[1], Dino McMahon[2], Robert Paxton[2] and Christina M. Grozinger[1], [1]Pennsylvania State Univ., Univ. Park, PA, [2]Martin-Luther-Universität Halle-Wittenberg, Halle (Saale), Germany

10:40 0105 Friends or foes: Microbial community of termites. **Rebeca B. Rosengaus**, r.rosengaus@neu.edu, Northeastern Univ., Boston, MA

10:58 0106 Parasite infections, toxic milkweeds and medication behavior in monarch butterflies. **Jacobus de Roode**, jderood@emory.edu, Emory Univ., Atlanta, GA

11:16 0107 Transportation and pollination service increase abundance and prevalence of *Nosema ceranae* in honey bees (*Apis mellifera*). **Zachary Y. Huang**, bees@msu.edu[1], Xiangjie Zhu[2] and Shujing Zhou[2], [1]Michigan State Univ., East Lansing, MI, [2]Fujian Agriculture and Forestry Univ., Fujian, China

11:28 SP0108 Impacts of multiple stressors on bumblebee queens and their colonies. Gemma L. Baron[1], Mark J.F. Brown[1] and **Nigel E. Raine**, nraine@uoguelph.ca[2], [1]Royal Holloway, Univ. of London, Egham, United Kingdom, [2]Univ. of Guelph, Guelph, ON, Canada

11:40 0109 Transcriptional changes in honey bee brain induced by mating and CO2 narcosis. **Fabio Manfredini**, fmanfredini79@gmail.com[1], Benjamin Oldroyd[2], Vanina Vergoz[2] and Mark Brown[1], [1]Royal Holloway, Univ. of London, Egham, United Kingdom, [2]Univ. of Sydney, Sydney, Australia

11:58 Concluding Remarks

Member Symposium: Design and Management of Agroecosystems for Functional Biodiversity

E143-144 (Oregon Convention Center)

Moderator and Organizer: Lene Sigsgaard, Univ. of Copenhagen, Frederiksberg, Denmark

8:00 Introductory Remarks

8:05 0110 Design and management of ornamental landscape systems for functional biodiversity. **Matthew H. Greenstone**, Matt.Greenstone@ars.usda.gov, USDA - ARS, Beltsville, MD

8:25 0111 Agricultural landscapes for bee diversity and pollination services. **Maj Rundlöf**, maj.rundlof@biol.lu.se[1], Riccardo Bommarco[2], Anna Persson[1] and Henrik Smith[1], [1]Lund Univ., Lund, Sweden, [2]Swedish Univ. of Agricultural Sciences, Uppsala, Sweden

8:45 SP0112 Functional diversity in apple orchards, effect on codling moth and its natural enemies. **Lene Sigsgaard**, les@plen.ku.dk, Univ. of Copenhagen, Frederiksberg, Denmark

8:57 SP0113 How should we domesticate crops to enhance pest control? **Yolanda H. Chen**, yolanda.chen@uvm.edu[1], Rieta Gols[2], and Betty Benrey[3] [1]Univ. of Vermont, Burlington, VT, [2]Wageningen Univ., Wageningen, Netherlands, [3]Univ. of Neuchâtel, Neuchâtel, Switzerland

9:09 Break

9:19 SP0114 Effects of agricultural intensification on bee functional diversity in a coffee agroforestry system in Costa Rica: Can small noncultivated areas support functionally diverse bee communities? **Levi Keesecker**, levi.keesecker@gmail.com[1], Nilsa A. Bosque-Pérez[2] and Philippe Tixier[1], [1]CATIE, Turrialba, Costa Rica, [2]Univ. of Idaho, Moscow, ID

9:31 SP0115 Ant diversity in organic versus conventional rice paddies of Uttarakhand, India. **Valerie S. Banschbach**, vbanschbach@smcvt.edu[1], and V.P. Uniyal[2], [1]Roanoke College, Salem, VA, [2]Wildlife Institute of India, Dehradun, India

9:43 SP0116 Glucosinolates, saponins, and use of *Barbarea* spp. (Brassicacaea) as a trap crop. **Francisco R. Badenes-Pérez**, fbadenes-perez@ica.csic.es[1], Michael Reichelt[2], Jonathan Gershenzon[2] and David G. Heckel[2], [1]Institute of Agricultural Sciences (CSIC), Madrid, Spain, [2]Max Planck Institute for Chemical Ecology, Jena, Germany

9:55 SP0117 Influence of agriculture and landscape elements on native bees in fragments of Palouse prairie. **Paul Raymond Rhoades**, paul.r.rhoades@gmail.com[1], Lisette Waits[1], Walter S. Sheppard[2], Nilsa A. Bosque-Pérez[1] and Sanford Eigenbrode[1], [1]Univ. of Idaho, Moscow, ID, [2]Washington State Univ., Pullman, WA

10:07 SP0118 Effect of tillage type, vegetable crops and other factors on epigeal insects in a sod-based crop rotation system. **Russell Mizell**, RFMizell@ufl.edu, Univ. of Florida, Quincy, FL

10:19 Panel Discussion

Member Symposium: Fall Armyworm: Current Challenges and Future Directions for Its Management

F150 (Oregon Convention Center)

Moderator and Organizer: Amit Sethi, DuPont Pioneer, Johnston, IA

8:00 Introductory Remarks

8:05 0119 Host strain and geographic variation in attraction of male fall armyworm to pheromone lures. **Robert L. Meagher**, rob.meagher@ars.usda.gov, USDA - ARS, Gainesville, FL

8:22 0120 Using genetic markers to study the distribution and migration of fall armyworm populations. **Rodney Nagoshi**, rodney.nagoshi@ars.usda.gov, USDA - ARS, Gainesville, FL

8:39 0121 Signals in secretions mediate fall armyworm-host plant interactions. **Gary Felton**, gwf10@psu.edu, Pennsylvania State Univ., Univ. Park, PA

8:56 0122 What goes around, comes around: Toxic maize proteins and the fall armyworm. **Dawn Luthe**, dsl14@psu.edu, Pennsylvania State Univ., Univ. Park, PA

9:13 0123 Field screening of maize germplasm lines for whorl-feeding fall armyworm resistance. **Xinzhi Ni**, xinzhi.ni@ars.usda.gov, USDA - ARS, Tifton, GA

9:30 0124 Characterization of Cry1F resistance in fall armyworm from Puerto Rico. **Ana Maria Velez**, anamaria.velez@gmail.com, Univ. of Nebraska, Lincoln, NE

9:47 0125 Susceptibility to insecticides and Bt toxins in GMO corn in field populations of the fall armyworm in Florida. **Gregg Nuessly**, gnuessly@ufl.edu[1], and Robert L. Meagher[2], [1]Univ. of Florida, Belle Glade, FL, [2]USDA - ARS, Gainesville, FL

10:04 Break

10:14 0126 Field resistance of fall armyworm to transgenic Bt corn in the mainland U.S. **Fangneng Huang**, fhuang@agcenter.lsu.edu[1], Jawwad A. Qureshi[2], Robert L. Meagher[3], Dominic Reisig[4], Graham Head[5], David Andow[6], Xinzhi Ni[7], David L. Kerns[8], David Buntin[9], Ying Niu[1], Fei Yang[1] and Vikash Dangal[1], [1]Louisiana State Univ., Baton Rouge, LA, [2]Univ. of Florida, Immokalee, FL, [3]USDA - ARS, Gainesville, FL, [4]North Carolina State Univ., Plymouth, NC, [5]Monsanto Company, St. Louis, MO, [6]Univ. of Minnesota, Saint Paul, MN, [7]USDA - ARS, Tifton, GA, [8]Louisiana State Univ., Winnsboro, LA, [9]Univ. of Georgia, Griffin, GA

10:31 0127 Fall armyworm resistance to Bt maize in Brazil. **Juilano Farias**, julianofarias@gmail.com, Univ. of Sao Paulo, Piracicaba, Brazil

10:48 0128 Managing resistance to Bt corn in challenging environments. **Analiza P. Alves**, analiza.alves@pioneer.com[1], Zaiqi Pan[2], David Onstad[2], Laura S. Higgins[3] and J. Lindsey Flexner[2], [1]DuPont Pioneer, Johnston, IA, [2]DuPont, Wilmington, DE, [3]Pioneer Hi-Bred International Inc., Johnston, IA

11:05 0129 Using trap baited with sex pheromone as a monitoring tool and decision making on integrated management of *Spodoptera frugiperda* in corn in Brazil. **Ivan Cruz**, ivan.cruz@embrapa.br, Embrapa Milho e Sorgo, Sete Lagoas, Brazil

11:22 0130 Use of integrin knockdown to enhance Bt toxicity against beet armyworm. **Yonggyun Kim**, hosanna@andong.ac.kr, Andong National Univ., Andong, South Korea

11:39 0131 Developmental control of *Spodoptera exigua* by ingestion of bacteria expressing dsRNA of the Chitin Synthase Gene A. **Wenqing Zhang**, lsszwq@mail.sysu.edu.cn and Honggang Tian, Sun Yat-Sen Univ., Guangzhou, China

11:56 Concluding Remarks

Member Symposium: Finding the Best Fit for You: Career Opportunities for Entomologists in Industry, Academia, Military, and Government

B113-114 (Oregon Convention Center)

Moderators and Organizers: Sunil Tewari[1] and Bill Hendrix[2], [1]Dow AgroSciences, Fowler, IN, [2]Dow AgroSciences, Indianapolis, IN

8:00 Introductory Remarks

8:10 0132 Working for the Federal Government: Studying what 'bugs' the American people. **Katherine Parys**, katherine.parys@ars.usda.gov, USDA - ARS, Stoneville, MS

8:30 0133 Getting to yes: A career in academia. **Sue Blodgett**, sblodg@iastate.edu[1], and David Wright[2], [1]Iowa State Univ., Ames, IA and David Wright, [2]South Dakota State Univ., Brookings, SD

8:50 0134 Life after graduation: Opportunities in higher education. **B. Rogers Leonard**, rleonard@agcenter.lsu.edu, Louisiana State Univ., Baton Rouge, LA

9:10 0135 Private-sector science: Are you ready, willing, and able? **Scott Hutchins**, shhutchins@dow.com, Dow AgroSciences, Indianapolis, IN

9:30 Break

9:40 0136 Finding your fit as an entomologist: A career in industry. **William H. Hendrix**, wmhendrix@dow.com, Dow AgroSciences, Indianapolis, IN

10:00 0137 What's my job today? Entomology in industry provides one-stop shopping for multiple careers. **John Greenplate**, John.t.greenplate@monsanto.com, Monsanto Company, St. Louis, MO

10:20 0138 Opportunities for entomologists in the U.S. military. **Jason H. Richardson**, jason.h.richardson.mil@mail.mil, Armed Forces Pest Management Board, Research Liaison Officer, LTC. PhD, MD

10:40 Panel Discussion

Member Symposium: The Challenges and Significant Contributions of Insect Repellents to Vector Control

B115-116 (Oregon Convention Center)

Moderator and Organizer: Mustapha Debboun, US Army, Fort Sam Houston, TX

8:00 Welcoming Remarks

8:03 0139 Extending the duration of repellency of plant-based active ingredients. **Brooke Bissinger**, bbissinger@tyratech.com, Jason Schmidt and John Owens, TyraTech, Inc., Morrisville, NC

8:18 0140 Semiochemical formulations to repel pests. **Agenor Mafra-Neto**, president@iscatech.com[1], Christopher J. Fettig[2], Steve Munson[3], and Edgar Rowton[4], [1]ISCA Technologies, Inc., Riverside, CA, [2]USDA - Forest Service, Davis, CA, [3]USDA - Forest Service, Ogden, UT, [4]Walter Reed Army Institute of Research, Silver Spring, MD

8:33 0141 Heritable insensitivity to DEET in *Anopheles gambiae* and implications for selection to insensitivity in other insect repellents. **James Ricci**, jricc001@ucr.edu, David Turissini, Raissa Green and Bradley White, Univ. of California, Riverside, CA

8:48 0142 Evaluation of essential oils as repellents for the bed bug, *Cimex lectularius*. **Alvaro Romero**, aromero2@nmsu.edu, New Mexico State Univ., Las Cruces, NM

9:03 0143 Assessing repellency status of a sesquiterpene on tobacco and confused flour beetles. **Francoise Favi**, ffavi@vsu.edu[1], Mark E. Kraemer[1] and Charles L. Cantrell[2], [1]Virginia State Univ., Petersburg, VA, [2]USDA - ARS, Univ., MS

9:18 0144 Building a better repellent. **Karen McKenzie**, Kmckenzie@bedoukian.com and Robert Bedoukian, Bedoukian Research Inc, Danbury, CT

9:33 Break

9:43 0145 Risk and rewards of insecticides as repellents. **Kamlesh R. Chauhan**, Kamal.Chauhan@ars.usda.gov, USDA - ARS, Beltsville, MD

9:58 0146 Finding a place for mosquito repellents in mosquito-borne disease management: An Australian perspective. **Cameron Webb**, cameron.webb@swahs.health.nsw.gov.au, Univ. of Sydney, Westmead, Australia

10:13 0147 Relationship between chemical compositions and biting deterrence of *Magnolia grandiflora* essential oils against *Aedes aegypti*. **Junaid Rehman**, junaiddua@gmail.com[1], Nurhayat Tabanca[2], Abbas Ali[2], Betul Demirci[3], Vijayasankar Raman[4], K. Husnu Baser[5] and Ikhlas Khan[2], [1]Univ. of Mississippi, Abbeville, MS, [2]Mississippi State Univ., National Center for Natural Products Research, MS, [3]Anadolu Univ., Eskisehir, Turkey, [4]Univ. of Mississippi, Oxford, MS, [5]KIng Saud Univ., Riyadh, Saudi Arabia

10:28 0148 Mosquito bite protection from insecticide-treated military clothing. **Ulrich R. Bernier**, Uli.Bernier@ars.usda.gov[1], Melynda Perry[2] and Amy Johnson[2], [1]USDA - ARS, Gainesville, FL, [2]Natick Soldier Research, Development, and Engineering Center, Natick, MA

10:43 0149 Recent advances in natural insect repellents. **Joel Coats**, jcoats@iastate.edu, Iowa State Univ., Ames, IA

10:58 0150 Potential of natural products in preventing mosquito bites. **Abbas Ali**, aali@olemiss.edu and Ikhlas Khan, Mississippi State Univ., National Center for Natural Products Research, MS

11:13 0151 Natural product based mosquito control agents. **Kumudini M. Meepagala**, kmeepaga@olemiss.edu[1], Ulrich R. Bernier[2] and James J. Becnel[2], [1]USDA - ARS, Univ., MS, [2]USDA - ARS, Gainesville, FL

11:28 0152 Outdoor evaluation of EverSafe, a feeding deterrent for small area mosquito control. **John Smith**, jpsmith2@fsu.edu, Florida State Univ., Panama City, FL

11:43 Concluding Remarks

Organized Meeting: Current Advances in Acarology

B110-112 (Oregon Convention Center)

Moderators and Organizers: Ronald Ochoa[1] and Mariam Lekveishvili[2], [1]USDA - ARS, Beltsville, MD, [2]Shenandoah Univ., Winchester, VA

8:00 Introductory Remarks

8:03 0153 Microscopy technologies to study mites. **Gary R. Bauchan**, gary.bauchan@ars.usda.gov[1], Chris Pooley[1], Samuel J. Bolton[2], Jenny Beard[3] and Ronald Ochoa[1], [1]USDA - ARS, Beltsville, MD, [2]The Ohio State Univ., Columbus, OH, [3]Queensland Museum, South Brisban, Australia

8:15 0154 Observations on the morphology of the Erythraeidae (Acari, Prostigmata, Erythraeoidea). **C. W. Welbourn**, welbouc@doacs.state.fl.us[1], and Gary R. Bauchan[2], [1]Univ. of Florida, Gainesville, FL, [2]USDA - ARS, Beltsville, MD

8:27 0155 Review of the genus *Tenuipalpus* (Acari: Tenuipalpidae). **Elizeu Castro**, elizeu_unesp@yahoo.com.br[1], Ronald Ochoa[2], Reinaldo JF. Feres[3] and Gary R. Bauchan[2], [1]UNESP, Rio Preto, Brazil, [2]USDA - ARS, Beltsville, MD, [3]Letras e Ciências Exatas IBILCE/UNESP, São José do Rio Preto, São Paulo, Brazil

8:39 0156 A rare case of horizontal transfer in feather mites (*Astigmata*). **Luiz Pedroso**, luizgustavopedroso@gmail.com[1], Fabio Hernandes[1], Sergey Mironov[2], David Boas-Filho[3] and Angelo Prado[3], [1]UNESP, Rio Claro, Brazil, [2]Russian Academy of Sciences, Saint Petersburg, Russia, [3]UNICAMP, Campinas, Brazil

8:51 0157 The *Dermacentor andersoni* microbiome and pathogen acquisition. **Cory Gall**, cgall@vetmed.wsu.edu[1], Glen Scoles[2] and Kelly Brayton[1], [1]Washington State Univ., Pullman, WA, [2]USDA - ARS, Pullman, WA

9:03 0158 *Amblyomma maculatum* and *Rickettsia parkeri* in the Eastern US. **Melissa K. Miller**, melissa.miller2@us.army.mil[1], Benedict Pagac[2], Meagan Mazzei[2], Ellen Stromdahl[3], Allen Richards[4] and Ju Jiang[4], [1]US Army, Fort George G Meade, MD, [2]US Army, Laurel, MD, [3]Army Institute of Public Health, Aberdeen Proving Ground, MD, [4]Naval Medical Research Center, Bethesda, MD

9:15 Break

9:20 0159 The strange and divergent mouthparts of dragon mites (Nematalycidae). **Samuel J. Bolton**, bolton.69@osu.edu[1], Gary R. Bauchan[2], Pavel B. Klimov[3], Ronald Ochoa[2] and Hans Klompen[1], [1]The Ohio State Univ., Columbus, OH, [2]USDA - ARS, Beltsville, MD, [3]Univ. of Michigan, Ann Arbor, MI

9:32 0160 Different strokes for different folks: Strategies used by two related species in adapting to a similar habitat. **Norman J. Fashing**, njfash@wm.edu, College of William and Mary, Williamsburg, VA

9:44 0161 New findings on *Daidalotarsonemus* and *Excelsotarsonemus* mites around the world (Prostigmata: Tarsonemidae). Jose Rezende[1], **Ronald Ochoa**, ron.ochoa@ars.usda.gov[2], Antonio Lofego[1] and Gary R. Bauchan[2], [1]São Paulo State Univ., Rio Preto, Brazil, [2]USDA - ARS, Beltsville, MD

9:56 0162 Ecdysteroid biosynthesis in Varroa mites: Identification of halloween genes from the biosynthetic pathway and their regulation during reproduction. **Paul D. Shirk**, paul.shirk@ars.usda.gov[1], Ana Cabrera[2], Jay D. Evans[3], Kaddie Hung[1], James Sims[1], Hans T. Alborn[1] and Peter E. A. Teal[1], [1]USDA - ARS, Gainesville, FL, [2]Univ. of Florida, Gainesville, FL, [3]USDA - ARS, Beltsville, MD

10:08 SP0163 Deer topping: Preferences for large hosts increase mating efficiency and reduce Allee threshold densities in tick vectors. **Jesse Brunner**, jesse.brunner@wsu.edu[1], and Justin Calabrese[2], [1]Washington State Univ., Pullman, WA, [2]Smithsonian Conservation Biology Institute, Front Royal, VA

10:20 SP0164 Comparative analysis of the circadian clock in *Metaseiulus occidentalis*, *Ixodes scapularis*, and *Tetranychus urticae* indicates a variety of mechanisms among the acarines. **Alden Estep**, alden.estep@yahoo.com and Marjorie A. Hoy, Univ. of Florida, Gainesville, FL

10:32 SP0165 Population prediction model for brown wheat mite (*Petrobia latens*) in rainfed wheat. **Manmeet Brar Bhullar**, manmeet@pau.edu, Beant Singh, Paramjit Kaur and Subash Singh, Punjab Agricultural Univ., Ludhiana, India

10:44 Concluding Remarks

Ten-Minute Papers, SysEB Section: Conservation

A106 (Oregon Convention Center)

Moderators: Robert Kula[1] and Carrie Hall[2], [1]USDA - ARS, Washington, DC, [2]Univ. of Tulsa, Tulsa, OK

9:00 Introductory Remarks

9:02 0166 An snapshot of a few arthropod conservation projects in British Columbia, Canada. **Jennifer Heron**, Jennifer.Heron@gov.bc.ca, British Columbia Ministry of Environment, Vancouver, BC, Canada

9:14 0167 Old World honey bee (*Apis mellifera*) populations: A genetic resource for U.S. honey bee breeding. **Megan Taylor**, megan.a.taylor@email.wsu.edu and Walter S. Sheppard, Washington State Univ., Pullman, WA

9:26 0168 Establishment of a germplasm repository for bee breeding based on cryopreservation of honey bee semen. Brandon Hopkins, Susan Cobey and **Walter Sheppard**, shepp@wsu.edu, Washington State Univ., Pullman, WA

9:38 0169 Effect of bioenergy crops in soybean fields on abundance and diversity of pollinators. **Milan Plećaš**, mdplecas@umn.edu, James O. Eckberg, Joe M. Kaser, Ian Lane, Gregg A. Johnson and George E. Heimpel, Univ. of Minnesota, Saint Paul, MN

9:50 0170 Impacts of agricultural land use on the diversity and abundance of wild bees (Apoidea). **Elaine Evans**, evan0155@umn.edu, Univ. of Minnesota, Saint Paul, MN

10:02 0171 Life tables and population growth modeling guide conservation actions for an alpine restricted rare insect, the wekiu bug, *Nysius wekiuicola*, in Hawaii. **Jesse A. Eiben**, eiben@hawaii.edu and Jessica Kirkpatrick, Univ. of Hawai'i, Hilo, HI

10:14 Break

10:29 0172 Can historical trophic structure be recovered for insects associated with an ecologically extinct host plant? **Robert Kula**, Robert.Kula@ars.usda.gov[1], and Harmony Dalgleish[2], [1]USDA - ARS, Washington, DC, [2]College of William and Mary, Williamsburg, VA

10:41 0173 The potential use of the Southeastern Beach Tiger Beetle, *Cicindela dorsalis media*, as an ecological indicator of human impact in Southeastern beach ecosystems. **Liz Studer**, lstuder@uga.edu and Joseph V. McHugh, Univ. of Georgia, Athens, GA

10:53 0174 Pheromone-based monitoring of threatened saproxylic insects: A game-changer in insect conservation. **Mattias Larsson**, mattias.larsson@slu.se, Swedish Univ. of Agricultural Sciences, Alnarp, Sweden

11:05 0175 Deliberate alteration of the elytra of the endangered *Nicrophorus americanus* Olivier (Coleoptera: Silphidae) during field surveys alters acoustic characters: Consequences for reproduction and conservation. **Carrie L. Hall**, carrie.hall@augie.edu[1], Daniel R. Howard[1], Andrew C. Mason[2] and Rosemary J. Smith[3], [1]Augustana College, Sioux Falls, SD, [2]Univ. of Toronto, Scarborough, ON, Canada, [3]Idaho State Univ., Pocatello, ID

11:17 Concluding Remarks

Ten-Minute Papers, SysEB Section: Invasive Arthropods in Systematics

A105 (Oregon Convention Center)

Moderators: Luc Leblanc[1] and Cheryl L. Bowker[2], [1]Univ. of Hawai'i, Honolulu, HI, [2]Colorado State Univ., Fort Collins, CO

9:30 Introductory Remarks

9:32 0176 The Dirty Dozens: An overview of the pest species of *Bactrocera* fruit flies (Diptera: Tephritidae: Dacinae). **Luc Leblanc**, leblancl@ctahr.hawaii.edu, Michael San Jose and Dan Rubinoff, Univ. of Hawai'i, Honolulu, HI

9:44 0177 What can molecular data tell us about oriental fruit fly (*Bactrocera dorsalis*) introductions in the U.S.? **Norman Barr**, Norman.B.Barr@aphis.usda.gov[1], Dan Rubinoff[2], Michael San Jose[2], Luc Leblanc[2], Scott Geib[3] and Stephen D. Gaimari[4], [1]USDA - APHIS, Edinburg, TX, [2]Univ. of Hawai'i, Honolulu, HI, [3]USDA - ARS, Hilo, HI, [4]Plant Pest Diagnostics Branch, Sacramento, CA

9:56 0178 Genetic differentiation of *Tecia solanivora* from Colombia based on two mitochondrial genes: Cytochrome b and cytochrome oxydase I. **Diego Villanueva-Mejia**, dvillanu@eafit.edu.co[1], Viviana Ramirez-Rios[2], Rafael Arango-Isaza[2] and Clara Saldamando-Benjumea[2], [1]Universidad Eafit, Medellin, Colombia, [2]Universidad Nacional de Colombia, Medellin, Colombia

10:08 0179 New invasive insect pests in California and their negative impact. **Gevork Arakelian**, GArakelian@acwm.lacounty.gov and Edmund Williams, Los Angeles County Dept. of Agricultural Commissioner/Weights & Measures, South Gate, CA

10:20 Break

10:35 0180 Coconut mite *Aceria guerreronis* Keifer, new to coconut plantation in North Sulawesi, Indonesia. **Meldy Hosang**, meldyhosang@yahoo.com, Indonesian Palm Crop Research Institute, Manado, Indonesia

10:47 0181 Management of pesticide resistance based on heterogeneous field management and type of pests. **Takehiko Yamanaka**, apple@affrc.go.jp[1], and Yoshito Suzuki[2], [1]National Institute for Agro-Environmental Sciences, Tsukuba, Japan, [2]National Agricultural Research Center, NARO, Tsukuba, Japan

10:59 0182 Tracing the invasion history of a parasitoid wasp in North America. **Cheryl L. Bowker**, cheryl@lamar.colostate.edu and Paul J. Ode, Colorado State Univ., Fort Collins, CO

11:11 0183 A new species of *Diatraea* in the U.S. and the identity of grass borers in the Western Hemisphere. **M. Alma Solis**, alma.solis@ars.usda.gov and Mark Metz, USDA - ARS, Washington, DC

11:23 0184 A new predatory mite species of the genus *Agistemus* (*Agistemus saeedii*) Stigmaeidae:Acari from Punjab, Pakistan. **Bilal Khan**, bilalentomologyuaf@gmail.com, Univ. of Agriculture, Faisalabad, Pakistan, Faisalabad, Pakistan

11:35 Concluding Remarks

Ten-Minute Papers, MUVE Section: Stored Products Pests

B117-119 (Oregon Convention Center)

Moderator: Sharon Dobesh, Kansas State Univ., Manhattan, KS

8:00 Introductory Remarks

8:05 0185 Advances in post-harvest pest control research. **Yong-Biao Liu**, YongBiao.Liu@ars.usda.gov, USDA - ARS, Salinas, CA, Samuel Liu, Certified Laboratories, Plainview, NY and Gregory Simmons, USDA - APHIS - PPQ - CPHST, Salinas, CA

8:17 0186 Effectiveness of diatomaceous earth formulations against seven stored-product insect species on wheat. **Blossom Sehgal**, blossom@ksu.edu and Bhadriraju Subramanyam, Kansas State Univ., Manhattan, KS

8:29 0187 Food source refuge and susceptibility of *Tribolium castaneum* and *Trogoderma variabile* on concrete treated with chlorfenapyr. **Sharon Dobesh**, sdobesh@ksu.edu[1], and Frank H. Arthur[2],[1]Kansas State Univ., Manhattan, KS, [2]USDA - ARS, Manhattan, KS

8:41 0188 Evaluation of confinement and dosage accumulation of sulfury fluoride with a low dose: Long exposure period for control of *Amyelois transitella* (NOW) in almond stockpiles. **Barb Nead-Nylander**, banead-nylander@dow.com[1], Ellen Thoms[2], and Cavan Bruederle[3], [1]Dow AgroSciences, Rancho Santa Margarita, CA, [2]Dow AgroSciences, Gainesville, FL, [3]Cardinal Professional Products, Woodland, CA

8:53 0189 Unique applications of Vikane® gas fumigant (sulfuryl fluoride) for pest control. **Ellen Thoms**, emthoms@dow.com, Dow AgroSciences, Gainesville, FL

9:05 0190 Susceptibility of different maize varieties to the maize weevil, *Sitophilus zeamais* (Coleoptera: Curculionidae). **Olalekan Soyelu**, jlekan2001@yahoo.co.uk, Obafemi Awolowo Univ., Ile-Ife, Nigeria

Ten-Minute Papers, PBT Section: Physiology and Immunology

C124 (Oregon Convention Center)

Moderators: Juliana Rangel[1] and Julian F. Hillyer[2], [1]Texas A&M Univ., College Station, TX, [2]Vanderbilt Univ., Nashville, TN

8:00 Welcoming Remarks

8:05 0191 What are ecdysteroids? Insect hormones, essential mammalian D-vitamins or polar sterols used for growth in plants? **Karel Sláma**, slama@entu.cas.cz, Institute of Entomology, Praha 6, Czech Republic

8:17 0192 Evolutional trace of pyrokinin/pheromone biosynthesis activating neuropeptide (PBAN) family of peptides. **Man-Yeon Choi**, mychoi@ars.usda.gov[1], and Robert Vander Meer[2], [1]USDA - ARS, Corvallis, OR, [2]USDA - ARS, Gainesville, FL

8:29 0193 Queen and young larval pheromones impact nursing and reproductive physiology of honey bee (*Apis mellifera*) workers. **Kirsten Traynor**, ktraynor@asu.edu[1], Yves Le Conte[2] and Robert Page[1], [1]Arizona State Univ., Tempe, AZ, [2]INRA/UAPV Ecologie des Invertébrés, Avignon, Cedex 9, France

8:41 0194 Inscet cytokine growth-blocking peptide (GBP) regulates density-dependent cuticular melanism in armyworm, *Pseudaletia separate*. **Juan He**, hejuan@mail.iee.ac.cn[1], Weidong Pan[2], Yuzhan Wang[2], Shaoyong Wang[2] and Jingjing Xu[2], [1]Northwest Agriculture & Forestry Univ., Yangling, China, [2]Chinese Academy of Sciences, Beijing, China

8:53 0195 The IMD pathway regulates the lysozyme like protein expression in the fat body of the wild silkmoth *Antheraea mylitta*. **V Satyavathi Valluri**, vsatya@cdfd.org.in, Centre for DNA Fingerprinting and Diagnostics, Hyderabad, Andhra Pradesh, India

9:05 Break

9:17 0196 Effects of blood meal on mosquito cellular immunity. Kristin Michel and **Bart Bryant**, wbb@ksu.edu, Kansas State Univ., Manhattan, KS

9:29 0197 Physiology of accessory pulsatile organs: Hemolymph circulation in the mosquito antennae. **Julian F. Hillyer**, julian.hillyer@vanderbilt.edu and Sushma Boppana, Vanderbilt Univ., Nashville, TN

9:41 0198 Proteolytic enzyme activity in the foregut region of adults of *Protophormia terraenovae* and implications for identification of fly spots. **David B. Rivers**, drivers@loyola.edu, Gillian Acca, Marc Fink, Rebecca Brogan and Andrew Schoeffield, Loyola Univ., Baltimore, MD

9:53 0199 Effects of protein availability on locomotor activity and oogenesis in female *Sarcophaga crassipalpis*. **Fritz Prohaska**, zfdp1@goldmail.etsu.edu, Darrell Moore and Karl H. Joplin, East Tennessee State Univ., Johnson City, TN

10:05 0200 Transgenerational immunity in an insect model organism. **Wendy Smith**, w.smith@neu.edu, Rebeca B. Rosengaus and Steve Vollmer, Northeastern Univ., Boston, MA

10:17 Concluding Remarks

Ten-Minute Papers, PBT Section: Chemical Ecology and Biotic Interactions

C123 (Oregon Convention Center)

Moderators: Blair Siegfried[1] and Nannan Liu[2], [1]Univ. of Nebraska, Lincoln, NE, [2]Auburn Univ., Auburn, AL

8:00 Welcoming Remarks

8:05 0201 The South Dakota pine beetle caper: Continuing saga. **Adrian S. Juttner**, adriantree@aol.com, Adrian's Tree Service, New Orleans, LA

8:17 0202 Reduced non-target insects captured with a chemical lure compared to a food bait for spotted wing *Drosophila* (*Drosophila suzukii*). **Todd B. Adams**, tadams@oda.state.or.us[1], Dong H. Cha[2], Peter J. Landolt[2] and Helmuth W. Rogg[1], [1]Oregon Dept. of Agriculture, Salem, OR, [2]USDA - ARS, Wapato, WA

8:29 0203 Effects of social environment on the behavior of both male and female flesh flies, *Sarcophaga crassipalpis*. **Dylan Shropshire**, shropshirej@goldmail.etsu.edu, Darrell Moore and Karl H. Joplin, East Tennessee State Univ., Johnson City, TN

8:41 0204 Enhancement of the *Musca domestica* hytrosavirus infection with peritrophic membrane disrupting chemistries. **Drion G. Boucias**, pathos@ufl.edu[1], Christopher J. Geden[2] and Julie Baniszewski[1], [1]Univ. of Florida, Gainesville, FL, [2]USDA - ARS, Gainesville, FL

8:53 0205 Relative contribution of essential amino acids by gut microbes of termites and cockroaches. **Paul Ayayee**, ayayee.1@osu.edu and Zakee Sabree, The Ohio State Univ., Columbus, OH

9:05 0206 Microbial gut fauna of termites *Coptotermes gestroi* and *Armitermes euamignathus*. Aline Peruchi and **Fernando L Cônsoli**, fconsoli@usp.br, Univ. of Sao Paulo, Piracicaba, Brazil

9:17 0207 Effects of symbiont removal on nymphal behavior in the harlequin bug and green stink bug. **Peter Coffey**, peterlcoffey@gmail.com, Christopher Taylor and Galen Dively, Univ. of Maryland, College Park, MD

9:29 Break

9:41 0208 Analysis of sounds produced by *Rhynchophorus ferrugineus* and *Oryctes elegans* larvae and adults in date palm trees and offshoots in Saudi Arabian commercial orchards.

Richard W. Mankin, Richard.Mankin@ars.usda.gov[1], Hassan Al-Ayied[2], and Yousif Aldryhim[3], [1]USDA - ARS, Gainesville, FL, [2]King Abdulaziz City for Science and Technology, Riyadh, Saudi Arabia, [3]King Saud Univ., Riyadh, Saudi Arabia

9:53 0209 Whitefly sensitivity to plant volatiles. **Francoise Djibode Favi**, ffavi@vsu.edu[1], Walter Mallory[1] and Charles Cantrell[2], [1]Virginia State Univ., Petersburg, VA, [2]USDA - ARS, Univ., MS

10:05 0210 Small hive beetle (*Aethina tumida*) attraction to diverse volatiles produced by diverse yeasts growing on pollen and liquid media. **Tracy Conklin**, tracy.conklin@gmail.com, Pennsylvania State Univ., Univ. Park, PA

10:17 0211 Laboratory evaluation of *Beauveria bassiana* as a biological control of *Drosophila suzukii* Matsumura (Diptera: Drosophilidae). **Timothy Lampasona**, tpl53@cornell.edu, Cornell Univ., Ithaca, NY

10:29 0212 Fieldwork on crepuscular and nocturnal Strepsiptera. **Marisano James**, mjajames@ucdavis.edu, Univ. of California, Davis, CA

10:41 0213 Perception and diversification of fertility signals in *Odontomachus* trap-jaw ants. Andrew V. Suarez[1], **Adrian A. Smith**, Smithaa@illinois.edu[1], Jocelyn G. Millar[2] and Lawrence M. Hanks[1], [1]Univ. of Illinois, Urbana, IL, [2]Univ. of California, Riverside, CA

10:53 Concluding Remarks

Ten-Minute Papers, P-IE Section: Pollinators

D137-138 (Oregon Convention Center)

Moderators: Sujaya Rao[1] and Theresa L. Pitts-Singer[2], [1]Oregon State Univ., Corvallis, OR, [2]USDA - ARS, Logan, UT

8:00 0214 Bee visitation to flowering plants on diversified vegetable farms in Connecticut. **Kimberly Stoner**, Kimberly.Stoner@ct.gov, Connecticut Agricultural Experiment Station, New Haven, CT

8:12 0215 Effects of honey bee management on oxidative stress and longevity. **Hongmei Li-Byarlay**, hmli@illinois.edu[1], Michael Simone-Finstrom[1], Ming Huang[1], Micheline Strand[2], Olav Rueppell[3] and David R. Tarpy[1], [1]North Carolina State Univ., Raleigh, NC, [2]Chemical and Biological Defense Laboratories, Durham, NC, [3]Univ. of North Carolina, Greensboro, NC

8:24 0216 On-farm restorations to promote pollinator beta-diversity. **Lauren Ponisio**, lponisio@berkeley.edu, Leithen M'Gonigle and Claire Kremen, Univ. of California, Berkeley, CA

8:36 0217 Can pollinators explain the variation in flower color in the Rocky Mountain columbine? **Johanne Brunet**, jbrunet@wisc.edu[1], and Margaret W. Thairu[2], [1]USDA - ARS, Madison, WI, [2]Univ. of Wisconsin, Madison, WI

8:48 0218 Antimicrobial diversity in plant resins used by honey bees, *Apis mellifera*. **Michael Wilson**, wils0888@umn.edu, Alison Pawlus, Adrian Hegeman, Jerry Cohen and Marla Spivak, Univ. of Minnesota, Saint Paul, MN

9:00 0219 Native bumble bee foraging: Pollen carrying capacity. **Alexander Hazlehurst**, hazlehua@onid.oregonstate.edu and Sujaya Rao, Oregon State Univ., Corvallis, OR

9:12 0220 Linking social and individual immunity: Relationships among social and individual defenses in honey bees. **Michael Simone-Finstrom**, mdsimone@ncsu.edu and David Tarpy, North Carolina State Univ., Raleigh, NC

9:24 0221 Bee Aware: The Mississippi honey bee stewardship program. **Jeff Gore**, jgore@drec.msstate.edu[1], Angus Catchot[2], Jeffrey W. Harris[2] and Don Cook[1], [1]Mississippi State Univ., Stoneville, MS, [2]Mississippi State Univ., Mississippi State, MS

9:36 0222 Why do bumble bees die after foraging on linden (*Tilia* spp.) trees? **Adriana Argoti**, Adriana.Argoti@oregonstate.edu and Sujaya Rao, Oregon State Univ., Corvallis, OR

9:48 0223 Breeding for quality: Assessing morphological and genetic variation of queens across strains of honey bees. Michael Simone-Finstrom[1], **David Tarpy**, david_tarpy@ncsu.edu[1] and Timothy A. Linksvayer[2], [1]North Carolina State Univ., Raleigh, NC, [2]Univ. of Pennsylvania, Philadelphia, PA

10:00 Break

10:12 0224 Following the lead of a sleep-deprived dancer: Honey bees (*Apis mellifera*) following waggle dancers respond differently if the dancers had lost sleep. **Barrett Klein**, barrett@pupating.org and Samuel Schneider, Univ. of Wisconsin, La Crosse, WI

10:24 0225 Where have all the foragers gone? Identifying the pollen sources of honey bees during spring corn planting. **Chia-Hua Lin**, lin.724@buckeyemail.osu.edu, Douglas B. Sponsler, Juan Quijia Pillajo and Reed Johnson, The Ohio State Univ., Wooster, OH

10:36 0226 What do continuous weight and temperature monitoring tell us about honey bee colony status and activity? **William Meikle**, william.meikle@ars.usda.gov, Milagra Weiss and Abby R. Stilwell, USDA - ARS, Tucson, AZ

10:48 0227 Progress in proteomic marker-assisted selection for honey bees (*Apis mellifera*). **Stephen Pernal**, Steve.Pernal@agr.gc.ca[1], Abdullah Ibrahim[1], Shelley Hoover[2], Rob Currie[3], M. Marta Guarna[4] and Leonard J. Foster[4], [1]Agriculture & Agri-Food Canada, Beaverlodge, AB, Canada, [2]Alberta Agriculture and Rural Development, Lethbridge, AB, Canada, [3]Univ. of Manitoba, Winnipeg, MB, Canada, [4]Univ. of British Columbia, Vancouver, BC, Canada

11:00 0228 Pollination in Pennsylvania apple orchards: Is it risky to rely on wild pollinator species? **David J. Biddinger**, djb134@psu.edu[1], Edwin Rajotte[2], Neelendra K. Joshi[1], Mark Otieno[2] and James Schupp[1], [1]Pennsylvania State Univ., Biglerville, PA, [2]Pennsylvania State Univ., Univ. Park, PA

11:12 0229 Presentation withdrawn

11:24 0230 Techniques used for disease management in commercial bumble bee mass rearing. **Kimberly Skyrm**, kskyrm@koppert.com[1], Wei-Fone Huang[2], Rene Ruiter[1] and Leellen Solter[2], [1]Koppert Biological Systems, Inc., Howell, MI, [2]Illinois Natural History Survey, Champaign, IL

Ten-Minute Papers, P-IE Section: Forest and Arboreal Entomology

E145 (Oregon Convention Center)

Moderators: Chris Werle[1] and Joseph D. Culin[2], [1]Louisiana State Univ., Baton Rouge, LA, [2]Clemson Univ., Clemson, SC

8:00 0231 Monitoring hemlock woolly adelgid infestations using citizen scientists. **Joseph Culin**, jculin@clemson.edu, Clemson Univ., Clemson, SC

8:12 0232 Factors influencing flight capacity of the mountain pine beetle (*Dendroctonus ponderosae*). **Maya L. Evenden**, mevenden@ualberta.ca[1], Caroline Whitehouse[2] and Jared Sykes[1], [1]Univ. of Alberta, Edmonton, AB, Canada, [2]Alberta Environment Sustainable Resource Development, Peace River, AB, Canada

8:24 0233 Genotype, temperature, and defoliation interact to influence tree growth and defense traits. **Mary A. Jamieson**, maryajamieson@gmail.com[1], Kenneth Raffa[1], Peter Reich[2], Eric Kruger[1] and Richard L. Lindroth[1], [1]Univ. of Wisconsin, Madison, WI, [2]Univ. of Minnesota, Saint Paul, MN

8:36 0234 Heat islands in the megalopolis: Effects of urban and regional climate on street-tree arthropods from Raleigh to Boston. **Elsa Youngsteadt**, ekyoungs@ncsu.edu, Robert R. Dunn and Steven D. Frank, North Carolina State Univ., Raleigh, NC

8:48 0235 Spatial co-colonization of the European woodwasp (*Sirex noctilio*) and native mortality agents at a pine plantation in the Adirondacks. **Christopher Jon Foelker**, cjfoelke@syr.edu, Dylan Parry, Christopher M. Whipps and Melissa K. Fierke, State Univ. of New York, ESF, Syracuse, NY

9:00 0236 Studies on an ambrosia beetle (*Euwallacea*) with an identity crisis, newly invasive in California. **Miriam Cooperband**, Miriam.F.Cooperband@aphis.usda.gov[1], Allard Cosse[2], Richard Stouthamer[3], Daniel Carrillo[4] and Akif Eskalen[3], [1]USDA - APHIS - PPQ - CPHST, Buzzards Bay, MA, [2]USDA - ARS, Peoria, IL, [3]Univ. of California, Riverside, CA, [4]Univ. of Florida, Homestead, FL

9:12 0237 Why isn't hemlock woolly adelgid (*Adelges tsugae*) a pest in western North America? **Aaron S. Weed**, aaron.s.weed@dartmouth.edu and Joseph Elkinton, Univ. of Massachusetts, Amherst, MA

9:24 0238 How land management changes have influenced the Douglas-fir tussock moth in southern California: The first recorded outbreak. **Andrew Graves**, adgraves@fs.fed.us[1], Michael Jones[2], Steven Seybold[3], and Tom W. Coleman[4], [1]USDA - Forest Service, Albuquerque, NM, [2]State Univ. of New York, ESF, Syracuse, NY, [3]USDA - Forest Service, Davis, CA, [4]USDA - Forest Service, San Bernardino, CA

9:36 0239 Forest responses to *Fraxinus* mortality following invasion by emerald ash borer (*Agrilus planipennis*). **Wendy S. Klooster**, klooster.2@osu.edu, Catherine P. Herms, John Cardina and Daniel A. Herms, The Ohio State Univ., Wooster, OH

9:48 0240 Effects of log-nesting ants on wood-decay fungi and forest decomposition. **Mary Jane Epps**, mycota@gmail.com and Robert R. Dunn, North Carolina State Univ., Raleigh, NC

10:00 Break

10:12 0241 European woodwasp (*Sirex noctilio*) in Ontario pine forests: Examining mortality factors of a worldwide pest in a newly invaded environment. **Laurel J. Haavik**, ljhaavik@gmail.com[1], Kevin J. Dodds[2], and Jeremy D. Allison[3], [1]Canadian Forest Service, Sault Ste. Marie, ON, Canada, [2]USDA - Forest Service, Durham, NH, [3]Natural Resources Canada, Great Lakes Forestry Centre, Sault Ste. Marie, ON, Canada

10:24 0242 *Protaphorura armata* (Collembola), a significant pest in cool-weather tree nurseries. **Ernest C. Bernard**, ebernard@utk.edu[1], and Jeffrey Stoven[2], [1]Univ. of Tennessee, Knoxville, TN, [2]Bailey Nurseries, Inc., Yamhill, OR

10:36 0243 Can interannual variation in foliar nitrogen explain the concordant fluctuations of forest Lepidoptera? **Nina K Lany**, Nina.K.Lany@Dartmouth.edu[1], Erik Stange[2] and Matthew P. Ayres[1], [1]Dartmouth College, Hanover, NH, [2]Norwegian Institute of Nature Research, Lillehammer, Norway

10:48 0244 Tree- and stand-level factors associated with tamarack mortality due to eastern larch beetle (*Dendroctonus simplex* LeConte) in Minnesota. **Susan J. Crocker**, scrocker@fs.fed.us[1], Greg Liknes[1], Fraser R. McKee[2], Brian Aukema[2] and Jana Albers[3], [1]USDA - Forest Service, St. Paul, MN, [2]Univ. of Minnesota, Saint Paul, MN, [3]Division of Forestry, Grand Rapids, MN

11:00 0245 Tree physiological basis for Jeffrey pine susceptibility to Jeffrey pine beetle (Dendroctonus jeffreyi Hopk.). **Nancy E. Grulke**, negrulke@fs.fed.us, USDA - Forest Service, Prineville, OR

11:12 0246 Effects of goldspotted oak borer, *Agrilus auroguttatus*, and treatment with two systemic insecticides on coast live oak trees in southern California. **Yigen Chen**, ygchen2007@gmail.com[1], Mary Louise Flint[1], Tom W. Coleman[2], Joseph Doccola[3], Don Grosman[3], David L. Wood[4] and Steven J. Seybold[5], [1]Univ. of California, Davis, CA, [2]USDA - Forest Service, San Bernardino, CA, [3]Arborjet, Inc., Woburn, MA, [4]Univ. of California, Berkeley, CA, [5]USDA - Forest Service, Davis, CA

11:24 0247 Threat of the polyphagous shot hole borer (*Euwallacea* sp.) to native hardwoods in the southern U.S. **Tom W. Coleman**, twcoleman@fs.fed.us[1], Yigen Chen[2], Andrew D. Graves[3], Robert Venette[4], and Steven Seybold[5], [1]USDA - Forest Service, San Bernardino, CA, [2]Univ. of California, Davis, CA, [3]USDA - Forest Service, Albuquerque, NM, [4]USDA - Forest Service, St. Paul, MN, [5]USDA - Forest Service, Davis, CA

11:36 0248 Cascade effect of laurel wilt disease on the palamedes swallowtail butterfly (*Papilio palamedes*) in the southeastern United States. **John P. Formby**, jpf9@msstate.edu[1], Kelly Oten[2] and John Riggins[1], [1]Mississippi State Univ., Mississippi State, MS, [2]North Carolina Forest Service, Raleigh, NC

Ten-Minute Papers, P-IE Section: Plant and Insect Interactions

E146 (Oregon Convention Center)

Moderators: Bonnie Pendleton[1] and Stephen L. Lapointe[2], [1]West Texas A&M Univ., Canyon, TX, [2]USDA - ARS, Ft. Pierce, FL

8:00 0249 Dela-where? Saproxylic beetles in urban forest fragments. **Judith A. Hough-Goldstein**, jhough@udel.edu[1], Kaitlin Handley[1], Vincent D'Amico[2], Lawrence M. Hanks[3] and Jocelyn G. Millar[4], [1]Univ. of Delaware, Newark, DE, [2]USDA - Forest Service, Newark, DE, [3]Univ. of Illinois, Urbana, IL, [4]Univ. of California, Riverside, CA

8:12 0250 Cerambycid beetles across heterogeneous urban landscapes. **Vincent D'Amico**, vdamico@fs.fed.us[1], Kaitlin Handley[2], Judith A. Hough-Goldstein[2], Lawrence M. Hanks[3] and Jocelyn G. Millar[4], [1]USDA - Forest Service, Newark, DE, [2]Univ. of Delaware, Newark, DE, [3]Univ. of Illinois, Urbana, IL, [4]Univ. of California, Riverside, CA

8:24 0251 Unraveling cerambycid movement in urban landscapes. **Emily Dunn**, edunn@udel.edu[1], Vincent D'Amico[2], Judith A. Hough-Goldstein[1], Lawrence M. Hanks[3] and Jocelyn G. Millar[4], [1]Univ. of Delaware, Newark, DE, [2]USDA - Forest Service, Newark, DE, [3]Univ. of Illinois, Urbana, IL, [4]Univ. of California, Riverside, CA

8:36 0252 Novel methodologies to asses feeding cessation of hemipteran vectors of plant diseases when exposed to insecticide treated plants. **Juan M. Alvarez**, juan.m.alvarez@usa.dupont.com, DuPont Crop Protection, Newark, DE

8:48 0253 Endophytic fungi affect the host selection behavior of two key hemipteran plant pests, *Lygus hesperus* (Miridae) and *Nezara viridula* (Pentatomidae). **Gregory Sword**, gasword@tamu.edu[1], Maria Julissa Ek-Ramos[2], and Ashley Tessnow[3], [1]Texas A&M Univ., College Station, TX, [2]Universidad Autónoma de Nuevo León, San Nicolás de los Garza, Nuevo León, Mexico, [3]Trinity Univ., San Antonio, TX

9:00 0254 The interaction of a defensive aphid phenotype and the natural enemy community. **Paul Lenhart**, palenhart@gmail.com and Jennifer White, Univ. of Kentucky, Lexington, KY

9:12 0255 Historical herbivore and competitive pressure contribute to contemporary herbivore defense. **Juli Carrillo**, carrillj@purdue.edu[1], and Evan Siemann[2], [1]Purdue Univ., West Lafayette, IN, [2]Rice Univ., Houston, TX

9:24 0256 Monitoring thrips populations and soybean vein necrosis virus (SVNV) in Wisconsin soybean. **Chris Bloomingdale**, bloomingdale@wisc.edu, Russell L. Groves and Damon Smith, Univ. of Wisconsin, Madison, WI

9:36 0257 Investigating insect-symbiont dynamics under stress in the soybean aphid (*Aphis glycines*). **Laramy Enders**, lenders2@unl.edu[1], Nicholas Miller[1] and Andrew Michel[2], [1]Univ. of Nebraska, Lincoln, NE, [2]The Ohio State Univ., Wooster, OH

9:48 0258 The impacts of a common plant associated bacterium, *Pseudomonas syringae*, on survival and reproduction of hemipteran insects. **Tory Hendry**, thendry@berkeley.edu[1], Martha S. Hunter[2], Nicholas J. Mills[1] and David Baltrus[2], [1]Univ. of California, Berkeley, CA, [2]Univ. of Arizona, Tucson, AZ

10:00 Break

10:12 0259 Impact of exotic herbivores on native tritrophic interactions: A case study of the African cotton leafworm, *Spodoptera littoralis*. **Gaylord Desurmont**, gaylord.desurmont@unine.ch, Yosra Chaabane, Diane Laplanche and Ted C. J. Turlings, Univ. of Neuchâtel, Neuchâtel, Switzerland

10:24 0260 Evaluating the effects of drought stress on cotton plant volatile emissions. **Esther Ngumbi**, enn0002@auburn.edu, Henry Fadamiro and Joseph Kloepper, Auburn Univ., Auburn, AL

10:36 0261 Root-associated fungi mediate plant-insect interactions in soil. **Huijie Gan**, hg326@cornell.edu and Kyle Wickings, Cornell Univ., Geneva, NY

10:48 0262 Results from a 4-year study developing economic thresholds for Asian citrus psyllid control under high HLB incidence. **Cesar Monzo**, cmonzo@ufl.edu and Philip A. Stansly, Univ. of Florida, Immokalee, FL

11:00 0263 Emergent effects of intraspecific and interspecific pathogen diversity on insect hosts. **Zhen Fu**, zhen.fu@wsu.edu[1], William E Snyder[1] and Emily Jones[2], [1]Washington State Univ., Pullman, WA, [2]Rice Univ., Houston, TX

11:12 0264 Use of herbivore-induced plant volatiles as search cues by *Tiphia* parasitoids to located their below-ground scarabaeid hosts. Piyumi Obeysekara[1], **Ana Legrand**, ana.legrand@uconn.edu[2] and Gary Lavigne[2], [1]Texas A&M Univ., College Station, TX, [2]Univ. of Connecticut, Storrs, CT

11:24 0265 Integrating aboveground-belowground herbivore interactions into pest management: Should aphids be a target for better nematode management? **Michael T. McCarville**, mikemcc@iastate.edu, Gregory L. Tylka and Matthew E. O'Neal, Iowa State Univ., Ames, IA

11:36 0266 Plant induced responses to herbivory and their effects on insect population dynamics. **André Kessler**, ak357@cornell.edu[1], Akane Uesugi[1], Katja Poveda[1] and Robert H. Johnson[2], [1]Cornell Univ., Ithaca, NY, [2]Medaille College, Buffalo, NY

11:48 0267 The effect of aphid and plant species on the reproductive capacity of sevenspotted lady beetles (*Coccinella septempunctata*). **Todd Ugine**, tau2@cornell.edu and John Losey, Cornell Univ., Ithaca, NY

Ten-Minute Papers, P-IE Section: Transgenic Host Plants

F151 (Oregon Convention Center)

Moderators: Ram B. Shrestha[1] and Ben Von Kanel[2], [1]Iowa State Univ., Ames, IA, [2]Bayer CropScience, Memphis, TN

8:00 0268 Understanding evolution of resistance to pyramided Bt crops in *Helicoverpa zea*. **Yves Carriere**, ycarriere@ag.arizona.edu[1], Kara Welch[1], Thierry Brévault[2] and Bruce E. Tabashnik[1], [1]Univ. of Arizona, Tucson, AZ, [2]Centre de Cooperation Internationale en Recherche Agronomique pour le Developpement, Montpellier, France

8:12 0269 Alternative splicing and highly variable cadherin transcripts are associated with field-evolved resistance of pink bollworm to Bt cotton in India. **Jeffrey A. Fabrick**, jeff.fabrick@ars.usda.gov[1], Jeyakumar Ponnuraj[2], Xianchun Li[3], Yves Carrière[3] and Bruce E. Tabashnik[3], [1]USDA - ARS, Maricopa, AZ, [2]National Institute of Plant Health Management, Hyderabad, India, [3]Univ. of Arizona, Tucson, AZ

8:24 0270 Countering multiple resistance with modified Bt toxins. **Bruce E. Tabashnik**, brucet@cals.arizona.edu[1], Jeffrey A. Fabrick[2], Alejandra Bravo[3], and Mario Soberón[4], [1]Univ. of Arizona, Tucson, AZ, [2]USDA - ARS, Maricopa, AZ, [3]Universidad Nacional Autónoma de México, Morelos, Mexico, [4]Universidad Nacional Autónoma de México, Cuernavaca, Mexico

8:36 0271 Genetically modified corn on *Spodoptera frugiperda* and *Helicoverpa zea* control in Sinaloa, Mexico. **Luis Aguirre-Uribe**, luisaguirreu@yahoo.com.mx, Agustín Hernández-Juárez, Gustavo Frías-Treviño, Mariano Flores-Dávila, Ernesto Cerna-Chávez and Jerónimo Landeros-Flores, Universidad Autónoma Agraria Antonio Narro, Saltillo, Mexico

8:48 0272 Performance of TwinLink™ and TwinLink Plus™ cotton from Bayer CropScience. **Ben Von Kanel**, ben.vonkanel@bayer.com[1], Mark Rinehardt[2], Scott Baker[1] and Walt Mullins[3], [1]Bayer CropScience, Memphis, TN, [2]Bayer CropScience, Zebulon, NC, [3]Bayer CropScience, Collierville, TN

9:00 0273 The impacts of inter-kernel movement in the evolution of resistance to Bt-corn in corn earworm (*Helicoverpa zea*). **Michael Caprio**, mcaprio@entomology.msstate.edu[1], Jeannette Martinez[1] and Patrick Porter[2], [1]Mississippi State Univ., Mississippi State, MS, [2]Texas A&M Univ., Lubbock, TX

9:12 0274 Status of western corn rootworm resistance to Bt toxins Cry3Bb1 and Cry34/35Ab1. **Siva Jakka**, sjakka@iastate.edu, Ram Shrestha and Aaron Gassmann, Iowa State Univ., Ames, IA

9:24 0275 Assessing impacts of supplemental control for heliothines on pyramided-Bt and non-Bt cottons. **Nathan Little**, nathan.little@ars.usda.gov, Donny Adams, K. Clint Allen and Randall Luttrell, USDA - ARS, Stoneville, MS

9:36 0276 Development and survivorship of Bt-resistant western corn rootworm in Iowa cornfields. **Ram Shrestha**, shrestrb@iastate.edu, Siva Jakka and Aaron Gassmann, Iowa State Univ., Ames, IA

9:48 0277 Evaluating the risk of western corn rootworm resistance to Bt corn in light of landsape irregularity. **Nicholas Friedenberg**, nick@ramas.com and Kevin Shoemaker, Applied Biomathematics, Setauket, NY

10:00 Break

10:12 0278 Performance of WideStrike® insect protection in the U.S. cotton belt. **Amanda Jacobson**, ajjacobson@dow.com[1], Gary D. Thompson[2], Bo Braxton[3], Melissa Siebert[1], Larry Walton[4], John Richburg[5], Robert A. Haygood[6], Randy M. Huckaba[7], Ryan Viator[8] and Mike Lovelace[9], [1]Dow AgroSciences, Greenville, MS, [2]Dow AgroSciences, Omaha, AR, [3]Dow AgroSciences, Travelers Rest, SC, [4]Dow AgroSciences, Tupelo, MS, [5]Dow AgroSciences, Headland, AL, [6]Dow AgroSciences, Memphis, TN, [7]Dow AgroSciences, Santa Isabel, PR, [8]Dow AgroSciences, Houma, LA, [9]Dow AgroSciences, Lubbock, TX

10:24 0279 "Say it ain't so, Joe!" Suspected Bt resistance in the rotation-resistant western corn rootworm. **Joseph Spencer**, spencer1@illinois.edu, Michael Gray, Sarah A. Hughson, Ronald Estes, Nicholas Tinsley and Alexandra McMillan, Univ. of Illinois, Urbana, IL

10:36 0280 Field trial performance of SmartStax for control of western corn rootworm (*Diabrotica virgifera*). **Kevin Johnson**, kdjohnson@dow.com[1], Dwain M. Rule[2], Amanda Jacobson[3] and Nicholas Storer[2], [1]Dow AgroSciences, Danville, IL, [2]Dow AgroSciences, Indianapolis, IN, [3]Dow AgroSciences, Greenville, MS

10:48 0281 Similarity of beneficial arthropod taxa in agroecosystems across geographies enables the transportability of Bt crop non-target arthropod field data across borders. **Christopher Brown**, christopher.r.brown@monsanto.com, Aqeel Ahmad, Peter Asiimwe, Sarah Donelson, Joy Whitsel and David Carson, Monsanto Company, St. Louis, MO

11:00 0282 The challenge of managing Bt products targeting western corn rootworm. **Matthew Carroll**, matthew.carroll@monsanto.com, Monsanto Company, St. Louis, MO

11:12 0283 Trait and insecticide efficacy against Bt-susceptible and Bt-resistant western corn rootworm (*Diabrotica virgifera virgifera*) populations: Implications for managing resistance, populations and crop loss. **Ken Ostlie**, ostli001@umn.edu, Elizabeth Schacht and Trisha Leaf, Univ. of Minnesota, Saint Paul, MN

11:24 0284 Evaluation of insecticide use in combination with single- or dual-toxin Bt hybrids for control of western corn rootworm larvae (*Diabrotica virgifera virgifera*). **Nicholas Tinsley**, tinsley@illinois.edu, Ronald Estes, Alexandra McMillan and Michael Gray, Univ. of Illinois, Urbana, IL

11:36 0285 Refuge techniques for low-dose rootworm transgenic events: A futile exorcise? **Bruce Hibbard**, Bruce.Hibbard@ars.usda.gov[1], Jennifer Deitloff[2], Lisa Meihls[1] and Aaron Gassmann[2], [1]USDA - ARS, Columbia, MO, [2]Iowa State Univ., Ames, IA

11:48 0286 Hybrid and environmental influences on larval corn rootworm protection by the Herculex rootworm trait (event DAS-59122-7). **Herb Eichenseer**, Herb.Eichenseer@Pioneer.com[1], June Burks[2], Rick Burns[1] and Tyler Lehman[1], [1]Pioneer Hi-Bred International Inc., Johnston, IA, [2]Pioneer Hi-Bred, retired, Johnston, IA

Ten-Minute Papers, P-IE Section: Crop Protection - Horticulture and Vegetable Production

F152 (Oregon Convention Center)

Moderators: Alton Sparks[1] and Paul W. Borth[2], [1]Univ. of Georgia, Tifton, GA, [2]Dow AgroSciences, LLC, Indianapolis, IN

8:00 0287 Subterranean springtail: A pest of lettuce in the Salinas Valley of California. **Shimat V. Joseph**, svjoseph@ucdavis.edu[1], Christopher Bettiga[1] and Felipe N. Soto-Adames[2], [1]Univ. of California, Salinas, CA, [2]Univ. of Illinois, Champaign, IL

8:12 0288 Management of sap-feeding insects in citrus and vegetables using Closer™ insecticide. **Alejandro Calixto**, AACalixto@dow.com[1], Anthony W. Weiss[2], Melissa Siebert[3], James D. Thomas[4], Joe Eger[5], Linda Lindenberg[6], and Scott Houk[7], [1]Dow AgroSciences, Wesley Chapel, FL, [2]Dow AgroSciences, Brandon, FL, [3]Dow AgroSciences, Greenville, MS, [4]Dow AgroSciences, Indianapolis, IN, [5]Dow AgroSciences, Tampa, FL, [6]Dow AgroSciences, Melbourne, FL, [7]Dow AgroSciences, Estero, FL

8:24 0289 Managing spider mites in strawberries with chemical, botanical, and microbial pesticides. **Surendra Dara**, skdara@ucdavis.edu, Univ. of California, San Luis Obispo, CA

8:36 0290 Recent developments in weevil (Coleoptera: Curculionidae) IPM in high value vegetables in the southeastern U.S. **David Riley**, dgr@uga.edu, Univ. of Georgia, Tifton, GA

8:48 0291 All mustards are not created equal: Optimizing trap cropping for the harlequin bug (*Murgantia histrionica,* Hahn) on collard. **Louis E.N. Jackai**, lejackai@ncat.edu, Beatrice N. Dingha, Sarah Adjei-Fremah and Mulumebet Worku, North Carolina A&T State Univ., Greensboro, NC

9:00 0292 Estimation of injury levels of *Spodoptera* sp. (Noctuidae: Lepidoptera) against hybrid variety of eggplant (*Solanum lycopersicum*). **Fatima Mustafa**, fatima1817@gmail.com[1], Muhammad Ullah[2] and Nasir Mehmood[1], [1]Univ. of Agriculture, Faisalabad, Pakistan, [2]Univ. of Sargodha, Sargodha, Pakistan

9:12 0293 Politics, money and misinformation derail IPM: The stories of virus-resistant papaya in Hawaii and Bt eggplant in southeast Asia. **Anthony M. Shelton**, ams5@cornell.edu, Cornell Univ., Geneva, NY

9:24 0294 Presentation Withdrawn

9:36 0295 Isoclast™ Active: Bringing a new tool for managing key heteropteran sap-feeding insects on horticultural crops globally. **Luis E. Gomez**, egomez2@dow.com[1], Melissa Siebert[2], Imre Mezei[3], Michael Lysandrou[4], Luis Pavan[5], Lakshmipathi Srigiriraju[6], Robert Annetts[7], and Catherine Ren[8], [1]Dow AgroSciences, Indianapolis, IN, [2]Dow AgroSciences, Greenville, MS, [3]Dow AgroSciences, Budapest, Hungary, [4]Dow AgroSciences, Lavrion, Greece, [5]Dow AgroSciences, Sao Paulo, Brazil, [6]Dow AgroSciences, Mumbai-Vikhroli, India, [7]Dow AgroSciences, Toowoomba, Australia, [8]Dow AgroSciences, Shanghai, China

9:48 Break

10:00 0296 Managing sucking insects in western vegetables with Sulfoxaflor. **C. Kuniyoshi**, chkuniyoshi@dow.com[1], Jesse M. Richardson[2], and Melissa Siebert[3], [1]Dow AgroSciences, Fresno, CA, [2]Dow AgroSciences, Hesperia, CA, [3]Dow AgroSciences, Greenville, MS

10:12 0297 The influence of crop management and landscape diversity on damage in tomatoes by brown marmorated stink bug. **Kevin Rice**, kbr10@psu.edu[1], Rachael Troyer[1], Kristal Watrous[1], Lynn Kime[2], John F. Tooker[1] and Shelby J. Fleischer[1], [1]Pennsylvania State Univ., Univ. Park, PA, [2]Pennsylvania State Univ., Biglerville, PA

10:24 0298 Melon thrips, *Thrips palmi* Karny (Thysanoptera: Thripidae), a serious concern to vegetable growers of South Florida. **Dakshina Seal**, dseal3@ufl.edu and Catherine Sabines, Univ. of Florida, Homestead, FL

10:36 0299 Chemigation as a risk reduction tool in fruiting vegetable production. **James F. Walgenbach**, Jim_Walgenbach@ncsu.edu[1], Stephen Schoof[2] and Dylan A. Tussey[2], [1]North Carolina State Univ., Fletcher, NC, [2]North Carolina State Univ., Mills River, NC

10:48 0300 Effects of thiamine treatment on potato to control potato virus Y and zebra chip. **Amber Vinchesi**, amber.vinchesi@oregonstate.edu, Silvia Rondon and Aymeric Goyer, Oregon State Univ., Hermiston, OR

11:00 0301 Alternative methods to control potato pests. Silvia Rondon, Ira Thompson and **Amelia Jordan**, amelia.jordan@wsu.edu, Oregon State Univ., Hermiston, OR

11:12 0302 Sultan miticide in ornamental integrated pest management programs. **Jennifer Bergh**, jennifer.bergh@basf.com, Will Fletcher and Kathie Kalmowitz, BASF Corporation, Research Triangle Park, NC

11:24 0303 Indirect effects of field management on pollination service by honey bees (*Apis mellifera*) and seed set in hybrid onion seed production. **Rachael Long**, rflong@ucanr.edu[1], Sandra Gillespie[2], and Neal M. Williams[3], [1]Univ. of California, Woodland, CA, [2]Simon Fraser Univ., Burnaby, BC, Canada, [3]Univ. of California, Davis, CA

11:36 0304 SIVANTO offers flexible control of sucking pests in vegetables. **Amanda Beaudoin**, amanda.beaudoin@bayer.com, Bayer CropScience, Research Triangle Park, NC

11:48 0305 Nealta® and Sultan®, a new generation of selective acaricides in the U.S. and their potential role in preserving beneficial mite populations. Anil Menon, Will Fletcher and **H. Alejandro Arevalo**, Alejandro.Arevalo@BASF.com, BASF Corporation, Research Triangle Park, NC

SUNDAY, NOVEMBER 16, 2014, AFTERNOON

Lunch and Learn: Science Policy: A View from Washington

Portland Ballroom 254 (Oregon Convention Center)

Moderators and Organizers: Karen Mowrer and Alison Thompson, Lewis-Burke Associates, Washington, DC

12:15 - 1:00

Responsible Conduct of Research (RCR) Training Workshop

E147-148 (Oregon Convention Center)

Moderator and Organizer: Ernest Delfosse, Michigan State Univ., East Lansing, MI

1:30 - 4:00

Challenges and Opportunities for Future Leaders: A Training Workshop for Student Transition and Early Professional Members of ESA

Portland Ballroom 256 (Oregon Convention Center)

Moderators and Organizers: Jennifer M. Tsuruda[1] and Wendy A. Johnson[2], [1]Clemson Univ., Clemson, SC, [2]Kansas State Univ., Manhattan, KS

1:15 Welcoming Remarks

1:20 Lunch

1:50 Introductory Remarks

2:00 0306 Becoming effective leaders and working in teams. **Tobias Spanier**, spani001@umn.edu[1], Anne L. Nielsen[2], and Jeffrey Bradshaw[3], [1]Univ. of Minnesota, Marshall, MN, [2]Rutgers, The State Univ. of New Jersey, Bridgeton, NJ, [3]Univ. of Nebraska, Scottsbluff, NE

2:30 Discussion

3:15 Intermission

3:30 0307 Managing the early years of the next career step. **Laura A. Campbell**, lacampbell@dow.com[1], and Jennifer M. Tsuruda[2], [1]Dow AgroSciences, Carbondale, IL [2]Clemson Univ., Clemson, SC

4:00 Discussion

4:20 0308 Emerging career opportunities in entomology. **Wendy A. Johnson**, wendyann@ksu.edu[1], and Ian M. Grettenberger[2], [1]Kansas State Univ., Manhattan, KS, [2]Pennsylvania State Univ., State College, PA

4:50 Discussion

5:05 Concluding Remarks

Program Symposium: The Futures of Insect Genomics: A Grand Challenge of Entomology

Portland Ballroom 251 (Oregon Convention Center)

Moderators and Organizers: David O'Brochta[1], Angela E. Douglas[2] and Kristin Michel[3], [1]Univ. of Maryland, Rockville, MD, [2]Cornell Univ., Ithaca, NY, [3]Kansas State Univ., Manhattan, KS

1:15 Introductory Remarks

1:20 0309 20/20 vision and insect genomics. **Robert Desalle**, desalle@amnh.org, American Museum of Natural History, New York, NY

1:45 0310 Are conserved elements a universal source of genomic information in insects? **Brant Faircloth**, brant@faircloth-lab.org, Univ. of California, Los Angeles, CA

2:10 0311 Harnessing multiple *Anopheles* genomes to explore the full complement of functional genomic elements in disease-vector mosquitoes. **Robert Waterhouse**, robert.waterhouse@unige.ch, Massachusetts Institute of Technology, Cambridge, MA

2:35 0312 Genomic/genetic applications in monarch butterflies. **Steven Reppert**, Steven.Reppert@umassmed.edu, Univ. of Massachusetts, Worcester, MA

3:00 Break

3:30 0313 How insect genomics can accelerate research in evolutionary developmental biology. **Cassandra Extavour**, extavour@oeb.harvard.edu, Harvard Univ., Cambridge, MA

3:55 0314 Populations genomics reveals rapid seasonal adaptation in *Drosophila*. **Dmitri Petrov**, dpetrov@stanford.edu, Stanford Univ., Stanford, CA

4:20 0315 Genome-wide associations with phenotype to identify functional determinants of insect-microbe interactions. **John Chaston**, chaston@cornell.edu, Cornell Univ., Ithaca, NY

4:45 0316 Decoding mosquito chemosensation using genome editing. **Conor McMeniman**, cmcmeniman@mail.rockefeller.edu, Rockefeller Univ., New York, NY

5:10 Concluding Remarks

P-IE/MUVE Section Symposium: Celebrating the 100th Anniversary of the Entomologist in the Cooperative Extension Service

Portland Ballroom 253 (Oregon Convention Center)

Moderators and Organizers: John J. Adamczyk[1], D. Wes Watson[2], Sujaya Rao[3], and Alton N. Sparks, Jr.[4], [1]USDA - ARS, Poplarville, MS, [2]North Carolina State Univ., Raleigh, NC, [3]Oregon State Univ., Corvallis, OR, [4]Univ. of Georgia, Tifton, GA

1:15 Welcoming Remarks

1:20 0317 Extension for the 21st century. **Sonny Ramaswamy**, sonny@nifa.usda.gov, USDA - NIFA, Washington, DC

1:50 0318 Extension–A critical component of agriculture's blue ribbon support team. **Gale Buchanan**, gale.buchanan@gmail.com, Former Under Secretary of Agriculture, Washington, DC

2:10 0319 Future possibilities: extension and Ag industry collaborating to deliver educational programs. **K. L. Steffey**, klsteffey@dow.com, Dow AgroSciences, Indianapolis, IN

2:25 0320 Using social media to reach the masses in extension. **Brian Adams**, bpa31@msstate.edu and Angus Catchot, Mississippi State Univ., Mississippi State, MS

2:43 0321 Bee extension: serving the beekeepers during challenging times. **Ramesh R. Sagili**, sagilir@hort.oregonstate.edu, Oregon State Univ., Corvallis, OR

3:01 0322 Grand challenges facing extension veterinary entomology and the legacy of those who preceded us. **Nancy Hinkle**, nhinkle@uga.edu, Univ. of Georgia, Athens, GA

3:19 0323 Extension medical entomology: the next 100 years. **C. Roxanne Connelly**, crr@ufl.edu, Univ. of Florida, Vero Beach, FL

3:37 0324 The recent rise of extension urban entomology. **Michael Merchant**, m-merchant@tamu.edu, Texas A&M Univ., Dallas, TX

3:55 Break and Video Presentation on Cooperative Extension Service

4:10 0325 Use of decision support systems and beyond to enhance IPM programs: an example from Washington tree fruit. **Vincent Jones**, vpjones@wsu.edu, Ute Chambers, Brad Petit and Carl Jackson, Washington State Univ., Wenatchee, WA

4:30 0326 Is biological control still relevant in research and extension: a historical perspective from California crop systems. **Kent Daane**, kdaane@ucanr.edu, Univ. of California, Berkeley, CA

4:50 0327 The career of L.D. Newsom. **Donald Cook**, dcook@drec.msstate.edu, Mississippi State Univ., Stoneville, MS

P-IE Section Symposium: Biological Insect Control - Ready for a Breakthrough?

Portland Ballroom 255 (Oregon Convention Center)

Moderator and Organizer: Peter Witzgall, Swedish Univ. of Agricultural Sciences, Alnarp, Sweden

1:15 Introductory Remarks

1:15 0328 Current status and future prospects of three bioinsecticides developed in Colombia. **Alba Marina Cotes**, Pacotesprado@yahoo.com, Laura Villamizar, Martha Isabel Gómez, Carlos Espinel, Maria Victoria Zuluaga, Juliana Gomez and Paola Cuartas, Corpoica, Bogota, Colombia

1:30 0329 Bt crops: a green cornerstone for future biological control programs. **Brian Federici**, brian.federici@ucr.edu, Univ. of California, Riverside, CA

1:45 0330 Moving from crises, regulations and consumer preferences to a sensible and stable pheromone-based pest management in orchard crops: allowing biological control to flourish. **Donald Thomson**, dthomson@pobox.com, Pacific Biocontrol Corporation, Seattle, WA

2:00 Break

SD0331 Number of *Trichogramma galloi* released, simulating an application by airplane to control *Diatraea saccharalis* in sugarcane. **Bruno Arroyo**, brunoarroyo16@hotmail.com[1], Jhonathan de Carvalho[2], Carlos Zambiasi[2], Nelson Rodrigues[3], Alexandre Pinto[1], Heraldo de Oliveira[1] and José dos Reis[2], [1]BUG- Agentes Biológicos, Piracicaba, Brazil, [2]Centro Universitário Moura Lacerda, Ribeirão Preto - SP, Brazil, [3]Usina Santo Antônio, Ribeirão Preto - SP, Brazil

SD0332 Applications of *Mesocyclops* spp. (Copepoda: Cyclopidae) to control larvae of *Aedes aegypti* and *Ae. albopictus* in flooded basements in metropolitan Kaohsiung, Taiwan. Ying-Chieh Lee[1], Kuo-Chih Wu[1], Chia-Hung Ni[2], Cheng-Yen Tasi[1], Tsai-Ying Yen[1], Chia-Hung Tsai[1], Yi-Ting Lai[1], Chin-Gi Huang[1], Wen-Jer Wu[1], Huei-Bin Ho[2], Chaur-Dong Chen[2] and **Kun-Hsien Tsai**, kunhtsai@ntu.edu.tw[1], [1]National Taiwan Univ., Taipei, Taiwan, [2]Dept. of Health, Kaohsiung City, Taiwan

SD0333 Comparison between biological and conventional management caterpillars in soybeans. **Lucas Cantori**, lucas@occasio.com.br[1], Alexandre Pinto[2], Murilo Litholdo[3], Thiago Sutherland[4] and Diogo Carvalho[2], [1]Ocassio, Piracicaba, Brazil, [2]BUG-Agentes Biológicos, Piracicaba, Brazil, [3]Centro Universitário Moura Lacerda, Ribeirão Preto - SP, Brazil, [4]Usina Agro Serra, São Raimundo das Mangabeiras, MA, Brazil

SD0334 *Paysandisia archon* (Burmeister, 1880) parasitized in laboratory by Trichogramma : First success. **Elisabeth Tabone**, elisabeth.tabone@paca.inra.fr[1], Emma Ferrero[1], Annabel Fourcade[1], Etty Colombel[1], Bastien Cabrol[1], Maurane Buradino[1], Fiona Gaglio[1] and Jean-Claude Martin[2], [1]INRA, Antibes, France, [2]INRA, Avignon, France

SD0335 *Aedes* cadherin mediates the *in vivo* toxicity of the Cry11Aa toxin to *Aedes aegypti*. **Jianwu Chen**, jwchen97@yahoo.com, Su-Bum Lee, Karlygash G. Aimanova and Sarjeet S. Gill, Univ. of California, Riverside, CA

SD0336 Utilizing *Metarhizium anisopliae* Strain F52 for control of black vine weevil *Otiorhynchus sulcatus* (Fabricius) (Coleoptera:Curculionidae). **Chase Metzger**, cwmetzger@wsu.edu and Kim Patten, Washington State Univ., Long Beach, WA

SD0337 Degree of treatment and pest control effect according to chemical spraying methods in areas of paprika cultivation. **Na-Young Jin**, dool12340@nate.com, You-Kyoung Lee, Yu-Seop Kim, Jun-Hack Jeon, Bo-Ram Lee, Mi-Ja Seo, Young-Nam Youn and Yong-Man Yu, Chungnam National Univ., Daejeon, South Korea

SD0338 Endosymbiont *Wolbachia* infection status with disease vector arthropod in South Korea. **Chan Hee Park**, haema9@gmail.com[1], HyungWoo Lim[1], Hyun Woo Kim[1], Wook Gyo Lee[1], Jong Yul Roh[2], Young Ran Ju[1] and E-Hyun Shin[1], [1]Korea National Institute of Health, Cheongwon-gun, South Korea, [2]Korea National Institute of Health, Chungbuk, South Korea

SD0339 Application of RNAi of *Bemisia tabaci* (Hemiptera: Aleyrodidae) with cDNA Library Construction. **Na-Yeon Ko**, 042-jung@hanmail.net, Jung-Kyu Kim, Hye-Ri Kwon, Tae-Hee Ryu, Yu-Bin Jung, Chan-yeong Kang, Hyun-Seung Kim, Mi-Ja Seo, Hyoun-Sub Lim, Yong-Man Yu and Young-Nam Youn, Chungnam National Univ., Daejeon, South Korea

SD0340 Isolation and characterization of *Bacillus thuringiensis* strains with insecticidal activity to lepidopteran pests. **You-Kyoung Lee**, dldbrud119@hanmail.net, Na-Young Jin, Jun-Hack Jeon, Yu-Seop Kim, Bo-Ram Lee, Mi-Ja Seo, Young-Nam Youn and Yong-Man Yu, Chungnam National Univ., Daejeon, South Korea

SD0341 Characterization of an novel chitin binding protein-like venom protein from Pteromalus puparum, an pupal endoparasitoid of Pieris rapae. **Yu Zhu**, zhuyuphd@foxmail.com, Qi Fang and Gongyin Ye, Zhejiang Univ., Hangzhou, China

SD0342 Singing all day long: the role of substrate-born vibrations in mating behaviour of the leafhopper *Empoasca vitis* (Göthe). **Rachele Nieri**, rachele.nieri@fmach.it[1], and Valerio Mazzoni[2], [1]Università di Firenze, Florence, Italy, [2]Fondazione Edmund Mach, San Michele all'Adige (TN), Italy

SD0343 Nutritional signals working through Insulin signaling pathway promote male accessory gland cell growth. **Jingjing Xu**, jxu222@uky.edu, Subba R. Palli and Ashlee Anciro, Univ. of Kentucky, Lexington, KY

SD0344 The influence of host species and location in the host detection ability of tiphiid (Hymenoptera: Tiphiidae) parasitoids. **Piyumi Obeysekara**, Piyumi.Obeysekara@ag.tamu.edu[1], and Ana Legrand[2], [1]Texas A&M Univ., College Station, TX, [2]Univ. of Connecticut, Storrs, CT

SD0345 Immune cell regeneration in the common bed bug (*Cimex lectularius*). **Rebecca Wilson**, boa08rmw@sheffield.ac.uk and Michael T. Siva-Jothy, Univ. of Sheffield, Sheffield, United Kingdom

SD0346 Determining the ability of *Dalotia coriaria* as a predator of larval *Drosophila suzukii* using functional response assays and molecular diagnostics. Zachariah Telfer[1], **Justin Renkema**, renkemaj@uoguelph.ca[1], Tara Gariepy[2] and Rebecca Hallett[1], [1]Univ. of Guelph, Guelph, ON, Canada, [2]Agriculture & Agri-Food Canada, London, ON, Canada

SD0347 An immunomarking technique for pinpointing arthropod predation events. **James Hagler**, james.hagler@ars.usda.gov, USDA - ARS, Maricopa, AZ

SD0348 Suitability of sugars and honeydew as food sources for *Psyttalia lounsburyi*, a parasitoid of olive fruit fly. **Livy Williams**, lwilliams@ars-ebcl.org[1], Michelangelo La Spina[1], Pauline Deschodt[2], Olivia Pointurier[2] and Emilie Deletre[3], [1]USDA - ARS, Montpellier, France, [2]Montpellier SupAgro, Montpellier, France, [3]UR Hortsys, CIRAD, Montpellier, France

SD0349 Evaluation of *Beauveria bassiana* spores compatibility with Bio-plastic surfactant to control tarnished plant bug (*Lygus lineolaris*) in cotton. **Maribel Portilla**, maribel.portilla@ars.usda.gov[1], Hamed Abbas[2], Cesare Accinelli[3] and Randall Luttrell[1], [1]USDA - ARS, Stoneville, MS, [2]USDA - ARS, Stonevilla, MS, [3]Univ. of Bologna, Bologna, Italy

SD0350 Biological control of pests in organic cole crops in coastal California. Diego J. Nieto and **Janet A. Bryer**, jbryer@ucsc.edu, Univ. of California, Santa Cruz, CA

SD0351 Winter Moth (*Operophtera brumata*): Biological control and population dynamics in the Northeastern United States. **Joseph Elkinton**, elkinton@ent.umass.edu and George Boettner, Univ. of Massachusetts, Amherst, MA

SD0352 Biological control strategies for management of croton scale, *Phalacrococcus howertoni* (Hemiptera: Coccidae), a new invasive pest in Florida. **Muhammad Haseeb**, Muhammad.Haseeb@FAMU.EDU[1], Lambert Kanga[2] and Netalie Francis[1], [1]Florida A&M Univ., Tallahassee, FL, [2]Florida Agricultural and Mechanical Univ., Tallahassee, FL

2:15 0353 The addition of kairomones for larval and adult pest management: supporting tactics for enhanced biological control. **Douglas Light**, doug.light@ars.usda.gov, USDA - ARS, Albany, CA

2:30 0354 Management of *Tuta absoluta* in tomato by mass trapping. **Cam Oehlschlager**, cam@pheroshop.com, ChemTica Internacional, San Jose, Costa Rica

2:45 0355 Area-wide mating disruption of a major citrus pest using an off-ratio blend. **Stephen L. Lapointe**, stephen.lapointe@ars.usda.gov, USDA - ARS, Ft. Pierce, FL

3:00 Break 2

3:15 0356 Predator conservation in protected agriculture. **Laura L. Ingwell**, laura.ingwell@gmail.com[1], Rick Foster[2] and Ian Kaplan[2], [1]Univ. of Idaho, Moscow, ID, [2]Purdue Univ., West Lafayette, IN

3:30 0357 Local and foreign field surveys of parasitoids of *Drosophila suzukii*. **Betsey Miller**, millebet@hort.oregonstate.edu[1], Vaughn Walton[1], Daniel T. Dalton[1], Gianfranco Anfora[2], Jeffrey C. Miller[1] and Xin-geng Wang[3], [1]Oregon State Univ., Corvallis, OR, [2]Fondazione Edmund Mach, San Michele all'Adige (TN), Italy, [3]Univ. of California, Berkeley, CA

3:45 0358 Insect vectors are 'deceptively' attracted to sub-optimal trees infected by a bacterial pathogen; can the environment be manipulated to prevent vectors from finding infected trees? **Lukasz Stelinski**, stelinski@crec.ifas.ufl.edu, Univ. of Florida, Lake Alfred, FL

4:00 Break 3

4:15 SP0359 The history of Asian citrus psyllid, *Diaphorina citri* (Hemiptera: Liviidae), biological control in the United States, with special reference to Florida. **Eric Rohrig**, Eric.Rohrig@freshfromflorida.com and Trevor Smith, Florida Dept. of Agriculture and Consumer Services, Gainesville, FL

4:27 SP0360 Hydrilla integrated pest management: research is improving extension efforts. Julie Baniszewski[1], Joan Bradshaw[2], James P. Cuda[1], Jennifer Gillett-Kaufman[1], Ken Gioeli[3], Raymond L. Hix[4], Eutychus Kariuki[4], Verena-Ulrike Lietze[1], Judy Shearer[5] and **Emma N. I. Weeks**, eniweeks@ufl.edu[1], [1]Univ. of Florida, Gainesville, FL, [2]Univ. of Florida, Lecanto, FL, [3]Univ. of Florida, Ft. Pierce, FL, [4]Florida A&M Univ., Tallahassee, FL, [5]US Army, Vicksburg, MS

4:39 0361 Reinforcing biological control in orchards: spray less with behavior enhancing baits. **Alan L. Knight**, aknight@yarl.ars.usda.gov, USDA - ARS, Wapato, WA

4:54 0362 On red, yellow and green. **Peter Witzgall**, peter.witzgall@ice3.se, Swedish Univ. of Agricultural Sciences, Alnarp, Sweden

Member Symposium: Horizons in the Field of Symbiosis

Portland Ballroom 252 (Oregon Convention Center)

Moderators and Organizers: Jacob Russell[1] and John McCutcheon[2], [1]Drexel Univ., Philadelphia, PA, [2]Univ. of Montana, Missoula, MT

1:15 Welcoming Remarks

1:20 0363 A genotoxic gut symbiont of honey bees with a unique colonization phenotype. **Philipp Engel**, philipp.engel@unil.ch[1], Maria Vizcaino[2], Kelsey Bartlett[3], Jason Crawford[2] and Nancy Moran[4], [1]Univ. of Lausanne, Lausanne, Switzerland, [2]Yale Univ., West Haven, CT, [3]Univ. of New Haven, West Haven, CT, [4]Yale Univ., New Haven, CT

1:40 0364 Spiroplasma-mediated defense against parasitic nematodes in Drosophila. **Steve J. Perlman**, stevep@uvic.ca, Phineas Hamilton, Benjamin Koop, Jong Leong, Martin Boulanger and Fangni Peng, Univ. of Victoria, Victoria, BC, Canada

2:00 0365 Beewolves' bodyguards: Evolution, ecology, and genomics of symbiont-mediated antibiotic defense in solitary wasps.

Martin Kaltenpoth, mkaltenpoth@ice.mpg.de, Max Planck Institute for Chemical Ecology, Jena, Germany

2:20 0366 Diverse phage roles in an aphid defensive mutualism. **Kerry M. Oliver**, kmoliver@uga.edu, Adam J. Martinez and Stephanie Weldon, Univ. of Georgia, Athens, GA

2:40 0367 An elegant mechanism regulates amino acid biosynthesis in the pea aphid/Buchnera holosymbiont. **Alex C.C. Wilson**, acwilson@bio.miami.edu, Univ. of Miami, Coral Gables, FL

3:00 0368 The intracellular symbiont Rickettsia influences whitefly biology in multiple ways. **Martha S. Hunter**, mhunter@Ag.arizona.edu, Anna G. Himler, Paul Nabity, Bodil N. Cass and Peter Asiimwe, Univ. of Arizona, Tucson, AZ

3:20 Break

3:30 0369 Wolbachia infections for vector-borne disease control: Letting the genie out of the bottle? **Grant Hughes**, glh20@psu.edu, Jason Rasgon and Brittany Dodson, Pennsylvania State Univ., Univ. Park, PA

3:50 0370 Unraveling tri-partite symbiosis in the termite gut with the goal of improved biomass-to-biofuel processing. **Brittany F. Peterson**, peter137@purdue.edu and Michael E. Scharf, Purdue Univ., West Lafayette, IN

4:10 0371 Pathogen genome sequences without culturing. **Dustin Brisson**, dbrisson@sas.upenn.edu and Aaron Leichty, Univ. of Pennsylvania, Philadelphia, PA

4:30 0372 Population genomic and transcriptomic insights into symbiont adaptation during a rapid insect invasion. **Amanda Brown**, amvbrown@gmail.com, Lynn Huynh and John McCutcheon, Univ. of Montana, Missoula, MT

4:50 0373 Convergent acquisition of symbionts by ants at extreme ends of the trophic scale. **Piotr Lukasik**, pl356@drexel.edu[1], Corrie Moreau[2] and Jacob Russell[1], [1]Drexel Univ., Philadelphia, PA, [2]Field Museum of Natural History, Chicago, IL

5:10 Concluding Remarks

2014 Symposium of the Society of Regulatory Entomology. Alternatives to Rulemaking: Non-regulatory Solutions for Regulatory Problems

E145 (Oregon Convention Center)

Moderators and Organizers: Laura Jeffers[1] and David E. Bellamy[2], [1]USDA - APHIS, Raleigh, NC, [2]USDA - ARS, Parlier, CA

1:15 Welcoming Remarks

1:20 0374 Alternatives to rulemaking: flexible approaches to advance animal and plant health and animal welfare. **Michael Gregoire**, Michael.C.Gregoire@aphis.usda.gov, USDA - APHIS, Washington, DC

1:50 0375 Getting along in a complicated world: regional cooperation to reduce the need for rulemaking. **Robert G. Ahern**, robert.g.ahern@usda.gov, Sanidad Agropecuaria e Inocuidad de Alimentos, San Jose, Costa Rica

2:15 0376 Alternatives to regulating genetically-engineered arthropods. **Michael Firko**, Michael.J.Firko@usda.gov, USDA - APHIS, Riverdale, MD

2:40 0377 Biologics potency: rulemaking alternatives for Veterinary Services. **Larry Granger**, Larry.M.Granger@aphis.usda.gov, USDA - APHIS, Fort Collins, CO

3:05 Break

3:25 0378 Post-harvest quarantine treatment strategies to reduce the regulatory red tape. **Laura Jeffers**, laura.a.jeffers@aphis.usda.gov, USDA - APHIS, Raleigh, NC

3:50 0379 Research and methods development to support rulemaking alternatives. **Woodward Bailey**, woodward.d.bailey@aphis.usda.gov, USDA - APHIS, Miami, FL

4:15 0380 Systems approaches as pest mitigations to reduce regulations needed for trade. **Michael K. Hennessey**, michael.k.hennessey@aphis.usda.gov, USDA, Raleigh, NC

4:40 0381 From beating around the bush to beating the system: the application of ecological niche modeling for determination of risk. **Lisa Neven**, Lisa.Neven@ars.usda.gov, USDA - ARS, Wapato, WA

P-IE Section Symposium: Bt Resistance Monitoring: Strengths, Limitations, and Challenges

E146 (Oregon Convention Center)

Moderators and Organizers: Jeff Gore[1], Scott D. Stewart[2], William D. Hutchison[3], Angus Catchot[4], and Walt Mullins[5], [1]Mississippi State Univ., Stoneville, MS, [2]Univ. of Tennessee, Jackson, TN, [3]Univ. of Minnesota, Saint Paul, MN, [4]Mississippi State Univ., Mississippi State, MS, [5]Bayer CropScience, Collierville, TN

1:15 Welcoming Remarks

1:20 0382 Historical perspective on monitoring for chemical insecticides. **Rick Roush**, rtr10@psu.edu, Univ. of Melbourne, Melbourne, Australia

1:40 0383 Historical perspective on how we have used monitoring for PIP's. **William Hutchison**, hutch002@umn.edu, Univ. of Minnesota, Saint Paul, MN

2:00 0384 Current monitoring requirements for Bt crops. **Alan Reynolds**, reynolds.alan@epa.gov, U.S. Environmental Protection Agency, Washington, DC

2:20 0385 Resistance monitoring for European corn borer. **Miles Lepping**, mdlepping@dow.com[1], Terence A. Spencer[2] and Blair Siegfried[2], [1]Univ. of Maryland, College Park, MD, [2]Univ. of Nebraska, Lincoln, NE

2:40 0386 Detection of Resistance to Bt Corn by Western Corn Rootworm: Matching Monitoring with Pest Biology. **Aaron Gassmann**, aaronjg@iastate.edu, Iowa State Univ., Ames, IA

3:00 Break

3:15 0387 Monitoring for corn earworm resistance in Bt sweet corn. **Galen Dively**, galen@umd.edu, Univ. of Maryland, College Park, MD

3:35 0388 Convergence on practical definitions of resistance and related decision-making criteria for IRM. **Timothy J. Dennehy**, timothy.dennehy@bayer.com, Univ. of Arizona, Tucson, AZ

3:55 0389 Monitoring perspective for tobacco budworm and bollworm in the Mid-South. **Randall Luttrell**, randy.luttrell@ars.usda.gov[1], Nathan Little[1], Omaththage P. Perera[1], Clint Allen[1], Maribel Portilla[1], Fred R. Musser[2], Don Cook[3] and Jeff Gore[3], [1]USDA - ARS, Stoneville, MS, [2]Mississippi State Univ., Mississippi State, MS, [3]Mississippi State Univ., Stoneville, MS

4:15 0390 Where do we go from here? **Scott D. Stewart**, sdstewart@utk.edu, Univ. of Tennessee, Jackson, TN

4:35 Discussion

P-IE Section Symposium: Global Grand Challenges and Opportunities in Grassland Entomology

D137-138 (Oregon Convention Center)

Moderators and Organizers: Jennifer White and Daniel Potter, Univ. of Kentucky, Lexington, KY

1:15 Introductory Remarks

1:20 0391 Ecological determinants of arthropod diversity in North American grasslands: fire, grazing and stoichiometry. **Anthony Joern**, ajoern@ksu.edu[1], Spencer T. Behmer[2], Angela N. Laws[3], Jesus Gomez[1] and Ellen Welti[1], [1]Kansas State Univ., Manhattan, KS, [2]Texas A&M Univ., College Station, TX, [3]Univ. of Notre Dame, Notre Dame, IN

1:45 0392 Grassland management for pollinators in a working landscape: Ecological and sociological challenges and successes. **Diane Debinski**, debinski@iastate.edu[1], Ray Moranz[1], James Miller[2], David Engle[3], John Delaney[1] and Lois Wright Morton[1], [1]Iowa State Univ., Ames, IA, [2]Univ. of Illinois, Urbana, IL, [3]Oklahoma State Univ., Stillwater, OK

2:10 0393 Sustainable management of grasshoppers in grassland ecosystems using fire and livestock grazing. **David Branson**, dave.branson@ars.usda.gov, USDA - ARS, Sidney, MT

2:35 0394 Bioenergy and beyond: Grasslands support farmland biodiversity and multiple ecosystem services. **Benjamin Werling**, werlingb@anr.msu.edu[1], Doug Landis[2], Rufus Isaacs[2], Claudio Gratton[3] and Timothy D. Meehan[3], [1]Michigan State Univ., Hart, MI, [2]Michigan State Univ., East Lansing, MI, [3]Univ. of Wisconsin, Madison, WI

3:00 Break

3:15 0395 Invertebrates in the airport landscape: implications for safety. **Thomas Seamans**, thomas.w.seamans@aphis.usda.gov, Bradley Blackwell and Brian Washburn, USDA - APHIS, Sandusky, OH

3:40 0396 Impacts and biological control of exotic pasture weevil pests in New Zealand. **Mark McNeill**, mark.mcneill@agresearch.co.nz[1], Stephen Goldson[1], Craig Phillips[1], Colin Ferguson[2] and Pip Gerard[3], [1]AgResearch Ltd, Christchurch, New Zealand, [2]AgResearch Ltd, Mosgiel, New Zealand, [3]AgResearch Ltd, Hamilton, New Zealand

4:00 0397 Native insect pests in an exotic pastoral ecosystem: sustainable management options using insect pathogens. **Sue Zydenbos**, Sue.Zydenbos@agresearch.co.nz[1], Mark Hurst[1], Sean Marshall[1], Tracey Nelson[1], Richard Townsend[1], Colin Ferguson[2], Jessica Dunbar[3], Per Wessman[1], Sarah Mansfield[1], Trevor Jackson[1] and Maureen O'Callaghan[1], [1]AgResearch Ltd, Christchurch, New Zealand, [2]AgResearch Ltd, Mosgiel, New Zealand, [3]Landcorp Farming Ltd, Wellington, New Zealand

4:20 0398 A collapse in biological control of Argentine stem weevil in New Zealand grassland ecosystems. **Stephen Goldson**, stephen.goldson@agresearch.co.nz[1], Mark McNeill[1], Craig Phillips[1], Scott Hardwick[1], Pip Gerard[2], Steve Wratten[3], Federico Tomasetto[3], Alison Popay[2], Barbara Barratt[4], Colin Ferguson[4] and Jason Tylianakis[5], [1]AgResearch Ltd, Christchurch, New Zealand, [2]AgResearch Ltd, Hamilton, New Zealand, [3]Lincoln Univ., Lincoln, New Zealand, [4]AgResearch Ltd, Mosgiel, New Zealand, [5]Univ. of Canterbury, Christchurch, New Zealand

4:35 0399 The great American lawn: Promoting invertebrate services for increased sustainability. **Daniel Potter**, dapotter@email.uky.edu, Emily K. Dobbs, Carl T. Redmond and Jonathan L. Larson, Univ. of Kentucky, Lexington, KY

5:00 Concluding Remarks

Member Symposium: Nutrition and the Health and Behavior of Wild and Managed Bees

D139-140 (Oregon Convention Center)

Moderators and Organizers: S. Hollis Woodard[1], Adam Dolezal[2] and Amy L. Toth[2], [1]Univ. of Texas, Austin, TX, [2]Iowa State Univ., Ames, IA

1:15 Introductory Remarks

1:20 0400 Seasonal shifts in the bacterial community structure of newly-collected and hive-stored pollen of honey bees (*Apis mellifera*). **Kirk E. Anderson**, kirk.anderson@ars.usda.gov, USDA - ARS, Tucson, AZ

1:38 0401 Diversity of pollen diet and viral infection profiles affect survival and physiology in honey bees. **Adam Dolezal**, adolezal@iastate.edu, Iowa State Univ., Ames, IA

1:56 0402 Effects of urbanization on immunocompetence and disease ecology of feral and managed honey bees. **David Tarpy**, drtarpy@ncsu.edu, North Carolina State Univ., Raleigh, NC

2:14 0403 Maturation-related gene expression changes in the pars intercerebralis of the honey bee brain. **Marsha M. Wheeler**, wheele10@illinois.edu, Univ. of Florida, Gainesville, FL

2:32 0404 Dissecting tissue-specific effects of pollen deprivation using high-throughput sequencing. **Vanessa Corby-Harris**, vanessa.corby@ars.usda.gov, USDA - ARS, Tucson, AZ

2:50 0405 Honey: A superfood for *Apis mellifera*. **May R. Berenbaum**, maybe@illinois.edu, Univ. of Illinois, Urbana, IL

3:08 Break

3:23 0406 Effects of dietary nutrients on mating, longevity, and reproductive success in queen bumble bees (*Bombus impatiens*). **S. Hollis Woodard**, euglossine@utexas.edu, Univ. of Texas, Austin, TX

3:41 0407 Patterns of pollen feeding in adult male and female solitary bees. **Heidi Dobson**, dobsonhe@whitman.edu, Whitman College, Walla Walla, WA

3:59 0408 Comparing nutrient acquisition from natural forage vs protein supplements and measuring the effects on colony health. **Gloria DeGrandi-Hoffman**, Gloria.Hoffman@ars.usda.gov, Carl Hayden Bee Research Center, Tucson, AZ

4:17 0409 Dietary pollen needs of adult female solitary bees. **James H. Cane**, Jim.Cane@ars.usda.gov, USDA - ARS, Logan, UT

4:35 0410 Nutritional regulation of behavior and honey bee health. **Miguel Corona**, miguel.corona@ars.usda.gov, USDA - ARS, Beltsville, MD

4:53 0411 The effects of nutritional stress on pheromone-mediated interactions. **Mark J. Carroll**, Mark.Carroll@ars.usda.gov, USDA - ARS, Tucson, AZ

Member Symposium: Advances in Pest Management for Turfgrass and Ornamentals

E143-144 (Oregon Convention Center)

Moderators and Organizers: Terri Billeisen and Adam Dale, North Carolina State Univ., Raleigh, NC

1:15 Introductory Remarks

1:20 0412 Management of invasive whiteflies in the south Florida landscape. **Catharine M. Mannion**, cmannion@ufl.edu, Univ. of Florida, Homestead, FL

1:34 0413 Urban warming and pests combine to reduce street tree condition. **Adam Dale**, agdale2@ncsu.edu and Steven D. Frank, North Carolina State Univ., Raleigh, NC

1:48 0414 Evaluation of field efficacy of intelligent spray systems in nursery production. **Robin Rosetta**, robin.rosetta@oregonstate.edu[1], Heping Zhu[2], Richard C. Derksen[3], Michael Reding[2], Christopher Ranger[2], Luis A. Cañas[4], Charles Krause[3], James Locke[5], Stanley Ernst[6], Randall H. Zondag[7], Amy F. Fulcher[8], Yu Chen[4], Hong Young Jeon[2] and Jiabing Gu[9], [1]Oregon State Univ., Aurora, OR, [2]USDA - ARS, Wooster, OH, [3]Application Technology Research Unit, Wooster, OH, [4]The Ohio State Univ., Wooster, OH, [5]Greenhouse Production Research Laboratory, Toledo, OH, [6]The Ohio State Univ., Columbus, OH, [7]The Ohio State Univ., Painesville, OH, [8]Univ. of Tennessee, Nashville, TN, [9]Nanjing Agricultural Univ., Nanjing, China

2:02 0415 Can interactions between native and non-native plants in urban landscapes influence herbivore abundance and diversity? **Carl Clem**, csc0013@tigermail.auburn.edu, Auburn Univ., Auburn, AL

2:16 0416 Effects of irrigation and plant adaptations on ambrosia beetle susceptibility. **Steven D. Frank**, sdfrank@ncsu.edu[1], and Christopher Ranger[2], [1]North Carolina State Univ., Raleigh, NC, [2]USDA - ARS, Wooster, OH

2:30 0417 Mobile friendly landscape pest identification website for the southeast. **Steven P. Arthurs**, spa@ufl.edu[1], and Amanda C. Hodges[2], [1]Univ. of Florida, Apopka, FL, [2]Univ. of Florida, Gainesville, FL

2:44 0418 Characterization of detoxification enzymes activity in Japanese beetles. **Adekunle Adesanya**, awa0004@tigermail.auburn.edu and David Held, Auburn Univ., Auburn, AL

2:58 Break

3:08 0419 Neonicitinoid pollinator protection label changes and the potential impact on turf and ornamental pest management. **Donald Booth**, dbooth@barlettlab.com, Bartlett Tree Experts, Charlotte, NC

3:22 0420 A novel immunomarking technique for examining feeding behavior of turfgrass pests. **Terri Billeisen**, tlhoctor@ncsu.edu and Rick Brandenburg, North Carolina State Univ., Raleigh, NC

3:36 0421 Black cutworm control on putting greens with anthranilic diamides. **Eric Rebek**, eric.rebek@okstate.edu and Jackson Seibert, Oklahoma State Univ., Stillwater, OK

3:50 0422 Consequences of bacterial inoculation on herbivore development, behaviors, and tri-trophic interactions. **R. Murphey Coy**, rmc0023@tigermail.auburn.edu, Auburn Univ., Auburn, AL

4:04 0423 Spatial biology of annual white grubs on golf courses on Indiana: Implications for management. **Douglas Richmond**, drichmon@purdue.edu, Purdue Univ., West Lafayette, IN

4:18 0424 Evaluating a novel endophytic grass purported to reduce invertebrate populations and associated bird strike risk at airports. **Diana Miller**, diana_mil@sbcglobal.net, Carl T. Redmond and Daniel Potter, Univ. of Kentucky, Lexington, KY

4:32 0425 Towards sustainable management of the annual bluegrass weevil. **Albrecht Koppenhöfer**, koppenhofer@aesop.rutgers.edu and Olga Kostromytska, Rutgers, The State Univ. of New Jersey, New Brunswick, NJ

4:46 0426 New stories of an old pest: Two possible insecticide resistance mechanisms in the southern chinch bug. **Yao Xu**, bigantbrl@hotmail.com, Drion G. Boucias and Eileen A. Buss, Univ. of Florida, Gainesville, FL

5:00 0427 Demonstrating an increase in preference for young growth by Japanese Beetles, *Popillia japonica* Newman, in Wisconsin grape vineyards. **Reid Maier**, rmaier2@wisc.edu, Univ. of Wisconsin, Madison, WI

Member Symposium: Wireworms: The Resurgence of a Key Pest of North American Cropland

F150 (Oregon Convention Center)

Moderators and Organizers: Kevin Wanner[1] and Arash Rashed[2], [1]Montana State Univ., Bozeman, MT, [2]Univ. of Idaho, Aberdeen, ID

1:15 Introductory Remarks

1:25 0428 Managing click beetles to control wireworms: Desperate times, desperate measures? **Bob Vernon**, VernonBS@AGR.GC.CA and Wim van Herk, Agriculture & Agri-Food Canada, Agassiz, BC, Canada

1:45 0429 Developing IPM tools for the key wireworm species damaging cereal crops in Montana. **Anuar Morales-Rodriguez**, a.moralesrodriguez@montana.edu, Montana State Univ., Bozeman, MT

2:05 0430 Controlling wireworms. **Aaron Esser**, aarons@wsu.edu, Washington State Univ., Ritzville, WA

2:25 0431 Management of wireworms in potatoes. **Christine Noronha**, Christine.Noronha@AGR.GC.CA, Agriculture & Agri-Food Canada, Charlottetown, PEI, Canada

2:45 Break

3:15 0432 A trophic perspective on wireworms and their management. **Michael Traugott**, michael.traugott@uibk.ac.at, Univ. of Innsbruck, Innsbruck, Austria

3:35 0433 Ecology and management of wireworms (Coleoptera: Elateridae) in cereal crops. **Ivan Milosavljevic**, ivan.milosavljevic@email.wsu.edu, Washington State Univ., Pullman, WA

3:55 0434 Taxonomic difficulties associated with identifying pest wireworm species in North America. **Frank E. Etzler**, fetzler@montana.edu and Michael A. Ivie, Montana State Univ., Bozeman, MT

4:15 0435 Wireworms and wireworm management in irrigated crops in the Columbia Basin. **Amber Vinchesi**, amber.vinchesi@oregonstate.edu, Oregon State Univ., Hermiston, OR

4:35 Discussion

Member Symposium: Biological Control in Acarology: Present and Future Challenges

B110-112 (Oregon Convention Center)

Moderators and Organizers: Cesar Monzo[1] and Raul Villanueva[2], [1]Univ. of Florida, Immokalee, FL, [2]Texas A&M Univ., Weslaco, TX

1:15 Welcoming Remarks

1:20 0436 The future of classical biological control in acarology. **Marjorie A. Hoy**, mahoy@ufl.edu, Univ. of Florida, Gainesville, FL

1:40 0437 Reducing impacts of Asian citrus psyllid insecticide programs on phytoseiid mites assemblages. **Cesar Monzo**, cmonzo@ufl.edu and Philip A. Stansly, Univ. of Florida, Immokalee, FL

2:00 0438 A tale of two mites: *Amblydromella caudiglans* and *Galendromus occidentalis* in Washington apple. **Rebecca Schmidt**, rebecca.schmidt@wsu.edu and Elizabeth E. Beers, Washington State Univ., Wenatchee, WA

2:20 0439 Current challenges in the biological control of spider mites in California walnuts. **Nicholas J. Mills**, nmills@berkeley.edu[1], Elizabeth Grafton-Cardwell[2], and Kris Tollerup[3], [1]Univ. of California, Berkeley, CA, [2] Univ. of California, Parlier, CA, [3]Univ. of California, Davis, CA

2:40 0440 Progress in the use of predatory mites in pest control. Maurice W. Sabelis[1], Arne Janssen[1], and **Karen Munoz Cardenas**, k.a.munozcardenas@uva.nl[2], [1]Univ. of Amsterdam, Amsterdam, Netherlands [2]Faculty of Science IBED, Amsterdam, Netherlands

3:00 Break

3:10 0441 Rearing of predatory mites for different purposes. Marcela Ribeiro da Silva, **Marina Ferraz de Camargo Barbosa**, marina.ferraz@usp.br and Gilberto de Moraes, Universidade de São Paulo, Piracicaba, Brazil

3:30 0442 Biological control with predaceous mites in open-field crops. **Philip A. Stansly**, pstansly@ufl.edu and Jose Castillo, Univ. of Florida, Immokalee, FL

3:50 0443 Evaluating potato psyllids, whiteflies (the diseases they transmit), and predacious phytoseiid mites under organic insecticides programs. **Raul Villanueva**, rtvillanueva@ag.tamu.edu and Gabriela Esparza-Diaz, Texas A&M Univ., Weslaco, TX

4:10 0444 Biological control of tetranychids affecting *Carica papaya*. **Jorge Peña**, jepena@ufl.edu[1], Martha de Coss[2], Jonathan H. Crane[1], Octavio Menocal[1] and Armando Monterroso[3], [1]Univ. of Florida, Homestead, FL, [2]Universidad Autónoma de Chiapas, Teran Tuxla Gutierrez, Mexico, [3]Brooks Tropicals, Homestead, FL

4:30 0445 Exploring the diversity of prey and predators in their environment as an approach to control invasive mite pests. **Maria Navajas**, navajas@supagro.inra.fr, Institut National de la Recherche Agronomique (INRA), Montferrier Sur Lez, France

4:50 Concluding Remarks

4:55 Acarological Society of America Business Meeting

Member Symposium: Grand Challenges in Keeping and Fostering Women in Entomology: Working Toward a Brighter Future on Our Horizon

B113-114 (Oregon Convention Center)

Moderators and Organizers: Rebecca T. Trout Fryxell[1], Jackie Lee[2], Susan E. Moser[3], Carey R. Minteer[4], Katherine Parys[5], Beth Choate[6] and Robin Verble-Pearson[7], [1]Univ. of Tennessee, Knoxville, TN, [2]Oklahoma State Univ., Stillwater, OK, [3]DuPont Pioneer, Johnston, IA, [4]Univ. of Arkansas, Fayetteville, AR, [5]USDA - ARS, Stoneville, MS, [6]Allegheny College, Meadville, PA, [7]Texas Tech Univ., Lubbock, TX

1:15 Introductory Remarks

1:20 0446 Why we still need a women in entomology symposium. Patricia Prasifka, Dow AgroSciences, West Fargo, ND and **Rayda K. Krell**, rayda.krell@earthlink.net, Rayda K. Krell, LLC, Ridgefield, CT

1:44 0447 Hat juggling 101: The path of a woman in science. **Tina Teague**, tteague@astate.edu, Arkansas State Univ., State Univ., AR

2:08 0448 To be or not to be. . . . choosing a job outside of your comfort zone and succeeding. **Sonja Brannon Thomas**, sbt0010@auburn.edu, Auburn Univ., Auburn, AL

2:32 0449 Poor balance: What industry is doing to improve gender diversity in leadership. **Michelle S. Smith**, mssmith@dow.com, Dow AgroSciences, Indianapolis, IN

2:56 Break

3:11 0450 Navigating the landmines to reach the next level (as a woman). **Caula Beyl**, cbeyl@tennessee.edu, Univ. of Tennessee, Knoxville, TN

3:35 0451 Gender is a verb, too: Facilitating the success of the one woman in the room. **Robert N. Wiedenmann**, rwieden@uark.edu, Univ. of Arkansas, Fayetteville, AR

3:59 0452 Faculty recruitment and retention for diversity and excellence – S.T.R.I.D.E. at UT. **Bonnie Ownley**, bownley@utk.edu, Univ. of Tennessee, Knoxville, TN

4:23 0453 Finding a refuge and succeeding as a woman in science. **Hope Jahren**, jahren@hawaii.edu, Univ. of Hawai'i, Honolulu, HI

4:47 Discussion

Member Symposium: Contributions of Mosquito Research to Science & Society

B115-116 (Oregon Convention Center)

Moderator and Organizer: Lee W. Cohnstaedt, USDA - ARS, Manhattan, KS

1:15 0454 On the shoulders of giants: Mosquito research landmarks. **Leonard E. Munstermann**, Leonard.Munstermann@yale.edu, Yale Univ., New Haven, CT

1:30 0455 Ruminations on old and new mosquito research. **L. Philip Lounibos**, lounibos@ufl.edu, Univ. of Florida, Vero Beach, FL

2:00 0456 Nectarivory: A formerly obscure piece of the mosquito behavioral-ecology puzzle. **Woodbridge Foster**, foster.13@osu.edu, The Ohio State Univ., Columbus, OH

2:30 0457 Resolving fundamental questions in evolutionary genetics. **William Bradshaw**, bradshaw@uoregon.edu and Christina Holzapfel, Univ. of Oregon, Eugene, OR

3:00 0458 A snapshot in time: Single season continental scale mosquito collections. **Lee W. Cohnstaedt**, Lee.Cohnstaedt@ars.usda.gov, USDA - ARS, Manhattan, KS

3:15 0459 The most dangerous animal in the New World: Small may not be beautiful. **Jan E. Conn**, jconn@wadsworth.org, Wadsworth Center, New York State DOH, Slingerlands, NY

3:45 0460 Complex speciation of malaria vectors. **Nora J Besansky**, nbesansk@nd.edu, Univ. of Notre Dame, Notre Dame, IN

4:15 0461 Malaria vector diversity in Southeast Asia and beyond: Challenges and opportunities. **Brandyce St. Laurent**, brandyce.stlaurent@nih.gov, National Institutes of Health, Rockville, MD

4:45 0462 Preventing outdoor transmission of malaria among mobile migrant populations in the Greater Mekong Subregion. **Michael Reddy**, michael.reddy@gatesfoundation.org, Bill and Melinda Gates Foundation, Seattle, WA

MUVE Section Symposium: Triatominae from Genes to Populations: The Road to New Insights and Challenges on the Horizon of Vector Ecology

C124 (Oregon Convention Center)

Moderators and Organizers: Jennifer Peterson[1], Andrew Dobson[1], and Jennifer Chiang[2], [1]Princeton Univ., Princeton, NJ, [2]Redeemer Univ. College, Ancaster, ON, Canada

1:15 Welcoming Remarks

1:20 0463 From predator to blood-feeder: An outline on systematics and evolution of Reduviidae, with emphasis on Triatominae. **Christiane Weirauch**, christiane.weirauch@ucr.edu, Univ. of California, Riverside, CA

1:45 0464 Sexual physiology of the blood-feeding insect, *Rhodnius prolixus*, a vector of Chagas disease. **Gary Chiang**, gchiang@redeemer.ca and Jennifer Chiang, Redeemer Univ. College, Ancaster, ON, Canada

2:10 0465 Infection by trypanosomes alters the patterns of locomotor activity shown by *Rhodnius prolixus*. **Alessandra Guarneri**, guarneri@cpqrr.fiocruz.br, The Oswaldo Cruz Foundation in the State of Minas Gerais, Brazil, Belo Horizonte, MG, Brazil

2:35 Intermission

2:50 0466 Molecular systematics in Triatominae: Understanding evolutionary trends in emerging vectors species. **Andrés Goméz Palacio**, amgomezpa@gmail.com, Universidad de Antioquia, Medellín, Colombia

3:15 0467 Keeping cool: thermoregulation during feeding in kissing bugs. **Claudio Lazzari**, claudio.lazzari@univ-tours.fr, Universitei François Rabelais, Tours, France

3:40 0468 Bloodmeal host preference of *Triatoma sanguisuga* (Hemiptera: Reduviidae) from Louisiana. Samuel Jameson, Claudia Herrera and **Dawn M. Wesson**, wesson@tulane.edu, Tulane Univ., New Orleans, LA

3:55 Break

4:05 0469 Sensory cues affecting fecundity in the blood-feeding insect, *Rhodnius prolixus*, a vector of Chagas disease. **Jennifer Chiang**, jchiang@redeemer.ca, and Gary Chiang, Redeemer Univ. College, Ancaster, ON, Canada

4:20 0470 Learning and memory in the disease vector insect, *Rhodnius prolixus*. **Clement Vinauger**, vinauger@uw.edu[1], Laura Buratti[2], Helene Lallement[2], Marcos Pereira[3], and Claudio Lazzari[4], [1]Univ. of Washington, Seattle, WA, [2]Univ. Francì§ois Rabelais, Tours, France, [3]Departamento de Parasitologia-ICB/UFMG, Belo Horizonte, MG, Brazil, [4]Universitei François Rabelais, Tours, France

4:45 0471 How do Chagas disease vectors respond to anthropogenic land use change? The case of *Rhodnius pallescens* in rural Panamanian landscapes. **Nicole Gottdenker**, gottdenk@gmail.com[1], Jose Calzada[2] and Azael Saldaña[2], [1]Univ. of Georgia, Athens, GA, [2]Gorgas Memorial Research Institute, Panama, Panama

5:10 Concluding Remarks

PBT Section Symposium: Chemical Communication in Longhorned Beetles

C123 (Oregon Convention Center)

Moderators and Organizers: Robert Mitchell[1], Matthew Ginzel[2] and Elizabeth Graham[3], [1]Univ. of Arizona, Tucson, AZ, [2]Purdue Univ., West Lafayette, IN, [3]Michigan State Univ., East Lansing, MI

1:15 Introductory Remarks

1:18 0472 Why the long horn: chemosensory receptors and pathways in the cerambycid antenna. **Robert Mitchell**, rfmitchell@email.arizona.edu and John Hildebrand, Univ. of Arizona, Tucson, AZ

1:38 0473 Initial attempts at understanding the peripheral olfactory system of the Asian longhorned beetle, *Anoplophora glabripennis*. **Loyal Hall**, lph1@psu.edu[1], Jianrong Wei[2], Robert Mitchell[3], Kelli Hoover[1], John Hildebrand[3], Michael Domingue[1] and Thomas C. Baker[1], [1]Pennsylvania State Univ., Univ. Park, PA, [2]Hebei Univ., Baoding, China, [3]Univ. of Arizona, Tucson, AZ

1:58 0474 Identification and behavior of a third male produced pheromone component for *Anoplophora glabripennis*. **Damon J. Crook**, damon.j.crook@aphis.usda.gov[1], D. R. Lance[1], Ann M. Ray[2], Joseph A. Francese[1] and Victor C. Mastro[1], [1]USDA - APHIS - PPQ - CPHST, Buzzards Bay, MA, [2]Xavier Univ., Cincinnati, OH

2:18 0475 A sex-specific trail pheromone is part of the complex mate finding behavior in the Asian longhoned beetle. **Melody A. Keena**, mkeena@fs.fed.us[1], Kelli Hoover[2], Maya Nehme[3], Shifa Wang[4], Peter S. Meng[2] and Aijun Zhang[5], [1]USDA - Forest Service, Hamden, CT, [2]Pennsylvania State Univ., Univ. Park, PA, [3]Lebanese Univ., Beirut, Lebanon, [4]Nanjing Forestry Univ., Nanjing, China, [5]USDA - ARS, Beltsville, MD

2:38 0476 Male-specific compounds in cuticular hydrocarbons of *Monochamus* species are responsible for sex recognition. **David R. Hall**, D.R.Hall@greenwich.ac.uk[1], Estela Sanchez[2] and Juan Pajares[2], [1]Univ. of Greenwich, Kent, United Kingdom, [2]Univ. of Valladolid, Palencia, Spain

2:58 0477 Towards understanding pheromone biosynthesis in the Cerambycinae (Coleoptera: Cerambycidae). **Gabriel Hughes**, ghughes@purdue.edu and Matthew Ginzel, Purdue Univ., West Lafayette, IN

3:18 Break

3:32 0478 Female long-range pheromone for *Megopis costipennis* (Cerambycidae: Prioninae). **Jacob D. Wickham**, wickham@iccas.ac.cn[1], Rhett Harrison[2], Wen Lu[3], Yi Chen[4], Lawrence M. Hanks[5], and Jocelyn G. Millar[6], [1]Institute of Chemistry, Chinese Academy of Sciences, Zhongguancun, China, [2]Chinese Academy of Sciences, Kunming, China, [3]Guangxi Univ., Nanning, China, [4]Institute of Chemistry, Chinese Academy of Sciences, Beijing, China, [5]Univ. of Illinois, Urbana, IL, [6]Univ. of California, Riverside, CA

3:52 0479 Mating Disruption of *Prionus californicus*. **Glenn Thayer**, gthayer@nwi.net, Pacific Biocontrol Corporation, Wenatchee, WA, James D. Barbour[1], and Diane G. Alston[2], [1]Univ. of Idaho, Parma, ID, [2]Utah State Univ., Logan, UT

4:12 0480 Factors affecting diversity and abundance of longhorn beetles captured in semiochemical-baited traps. **Jon Sweeney**, jsweeney@nrcan.gc.ca[1], Peter J. Silk[1], Reginald Webster[1], Daniel R. Miller[2], Jerzy Gutowski[3], Krista Ryall[4], Qingfan Meng[5], Li Yan[5], Leah Flaherty[6], David Langor[7], Greg Pohl[7], Robert Johns[1], Vasily Grebennikov[8], P. Mayo[1], Bruce Gill[8] and Troy Kimoto[9], [1]Natural Resources Canada, Fredericton, NB, Canada, [2]USDA - Forest Service, Athens, GA, [3]Forest Research Institute, Bialowieza, Poland, [4]Natural Resources Canada, Canadian Forest Service, Sault Ste. Marie, ON, Canada, [5]Beihua Univ., Jilin City, China, [6]MacEwen Univ., Edmonton, AB, Canada, [7]Natural Resources Canada, Edmonton, AB, Canada, [8]Canadian Food Inspection Agency, Ottawa, ON, Canada, [9]Canadian Food Inspection Agency, Burnaby, BC, Canada

4:32 0481 Evaluation of lure and trap design to survey for longhorned beetles in southeast Alaska. **Ann M. Ray**, raya6@xavier.edu[1], Michael Apicella[1], Alexander Vaisvil[1], Max Buot[1] and Elizabeth Graham[2], [1]Xavier Univ., Cincinnati, OH, [2]USDA - Forest Service, Juneau, AK

4:52 0482 Ready for prime time: quarantine monitoring for exotic Cerambycids with semiochemicals. **Lawrence M. Hanks**, hanks@life.illinois.edu[1], and Jocelyn G. Millar[2], [1]Univ. of Illinois, Urbana, IL, [2]Univ. of California, Riverside, CA

5:12 Concluding Remarks

Organized Meeting: International Association of Black Entomologists: Embracing Diversity Through Global Education and Collaboration in Entomology

Portland Ballroom 254 (Oregon Convention Center)

Moderators and Organizers: Michelle Samuel-Foo[1], Simon Zebelo[2], and Mamoudou Setamou[3], [1]Univ. of Florida, Gainesville, FL, [2]Auburn Univ., Auburn, AL, [3]Texas A&M Univ., Weslaco, TX

1:15 Welcoming Remarks

1:25 0483 The International Association of Black Entomologists: History and accomplishments. **Henry Fadamiro**, fadamhy@auburn.edu, Auburn Univ., Auburn, AL

1:45 0484 Agricultural insect pest solutions by cooperative international research. **Alvin M. Simmons**, alvin.simmons@ars.usda.gov, USDA - ARS, Charleston, SC

2:05 0485 Using colloborative efforts and experience to reduce exposure to toxic pesticide residues in developing countries. **Oscar Liburd**, oeliburd@ufl.edu, Univ. of Florida, Gainesville, FL

2:25 0486 How world collaboration helped the success of a tropical fruit entomology program. **Jorge Peña**, jepena@ufl.edu, Univ. of Florida, Homestead, FL

2:45 Break

SD0487 An island of insect diversity in Central Park (New York City). **Jhunior Morillo**, morillojhunior@gmail.com, Amy Berkov and Jordan Ng, City College of New York, New York, NY

SD0488 What makes an Amazonian biodiversity hotspot hot? **Amy Berkov**, berkov@sci.ccny.cuny.edu, City College of New York, New York, NY

SD0489 Susceptibility to insecticides and enzymatic mechanisms of resistance of *Aedes aegypti* (L.) in Puerto Rico. **Gustavo Ponce**, gponcealfa@gmail.com[1], Samantha Del Río[2], Adriana Flores[2], Roberto Barrera[3], Gilberto Felix[3] and Manuel Amador[4], [1]Universidad Autónoma de Nuevo León, Guadalupe, N. L., Mexico, [2]Universidad Autónoma de Nuevo León, San Nicolas de los Garza, Mexico, [3]Centers for Disease Control and Prevention, San Juan, PR, [4]Univ. of Puerto Rico, San Juan, PR

SD0490 Judging a beetle by its cover: Does elytral melanism predict microhabitat? **Ricky Zhu**, rzhubio@gmail.com, City College of New York, New York, NY

3:05 0491 Promoting diversity through interdisciplinary and international endeavours. **Nilsa A. Bosque-Pérez**, nbosque@uidaho.edu, Univ. of Idaho, Moscow, ID

3:25 0492 International networking and the land grant university mission: A perspective as an exchange student, CGIAR scientist, USDA program leader and university faculty member. **Steve Yaninek**, yaninek@purdue.edu, Purdue Univ., West Lafayette, IN

3:45 0493 Science for development - the importance of capacity building. **Christian Borgemeister**, cb@uni-bonn.de, Center for Development Research (ZEF), Univ. of Bonn, Bonn, Germany

4:05 Panel Discussion

4:30 Concluding Remarks

Organized Meeting: SOLA Scarab Workers

A103-104 (Oregon Convention Center)

Moderator and Organizer: Andrew B. T. Smith, Canadian Museum of Nature, Ottawa, ON, Canada

1:15 Introductory Remarks

1:20 0494 Did the Missoula floods of the Pleistocene affect speciation and distribution of Pacific Northwest *Stenotothorax*, a genus of flightless winter-active aphodiine beetles? **Ron McPeak**[1], rmcpeak@q.com and Guy Hanley[2], [1]Battle Ground, WA, [2]Minot State Univ., Minot, ND

1:40 0495 When it rains it pours beetles! An overview of Oregon Scarabaeoidea with a focus on *Pleocoma*. **Dan Clark**, dclark@oda.state.or.us, Oregon Dept. of Agriculture, Salem, OR

2:00 0496 Canopy Ceratocanthinae (Coleoptera: Hybosoridae): A review of their diversity, with notes and hypotheses on ecology, morphology and biology. Alberto Ballerio, Certatocanthinae International, Brescia, Italy, **Alexey Tishechkin**, atishe1@lsu.edu, and Terry Erwin[2], [1]Louisiana State Univ., Baton Rouge, LA, [2]Smithsonian Institution National Museum of Natural History, Washington, DC

2:20 0497 We're not in Kansas anymore; we're in Lyon: Rutelinae curation and revision across the pond. **Beulah Garner**, b.garner@nhm.ac.uk[1], and Matthew Moore[2], [1]Natural History Museum, London, United Kingdom, [2]Univ. of Florida, Gainesville, FL

2:40 0498 A review of the genus *Hoplopyga* (Coleoptera: Scarabaeidae: Cetoniinae). **Jennifer Shaughney**, jenshaughney@gmail.com, Univ. of Nebraska, Lincoln, NE

3:00 Break

3:20 0499 Summary of the London Scarab Symposium. **Maxwell Barclay**, m.barclay@nhm.ac.uk and Beulah Garner, Natural History Museum, London, United Kingdom

3:40 0500 The Hawaiian stag beetle genus *Apterocyclus* Waterhouse (Coleoptera: Lucanidae). **MJ. Paulsen**, mpaulsen@unlserve.unl.edu[1], and David Hawks[2], [1]Univ. of Nebraska, Lincoln, NE, [2]Univ. of California, Riverside, CA

4:00 0501 Reconstructing phylogeny of dung beetles (Coleoptera: Scarabaeidae: Scarabaeinae) based on multigene data. **Sergei Tarasov**, sergxf@yandex.ru, Univ. of Oslo, Oslo, Norway

4:20 0502 The Dynastine Scarab Beetles of the West Indies (Coleoptera: Scarabaeidae: Dynastinae). **Brett C. Ratcliffe**, bratcliffe1@unl.edu[1], and Ronald D. Cave[2], [1]Univ. of Nebraska, Lincoln, NE, [2]Univ. of Florida, Ft. Pierce, FL

4:40 0503 Beyond the lights: Little-used techniques for collecting rare and not-so-rare scarabs. **William B. Warner**, wbwarner1@cox.net, Scarabs Newsletter, Chandler, AZ

5:00 Discussion

Organized Meeting: Americas Neuropterists Meeting

A105 (Oregon Convention Center)

Moderators and Organizers: Atilano Contreras-Ramos[1] and Ben Diehl[2], [1]Instituto de Biologia, UNAM, Mexico City, Mexico, [2]Texas A&M Univ., College Station, TX

1:15 Welcoming Remarks

1:20 0504 Systematics of the New World chrysopid larvae—an update. **Catherine A. Tauber**, cat6@cornell.edu, Cornell Univ., Davis, CA

1:40 0505 A world review of the Neuropterida - Sternorrhyncha associations. **Gary L. Miller**, gary.miller@ars.usda.gov, USDA - ARS, Belstville, MD

2:00 0506 Towards a global monograph of the Neuropterida. **John D. Oswald**, joswald@ag.tamu.edu, Texas A&M Univ., College Station, TX

2:20 0507 The taxonomic issues of the subtribe Periclystina (Myrmeleontidae: Dendroleontini). **Renato Machado**, rjpmachado@neo.tamu.edu, Texas A&M Univ., College Station, TX

2:40 0508 Revision of the New World Haplogleniine (Ascalaphidae). **Joshua R. Jones**, grenouille1333@neo.tamu.edu, Texas A&M Univ., College Station, TX

3:00 Break

3:15 0509 An overview of the taxonomic status of genus *Plega* Navás (Mantispidae: Symphrasinae). **Daniel Reynoso-Velasco**, drmvd@mail.missouri.edu, Univ. of Missouri, Columbia, MO

3:35 0510 Mark-recapture studies involving some common Texas antlions (Insecta: Myrmeleontidae). **Ben Diehl**, b-diehl@neo.tamu.edu, Texas A&M Univ., College Station, TX

3:55 0511 A survey of the Myrmeleontidae of tropical dry forests of the Mexican Pacific. **Roberto Lopez-Garcia**, exoddous@hotmail.com and Atilano Contreras-Ramos, Instituto de Biologia, UNAM, Mexico City, Mexico

4:15 0512 Genome size diversity in Neuropterida. **Shawn Hanrahan**, shawnhanrahan@tamu.edu, J. Spencer Johnston and John D. Oswald, Texas A&M Univ., College Station, TX

4:35 0513 Alpha and beta diversity of Coniopterygidae of tropical dry forests of the Mexican Pacific. **Mariza A. Sarmiento-Cordero**, marizilla@hotmail.com and Atilano Contreras-Ramos, Instituto de Biologia, UNAM, Mexico City, Mexico

4:55 0514 Discussion and towards the International Symposium of Neuropterology in 2015. **Atilano Contreras-Ramos**, acontreras@ib.unam.mx[1], and John D. Oswald[2], [1]Instituto de Biologia, UNAM, Mexico City, Mexico, [2]Texas A&M Univ., College Station, TX

Organized Meeting: Heteropterist Symposium

A106 (Oregon Convention Center)

Moderator and Organizer: Katrina L. Menard, Sam Noble Oklahoma Museum of Natural History, Norman, OK

1:15 Introductory Remarks

1:20 0515 The Naucoridae (Heteroptera: Nepomorpha) of Mexico: Taxonomic status of species of *Ambrysus* Stål. **Daniel Reynoso-Velasco**, drmvd@mail.missouri.edu, Universidad Nacional Autónoma de México, Mexico City, Mexico

1:40 0516 Taking another look at diversity in Myrtaceae-feeding Miridae from Australia. **Randall T. Schuh**[1], and Christiane Weirauch[2], [1]American Museum of Natural History, New York, NY, [2]Univ. of California, Riverside, CA

2:00 0517 Husbandry of pest enemies: Is there hope for "HOPE"? **Jeffrey R. Aldrich**, DrJeffAldrich@gmail.com, Univ. of California, Davis, CA

2:20 0518 Reticulate macro- and microevolution in an Australian soapberry bug on native and introduced host plants. **Scott P. Carroll**, spcarroll@ucdavis.edu[1], Jose Andres[2], Jenella Loye[1] and Trevor Fowles[3], [1]Univ. of California, Davis, CA, [2]Univ. of Saskatchewan, Saskatoon, SK, Canada, [3]Institute for Contemporary Evolution, Davis, CA

2:40 0519 Walking in the dark: Insights into the relationships within Pentatominae (Pentatomidae). **Filipe Bianchi**, bianchi.fm@hotmail.com, Universidade Federal do Rio, Porto Alegre, Brazil

3:00 Break

3:20 0520 Research on Neotropical and Old World Tropical Miridae . . . in Oklahoma. **Katrina L. Menard**, kmenard@ou.edu, Sam Noble Oklahoma Museum of Natural History, Norman, OK

3:40 0521 Preliminary observations on the biology of the lace bug A*calypta lilliani* (Heteroptera: Tingidae). **Laura Miller**, lmiller@ag.state.wv.us, West Virginia Dept. of Agriculture, Charleston, WV

4:00 0522 Straight to the point? The astonishing world of Dipsocoromorpha curation. **Stephanie Leon**, Sleon002@ucr.edu and Alexander Knyshov, Univ. of California, Riverside, CA

4:20 0523 Highlights of the Fifth Quadrennial Meeting of the International Heteropterist Society. **Katrina L. Menard**, kmenard@ou.edu, Sam Noble Oklahoma Museum of Natural History, Norman, OK

4:40 Concluding Remarks

Organized Meeting: International Society of Hymenopterists

A107-109 (Oregon Convention Center)

Moderators and Organizers: Lars Krogmann[1] and John M. Heraty[2], [1]State Museum of Natural History, Stuttgart, Germany, [2]Univ. of California, Riverside, CA

1:15 0524 *Caenophanes* (Hymenoptera: Braconidae): A doryctine genus new to the new world. **Lawrence Haimowitz**, lhaimowi@uwyo.edu, Univ. of Wyoming, Laramie, WY

1:35 0525 Pondering parasitoid planidia: Biology and systematics of the ant parasitic genus *Orasema* (Eucharitidae). **Judith Herreid**, jherr019@ucr.edu, Univ. of California, Riverside, CA

1:55 0526 Does Comanche dominant the prairie? Spatial ecology of the Comanche harvester ant, *Pogonomyrmex comanche* (Hymenoptera: Formicidae). **Ann B. Mayo**, amayo@uta.edu, Univ. of Texas, Arlington, TX

2:15 Break

2:35 0527 Progress in the revision of *Disholcaspis* Dalla Torre and Kieffer. **Crystal McEwen**, clmcewen@gmail.com, Univ. of Maryland, College Park, MD

2:55 0528 Variations on a theme: Investigating color patterns and species delineation of *Zagrammosoma* (Hymenoptera: Eulophidae). **Ryan K Perry**, rkperry@calpoly.edu, Univ. of California, Riverside, CA

3:15 0529 Pincher wasps and their prey: Geometric morphometrics, morphology, and molecules contribute to the phylogeny of Dryinidae (Hymenoptera: Chrysidoidea) and the study of host-specificity. **Carly M. Tribull**, ctribull@amnh.org, American Museum of Natural History, New York, NY

Ten-Minute Papers, MUVE Section: Tick and Tick Borne Disease

B117-119 (Oregon Convention Center)

Moderator: Glen Scoles, USDA - ARS, Pullman, WA

1:15 Introductory Remarks

1:27 0530 Exploring 24 to 48h fed female *Amblyomma americanum* tick saliva immunogenic proteins. **Zeljko Radulovic**, amulenga@tamu.edu, Tae Kim, Lindsay Porter, Sing-Hoi Sze, Lauren Lewis and Albert Mulenga, Texas A&M Univ., College Station, TX

1:39 0531 Isolation of *Rickettsia slovaca* from the American dog tick, *Dermacentor variabilis*. **Lindsay Killmaster**, LKillmaster@cdc.gov, Galina E. Zemtsova, Lauren Schumacher, Merrill Montgomery, Matthew Burrows and Michael L. Levin, Centers for Disease Control and Prevention, Atlanta, GA

1:51 0532 Challenges with the southern cattle fever tick in Puerto Rico: Then and now. **Adalberto A. Pérez de León**, beto.perezdeleon@ars.usda.gov[1], Fred Soltero[2], Felix Guerrero[1], Carmen Oliver Canabal[3], Matthew Messenger[4], Patricia Holman[5], Ivan Castro Arellano[6], Pete Teel[5], Jose Urdaz[7] and Robert J. Miller[8], [1]USDA - ARS, Kerrville, TX, [2]USDA - APHIS, Hato Rey, PR, [3]Puerto Rico Dept. of Agriculture, San Juan, PR, [4]USDA - APHIS, Riverdale, MD, [5]Texas A&M Univ., College Station, TX, [6]Texas State Univ., San Marcos, TX, [7]USDA - APHIS, San Juan, PR, [8]USDA - ARS, Edinburg, TX

2:03 0533 Natural prevalence of an *Ehrlichia* species previously unknown to the U.S. in cattle on northwestern range lands. **Glen Scoles**, scoles@vetmed.wsu.edu, Sara Davis and Kathy Mason, USDA - ARS, Pullman, WA

2:15 Break

2:27 0534 Diet and the demands of defense: Testing resource tradeoffs with deer mice and Rocky Mountain wood ticks. **Cami R. Jones**, cami.jones@email.wsu.edu and Jeb Owen, Washington State Univ., Pullman, WA

2:39 0535 The expanding distribution of *Ixodes scapularis* and associated pathogens in the Chicago, IL metropolitan area. **Tyler Hedlund**, tjhedlun@gmail.com[1], Lisa Fredericks[1], Seth Magle[2], James Miller[1] and Brian F. Allan[1], [1]Univ. of Illinois, Urbana, IL, [2]Lincoln Park Zoo Urban Wildlife Institute, Chicago, IL

2:51 0536 One Health initiatives in tick-borne diseases. **Eric J. Dotseth**, Eric.J.Dotseth@wv.gov and Miguella Mark-Carew, West Virginia Dept. of Health & Human Resources, Charleston, WV

3:03 0537 Is tick-borne disease risk altered by the red imported fire ant? **Sarah Hamer**, shamer@cvm.tamu.edu[1], Adrian Castellanos[1], Gabriel Hamer[1], Mike Morrow[2], Pete Teel[1], Micky Eubanks[1] and Jessica E. Light[1], [1]Texas A&M Univ., College Station, TX, [2]Attwater Prairie Chicken National Wildlife Refuge, Eagle Lake, TX

3:15 0538 Ticks as natural booster shots. Tae Kim and **Albert Mulenga**, amulenga@ag.tamu.edu, Texas A&M Univ., College Station, TX

Ten-Minute Papers, P-IE Section: Invasive Species

D136 (Oregon Convention Center)

Moderators: Ash Ahmad[1] and Scott Hutchins[2], [1]Univ. of Georgia, Athens, GA, [2]Dow AgroSciences, Indianapolis, IN

1:15 0539 Quantitative losses in stored wheat grain caused by khapra beetle, *Trogoderma granarium* Everts (Coleoptera: Dermestidae). **Muhammad Afzal**, chafzal64@yahoo.com, Muhammad Haq and Muhammad Ullah, Univ. of Sargodha, Sargodha, Pakistan

1:27 0540 Environmental drivers of feeding behavior of *Halyomorpha halys* in the lab and field. **Nik G. Wiman**, nik.wiman@oregonstate.edu[1], Peter W. Shearer[2], Vaughn Walton[1] and Silvia Rondon[3], [1]Oregon State Univ., Corvallis, OR, [2]Oregon State Univ., Hood River, OR, [3]Oregon State Univ., Hermiston, OR

1:39 0541 Trap cropping: Controlling brown marmorated stink bug (Hemiptera: Pentatomidae) (*Halyomorpha halys*) (Stål) in organic cropping systems with pheromone lures, sorghum and pollenless sunflowers. **Taliaferro Trope**, talia84@vt.edu, Douglas G. Pfeiffer and Thomas P. Kuhar, Virginia Tech, Blacksburg, VA

1:51 0542 Do brown marmorated stink bugs (*Halyomorpha halys*) track resources in diverse woody plant nurseries? **Holly M. Martinson**, hmartins@umd.edu, Erik J. Bergmann, P. Dilip Venugopal and Michael J. Raupp, Univ. of Maryland, College Park, MD

2:03 0543 Fate of brown marmorated stink bug (*Halyomorpha halys*) egg masses exposed to common generalist predators in the laboratory and in organic vegetable plots. **Clarissa Mathews**, cmathews@shepherd.edu[1], William R. Morrison[2] and Tracy C. Leskey[2], [1]Shepherd Univ., Shepherdstown, WV, [2]USDA - ARS, Kearneysville, WV

2:15 0544 Effect of orchard border habitat on *Halyomorpha halys* captures in pheromone traps and fruit injury. **J. Christopher Bergh**, cbergh@vt.edu[1], Tracy C. Leskey[2], Brent Short[2] and John P. Cullum[3], [1]Virginia Polytechnic Institute and State Univ., Winchester, VA, [2]USDA - ARS, Kearneysville, WV, [3]Virginia Polytechnic Institute and State Univ., Blacksburg, VA

2:27 0545 Impact of the invasive brown marmorated stink bug, *Halyomorpha halys* Stål, on soybean seed quality, yield and delayed senescence. **P. Dilip Venugopal**, dilip@umd.edu[1], Peter Coffey[1], Terry Patton[1], Ames Herbert[2], Cerruti Hooks[1], Joanne Whalen[3] and Galen Dively[1], [1]Univ. of Maryland, College Park, MD, [2]Virginia Polytechnic Institute and State Univ., Blacksburg, VA, [3]Univ. of Delaware, Newark, DE

2:39 0546 Preparing for invasion: How New Zealand is responding to the potential arrival of the brown marmorated stink bug. **Catherine Duthie**, catherine.duthie@mpi.govt.nz, Ministry for Primary Industries, Wellington, New Zealand

2:51 0547 A century of data suggests a key role for biological interactions in the global spread of the South American cactus moth, *Cactoblastis cactorum* (Berg). **Christopher P. Brooks**, cpbrooks@biology.msstate.edu, Mississippi State Univ., Mississippi State, MS

3:03 0548 Potential distribution of *Myllocerus undecimpustulatus undatus* (Sri Lankan weevil) in North America. **Anita Neal**, asn@ufl.edu, Ronald D. Cave and Rodrigo Diaz, Univ. of Florida, Ft. Pierce, FL

3:15 Break

3:27 0549 Hot on *D. suzukii's* trail: Identifying high-risk areas inside and outside the crop. **Amanda Ohrn**, ohrna@onid.orst.edu, Amy J. Dreves and Tammy Winfield, Oregon State Univ., Corvallis, OR

3:39 0550 Invasive pests of SE Asian cassava crops: A threat to regional food security and rural livelihoods. **Kris Wyckhuys**, k.wyckhuys@cgiar.org, International Center for Tropical Agriculture CIAT, Hanoi, Vietnam

3:51 0551 Risks posed by cerambycids intercepted in solid wood packing material. **Peter F. Reagel**, Peter.F.Reagel@aphis.usda.gov[1], Hannah Nadel[2], Scott Myers[2] and Ann Ray[3], [1]Xavier Univ., Cincinnati, OH, [2]USDA - APHIS - PPQ - CPHST, Buzzards Bay, MA, [3]Univ. of Illinois, Urbana, IL

4:03 0552 New pest response guidelines: A field reference for emergency response to high priority invasive pests. **Godshen Pallipparambil**, grpallip@ncsu.edu[1], Jaap B. van Kretschmar[1], Gary Cave[2] and Karl Suiter[1], [1]NSF Center for Integrated Pest Management, Raleigh, NC, [2]USDA, Raleigh, NC

4:15 0553 Dual regime shifts in dynamics of an invasive predatory ladybug are linked to the invasion and pesticidal control of its aphid prey. **Christie Bahlai**, cbahlai@msu.edu[1], Wopke van der Werf[2] and Doug A. Landis[1], [1]Michigan State Univ., East Lansing, MI, [2]Wageningen Univ., Wageningen, Netherlands

4:27 0554 Interception of leafhoppers (Cicadellidae) infesting Mexican agricultural products coming to the U.S. through the Mexican-American ports of entry. **Joel Perez-Mendoza**, Joel.Perez-Mendoza@aphis.usda.gov, USDA - APHIS - PPQ, Laredo, TX

4:39 0555 Using museum specimens to understand distributional changes of agricultural pests. **Adam Zeilinger**, arz@berkeley.edu, Nicholas J. Mills and George K. Roderick, Univ. of California, Berkeley, CA

Ten-Minute Papers, P-IE Section: Crop Protection - Row Crops

E141-142 (Oregon Convention Center)

Moderators: Dominic Reisig[1] and Fred R. Musser[2], [1]North Carolina State Univ., Plymouth, NC, [2]Mississippi State Univ., Mississippi State, MS

1:15 0556 Control of key sap-feeding pests of agronomic crops with Transform® WG insecticide. **Harvey A. Yoshida**, hyoshida@dow.com[1], Jesse M. Richardson[2], Boris Castro[3], Mogi Mirim[4], and Luis E. Gomez[5], [1]Dow AgroSciences, Richland, WA, [2]Dow AgroSciences, Hesperia, CA, [3]Dow AgroSciences, [4]Brazil, Melissa Siebert, Dow AgroSciences, Greenville, MS, [5]Dow AgroSciences, Indianapolis, IN

1:27 0557 Isoclast™ Active: A new tool for managing key sap-feeding insects on commodity crops globally. **Melissa Siebert**, mwillrichsiebert@dow.com[1], Luis E. Gomez[2], Imre Mezei[3], Michael Lysandrou[4], Luis Pavan[5], Lakshmipathi Srigiriraju[6], Robert Annetts[7], and Catherine Ren[8], [1]Dow AgroSciences, Greenville, MS, [2]Dow AgroSciences, Indianapolis, IN, [3]Dow AgroSciences, Budapest, Hungary, [4]Dow AgroSciences, Lavrion, Greece, [5]Dow AgroSciences, Sao Paulo, Brazil, [6]Dow AgroSciences, Mumbai-Vikhroli, India, [7]Dow AgroSciences, Toowoomba, Australia, [8]Dow AgroSciences, Shanghai, China

1:39 0558 TRANSFORM® insecticide: 2014 performance update in U.S. cotton. **Gary D. Thompson**, gdthompson@dow.com[1], Melissa Siebert[2], Larry Walton[3], Jesse M. Richardson[4], Robert A. Haygood[5], Ryan Viator[6], Mike Lovelace[7], and John Richburg[8],[1]Dow AgroSciences, Omaha, AR, [2]Dow AgroSciences, Greenville, MS, [3]Dow AgroSciences, Tupelo, MS, [4]Dow AgroSciences, Hesperia, CA, [5]Dow AgroSciences, Memphis, TN, [6]Dow AgroSciences, Houma, LA, [7]Dow AgroSciences, Lubbock, TX, [8]Dow AgroSciences, Headland, AL

1:51 0559 Field trial performance of SmartStax and PowerCore against above-ground corn insects. **Laura Campbell**, lacampbell@dow.com[1], Dwain M. Rule[2], Kevin Johnson[3], and Amanda Jacobson[4], [1]Dow AgroSciences, Carbondale, IL, [2]Dow AgroSciences, Indianapolis, IN, [3]Dow AgroSciences, Danville, IL, [4]Dow AgroSciences, Greenville, MS

2:03 0560 Novel insecticide types and methods of application for thrips management in the Southeast. **Dominic Reisig**, dominic_reisig@ncsu.edu[1], Jack S. Bacheler[2], Jeremy Greene[3], DA. Herbert[4], Francis Reay-Jones[3], Tim Reed[5], Phillip Roberts[6], Ronald Smith[7] and MD. Toews[6], [1]North Carolina State Univ., Plymouth, NC, [2]North Carolina State Univ., Raleigh, NC, [3]Clemson Univ., Florence, SC, [4]Virginia Polytechnic Institute and State Univ., Suffolk, VA, [5]Alabama CES, Madison, AL, [6]Univ. of Georgia, Tifton, GA, [7]Auburn Univ., Auburn, AL

2:15 0561 Performance of Seeker™ insecticide on soybean and corn insect pests in the Midwest. **Fikru Haile**, fhaile@dow.com[1], Patricia Prasifka[2], Dave Ruen[3], Kevin Johnson[2], Eric Scherder[4] and Melissa Siebert[5], [1]Dow AgroSciences, Carmel, IN, [2]Iowa State Univ., Ames, IA, [3]Dow AgroSciences, Lanesboro, MN, [4]Dow AgroSciences, Huxley, IA, [5]Dow AgroSciences, Greenville, MS

2:27 0562 Insect resistance monitoring program for WideStrike™ cotton: 10 years of successful collaborations. **Desmi Chandrasena**, dichandrasena@dow.com, Miles Lepping, Nicholas Storer and Rod A. Herman, Dow AgroSciences, Indianapolis, IN

2:39 0563 Cyclaniliprole: New anthranilic diamide insecticide. **Kiyomitsu Yoshida**, ki-yoshida@iskweb.co.jp[1], Taku Hamamoto[1], Masayuki Morita[2], Kenichi Nakamoto[1] and Tohru Koyanagi[1], [1]Ishihara Sangyo Kaisha, Ltd., Kusatsu, Shiga, Japan, [2]Ishihara Sangyo Kaisha, Ltd., Osaka, Japan

2:51 0564 Fall armyworm (*Spodoptera frugiperda*) Cry1F resistance monitoring program in the US. **Mary Kubiszak-Rushton**, MKubiszak@dow.com[1], Miles Lepping[1], Dwain M. Rule[1], Ed King[1], Nicholas Storer[1], Luis E. Gomez[1], Abhilash Balachandran[1], Desmi Chandrasena[1], Elizabeth Owens[2] and Clinton D. Pilcher[2], [1]Dow AgroSciences, Indianapolis, IN, [2]DuPont Pioneer, Johnston, IA

3:03 0565 Developing an action threshold for aphids in cotton. **David L. Kerns**, dkerns@agcenter.lsu.edu[1], and Daniel Fromme[2], [1]Louisiana State Univ., Winnsboro, LA, [2]Louisiana State Univ., Alexandria, LA

3:15 Break

3:27 0566 Agronomic and economic benefit of Cruiser seed treatments in US. **Palle Pedersen**, palle.pedersen@syngenta.com, Dale Ireland, Jay Overmyer, Caydee Savinelli and Patrick Mccain, Syngenta Plant Protection, Greensboro, NC

3:39 0567 Weed management interactions with insect-related injury and yield loss in soybean. **Julien M. Beuzelin**, jbeuzelin@agcenter.lsu.edu, Dana M. May and Daniel O. Stephenson, Louisiana State Univ., Alexandria, LA

3:51 0568 Is there a place for insecticidal seed treatments in the IPM toolbox? **Fred R. Musser**, fm61@msstate.edu[1], Jeff Gore[2], Angus Catchot[1], Dominic Reisig[3], Ames Herbert[4] and Apurba Barman[5], [1]Mississippi State Univ., Mississippi State, MS, [2]Mississippi State Univ., Stoneville, MS, [3]North Carolina State Univ., Plymouth, NC, [4]Virginia Polytechnic Institute and State Univ., Blacksburg, VA, [5]Texas A&M Univ., Lubbock, TX

4:03 0569 Management of Western bean cutworm (*Striacosta albicosta*) and mycotoxins using transgenic corn. **Jocelyn L. Smith**, jocelyn.smith@uoguelph.ca, Victor Limay-Rios and Arthur W. Schaafsma, Univ. of Guelph, Ridgetown, ON, Canada

4:15 0570 Efficacy and persistence of neonicotinoid seed treatments in cotton. **Apurba Barman**, Apurba.Barman@ag.tamu.edu and Lauren Harrell, Texas A&M Univ., Lubbock, TX

4:27 0571 Pest management concerns among Iowa row-crop farmers. **Paul Lasley**, plasley@iastate.edu, J. Arbuckle, Aaron Gassmann, Erin W. Hodgson, Matthew E. O'Neal and Wendy Wintersteen, Iowa State Univ., Aimes, IA

Ten-Minute Papers, P-IE Section: Crop Protection - Fruit Trees and Vines

F151 (Oregon Convention Center)

Moderators: Tracy C. Leskey[1] and David Shapiro-Ilan[2], [1]USDA - ARS, Kearneysville, WV, [2]USDA - ARS, Byron, GA

1:15 0572 Integrated control of pecan leaf scorch mite (*Eotetranychus hicoriae*) in pecan orchards. **James D. Dutcher**, jimdutcher@lycos.com, Univ. of Georgia, Tifton, GA

1:27 0573 Navel orangeworm population dynamics and chemical control. Gary Weinberger, Weinberger & Associates, Hanford, CA and **Joel Siegel**, joel.siegel@ars.usda.gov, USDA - ARS, Parlier, CA

1:39 0574 Crop yield and insect resistance: Effects of selection for increased fruit size on codling moth resistance in wild and domestic apples. **Susan Whitehead**, susan.whitehead@cornell.edu and Katja Poveda, Cornell Univ., Ithaca, NY

1:51 0575 Laboratory tests of spinosad, neem and Surround on *Bactrocera invadens* survival in mango. **Assa Balayara**, balayara@vt.edu, Virginia Tech, Blacksburg, VA

2:03 0576 Management of invasive insect pests attacking *Ficus* tree species in Hawaii. **Zhiqiang Cheng**, cheng241@hawaii.edu and Bishnu Bhandari, Univ. of Hawai'i, Honolulu, HI

2:15 0577 Suppression of peachtree borer and lesser peachtree borer with entomopathogenic nematodes: Effects of application method and formulation. **David Shapiro-Ilan**, David.Shapiro@ars.usda.gov[1], Ted E. Cottrell[1], Russell Mizell[2] and Dan L. Horton[3], [1]USDA - ARS, Byron, GA, [2]Univ. of Florida, Quincy, FL, [3]Univ. of Georgia, Athens, GA

2:27 0578 SIVANTO offers flexible control of sucking pests in tree fruit. **Steve Olson**, steve.olson@bayer.com, Bayer CropScience, Research Triangle Park, NC

2:39 0579 Role of DuPont™ Cyazypyr™ (DPX-HGW86, cyantraniliprole) in the management of fruit fly pests on tree fruit crops. **I. Billy Annan**, i-billy.annan@usa.dupont.com[1], Sebastia Pons[2], Ravinder Balain[3], John A. Wiles[4], Roberto Morano[5], Hector E. Portillo[1], Jean-Luc Rison[6], Wilbert Flier[7] and Joseph T. Mares[8], [1]DuPont Crop Protection, Newark, DE, [2]DuPont Crop Protection,

Wilmington, DE, [3]DuPont, Gurgaon, India, [4]DuPont, Stevenage, United Kingdom, [5]DuPont, Cernusco, Italy, [6]DuPont, Nambsheim, France, [7]DuPont, Dordrecht, Netherlands, [8]DuPont Crop Protection, Valdosta, GA

2:51 0580 Introducing Cyclaniliprole 50SL: New anthranilic diamide insecticide in the U.S. **Sean Whipple**, whipples@iskbc.com[1], Masayuki Morita[2], Tohru Koyanagi[3], Mel Grove[4] and Max Parks[1], [1]ISK Biosciences Corporation, Kearney, MO, [2]Ishihara Sangyo Kaisha, Ltd., Osaka, Osaka, Japan, [3]Ishihara Sangyo Kaisha, Ltd., Kusatsu, Shiga, Japan, [4]ISK Biosciences Corporation, Houston, TX

3:03 Break

3:15 0581 Sulfoxaflor: A novel chemistry for managing insect pests of citrus in the Western U.S. **Alistair McKay**, ahmckay@dow.com[1], Elizabeth Grafton-Cardwell[2], Jesse M. Richardson[3], Alejandro Calixto[4], and Melissa Siebert[5], [1]Dow AgroSciences, Clovis, CA, [2]Univ. of California, Parlier, CA, [3]Dow AgroSciences, Hesperia, CA, [4]Dow AgroSciences, Wesley Chapel, FL, [5]Dow AgroSciences, Greenville, MS

3:27 0582 No rain, cold winter: The terroir of successful IPM in Washington State wine grapes. **Tara Piraneo**, tara.piraneo@wsu.edu, Ste. Michelle Wine Estates, Prosser, WA and Douglas Walsh, Washington State Univ., Prosser, WA

3:39 0583 Evaluation of miticides for control of European red mite (*Panonychus* ulmi) in apple. **Dave Combs**, dbc10@cornell.edu, Cornell Univ., Geneva, NY

3:51 0584 High elevation infestations of the spotted winged drosophila, *Drosophila suzukii* Matsumura (Diptera: Drosophilidae) on culturally significant *Vaccinium* spp. **Todd Murray**, tmurray@co.skamania.wa.us[1], Peter W. Shearer[2] and Steve Castagnoli[2], [1]Washington State Univ., Stevenson, WA, [2]Oregon State Univ., Hood River, OR

4:03 0585 Seasonal timing of infestation of sweet cherries and non-crop plants by *Drosophila suzukii* (Diptera: Drosophilidae) in and around sweet cherry orchards of British Columbia, 2010-2013. **Howard Thistlewood**, howard.thistlewood@agr.gc.ca and Brigitte Rozema, Agriculture & Agri-Food Canada, Summerland, BC, Canada

4:15 0586 Asian citrus psyllid, huanglongbing and the orange jasmine conundrum. **David Hall**, David.Hall@ars.usda.gov and Mark Hilf, USDA - ARS, Ft. Pierce, FL

4:27 0587 Characterization and abundance of arthropods associated with various citrus cultivars in Sargodha, Pakistan. **Muhammad Ullah**, m.irfanullah@huskers.unl.edu[1], Abdul Mustan[1], Fatima Mustafa[2], Muhammad Afzal[1], Abu Bakar Raza[1] and Yasir Iftikhar[1], [1]Univ. of Sargodha, Sargodha, Pakistan, [2]Univ. of Agriculture, Faisalabad, Pakistan

4:39 0588 Nealta: A novel miticide from BASF for tree nuts and grapes. **Sanjeev Bangarwa**, sanjeev.k.bangarwa@basf.com, Rebecca Willis, Joe Stout, Tommy Wofford, Curtis Rainbolt, Dawn Brunmeier and Katherine Walker, BASF Corporation, Research Triangle Park, NC

4:51 0589 Development of use pattern recommendations for miticides against Pacific spider mite (*Tetranychus pacificus*) in California almonds. **David R. Haviland**, dhaviland@ucdavis.edu and Stephanie M. Rill, Univ. of California, Bakersfield, CA

Ten-Minute Papers, P-IE Section: Host Plant Resistance

F152 (Oregon Convention Center)

Moderators: Jarrad Prasifka[1] and D. Michael Jackson[2], [1]USDA - ARS, Ames, IA, [2]USDA - ARS, Charleston, SC

1:15 0590 Biochemical studies of canola plant resistance against aphids. **Nasir Masood**, nasirmasood2004@gmail.com, COMSATS,Vehari, Vehari, Pakistan

1:27 0591 The effects of plant variation on the population genetic structure of a seed predator and its parasitoid. **J. Gwen Shlichta**, bugheart@gmail.com[1], Philippa Griffin[2] and Betty Benrey[1], [1]Univ. of Neuchâtel, Neuchâtel, Switzerland, [2]Univ. of Melbourne, Melbourne, Australia

1:39 0592 Sesquiterpene lactone composition of wild and cultivated sunflowers and biological activity against an insect pest. **Jarrad Prasifka**, jarrad.prasifka@ars.usda.gov, USDA - ARS, Fargo, ND

1:51 0593 The enemy of my enemy is not always my friend: Wild cabbage is negatively affected by both herbivores and their parasitoids. **Paul Ode**, paul.ode@colostate.edu, Colorado State Univ., Fort Collins, CO

2:03 0594 *Spodoptera* caterpillars neutralize maize chemical defenses by converting a toxic 1,4-benzoxazin-3-one breakdown product to non-toxic 3-*ß*-D-glucopyranosyl-6-methoxy-2-benzoxazolinone (MBOA-*N*-Glc). **Daniel Maag**, daniel.maag@unine.ch[1], Claudio Dalvit[1], Damien Thevenet[1], Angela Köhler[1], Felipe Wouters[2], Daniel Vassão[2], Jonathan Gershenzon[2], Jean-Luc Wolfender[3], Ted C. J. Turlings[1], Matthias Erb[4] and Gaetan Glauser[1], [1]Univ. of Neuchâtel, Neuchâtel, Switzerland, [2]Max Planck Institute for Chemical Ecology, Jena, Germany, [3]Univ. of Geneva, Geneva, Switzerland, [4]Univ. of Bern, Bern, Switzerland

2:15 0595 Pathogen infection of tomato plants influences potato/tomato psyllid (*Bactericera cockerelli*) host plant use and performance. **Sean Prager**, Sean.prager@ucr.edu[1], Christopher Wallis[2] and John T. Trumble[1], [1]Univ. of California, Riverside, CA, [2]USDA - ARS, Parlier, CA

2:27 0596 The role of VOCs in within-plant signaling and systemically acquired resistance following herbivory in *Datura wrightii*. **Jia Sun**, jsun008@ucr.edu and J. Daniel Hare, Univ. of California, Riverside, CA

2:39 0597 Characterization of tolerance in the soybean KS-4202 to *Bemisia tabaci* biotype B. **Edson Baldin**, elbaldin@fca.unesp.br[1], Patrícia Cruz[1] and Tiffany Heng-Moss[2], [1]São Paulo State Univ., Botucatu, Brazil, [2]Univ. of Nebraska, Lincoln, NE

2:51 0598 Trade-offs between Colorado potato beetle resistance and late blight resistance in commercial potato varieties. **Christopher Stieha**, stieha@hotmail.com, Sara Cilles, Etzel Garrido, William Fry and Katja Poveda, Cornell Univ., Ithaca, NY

3:03 0599 Signals of host plant domestication in the morphological and genetic structuring of a specialist herbivore. Amanda Davila-Flores, Milena Chinchilla-Ramirez, Thomas J. DeWitt, Raul Medina and **Julio S. Bernal**, juliobernal@neo.tamu.edu, Texas A&M Univ., College Station, TX

3:15 Break

3:27 0600 Role of vectors and their host plants in the epidemiology of maize lethal necrosis in eastern Africa. Johnson Nyasani[1], Elizabeth Kusia[2], and **S. Subramanian**, ssubramania@icipe.org[3],[1]Kenya Agricultural Research Institute, Embu, Kenya, [2]Pan African Univ.-Institute for Basic Science, Technology and Innovation, Juja, Kenya, [3]International Centre of Insect Physiology and Ecology, Nairobi, Kenya

3:39 0601 miRNA mediate regulatory network in aphid resistance. **Sampurna Sattar**, sus56@psu.edu[1], Charles Addo-Quaye[2] and Gary A Thompson[1], [1]Pennsylvania State Univ., Univ. Park, PA, [2]Purdue Univ., West Lafayette, IN

3:51 0602 Effect of host diet on the development of larval parasitoid *Apanteles opuntiarum* Martínez & Bertha (Hymenoptera: Braconidae) in *Cactoblastis cactorum* (Berg) (Lepidoptera: Pyralidae). Oulimathe Paraiso, Trevor Smith and **Bobbie Jo Davis**, bobbie.davis@freshfromflorida.com, Florida Dept. of Agriculture and Consumer Services, Gainesville, FL

4:03 0603 Plant utilization patterns of the gall midge *Jaapiella ivannikovi* on its host, the exotic Russian knapweed (*Rhaponticum repens*). **Rich Hansen**, richard.w.hansen@aphis.usda.gov, USDA - APHIS - PPQ - CPHST, Fort Collins, CO

4:15 0604 Effect of host plant resistance and a grass intercrop on biological control of potato leafhopper (*Empoasca fabae*) in alfalfa. **Cory Straub**, cstraub@ursinus.edu, Ursinus College, Collegeville, PA

4:27 0605 How non-native plants affect host-finding in native insects: Evidence of associational resistance against specialist herbivores. **Meg Ballard**, mballard@udel.edu and Douglas W. Tallamy, Univ. of Delaware, Newark, DE

4:39 0606 Constitutive and induced resistance in soybeans against fall army worm (*Spodoptera frugiperda*). Michael J. Stout and **Srinivas Lanka**, slanka@agcenter.lsu.edu, Louisiana State Univ., Baton Rouge, LA

MONDAY, NOVEMBER 17, 2014, MORNING

01 - Undergraduate Student Ten-Minute Paper Competition: MUVE, SysEB

F149 (Oregon Convention Center)

Moderators: Jennifer Peterson[1] and Geoffrey Morse[2], [1]Princeton Univ., Princeton, NJ, [2]Univ. of San Diego, San Diego, CA

8:45 Introductory Remarks

8:48 0607 Presentation Withdrawn

9:00 0608 A comparative study of aposematic coloration in central Florida beetles. **Ji Min Noh**, jiminnoh7@knights.ucf.edu and Hojun Song, Univ. of Central Florida, Orlando, FL

9:12 0609 Succession pasterns of arachnids on decomposing vertebrate tissues and their forensic significance. **Laurie Casebier**, setofconnections@yahoo.com, Univ. of California, Davis, CA

9:24 0610 A fungal pathogen of the cellar spider, *Pholcus phalangioides*. **Derrick Jent**, djent@murraystate.edu and Claire A. Fuller, Murray State Univ., Murray, KY

9:36 0611 Population genetic analysis of *Trichogramma kaykai* using molecular markers. **Amber Kincaid**, akincai1@ggc.edu and James Russell, Georgia Gwinnett College, Lawrenceville, GA

9:48 0612 ¿De dónde son? Provenance of a South American species of seed beetle new to California. **Shannon Trujillo**, strujillo@sandiego.edu[1], Joseph Deas[2] and Geoffrey Morse[1], [1]Univ. of San Diego, San Diego, CA, [2]Univ. of Arizona, Tucson, AZ

10:00 Break

10:12 0613 Using multiple lines of evidence to compare Western and Eastern populations of *Pyractomena dispersa* (Lampyridae). **Yelena Pacheco**, ympacheco15@gmail.com[1], Gavin J. Martin[1], Marc A. Branham[2], Michael F. Whiting[1] and Seth M. Bybee[1], [1]Brigham Young Univ., Provo, UT, [2]Univ. of Florida, Gainesville, FL

10:24 0614 First molecular phylogeny of world stag beetles (Coleoptera: Lucanidae) revealed the Gondwanan origin of Darwin's stag beetle: Testing Jeannel's hypothesis. **Sang Il Kim**, sikim@fas.harvard.edu and Brian D. Farrell, Harvard Univ., Cambridge, MA

10:36 0615 Taxonomic revision of the robber-fly genus *Leptopteromyia* Williston, 1907. **Chris Cohen**, cohenc@onid.orst.edu[1], and Torsten Dikow[2], [1]Oregon State Univ., Corvallis, OR, [2]National Museum of Natural History, Smithsonian Institution, Washington, DC

10:48 0616 A revision of the oriental *Euscelidia* Westwood, 1850 (Diptera: Asilidae: Leptogastrinae). **Kevin Moran**, kevinmoran88@comcast.net, Cornell Univ., Naples, FL

11:00 0617 Taxonomic revision of the robber-fly genus *Acronyches* (Diptera: Asilidae). **Allan Cabrero**, acabrero67@gmail.com, San Diego State Univ., San Diego, CA

02 - Undergraduate Student Ten-Minute Paper Competition: PBT, P-IE

D131 (Oregon Convention Center)

Moderators: Mark R. Brown[1] and Jianguo Tan[2], [1]Univ. of Georgia, Athens, GA, [2]Monsanto Company, St. Louis, MO

8:45 Introductory Remarks

8:48 0618 Differential gene expression of heat shock proteins in crowded and isolated *Schistocerca americana*. **Grace Avecilla**, graceavecilla@knights.ucf.edu and Hojun Song, Univ. of Central Florida, Orlando, FL

9:00 0619 Study on different methods of ovarian induction in diapausing female adults of the sunn pest *Eurygaster integriceps*. **Sara Khodahemmati**, sara.khodahemmati@gmail.com, Beijing Univ. of Technology, Beijing, China

9:12 0620 Improving hydrilla biological control via the hydrilla midge tip miner. **Julie Baniszewski**, jbaniszewski10@ufl.edu, Emma N. I. Weeks and Jim Cuda, Univ. of Florida, Gainesville, FL

9:24 0621 Does the clock stop ticking? Ontogeny of the circadian clock in *Sarcophaga crassipalpis*. **Clancy Short**, short.237@osu.edu, The Ohio State Univ., Columbus, OH

9:36 0622 Impact of mutation in odor receptor (*Or42a*) on the circadian locomotor activity rhythm of *Drosophila melanogaster*. **Breanna Lyle**, bl334@msstate.edu, John Guyton and Natraj Krishnan, Mississippi State Univ., Mississippi State, MS

9:48 0623 Oviposition periodocity for spotted wing Drosophila. **Riki York**, yorkr@oregonstate.edu, Vaughn Walton and Nik G. Wiman, Oregon State Univ., Corvallis, OR

10:00 Break

10:12 0624 Reproduction and optimal foraging in the parasitoid wasp *Trichogramma kaykai*. **Angela Burrow**, aburrow@ggc.edu[1], Mehul Desai[2] and James Russell[2], [1]Georgia Gwinnett College, Lilburn, GA, [2]Georgia Gwinnett College, Lawrenceville, GA

10:24 0625 The nicotinic acetylcholine receptor subunit family of the codling moth, *Cydia pomonella* (L.)(Lepidoptera: Tortricidae). **Jessica A. Martin**, jessica.martin@ars.usda.gov and Stephen F. Garczynski, USDA - ARS, Wapato, WA

10:36 0626 Non-target effects of clothianidin on *Danaus plexippus*. **Jacob Pecenka**, jacob.pecenka@gmail.com, South Dakota State Univ., Brookings, SD and Jonathan Lundgren, USDA - ARS, Brookings, SD

10:48 0627 Nutrient levels in individual honey bees (*Apis mellifera*) following treatment with pesticides. **Haley K. Feazel-Orr**, hkfeazel@vt.edu, Brenna E. Traver, Katelyn M. Catalfamo, Carlyle C. Brewster, Troy D. Anderson and Richard D. Fell, Virginia Tech, Blacksburg, VA

11:00 0628 Drinking dirty water: Why do honey bees (*Apis mellifera*) collect agricultural water and urban runoff? **Pierre Lau**, plau0168@yahoo.com, Univ. of California, Walnut, CA and James C. Nieh, Univ. of California, La Jolla, CA

11:12 0629 Effects of altered cyanogenesis in salt-stressed white clover plants on *Hypera punctata*. **Jacob Elias**, jelias@pdx.edu and Daniel J. Ballhorn, Portland State Univ., Portland, OR

11:24 2183 Individual personality in honeybees, *Apis mellifera*. **Amelia Weller**, amelia.weller@colorado.edu, Univ. of Colorado, Boulder, CO

03 - Undergraduate Student Ten-Minute Paper Competition: P-IE

D132 (Oregon Convention Center)

Moderator: Mike Shaw, Dow AgroSciences, LLC, Indianapolis, IN

8:45 Introductory Remarks

8:48 0630 The contribution of non-consumptive effects to the biological control of pest caterpillars. **John Krauska**, jjkfy6@mail.missouri.edu, Kathryn Ingerslew and Deborah Finke, Univ. of Missouri, Columbia, MO

9:00 0631 Biotic potential of *Trissolcus japonicus* Ashmead (Hymenoptera: Scelionidae), a solitary egg parasitoid of the brown marmorated stink bug, *Halyomorpha halys* (Stål). **Ryan Paul**, rlpaul@rams.colostate.edu and Ernest Delfosse, Michigan State Univ., East Lansing, MI

9:12 0632 Immature stages of development of the solitary endoparasitoid wasp, *Trissolcus japonicus*, on its host, *Halyomorpha halys*. **Heather Leach**, heatherleach.tc@gmail.com and Ernest Delfosse, Michigan State Univ., East Lansing, MI

9:24 0633 Oviposition, survival, and seasonality of *Oobius agrili* (Hymenoptera: Encyrtidae), a parasitoid of emerald ash borer (Coleoptera: Buprestidae), in the southeastern U.S. **Bryson Scruggs**, bscrugg1@mail.tennessee.edu[1], Gregory J. Wiggins[1], Jerome F. Grant[1] and Jonathan Lelito[2], [1]Univ. of Tennessee, Knoxville, TN, [2]USDA - APHIS - PPQ, Brighton, MI

9:36 0634 The predator potential of the margined leatherwing beetle in Virginia agro-ecosystems. **Elizabeth L. Fread**, elifread@vt.edu[1], Thomas P. Kuhar[1] and Christopher R. Philips[2], [1]Virginia Polytechnic Institute and State Univ., Blacksburg, VA, [2]Washington State Univ., Pullman, WA

9:48 0635 Effects of intercropping on biological control of potato leafhopper, *Empoasca fabae*. **Jamie Faselt**, jafaselt@ursinus.edu, Ursinus College, Collegeville, PA

10:00 Break

10:12 0636 Effects of flowering cover crops and landscape heterogeneity on native bee diversity in vineyards. **Jessica Wong**, jessicawong@berkeley.edu[1], Houston Wilson[1], Robbin W. Thorp[2], Kent Daane[1] and Miguel Altieri[1], [1]Univ. of California, Berkeley, CA, [2]Univ. of California, Davis, CA

10:24 0637 Survey of bee diversity and pollen loads in the Appalachian foothills of southeastern Ohio. **MaLisa Spring**, malisa.spring@gmail.com[1], Katy Lustofin[2], Dave McShaffrey[2] and Chia-Hua Lin[3], [1]The Ohio State Univ., Wooster, OH, [2]Marietta College, Marietta, OH, [3]The Ohio State Univ., Columbus, OH

10:36 0638 Evidence of *Wolbachia* infection in five sympatric species of nicrophorine burying beetles including the endangered American burying beetle. **Claire Bestul**, cebestul10@ole.augie.edu[1], Jonathan Lundgren[2], Daniel Howard[1] and Carrie Hall[1], [1]Augustana College, Sioux Falls, SD, [2]USDA - ARS, Brookings, SD

10:48 0639 Detecting and controlling *D. suzukii* with traps. **Monica Marcus**, marcusm@onid.orst.edu[1], Amy J. Dreves[1], Jana C. Lee[2], Colleen Burrows[3], Adam Cave[2] and Marcus Chatfield[1], [1]Oregon State Univ., Corvallis, OR, [2]USDA - ARS, Corvallis, OR, [3]Washington State Univ., Bellingham, WA

11:00 0640 Swimming behavior in temperate forest ants. Stephen Yanoviak and **Sarah Handlon**, sfhand01@cardmail.louisville.edu, Univ. of Louisville, Louisville, KY

11:12 2182 Persistence in ants and its effects on cooperative transport efficiency. **Jenna Bilek**, jenna.bilek@colorado.edu, Z. Dix, and H. F. McCreery, Univ. of Colorado, Boulder, CO

04 - Graduate Student Ten-Minute Paper Competition: MUVE

B110-112 (Oregon Convention Center)

Moderators: Janet Hurley[1] and Sonja Thomas[2], [1]Texas A&M AgriLife Extension, Dallas, TX, [2]Auburn Univ., Auburn, AL

8:20 Introductory Remarks

8:24 0641 Expression of costimulatory molecules on antigen presenting cells treated with *Ixodes scapularis* and *Amblyomma americanum* recombinant saliva proteins. **Mariam Bakshi**, mariambakshi@tamu.edu, Albert Mulenga, Waithaka Mwangi, Lindsay Porter and Tae Kim, Texas A&M Univ., College Station, TX

8:36 0642 *Ixodes scapularis* tick saliva serine protease inhibitors (serpins): Roles in tick feeding regulation. **Lauren Lewis**, lspike99@neo.tamu.edu and Albert Mulenga, Texas A&M Univ., College Station, TX

8:48 0643 Functional characterization and target validation of *Amblyomma americanum* serpin: AAS8. **Lindsay Porter**, lindsayporter84@gmail.com and Albert Mulenga, Texas A&M Univ., College Station, TX

9:00 0644 Comparative transcriptomics: Using high-through put sequencing technology to explore biology and behavior of an ixodid I*xodes scapularis* and an argasid O*rnithodoros turicata*. **N. Egekwu**, negek001@odu.edu[1], Daniel E. Sonenshine[1] and R. Michael Roe[2], [1]Old Dominion Univ., Norfolk, VA, [2]North Carolina State Univ., Raleigh, NC

9:12 0645 Community genomics of the Chagas Disease vector, *Triatoma dimidiata*: uncovering genetic variation and gut microbial fauna of a deadly kissing bug. **Lucia Orantes**, lorantes@uvm.edu[1], Lori Stevens[1], Patricia Dorn[2], Rachel Fredericksen[1], John Hanley[1], Leslie Morrissey[1], Donna Rizzo[1], M. Carlota Monroy[3], Kimberly F. Wallin[4] and Sara Cahan[1], [1]Univ. of Vermont, Burlington, VT, [2]Loyola Univ., New Orleans, LA, [3]Universidad de San Carlos, Guatemala City, Guatemala, [4]USDA - Forest Service, South Burlington, VT

9:24 0646 Presentation Withdrawn

9:36 0647 Genetic basis of insensitivity to DEET in *Anopheles gambiae*. **James Ricci**, jricc001@ucr.edu, David Turissini, Raissa Green and Bradley White, Univ. of California, Riverside, CA

9:48 0648 Males are from Mars, females are from Venus… and Earth? Adventures in sex determination and transcriptomics. **Meaghan Pimsler**, mlpimsler@gmail.com[1], Sing-Hoi Sze[1], Corbin D. Jones[2], Max Scott[3], Shuhua Fu[1], Christine Picard[4], Anne Andere[4], Jeffery K. Tomberlin[1] and Aaron Tarone[1], [1]Texas A&M Univ., College Station, TX, [2]Univ. of North Carolina, Chapel Hill, NC, [3]North Carolina State Univ., Raleigh, NC, [4]Indiana Univ. Purdue Univ., Indianapolis, IN

10:00 Break

10:12 0649 Investigation on the humoral immune factors putatively associated with different vector competence between human body and head lice. **Ju Hyeon Kim**, biomyst5@snu.ac.kr[1], Kyong Sup Yoon[2], Domenic J. Previte[2], John M. Clark[2] and Si Hyeock Lee[1], [1]Seoul National Univ., Seoul, South Korea, [2]Univ. of Massachusetts, Amherst, MA

10:24 0650 The effect of bacterial challenge on the midgut physiology and development of sand fly *Lutzomyia longipalpis*. **Matthew Heerman**, mch7766@ksu.edu[1], Ju Lin Weng Huang[1], Ivy Hurwitz[2], Ravi Durvasula[2] and Marcelo Ramalho-Ortigao[1], [1]Kansas State Univ., Manhattan, KS, [2]Univ. of New Mexico, Albuquerque, NM

10:36 0651 Genetic variation of the drywood termite *Incisitermes schwarzi* (Isoptera: Kalotermitidae). **Mark Janowiecki**, majanowi@uark.edu[1], Allen L. Szalanski[1], Rudolph H. Scheffrahn[2] and James W. Austin[3], [1]Univ. of Arkansas, Fayetteville, AR, [2]Univ. of Florida, Ft. Lauderdale, FL, [3]BASF Corporation, Research Triangle Park, NC

10:48 0652 Characterization of black carpenter ant (*Camponotus pennsylvanicus*) population genetics in Indiana. **Adam Salyer**, asalyer@purdue.edu, Purdue Univ., West Lafayette, IN

11:00 0653 Reproductive compatibility among populations and host-associated lineages of bed bugs, *Cimex lectularius*. **Zachary DeVries**, zdevries@gmail.com and Coby Schal, North Carolina State Univ., Raleigh, NC

11:12 0654 Little population structure within the American dog tick, *Dermacentor variabilis*, across North America. **Emily Kaufman**, elk38@nau.edu[1], Joseph D. Busch[1], Glen Scoles[2] and David M. Wagner[1], [1]Northern Arizona Univ., Flagstaff, AZ, [2]USDA - ARS, Pullman, WA

11:24 0655 The effect of two commercial baits on bacterial community in the termite gut. **Rachel Ann Arango**, rarango@fs.fed.us[1], Kenneth Raffa[2] and Frederick Green III[1], [1]USDA - Forest Service, Madison, WI, [2]Univ. of Wisconsin, Madison, WI

11:36 0656 Impacts of *Aedes albopictus* larvae on water column and biofilm bacterial community profiles using DGGE. **Nicholas Travanty**, nvtravan@ncsu.edu, Charles Apperson and Loganathan Ponnusamy, North Carolina State Univ., Raleigh, NC

05 - Graduate Student Ten-Minute Paper Competition: MUVE

B113-114 (Oregon Convention Center)

Moderators: Michael Reiskind[1] and Jennifer Henke[2], [1]North Carolina State Univ., Raleigh, NC, [2]Coachella Valley Mosquito and Vector Control District, Indio, CA

8:20 Introductory Remarks

8:24 0657 Field assessment of honeydew odors for attraction of house flies (*Musca domestica*). **Kim Hung**, kim.hung@ucr.edu and Alec Gerry, Univ. of California, Riverside, CA

8:36 0658 Bimodal cue complex signifies suitable oviposition sites to gravid females of the common green bottle fly. **Bekka Brodie**, bekka.brodie@umit.maine.edu[1], Regine Gries[1], Alysha Martins[1], Sherah L. VanLaerhoven[2] and Gerhard Gries[1], [1]Simon Fraser Univ., Burnaby, BC, Canada, [2]Univ. of Windsor, Windsor, ON, Canada

8:48 0659 A stable isotope mark-capture study of *Culex quinquefasciatus* and *Aedes albopictus* in College Station, Texas. **Emily Boothe**, emilyboothe@tamu.edu and Gabriel Hamer, Texas A&M Univ., College Station, TX

9:00 0660 Behavioral responses of *Culex tarsalis* to semiochemicals associated with the western mosquitofish, *Gambuis affinis*, in wind tunnel bioassays. **Adena Why**, awhy001@ucr.edu and William E. Walton, Univ. of California, Riverside, CA

9:12 0661 Mechanisms involved in DEET's effect on the responses of bed bugs to human odorants. **Feng Liu**, fzl0009@auburn.edu and Nannan Liu, Auburn Univ., Auburn, AL

9:24 0662 Citizen science meets biting pests: Determining the spatial pattern of nuisance black flies (Diptera: Simuliidae) in western Maryland. **Rebecca Wilson**, rcwilson@umd.edu, Elanor Spadafora, Alan Leslie and William O. Lamp, Univ. of Maryland, College Park, MD

9:36 0663 Historical changes in the local distribution of yellow fever mosquito (*Aedes aegypti* L.) in south Florida, U.S.A. **Kristen Hopperstad**, kahopper@ncsu.edu and Michael Reiskind, North Carolina State Univ., Raleigh, NC

9:48 0664 Honey-baited FTA cards for arbovirus surveillance: Sensitivity, mosquito feeding rates and feeding time course. **Emily Johnston**, Emilyj77@gmail.com, Claire Fisk and Craig Williams, Univ. of South Australia, Adelaide, Australia

10:00 0665 Subacute exposure to prallethrin modifies behavior of medically important vectors. **Kyndall Dye**, kyndall.dye@uky.edu and Grayson C. Brown, Univ. of Kentucky, Lexington, KY

10:12 Break

10:24 0666 Management practices that improve honey bee colony survivorship in the U.S.: Results from a multiyear national survey. **Nathalie Steinhauer**, nathalie.steinhauer@gmail.com[1], Claude Saegerman[2], Karen Rennich[1], Michael Wilson[3] and Dennis vanEngelsdorp[1], [1]Univ. of Maryland, College Park, MD, [2]Univ. of Liège, Liege, Belgium, [3]Univ. of Tennessee, Knoxville, TN

10:36 0667 Location, location, location: Optimizing surveillance efforts for *Culicoides sonorensis* and bluetongue virus through trap placement and attractant choices. **Emily McDermott**, emcde002@ucr.edu[1], Christie Mayo[2], Alec Gerry[1] and Bradley A. Mullens[1], [1]Univ. of California, Riverside, CA, [2]Univ. of California, Davis, CA

10:48 0668 Monitoring of *Culicoides* spp. as disease vectors in white-tailed deer (*Odocoileus virginianus*) production facilities. **Cassie A. Schoenthal**, schoenthal@tamu.edu and Roger E. Gold, Texas A&M Univ., College Station, TX

11:00 0669 Phenotypic variation in developmental characteristics of the black blow fly *Phormia regina* (Diptera: Calliphoridae) across New Jersey. **Lauren M. Weidner**, laurenmweidner@gmail.com[1], Aaron Tarone[2] and George C. Hamilton[1], [1]Rutgers, The State Univ. of New Jersey, New Brunswick, NJ, [2]Texas A&M Univ., College Station, TX

11:12 0670 Carrion community and temperature influence oviposition preferences of forensically relevant blow flies (Diptera: Calliphoridae). **Krystal R. Hans**, hansk@uwindsor.ca and Sherah L. VanLaerhoven, Univ. of Windsor, Windsor, ON, Canada

11:24 0671 Does blow fly (Diptera: Calliphoridae) community structure on burnt remains effect offspring fitness levels? **Vincenzo A. Pacheco**, pachecov@uwindsor.ca and Sherah L. VanLaerhoven, Univ. of Windsor, Windsor, ON, Canada

11:36 0672 Patterns of the fly associated bacteria *Ignatzschineria* Tóth 2007 and *Wohlfahrtiimonas* Tóth 2008 (Gammaproteobacteria; Xanthomonadales; Xanthomonadaceae) on cadavers through time.

Daniel Haarmann, dph007@SHSU.EDU[1], Embriette Hyde[2], Joseph Petrosino[3], Aaron Lynne[1] and Sibyl Bucheli[1], [1]Sam Houston State Univ., Huntsville, TX, [2]Univ. of Colorado, Boulder, CO, [3]Baylor Univ., Houston, TX

11:48 0673 Host-finding in necrophilous insects: Visual versus chemical cues. **Angela Bucci**, ambucci@ncsu.edu, D. Wes Watson and Coby Schal, North Carolina State Univ., Raleigh, NC

06 - Graduate Student Ten-Minute Paper Competition: MUVE

B115-116 (Oregon Convention Center)

Moderators: Nancy Hinkle[1] and David Poplin[2], [1]Univ. of Georgia, Athens, GA, [2]Legion Pest Management, Murrieta, CA

8:20 Introductory Remarks

8:24 0674 Significance of animal feces and its bacterial community in larval development and fitness of the biting midge, *Culicoides sonorensis*. **Dinesh Erram**, derram@ksu.edu and Ludek Zurek, Kansas State Univ., Manhattan, KS

8:36 0675 Along the Chisholm Trail: Establishing the distribution of lone star tick (*Amblyomma americanum*) populations in Oklahoma. **Jaclyn Martin**, jaclyn.e.martin@okstate.edu and Bruce Noden, Oklahoma State Univ., Stillwater, OK

8:48 0676 Ticks and tick-borne pathogens from two populations of American black bear in eastern Oklahoma. **Jessica Mitcham**, rmitcha@ostatemail.okstate.edu, Delaina Skinner, Eileen Johnson and Bruce Noden, Oklahoma State Univ., Stillwater, OK

9:00 0677 Specifying host and pathogen associations of *Amblyomma maculatum* (Gulf Coast tick). **Sarah E. Mays**, sarahmays12@gmail.com, Allan E. Houston and Rebecca T. Trout Fryxell, Univ. of Tennessee, Knoxville, TN

9:12 0678 Nitrogen economy at colony foundation in the Formosan subterranean termite (Isoptera: Rhinotermitidae). **Aaron Mullins**, amull81@ufl.edu[1], and Nan-Yao Su[2], [1]Univ. of Florida, Ft. Lauderdale, FL, [2]Univ. of Florida, Davie, FL

9:24 0679 Effect of temperature on tunneling behavior of *Coptotermes formosanus* Shiraki (Isoptera: Rhinotermitidae). **Jie Chen**, jchen31@tigers.lsu.edu and Gregg Henderson, Louisiana State Univ., Baton Rouge, LA

9:36 0680 Age polyethism of workers in relation to egg clusters in juvenile colonies of *Coptotermes formosanus* Shiraki. **He Du**, hdu@ufl.edu[1], Thomas Chouvenc[1], Weste Osbrink[2] and Nan-Yao Su[1], [1]Univ. of Florida, Davie, FL, [2]USDA - ARS, Kerrville, TX

9:48 0681 Evaluating the impact of temperature on interspecific competition of *Nylanderia fulva* (Mayr) and *Solenopsis invicta* (Buren). **M. T. Bentley**, Volcum1@ufl.edu and Faith M. Oi, Univ. of Florida, Gainesville, FL

10:00 0682 Polydomy and intraspecific aggression in the Asian needle ant, *Pachyconcyla chinensis* (Emery). **Hamilton Allen**, hrallen@clemson.edu, Eric P. Benson and Patricia Zungoli, Clemson Univ., Clemson, SC

10:12 Break

10:24 0683 Bed bug, *Cimex lectularius,* aversion to smooth surfaces. **Benjamin A Hottel**, bhottel@ufl.edu, Roberto Pereira and Philip G. Koehler, Univ. of Florida, Gainesville, FL

10:36 0684 Bed bug feeding and defecation behaviors on a live host compared to an artificial membrane system. **Courtney Darrington**, darrington.3@buckeyemail.osu.edu and Susan C. Jones, The Ohio State Univ., Columbus, OH

10:48 0685 Effects of feeding, mating, and starvation on oviposition and fertility in the bed bug, *Cimex lectularius*. **Yvonne Matos**, ymatos@ncsu.edu and Coby Schal, North Carolina State Univ., Raleigh, NC

11:00 0686 The diversity and stability of native bee communities in diversified urban and rural farming systems. **Elias Bloom**, elias.bloom@email.wsu.edu and David Crowder, Washington State Univ., Pullman, WA

11:12 0687 Mosquito species diversity patterns in an urban environment of Okinawa, Japan. **Tomonori Hoshi**, tomonori.hoshi.japan@gmail.com, Nozomi Imanishi, Yukiko Higa and Luis Chaves, Nagasaki Univ., Nagasaki, Japan

11:24 0688 Larval nutrition affects the capacity of mosquitoes to vector malaria by shaping adult life-history traits. **Lillian Moller-Jacobs**, llm233@psu.edu, Courtney Murdock, Mark Kennedy, Rachel Thomas and Matthew B. Thomas, Pennsylvania State Univ., Univ. Park, PA

11:36 0689 Vector competence of selected mosquito strains infected with dog heartworm (*Dirofilaria immitis*). **Chris J. Holderman**, chrish2@ufl.edu[1], P. E. Kaufman[1], Salvador Gezan[1] and C. Roxanne Connelly[2], [1]Univ. of Florida, Gainesville, FL, [2]Univ. of Florida, Vero Beach, FL

11:48 0690 Quantitatively predicting the important pathways and hosts for Rift Valley fever virus introduction and transmission in the United States. **Andrew Golnar**, agolnar@tamu.edu and Gabriel Hamer, Texas A&M Univ., College Station, TX

07 - Graduate Student Ten-Minute Paper Competition: MUVE

B117-119 (Oregon Convention Center)

Moderators: Nan-Yao Su[1] and Julian Yates[2], [1]Univ. of Florida, Davie, FL, [2]Univ. of Hawai'i, Honolulu, HI

8:20 Introductory Remarks

8:24 0691 Insecticidal sugar trap for biting midges (*Culicoides sonorensis*). **Darren Snyder**, snyderd@ksu.edu, Kansas State Univ., Manhattan, KS and Lee Cohnstaedt, USDA - ARS, Manhattan, KS

8:36 0692 Comparing the ability of various plant essential oils to enhance synthetic pyrethroids against *Aedes aegypti* and *Anopheles gambiae*. **Edmund Norris**, ejnorris@iastate.edu, Aaron Gross, Lyric Bartholomay and Joel Coats, Iowa State Univ., Ames, IA

8:48 0693 Determining a lethal and non-deterrent concentration range of the ecdysone agonist, halofenozide, alone and in combination with the chitin synthesis inhibitor, noviflumeron, against the Formosan subterranean termite. **Lucas P. Carnohan**, carnohanl@ufl.edu[1], and Nan-Yao Su[2], [1]Univ. of Florida, Gainesville, FL, [2]Univ. of Florida, Davie, FL

9:00 0694 Effect of treating above-ground tunnels with RTU dry Termidor on eastern subterranean termite populations (Isoptera: Rhinotermitidae). **Znar Barwary**, zsb0001@tigermail.auburn.edu, Auburn Univ., Auburn, AL

9:12 0695 Molting site fidelity: A case of death chase in *Coptotermes formosanus* (Isoptera: Rhinotermitidae) colonies treated with chitin synthesis inhibitor baits. **Garima Kakkar**, garimaiari@ufl.edu[1], Thomas Chouvenc[1], Weste Osbrink[2] and Nan-Yao Su[1], [1]Univ. of Florida, Davie, FL, [2]USDA - ARS, Kerrville, TX

9:24 0696 Evaluation of lethal and sub-lethal effects of ingestible pesticides on bed bugs (*Cimex lectularius*). **Angela Sierras**, ajsierra@ncsu.edu and Coby Schal, North Carolina State Univ., Raleigh, NC

9:36 0697 Toxicity of selected essential oils against bed bugs, *Cimex lectularius*. **Chen Zha**, chen.zha1@rutgers.edu, Rutgers, The State Univ. of New Jersey, New Brunswick, NJ

9:48 0698 The importance of methodology and strain selection when determining efficacy of insecticides against bed bugs. **David Lilly**, dlil7680@uni.sydney.edu.au[1], Stephen Doggett[2] and Cameron Webb[1], [1]Univ. of Sydney, Westmead, Australia, [2]Pathology West - ICPMR Westmead, Westmead, NSW, Australia

10:00 0699 The influence of entomopathogenic fungi from forest and urban landscapes on founding pairs of *Reticulitermes flavipes* (Blattodea: Rhinotermitidae). **Tamra Reall Lincoln**, TRFY9F@mail.mizzou.edu and Richard Houseman, Univ. of Missouri, Columbia, MO

10:12 Break

10:24 0700 Lethal and sub-lethal impacts of oil-formulated fungal biopesticides on house fly populations in simulated field settings (biocosms). **Naworaj Acharya**, naworaj@yahoo.com[1], Edwin Rajotte[2], Nina Jenkins[2] and Matthew Thomas[2], [1]Pennsylvania State Univ., State College, PA, [2]Pennsylvania State Univ., Univ. Park, PA

10:36 0701 Nutritional ecology of parasitic *Pseudacteon* phorid flies: Natural enemies of imported fire ants, *Solenopsis* spp. **Olufemi Ajayi**, osa0001@auburn.edu and Henry Fadamiro, Auburn Univ., Auburn, AL

10:48 0702 Evaluation of bio-rational insecticides to manage chilli thrips, *Scirtothrips dorsalis* Hood (Thysanoptera: Thripidae) on roses. **Luis Aristizabal**, larist@ufl.edu[1], Yan Chen[2], Ronald H. Cherry[3], Ronald Cave[4] and Steven P. Arthurs[1], [1]Univ. of Florida, Apopka, FL, [2]Louisiana State Univ., Hammond, LA, [3]Univ. of Florida, Belle Glade, FL, [4]Univ. of Florida, Ft. Pierce, FL

11:00 0703 Presentation Withdrawn

11:12 0704 Adapting ectoparasite control to welfare-driven changes in poultry production systems. **Amy C. Murillo**, alock001@ucr.edu and Bradley A. Mullens, Univ. of California, Riverside, CA

11:24 0705 A push-pull, intergrated pest management scheme for the protection of barn owl nest boxes and sugarcane workers from invasive Africanized honey bees. **Caroline Efstathion**, cefstathion@ufl.edu[1], Bill Kern[1] and Richard Raid[2], [1]Univ. of Florida, Davie, FL, [2]Univ. of Florida, Belle Glade, FL

11:36 0706 Red flour beetle, *Tribolium castaneum* (Herbst), larval development when fed ground and raw dried distiller's grains with solubles at 30 and 50% r.h. **Mahsa Fardisi**, mfardisi@purdue.edu, Linda Mason and Klein Ileleji, Purdue Univ., West Lafayette, IN

11:48 0707 Maternal effects of female size on egg viability and first instar size in container-inhabiting mosquitoes. **Francis N. Ezeakacha**, kakaluvs@yahoo.com and Donald A. Yee, Univ. of Southern Mississippi, Hattiesburg, MS

08 - Graduate Student Ten-Minute Paper Competition: PBT

A103-104 (Oregon Convention Center)

Moderators: David W. Stanley[1] and Ana Maria Vélez[2], [1]USDA - ARS, Columbia, MO, [2]Univ. of Nebraska, Lincoln, NE

8:20 Introductory Remarks

8:24 0708 Evaluating entomopathogenic nematode production on injured black soldier fly, *Hermetia illucens* (L.) (Diptera: Stratiomyidae). **Joseph Tourtois**, joseph.tourtois@gmail.com and Matthew Grieshop, Michigan State Univ., East Lansing, MI

8:36 0709 Effect of *Isaria fumosorosea* Wize on survival and leaf consumption of *Microtheca ochroloma* Stål (Coleoptera: Chrysomelidae). **Angie A. Niño**, anino@ufl.edu[1], Cecilia Gámez-Herrera[2] and Pasco B. Avery[1], [1]Univ. of Florida, Ft. Pierce, FL, [2]Escuela Agrícola Panamericana Zamorano, Tegucigalpa, Honduras

8:48 0710 Older beetles are stronger than young: Influence of maturation, aging and mating on response to an entomopathogenic fungus. **Joanna Fisher**, jjf236@cornell.edu, Louela Castrillo and Ann Hajek, Cornell Univ., Ithaca, NY

9:00 0711 Potential fungistatic effects of the defensive compound of the brown marmorated stink bug, *Halyomorpha halys* (Stål), on entomopathogenic fungi. **Thomas Pike**, tpike@umd.edu, Raymond J. St. Leger and Paula M. Shrewsbury, Univ. of Maryland, College Park, MD

9:12 0712 The activity of methyl ketones as fumigants for insect control. **Jiwei Zhu**, jzhu4@ncsu.edu[1], Anirudh Dhammi[1], Jaap B. van Kretschmar[2], Charles Apperson[1] and R. Michael Roe[1], [1]North Carolina State Univ., Raleigh, NC, [2]NSF Center for Integrated Pest Management, Raleigh, NC

9:24 0713 Refining trunk injection strategies for control of foliar insects and disease in Michigan apple orchards. **Charles Coslor**, ccoslor@gmail.com, Anthony Hale VanWoerkom, Christine Vandervoort and John C. Wise, Michigan State Univ., East Lansing, MI

9:36 0714 Combination of sulfuryl floride with heat to control the mold mite, T*yrophagus putrescentiae* (Schrank) (Acarina: Acaridae), a serious pest of country hams. **Salehe Abbar**, abbar@ksu.edu[1], M. Wes Schilling[2] and Thomas Phillips[1], [1]Kansas State Univ., Manhattan, KS, [2]Mississippi State Univ., Starkville, MS

9:48 0715 Effects of droplet size, density, and concentration of a spinosad bait spray on control of *Drosophila suzukii* (Diptera: Drosophilidae). **Alix Whitener**, alix.crilly@email.wsu.edu[1], and Elizabeth H. Beers[2], [1]Washington State Univ., Pullman, WA, [2]Washington State Univ., Wenatchee, WA

10:00 0716 Insecticide use practices in cocoa production in Ashanti, eastern Volta and western regions of Ghana. **Akua Antwi-Agyakwa**, akuakonaduantwi@gmail.com[1], Richard Adu-acheampong[2], Kodwo D. Ninsin[3] and Enoch A. Osekre[1], [1]Kwame Nkrumah Univ. of Science and Technology, Kumasi, Ghana, [2]Cocoa Research Institute of Ghana, Akim-Tafo, Ghana, [3]CSIR- Animal Research Institute, Accra, Ghana

10:12 Break

10:24 0717 Penetration-enhancing effect of rosemary essential oil components as a possible mechanism of synergy. **Jun-hyung Tak**,

saturnpg7@yahoo.com and Murray B. Isman, Univ. of British Columbia, Vancouver, BC, Canada

10:36 0718 Chronic toxicity of rynaxypyr 20%EC, an anthranilic diamide insecticide, on the egg parasitoid, *Trichogramma chilonis* Ishii. **Sayanti Mallick**, sayanti.mum@gmail.com and Swapan Mandal, Bidhan Chandra Krishi Viswa Vidyalaya, Mohanpur, India

10:48 0719 Individual and colony effects of dietary imidacloprid on managed *Bombus impatiens* in Maine's lowbush blueberry fields. **Kalyn Bickerman**, Kalyn.bickerman@umit.maine.edu, Univ. of Maine, Orono, ME

11:00 0720 Whole-plant systemic bioassay method for assessing susceptibility to neonicotinoid insecticides in *Aphis glycines*. **Matheus Ribeiro**, matheusgpmr@gmail.com[1], Carolina Camargo[1], Laramy Enders[1], Blair Siegfried[1] and Thomas E. Hunt[2], [1]Univ. of Nebraska, Lincoln, NE, [2]Univ. of Nebraska, Concord, NE

11:12 0721 Study of the translocation of thiamethoxam/mefenoxam seed treatments to soybean flowers. **Carolina Camargo**, caro.camargo@yahoo.es, Blair Siegfried and Thomas Hunt, Univ. of Nebraska, Lincoln, NE

11:24 0722 The impact of nutrition on susceptibility to Cry endotoxins in *Helicoverpa zea* (Lepidoptera: Noctuidae). **Carrie Deans**, cadeans@tamu.edu, Spencer T. Behmer and Gregory Sword, Texas A&M Univ., College Station, TX

11:36 0723 Effect of plant species on insecticidal response of Asian citrus psyllid, *Diaphorina citri* Kuwayama. **Bin Liu**, jingliubin@ufl.edu[1], Monique Coy[2], Jin-Jun Wang[1] and Lukasz L. Stelinski[2], [1]Southwest Univ. of China, Chongqing, China, [2]Univ. of Florida, Lake Alfred, FL

11:48 0724 Crowding effects in the yellow fever mosquito (*Aedes aegypti*) and its impact on insecticide sensitivity. **Thomas Bilbo**, thomas.bilbo@ttu.edu[1], Dan Dawson[1] and Chris Salice[2], [1]Texas Tech Univ., Lubbock, TX, [2]Towson Univ., Towson, MD

09 - Graduate Student Ten-Minute Paper Competition: PBT

A105 (Oregon Convention Center)

Moderators: Yoonseong Park[1] and Troy D. Anderson[2], [1]Kansas State Univ., Manhattan, KS, [2]Virginia Tech, Blacksburg, VA

8:20 Introductory Remarks

8:24 0725 Protein and carbohydrates in detoxification processes of a generalist herbivore. **Marion Le Gall**, le-marron@hotmail.fr, Pennsylvania State Univ., Univ. Park, PA and Spencer T. Behmer, Texas A&M Univ., College Station, TX

8:36 0726 Do metabolic detoxification enzymes mediate pyrethroid resistance in the southern chinch bug? **Yao Xu**, bigantbrl@hotmail.com[1], Michael E. Scharf[2], Eileen A. Buss[1] and Drion G. Boucias[1], [1]Univ. of Florida, Gainesville, FL, [2]Purdue Univ., West Lafayette, IN

8:48 0727 Response of termite (*Reticulitermes flavipes*) cytochrome P450 enzymes when subjected to oxidation inhibitors. **Mary Kubiszak-Rushton**, mkubisza@purdue.edu and Michael E. Scharf, Purdue Univ., West Lafayette, IN

9:00 0728 Functional analysis of cytochrome P450 genes in the yellowfever mosquito *Aedes aegypi* (Diptera: Culicidae). **Moustapha Soumaila Issa**, msoumai@k-state.edu, Yoonseong Park, Marcelo Ramalho-Ortigao and Kun Yan Zhu, Kansas State Univ., Manhattan, KS

9:12 0729 Roles of P450 genes in permethrin resistance of the house fly, *Musca domestica*. **Ming Li**, mzl0025@auburn.edu and Nannan Liu, Auburn Univ., Auburn, AL

9:24 0730 Molecular mechanisms of imidacloprid resistance in Colorado potato beetles (*Leptinotarsa decemlineata*) in the Central Sands region of Wisconsin. **Justin Clements**, jclements2@wisc.edu and Russell L Groves, Univ. of Wisconsin, Madison, WI

9:36 0731 Developing a "quick test" for phosphine resistance in the lesser grain borer, *Rhyzopertha dominica (Fabricius)* (Coleoptera: Bostrichidae). **Edwin Afful**, edafful@yahoo.com, Kansas State Univ., Manhattan, KS

9:48 0732 Impact of neonate pre-treatment conditions on insecticidal protein activity and laboratory bioassay variation. **Karen F. da Silva**, kfdsilva@gmail.com, Univ. of Nebraska, Lincoln, NE

10:00 0733 Detection and bioactivity of Cry1Ab fragments: Implications on risk assessments. **Vurtice Albright**, valbrigh@iastate.edu[1], Richard Hellmich[2] and Joel Coats[1], [1]Iowa State Univ., Ames, IA, [2]USDA - ARS, Ames, IA

10:12 Break

10:24 0734 Identification of Cry1Ie toxin receptors in *Ostrinia nubilalis*. **Can Zhao**, czhao7@utk.edu[1], Juan Luis Jurat-Fuentes[2], Zishan Zhou[1], Hongyu Pan[3] and Jie Zhang[4], [1]Chinese Academy of Agricultural Sciences, Beijing, China, [2]Univ. of Tennessee, Knoxville, TN, [3]Jilin Univ., Changchun, China, [4]Chinese Academy of Agricultural Sciences, Bejing, China

10:36 0735 Investigating symbiont-mediated protection in the eastern subterranean termite (*Reticulitermes flavipes* Kollar). **Brittany F. Peterson**, peter137@purdue.edu and Michael E. Scharf, Purdue Univ., West Lafayette, IN

10:48 0736 Cellulase gene expression profiles in termites according to different habitats and diets. **Kyungjae Yoon**, kongbob89@snu.ac.kr[1], Ju Hyeon Kim[1], Young-Ho Kim[1], Won-Hoon Lee[2] and Si Hyeock Lee[1], [1]Seoul National Univ., Seoul, South Korea, [2]Animal and Plant Agency, Busan, South Korea

11:00 0737 Investigating effects of colony nutrition on *Nosema ceranae* infection and persistence in honey bee colonies. **Cameron Jack**, cameronjeromejack@gmail.com and Ramesh R. Sagili, Oregon State Univ., Corvallis, OR

11:12 0738 The effects of benzoxazinoids on specialist and generalist *Diabrotica* spp. (Coleoptera: Chrysomelidae). **Jelfina Alouw**, jelfine_alouw@yahoo.com and Nicholas Miller, Univ. of Nebraska, Lincoln, NE

11:24 0739 How temperature and humidity affect brown marmorated stink bug (*Halyomorpha halys*) egg masses and the symbionts deposited there. **Christopher Taylor**, cmjtaylor3@gmail.com, Peter Coffey and Galen Dively, Univ. of Maryland, College Park, MD

11:36 0740 Functional characterization of gut bacteria essential for development of mosquitoes. **Kerri L. Coon**, kerri@uga.edu and Michael R. Strand, Univ. of Georgia, Athens, GA

11:48 0741 Interactions of the pea aphid secondary symbiont *Hamiltonella defensa* and its bacteriophage, APSE. **Jayce W. Brandt**, jayce@uga.edu, Kerry M. Oliver and Michael R. Strand, Univ. of Georgia, Athens, GA

10 - Graduate Student Ten-Minute Paper Competition: PBT

A106 (Oregon Convention Center)

Moderators: Marianne Alleyne[1] and Shahid Karim[2], [1]Univ. of Illinois, Urbana, IL, [2]Univ. of Southern Mississippi, Hattiesburg, MS

8:20 Introductory Remarks

8:24 0742 Molecular cloning and RNA interference of *Cullin-1* gene in the codling moth *Cydia pomonella*. **Stephen Ireland**, scirelan@umich.edu[1], Jinda Wang[2], and Douglas Knipple[3], [1]Univ. of Michigan, Ann Arbor, MI, [2]Nanjing Agricultural Univ., Nanjing, China, [3]Cornell Univ., Geneva, NY

8:36 0743 Inducing RNA interference in the arbovirus vector, *Culicoides sonorensis*. **Mary Mills**, mm02463@ksu.edu[1], Dana Nayduch[2] and Kristin Michel[1], [1]Kansas State Univ., Manhattan, KS, [2]USDA - ARS, Manhattan, KS

8:48 0744 Development of RNA interference tools for functional genomic assays and control strategies of *Frankliniella occidentalis*. **Ismael E. Badillo-Vargas**, ibadillo@ksu.edu, Brandi Schneweis, Dorith Rotenberg and Anna E. Whitfield, Kansas State Univ., Manhattan, KS

9:00 0745 Identification of genes involved in juvenile hormone signaling through RNA interference screening in *Drosophila* cells. **Joliene Lindholm**, jlindholm@entomology.wisc.edu and Walter G Goodman, Univ. of Wisconsin, Madison, WI

9:12 0746 The role of juvenile hormone in the growth of the condition-dependent weapons of rhinoceros beetles (*Trypoxylus dichotomus*). **Robert A. Zinna**, Robert.Zinna@wsu.edu[1], Hiroki Gotoh[2], James Hust[1], Doug Emlen[3], Colin S. Brent[4] and Laura Corley Lavine[1], [1]Washington State Univ., Pullman, WA, [2]Nagoya Univ., Chikusa, Japan, [3]Univ. of Montana, Missoula, MT, [4]USDA, Maricopa, AZ

9:24 0747 Specific signal pathway inhibition reduces ecdysteroid production and follicle cell proliferation in *Aedes aegypti* ovaries. **Melissa Mattee**, mmattee@uga.edu, Michael R. Strand and Mark R. Brown, Univ. of Georgia, Athens, GA

9:36 0748 Conserved microRNA miR-8 targets the wingless signaling pathway to regulate reproductive processes in the female mosquito, *Aedes aegypti*. **Keira J. Lucas**, kneum001@ucr.edu, Vladimir A. Kokoza, Sourav Roy, Jisu Ha, Amanda L. Gervaise and Alexander S. Raikhel, Univ. of California, Riverside, CA

9:48 0749 Ovarian follicle cells are the source of ecdysone in the ovaries of *Aedes aegypti* mosquitoes. **David A. McKinney**, dmckinn7@uga.edu, Michael R. Strand and Mark R. Brown, Univ. of Georgia, Athens, GA

10:00 0750 Activating and repressive actions of the insect steroid hormone, 20-hydroxyecdysone, and ecdysone receptor in the female mosquito, *Aedes aegypti*. **Lisa K. Johnson**, ljohn011@ucr.edu, Sourav Roy and Alexander S. Raikhel, Univ. of California, Riverside, CA

10:12 Break

10:24 0751 Overwintering fertilized adults and bias sex ratios: New aspects of the life history of *Megacopta cribraria* (Hemiptera: Plataspidae). **Julian Golec**, JRG0027@auburn.edu and Xing Ping Hu, Auburn Univ., Auburn, AL

10:36 0752 Effects of diapause on the excretory physiology of the northern house mosquito, *Culex pipiens*. **Liu Yang**, yang.554@osu.edu, The Ohio State Univ., Wooster, OH

10:48 0753 Transcriptomic evidence of a dramatic functional transition of the Malpighian tubules after a blood meal in the Asian tiger mosquito (*Aedes albopictus*). **Carlos Esquivel**, esquivelpalma.1@buckeyemail.osu.edu, The Ohio State Univ., Wooster, OH

11:00 0754 The molecular physiology of gap junctions (innexins) in the mosquito *Aedes aegypti*: Integrating pharmacology and functional genetics. **Travis Calkins**, calkins.21@osu.edu and Peter Piermarini, The Ohio State Univ., Wooster, OH

11:12 0755 Mosquito ABC transporters: A pharmacological barrier to anticholinesterase delivery. **Ngoc N. Pham**, npham914@vt.edu and Troy D. Anderson, Virginia Tech, Blacksburg, VA

11:24 0756 Evaluation of ABC transporter gene expression in invertebrates as a biomarker in aquatic environments: Is it as useful as we think? **Ryan Gott**, ryan.c.gott@gmail.com and William O. Lamp, Univ. of Maryland, College Park, MD

11:36 0757 Comparative analysis of *Anopheles gambiae* larval and adult dorsal vessel structure and hemolymph circulation. **Garrett P. League**, garrett.p.league@vanderbilt.edu and Julian F. Hillyer, Vanderbilt Univ., Nashville, TN

11:48 0758 Periostial hemocyte aggregation patterns correlate with differential pathogen phagocytosis on the heart of *Anopheles gambiae*. **Leah T. Sigle**, leah.t.sigle@vanderbilt.edu and Julian F. Hillyer, Vanderbilt Univ., Nashville, TN

11 - Graduate Student Ten-Minute Paper Competition: PBT

A107-109 (Oregon Convention Center)

Moderators: Aijun Zhang[1] and Reed Johnson[2], [1]USDA - ARS, Beltsville, MD, [2]The Ohio State Univ., Wooster, OH

8:20 Introductory Remarks

8:24 0759 *Varroa jacobsoni* mites that differ in their reproductive success on the European honey bee (*Apis mellifera*) display differential gene expression. **Gladys Andino**, gandino@purdue.edu[1], Greg J. Hunt[1], Michael Gribskov[1] and Denis Anderson[2], [1]Purdue Univ., West Lafayette, IN, [2]CSIRO, Canberra, Australia

8:36 0760 Short neuropeptide F receptor localization in the brain of fire ant worker subcastes: A possible role in mechanisms of division of labor and nutritional status. **Paula Castillo**, paulacastillobravo@yahoo.com and Patricia V. Pietrantonio, Texas A&M Univ., College Station, TX

8:48 0761 Determination of double bond position and stereochemistry in unsaturated cuticular hydrocarbons of *Drosophila* species. **Jacqueline Serrano**, jserr005@ucr.edu[1], J. Steven McElfresh[1], Yehuda Ben-Shahar[2], Kathleen Zelle[2] and Jocelyn G. Millar[1], [1]Univ. of California, Riverside, CA, [2]Washington Univ., St. Louis, MO

9:00 0762 Characterization of material properties of bed bug cuticle (*Cimex lectularius*). **Jorge Bustamante**, bustamaj@uci.edu, Jason Panzarino, Timothy Rupert and Catherine Loudon, Univ. of California, Irvine, CA

9:12 0763 Differential gene expression of density-dependent phenotypic plasticity in *Schistocerca americana* (Orthoptera: Acrididae). **Steve Gotham**, sgothamjr@knights.ucf.edu and Hojun Song, Univ. of Central Florida, Orlando, FL

9:24 0764 Molecular and functional characterization of a prostaglandin E_2 synthase in the blacklegged tick, *Ixodes scapularis* Say. **Joshua R. Urban**, josurb@ksu.edu and Yoonseong Park, Kansas State Univ., Manhattan, KS

9:36 0765 Osmoregulatory functions of V-ATPase and Na/K-ATPase in the salivary gland of the blacklegged tick, *Ixodes scapularis* Say. **Donghun Kim**, kp5091@k-state.edu and Yoonseong Park, Kansas State Univ., Manhattan, KS

9:48 0766 The venom of *Megarhyssa* (Hymenoptera: Ichneumonidae): Putative proteins and possible functions. **Victoria G. Pook**, victoria.pook@uky.edu and Michael J. Sharkey, Univ. of Kentucky, Lexington, KY

10:00 0767 Transcriptional regulation of diapause induction in the female Asian tiger mosquito, *Aedes albopictus* (Skuse). **Xin Huang**, xh33@georgetown.edu, Monica Poelchau and Peter Armbruster, Georgetown Univ., Washington, DC

10:12 Break

10:24 0768 Drought-induced rapid cold-hardening in *Eurosta solidaginis*: Thresholds, response strength, and tissue-level induction. **J.D. Gantz**, gantzjd@miamioh.edu and R. E. Lee, Miami Univ., Oxford, OH

10:36 0769 Cold hardiness of Asian longhorned beetle (*Anoplophora glabripennis*) larvae in different populations. **Yuqian Feng**, fengyuqian1988@163.com, Beijing Forestry Univ., Beijing, China

10:48 0770 Evaluating DNA methylation's link to alternative splicing in the Nevada dampwood termite. **Karl Glastad**, karlglastad@gmail.com[1], Juergen Liebig[2] and Michael AD. Goodisman[1], [1]Georgia Institute of Technology, Atlanta, GA, [2]Arizona State Univ., Tempe, AZ

11:00 0771 Chemical mediation of queen and king recognition in subterranean termites (*Reticulitermes flavipes*). **Colin Funaro**, cffunaro@ncsu.edu and Edward L. Vargo, North Carolina State Univ., Raleigh, NC

11:12 0772 Effects of zingerone on the mating efficacy of male fruit flies (Diptera: Tephritidae). **Jess R. Inskeep**, jinskeep@hawaii.edu, Univ. of Hawai'i, Honolulu, HI

11:24 0773 Avoidance, tolerance, or preference: Responses of the western honey bee (*Apis mellifera*) to xenobiotics. **Ling-Hsiu Liao**, liao19@illinois.edu and May R. Berenbaum, Univ. of Illinois, Urbana, IL

11:36 0774 Attraction of *Diaphorina citri* (Hemiptera: Liviidae) to colored light. **Thomson Paris**, thomsonparis@ufl.edu[1], Sandra A. Allan[2], and Philip A. Stansly[3], [1]Univ. of Florida, Gainesville, FL, [2]USDA-ARS-CMAVE, Gainesville, FL, [3]Univ. of Florida, Immokalee, FL

11:48 0775 The nose knows: Using the olfactory system to dissect mosquito host-seeking behavior. **Genevieve Tauxe**, genevieve.tauxe@email.ucr.edu and Anandasankar Ray, Univ. of California, Riverside, CA

12 - Graduate Student Ten-Minute Paper Competition: P-IE

C123 (Oregon Convention Center)

Moderator: Rosalind James, USDA - ARS, Logan, UT

8:20 Introductory Remarks

8:24 0776 Short-term effects of introduced honeybees (Hymenoptera: Apidae) on native megachild bees (Hymenoptera: Megachilidae) in temperate, mixed-wood forests. **Susan Frye**, s.frye@mail.utoronto.ca, Univ. of Toronto, Toronto, ON, Canada

8:36 0777 Consequences of urban land use change for bee community composition and function. **Scott Prajzner**, prajzner.1@osu.edu and Mary M. Gardiner, The Ohio State Univ., Wooster, OH

8:48 0778 Widespread modified hairs in bees: An explanation for floral specialization? **Zach Portman**, zportman@gmail.com[1], and Terry Griswold[2], [1]Utah State Univ., Logan, UT, [2]USDA - ARS, Logan, UT

9:00 0779 Standardizing bee sampling protocols using geostatistics. **Matthew I McKinney**, mm.entomology@gmail.com and Yong-Lak Park, West Virginia Univ., Morgantown, WV

9:12 0780 Tillage effects on the ground nesting bee *Peponapis pruinosa*. **Katharina Ullmann**, katharina_uk@yahoo.com, Matthew Meisner and Neal M. Williams, Univ. of California, Davis, CA

9:24 0781 How do chlorpyrifos residues and leaf characteristics affect leaf selection by nest building *Megachile rotundata*? **Margaret Scampavia**, mrscampavia@ucdavis.edu[1], Edwin Lewis[2] and Neal M. Williams[2], [1]Univ. of California, Oakland, CA, [2]Univ. of California, Davis, CA

9:36 0782 Dually improving biodiversity and pollination services for enhanced cotton yields and sustainability. **Sarah Cusser**, sarah.cusser@gmail.com and Shalene Jha, Univ. of Texas, Austin, TX

9:48 0783 Investigation of cotton fleahoppers (*Pseudatomoscelis seriatus*) as pollinators of cotton. **Loriann C Garcia**, garcia_lc@tamu.edu and Micky Eubanks, Texas A&M Univ., College Station, TX

10:00 0784 The effect of excluding centuries-long ungulate grazing on unmanaged pollination in the Mongolian steppe. **Daniel Song**, songdan@sas.upenn.edu[1], Pierre Liancourt[2], Bazartseren Boldgiv[3], Laura Spence[4], Peter Petraitis[1] and Brenda Casper[1], [1]Univ. of Pennsylvania, Philadelphia, PA, [2]Academy of Sciences of the Czech Republic, Prùhonice, Czech Republic, [3]National Univ. of Mongolia, Ulaanbaatar, Mongolia, [4]Sterling College, Craftsbury, VT

10:12 Break

10:24 0785 Defining the community of insect pollinators found in Iowa corn and soybean fields. **M. Joseph Wheelock**, wheelock@iastate.edu and Matthew E. O'Neal, Iowa State Univ., Ames, IA

10:36 0786 Species-specific responses to pesticide use and habitat quality in wild bee communities visiting blueberry fields. **Emily May**, mayemil1@msu.edu, Julianna Wilson, Jason Gibbs and Rufus Isaacs, Michigan State Univ., East Lansing, MI

10:48 0787 Spillover of pollinators between crops: Competition or facilitation? **Heather Connelly**, hlc66@cornell.edu[1], Eleanor J. Blitzer[2], Bryan N. Danforth[1], Gregory M. Loeb[3] and Katja Poveda[1], [1]Cornell Univ., Ithaca, NY, [2]Univ. of California, Berkeley, CA, [3]Cornell Univ., Geneva, NY

11:00 0788 Evaluating the attractiveness of Coreopsis (*Coreopsis* spp.) wild types and cultivars to pollinators. **Owen Cass**, ocass@udel.edu and Deborah A. Delaney, Univ. of Delaware, Newark, DE

11:12 0789 Influence of an invasive bush on native bee communities adjacent to intensive agriculture. **Michael Minnick**, minnicmj@miamiOH.edu, Valerie Peters and Thomas O. Crist, Miami Univ., Oxford, OH

11:24 0790 Understanding the impact of land use on bee populations in a seasonally dry tropical agro-ecosystem. **Sara M. Galbraith**, sara.marie.galbraith@gmail.com[1], Jenny Ordoñez[1] and Nilsa A. Bosque-Pérez[2], [1]Tropical Agricultural Research and Higher Education Center (CATIE), Turrialba, Costa Rica, [2]Univ. of Idaho, Moscow, ID

11:36 0791 Promiscuous flowers attract high numbers of bees and even higher numbers of non-bee flower visitors. **Kate Zemenick**, kazemenick@ucdavis.edu and Jay Rosenheim, Univ. of California, Davis, CA

11:48 0792 Presentation Withdrawn

13 - Graduate Student Ten-Minute Paper Competition: P-IE

C124 (Oregon Convention Center)

Moderator: Robert L. Meagher, USDA - ARS, Gainesville, FL

8:20 Introductory Remarks

8:24 0793 Digital image processing and honey bee (*Apis mellifera*) grooming. **Carl Giuffre**, cjgiuffre@gmail.com, Michael Simone-Finstrom and David Tarpy, North Carolina State Univ., Raleigh, NC

8:36 0794 Honey bees (*Apis mellifera*) in anthropogenic landscapes: A citizen-science study of colony success in relation to urban and agricultural land use. **Douglas B. Sponsler**, sponsler.18@osu.edu and Reed Johnson, The Ohio State Univ., Wooster, OH

8:48 0795 Effects of protein feeding on the nutritional and immunological systems of the worker honey bee (*Apis mellifera*). **Matthew Smart**, smart053@umn.edu and Marla Spivak, Univ. of Minnesota, Saint Paul, MN

9:00 0796 Multiple fungal infections in the solitary bee, *Megachile rotundata*. **Ellen Klinger**, Ellen.Klinger@ars.usda.gov[1], Rosalind James[1] and Dennis Welker[2], [1]USDA - ARS, Logan, UT, [2]Utah State Univ., Logan, UT

9:12 0797 Variation in sterilization and genetic diversity of *Deladenus proximus* Bedding, a nematode of the native, pine-inhabiting woodwasp, *Sirex nigricornis* F. (Hymenoptera: Siricidae). **Jessica Hartshorn**, jhartsho@uark.edu, Fred M. Stephen and Jake Bodart, Univ. of Arkansas, Fayetteville, AR

9:24 0798 Does an increase in invertebrate biodiversity in rice fields affect rice water weevil (*Lissorhoptrus oryzophilus*) populations? **Nathan Mercer**, nhmercer13@gmail.com and Michael J. Stout, Louisiana State Univ., Baton Rouge, LA

9:36 0799 Use of acoustics to deter bark beetles from entering tree material. **Nicholas C. Aflitto**, na279@nau.edu and Richard W. Hofstetter, Northern Arizona Univ., Flagstaff, AZ

9:48 0800 The effect of early season row cover on pest and natural enemy populations in cucurbit production in central Kentucky. **Amanda Skidmore**, amanda.skidmore@gmail.com and Ric Bessin, Univ. of Kentucky, Lexington, KY

10:00 Break

10:12 0801 Manipulation of natural enemies of key arthropod pests in Oklahoma vineyards. **Shane McMurry**, shane.mcmurry@okstate.edu and Eric Rebek, Oklahoma State Univ., Stillwater, OK

10:24 0802 Effect of earthworm population on survival and abundance of white grubs in different habitats. **Sudan Gyawaly**, gyawaly17@gmail.com, Curt A. Laub and Thomas P. Kuhar, Virginia Tech, Blacksburg, VA

10:36 0803 Development of an IPM program for the tropical sod webworm *Herpetogramma phaeopteralis* Guenée. **Nastaran Tofangsazi**, ntsazi@ufl.edu[1], Steven P. Arthurs[1], Ronald H. Cherry[2] and Robert L. Meagher[3], [1]Univ. of Florida, Apopka, FL, [2]Univ. of Florida, Belle Glade, FL, [3]USDA - ARS, Gainesville, FL

10:48 0804 Determining the phenology of the pine bark adelgid (*Pineus strobi*) in southwestern Virginia. **Holly Wantuch**, hawantuc@ncsu.edu, Scott Salom and Thomas P. Kuhar, Virginia Tech, Blacksburg, VA

11:00 0805 Development and fecundity of *Scymnus (Pullus) coniferarum*, a potential biocontrol agent for hemlock woolly adegid. **Molly Darr**, mdarr@vt.edu, Virginia Polytechnic Institute and State Univ., Blacksburg, VA

11:12 0806 Field release and reproductive success in the lab of *Laricobius osakensis,* a predatory beetle of the hemlock woolly adelgid (*Adelges tsugae*). **Katlin Mooneyham**, katlinm@vt.edu and Scott Salom, Virginia Tech, Blacksburg, VA

11:24 0807 Spatial and temporal associations between hemlock woolly adelgids (Hemiptera: Adelgidae) and surrounding environment. **Sunghoon Baek**, shbaek007@hotmail.com and Yong-Lak Park, West Virginia Univ., Morgantown, WV

11:36 0808 An Extension program incorporating biological control into decision-making for management of sweetpotato whitefly in cotton. **Timothy Vandervoet**, tvandervoet@email.arizona.edu[1], Peter C. Ellsworth[2], Steven Naranjo[3] and Al Fournier[1], [1]Univ. of Arizona, Tucson, AZ, [2]Univ. of Arizona, Maricopa, AZ, [3]USDA - ARS, Maricopa, AZ

14 - Graduate Student Ten-Minute Paper Competition: P-IE

D133-134 (Oregon Convention Center)

Moderator: Jessica D. Petersen, Cornell Univ., Salem, VA

7:55 Introductory Remarks

8:00 0809 Evaluating parasitoids and biocontrol of brassica pests in urban food production sites. **David Lowenstein**, dlowen2@uic.edu and Emily Minor, Univ. of Illinois, Chicago, IL

8:12 0810 Composition and impact of parasitoids of the lecanium scales in South Carolina. **Ernesto Robayo Camacho**, crobayo@clemson.edu and Juang Horng Chong, Clemson Univ., Florence, SC

8:24 0811 Assassins unmasked: Revealing the biology of the hyperparasitoid *Psyllaphycus diaphorinae*. **Allison Bistline-East**, allison.bistline@ucr.edu and Mark S. Hoddle, Univ. of California, Riverside, CA

8:36 0812 Functional and behavioral response of *Tamarixia radiata* (Hymenoptera: Eulophidae) to different densities of its host, *Diaphorina citri* (Hemiptera: Psyllidae). **Xulin Chen**, xulin527@ufl.edu and Philip A. Stansly, Univ. of Florida, Immokalee, FL

8:48 0813 Host range, apparent competition, and biological control of the soybean aphid. **Joe M. Kaser**, kaser008@umn.edu and George E. Heimpel, Univ. of Minnesota, Saint Paul, MN

9:00 0814 Fecundity compensation by caged soybean aphid (*Aphis glycines*) populations does not prevent eventual suppression by the parasitoid *Lysiphlebus orientalis*. **Matthew C. Kaiser**, kais0101@umn.edu and George E. Heimpel, Univ. of Minnesota, Saint Paul, MN

9:12 0815 Investigation of interactions between a native and exotic egg parasitoid of brown marmorated stink bug, *Halyomorpha halys* (Hemiptera: Pentatomidae). **Samuel Ramsey**, insectious@gmail.com and Paula M. Shrewsbury, Univ. of Maryland, College Park, MD

9:24 0816 Cold tolerance of *Trissolcus japonicus* (Hymenoptera: Platygastridae), an egg parasitoid of brown marmorated stink bug, *Halyomorpha halys* (Hemiptera: Pentatomidae). **Erica C. Nystrom Santacruz**, nyst0065@umn.edu[1], Robert Koch[1], Robert Venette[2], Kim A. Hoelmer[3] and Christine Dieckhoff[4], [1]Univ. of Minnesota, Saint Paul, MN, [2]USDA - Forest Service, St. Paul, MN, [3]USDA - ARS, Newark, DE, [4]USDA, Agricultural Research Service, Beneficial Insects Introduction Research Laboratory (BIIRL), Newark, DE

9:36 Break

9:48 0817 Evidence for manipulation in caterpillar feeding behavior by a parasitoid wasp. **Melissa A. Bernardo**, mbernardo@wesleyan.edu and Michael S. Singer, Wesleyan Univ., Middletown, CT

10:00 0818 Hymenopteran parasitoids are attracted by sex pheromones of cerambycid beetles. **Todd D. Johnson**, tdjohns2@illinois.edu and Lawrence M. Hanks, Univ. of Illinois, Urbana, IL

10:12 0819 Hunting behavior and competition of two parasitoids of the soybean aphid. **James Kopco**, jk729@cornell.edu and Jason P. Harmon, North Dakota State Univ., Fargo, ND

10:24 0820 Potential biocontrol of *Erwinia tracheiphila* by *Pseudomonas fluorescens* via cucumber beetle gut interactions. **Dana C. Roberts**, dcr5101@psu.edu, Shelby J. Fleischer, Joyce Sakamoto and Jason Rasgon, Pennsylvania State Univ., Univ. Park, PA

10:36 0821 Life stage influence on subterranean plum curculio, *Conotrachelus nenuphar*, susceptibility to microbial control agents. **Peter Nelson**, nelsonp8@msu.edu and Mark E. Whalon, Michigan State Univ., East Lansing, MI

10:48 0822 Increased susceptibility of Colorado potato beetle to pathogens following exposure to predators. **Elizabeth D'Auria**, elizabeth.dauria@email.wsu.edu and David Crowder, Washington State Univ., Pullman, WA

11:00 0823 Analysis of acidic plant hormones in cotton (*Gossypium hirsutum*) under herbivore stress and inoculated with *Beauveria bassiana* entomopathogenic endophyte. **Diana Castillo**, dianacastillo8@tamu.edu, Gregory Sword and Michael Kolomiets, Texas A&M Univ., College Station, TX

11:12 0824 Baculovirus and coinfection dynamics in an insect host, *Trichoplusia ni*. **Jennifer Scholefield**, jscholef@sfu.ca and Jenny Cory, Simon Fraser Univ., Burnaby, BC, Canada

15 - Graduate Student Ten-Minute Paper Competition: P-IE

D135 (Oregon Convention Center)

Moderator: Kelley Tilmon, South Dakota State Univ., Brookings, SD

7:55 Introductory Remarks

8:00 0825 Cover crop diversification can interfere with pest suppression by key generalist natural enemies. **Jermaine Hinds**, jxh557@psu.edu and Mary Barbercheck, Pennsylvania State Univ., Univ. Park, PA

8:12 0826 DNA detection methods in aphid honeydew: Implications for wheat biological control. **Katelyn A. Kowles**, katelyn.kowles@uky.edu[1], Hannah J. Penn[1], Douglas W. Johnson[2] and James D. Harwood[1], [1]Univ. of Kentucky, Lexington, KY, [2]Univ. of Kentucky, Princeton, KY

8:24 0827 Colonisation alters ecological community structure by modulating food web interactions. **Ashkaan Fahimipour**, Ashkaan.Fahimipour@gmail.com and Kurt Anderson, Univ. of California, Riverside, CA

8:36 0828 Predators of the asparagus miner (Diptera: Agromyzidae) and the impact of border habitats on their diversity and abundance. **Adam Ingrao**, ingraoad@msu.edu, Jason Schmidt and Zsofia Szendrei, Michigan State Univ., East Lansing, MI

8:48 0829 Tracking billbugs (*Sphenophorus* spp.) and generalist predators to advance biocontrol in Intermountain West turfgrass. **Madeleine Dupuy**, madeleine.dupuy@usu.edu and Ricardo A. Ramirez, Utah State Univ., Logan, UT

9:00 0830 The effect of prey quality on the prey preference of *Dicyphus hesperus*: Are omnivores picky eaters? **Meghan Vankosky**, vankosk@uwindsor.ca and Sherah L. VanLaerhoven, Univ. of Windsor, Windsor, ON, Canada

9:12 0831 Conservation agriculture contributes to higher predator abundance in central Mexico. **Ariel Rivers**, arielrivers@psu.edu[1], Mary Barbercheck[1], Nele Verhulst[2] and Bram Govaerts[2], [1]Pennsylvania State Univ., Univ. Park, PA, [2]International Maize and Wheat Improvement Center (CIMMYT), El Batán, Mexico

9:24 0832 Potential biological control agents of the Western corn rootworm (*Diabrotica virgifera virgifera*) in continuous corn of West Central Nebraska. **Camila F. de Oliveira**, oliveira-camila@live.com[1], Lance Meinke[1] and Julie Peterson[2], [1]Univ. of Nebraska, Lincoln, NE, [2]Univ. of Nebraska, North Platte, NE

9:36 Break

9:48 0833 Characterization of long-legged fly (Diptera: Dolichopodidae) communities in Ohio agroecosystems. **Andrea Kautz**, kautz.14@osu.edu and Mary M. Gardiner, The Ohio State Univ., Wooster, OH

10:00 0834 Impact of natural enemies on *Gynaikothrips ficorum* (Thysanoptera: Phlaeothripidae) populations in southern California. **Christopher Shogren**, cshog001@ucr.edu, Univ. of California, Riverside, CA

10:12 0835 A potential push strategy involving native, hayed prairie. **Wayne J. Ohnesorg**, wohnesorg2@unl.edu[1], Robert Wright[2], Marion Ellis[2] and Thomas E. Hunt[3], [1]Univ. of Nebraska, Norfolk, NE, [2]Univ. of Nebraska, Lincoln, NE, [3]Univ. of Nebraska, Concord, NE

10:24 0836 The role of margins in herbivore and natural enemy abundance within Michigan celery fields. **Jeremy Jubenville**, jubenvi3@msu.edu and Zsofia Szendrei, Michigan State Univ., East Lansing, MI

10:36 0837 Interactions among Ants (*Formica montana)*, Aphids (*Myzius persicae)*, Imported Cabbageworm (*Pieris rapae*) eggs, and Pink Lady Beetles (*Coleomagilla maculata)* and their implications for an Oilseed Crop (*Brassica napus)*. **Marissa Layman**, marissa.layman@jacks.sdstate.edu[1], and Jonathan Lundgren[2], [1]South Dakota State Univ., Brookings, SD, [2]USDA - ARS, Brookings, SD

10:48 0838 Trophic interactions and population persistence in the cherry fruit fly (*Rhagoletis cingulata*) and its natural enemy (*Diachasma ferrugineum*) in urban versus agricultural landcover. **Amanda Nelson**, amanda-nelson@uiowa.edu and Andrew Forbes, Univ. of Iowa, Iowa City, IA

11:00 0839 Abundance and diversity of beneficial arthropods after exposure to selective insecticides in Virginia soybean. **Rebecca Whalen**, wrebec9@vt.edu[1], Ames Herbert[1], Sean Malone[2] and Dominic Reisig[3], [1]Virginia Polytechnic Institute and State Univ., Blacksburg, VA, [2]Virginia Polytechnic Institute and State Univ., Suffolk, VA, [3]North Carolina State Univ., Plymouth, NC

11:12 0840 Investigation of reduced agent and area treatments for soybean aphid management and its effects on key predators. **Jenny Freed**, jenny.freed@huskers.unl.edu, Univ. of Nebraska, Lincoln, NE

16 - Graduate Student Ten-Minute Paper Competition: P-IE

D136 (Oregon Convention Center)

Moderator: Lisa Neven, USDA - ARS, Wapato, WA

7:55 Introductory Remarks

8:00 0841 Using citizen science to track the spread of brown marmorated stink bug (*Halyomorpha halys*). **Noel Hahn**, nghahn@gmail.com, Alex Kaufman and George C. Hamilton, Rutgers, The State Univ. of New Jersey, New Brunswick, NJ

8:12 0842 When *halys* freezes over: Cold hardiness of brown marmorated stink bug (*Halyomorpha halys*). **Theresa M. Cira**, cirax002@umn.edu[1], Eric C. Burkness[1], Robert Venette[2] and William Hutchison[1], [1]Univ. of Minnesota, Saint Paul, MN, [2]USDA - Forest Service, St. Paul, MN

8:24 0843 Improving and refining the utility of pheromone traps for monitoring brown marmorated stink bug, *Halyomorpha halys* (Hemiptera: Pentatomidae). **Austin Gorzlancyk**, agorzlan@vt.edu[1], Tracy C. Leskey[2], and J. Christopher Bergh[3], [1]Virginia Polytechnic Institute and State Univ., Blacksburg, VA, [2]USDA - ARS, Kearneysville, WV, [3]Virginia Polytechnic Institute and State Univ., Winchester, VA

8:36 0844 Patterns and predictions for visual sampling of the brown marmorated stink bug. **John Cambridge**, john.cambridge000@gmail.com and George C. Hamilton, Rutgers, The State Univ. of New Jersey, New Brunswick, NJ

8:48 0845 Identifying the predators of brown marmorated stink bug. **John Pote**, pote30@gmail.com and Anne L. Nielsen, Rutgers, The State Univ. of New Jersey, Bridgeton, NJ

9:00 0846 Monitoring for existing natural enemies of brown marmorated stink bug (*Halyomorpha halys*) using video surveillance in Michigan. **Kristin Deroshia**, deroshia@msu.edu and Matthew Grieshop, Michigan State Univ., East Lansing, MI

9:12 0847 Mechanical exclusion and biological control of brown marmorated stink bug (*Halyomorpha halys*) in organic agriculture. **Rachelyn Dobson**, rachelyn.dobson@uky.edu and Ric Bessin, Univ. of Kentucky, Lexington, KY

9:24 0848 Population dynamics and functional response of the European earwig (Dermaptera: Forficulidae) to biotic factors, environmental resistance, and peach-orchard management. **Andrew S. Tebeau**, Andrew.tebeau@usu.edu, Utah State Univ., Logan, UT

9:36 Break

9:48 0849 Testing the intermediate landscape complexity hypothesis for augmentative biological control. **Ricardo Perez-Alvarez**, mrp245@cornell.edu[1], Brian A. Nault[2] and Katja Poveda[1], [1]Cornell Univ., Ithaca, NY, [2]Cornell Univ., Geneva, NY

10:12 0851 Predator to prey ratios: A way to judge biological control potential in the field? **Kevi C. Mace-Hill**, kmace@berkeley.edu, Univ. of California, Berkeley, CA

10:24 0852 The hidden world: Ground predation and its impact on the yield of organic cucurbit crops. **Kacie J. Athey**, kacie.johansen@uky.edu, Mark A. Williams, Jamin Dreyer and James D. Harwood, Univ. of Kentucky, Lexington, KY

10:36 0853 Do generalist predators prevent spider mite (*Tetranychus urticae*) outbreaks in potato fields? **Karol Krey**, karol.krey@wsu.edu and William E. Snyder, Washington State Univ., Pullman, WA

10:48 0854 Cucurbit production systems and their impact on beneficial insect conservation. **Margaret Lewis**, mtl183@psu.edu, Pennsylvania State Univ., Univ. Park, PA

11:00 0855 Native habitat restoration in wine grape vineyards as a pest management strategy. **Katharine Buckley**, katie.buckley@email.wsu.edu, Lorraine M. Seymour, Geraldine L. Lauby and David G. James, Washington State Univ., Prosser, WA

11:12 0856 The effect of cover crop residue and reduced tillage on natural enemies, herbivores, and weed seeds in acorn squash (*Cucurbita pepo* var. turbinata). **Nicole Quinn**, quinnni2@msu.edu, Jason Schmidt, Daniel Brainard and Zsofia Szendrei, Michigan State Univ., East Lansing, MI

17 - Graduate Student Ten-Minute Paper Competition: P-IE

D137-138 (Oregon Convention Center)

Moderator: Joe Louis, Univ. of Nebraska, Lincoln, NE

7:55 Introductory Remarks

8:00 0857 *Delphastus catalinae* (Coleoptera: Coccinellidae) search pattern results in the establishment of intra-plant refuges of *Bemisia tabaci* biotype B (Hemiptera: Aleyrodidae). **Diego Rincon**, rincon-rueda.1@osu.edu, Luis A. Cañas and Casey Hoy, The Ohio State Univ., Wooster, OH

8:12 0858 Insect community activity patterns on a diel scale: Trophic position and body size. **Marshall McMunn**, msmcmunn@ucdavis.edu and Joel Hernandez, Univ. of California, Davis, CA

8:24 0859 Associative learning of *Podisus maculiventris* (Hemiptera: Pentatomidae) to herbivore-induced plant volatiles. **Ulianova Vidal Gómez**, uvidalgo@purdue.edu and Ian Kaplan, Purdue Univ., West Lafayette, IN

8:36 0860 A prototype standalone device to attract male Asian citrus psyllids (*Diaphorina citri*) using conspecific mating calls. **Barukh Rohde**, barukh94-school@yahoo.com[1], Daniel Fialkovsky[2], Mechael Brun-Kestler[3], Avraham-Nachum Brun-Kestler[4], Thomson Paris[5] and Richard W. Mankin[4], [1]Univ. of Florida, New York, NY, [2]Hunter College of the City Univ. of New York, Bronx, NY, [3]Hofstra Univ., West Hempstead, NY, [4]USDA - ARS, Gainesville, FL, [5]Univ. of Florida, Gainesville, FL

8:48 0861 Hessian fly, *Mayetiola destructor*, behavioral responses to potential attractants. **Ryan Schmid**, rbschmid@ksu.edu[1], Darren Snyder[2], Lee Cohnstaedt[2] and Brian McCornack[1], [1]Kansas State Univ., Manhattan, KS, [2]USDA - ARS, Manhattan, KS

9:00 0862 Static flow, two-choice olfactometer designed to screen compounds that attract or repel gravid fungus flies*, Lycoriella mali*. **Kevin Cloonan**, krc204@psu.edu[1], Stefanos Andreadis[1] and Thomas C. Baker[2], [1]Pennsylvania State Univ., State College, PA, [2]Pennsylvania State Univ., Univ. Park, PA

9:12 0863 Effect of *Botrytis cinerea*-infected leaves and berries of *Vitis vinifera* on the ovipositional preference and larval performance of *Epiphyas postvittana*. **Syed Rizvi**, srizvi@csu.edu.au, Charles Stuart University, Australia

9:24 Break

9:36 0864 Adult cannibalism in the Colorado potato beetle (*Leptinotarsa decemlineata*). **Everett Booth**, Everett.booth@umit.maine.edu and Andrei Alyokhin, Univ. of Maine, Orono, ME

9:48 0865 Are associational effects driven by insect herbivore abundance or foraging behavior? A test of foraging decisions by grasshoppers (Order: Orthoptera). **Philip Hahn**, pghahn@wisc.edu and John Orrock, Univ. of Wisconsin, Madison, WI

10:00 0866 Preference of the kudzu bug, *Megacopta cribraria* (Hemiptera: Plataspidae) to different growth stages of soybean. **Liu Yang**, lzy0017@auburn.edu[1], Julian Golec[2] and Xing Ping Hu[2], [1]South China Agricultural Univ., Guangzhou, China, [2]Auburn Univ., Auburn, AL

10:12 0867 The effects of crop diversity on potato psyllid *(Bactericera cockerelli*) distribution. **Matthew Klein**, matthew.klein@oregonstate.edu[1], and Silvia Rondon[2], [1]Oregon State Univ., Corvallis, OR, [2]Oregon State Univ., Hermiston, OR

10:24 0868 Modular, low-cost arboreal ant *(Azteca alfari)* tracking sensor development in Panama. **Andrew Quitmeyer**, andy@quitmeyer.org, Georgia Tech, Atlanta, GA

10:36 0869 Effects of whitefly-transmitted tomato yellow leaf curl virus on the preference and fitness of non-vector herbivores on tomato. **Wendy G. Marchant**, wmar@uga.edu[1], Rajagopalbabu Srinivasan[2] and Kerry M. Oliver[1], [1]Univ. of Georgia, Athens, GA, [2]Univ. of Georgia, Tifton, GA

10:48 0870 Bee foraging strategies are shaped by pollen nutritional quality. **Anthony D. Vaudo**, adv124@psu.edu[1], Harland M. Patch[1], David A. Mortensen[1], Daniel Stabler[2], Geraldine A. Wright[2], Christina M. Grozinger[1] and John F. Tooker[1], [1]Pennsylvania State Univ., Univ. Park, PA, [2]Newcastle Univ., Newcastle Upon Tyne, United Kingdom

11:00 0871 Do honey bees know when they're out of storage space? **Parry Kietzman**, amacd001@ucr.edu, Univ. of California, Riverside, CA

18 - Graduate Student Ten-Minute Paper Competition: P-IE

D139-140 (Oregon Convention Center)

Moderator: Robert K. D. Peterson, Montana State Univ., Bozeman, MT

7:55 Introductory Remarks

8:00 0872 Use of *Amblyseius swirskii* for biological control of broad mites in high-tunnel pepper production in Florida. **Lorena Lopez**, lorelopezq.257@ufl.edu[1], Hugh A. Smith[1], Marjorie A. Hoy[2], Ronald D. Cave[3] and Bielinski Santos[1], [1]Univ. of Florida, Wimauma, FL, [2]Univ. of Florida, Gainesville, FL, [3]Univ. of Florida, Ft. Pierce, FL

8:12 0873 The role of temperature in the dispersal capacity of emerald ash borer (*Agrilus planipennis*) and its parasitoid, *Tetrastichus planipennisi*. **Samuel J. Fahrner**, fahr0051@umn.edu[1], Jonathan Lelito[2] and Brian Aukema[1], [1]Univ. of Minnesota, Saint Paul, MN, [2]USDA - APHIS - PPQ, Brighton, MI

8:24 0874 Effects of drought on the colonization speed and pattern of benthic macroinvertebrate communities in experimental mesocosm wetlands. **Dong Gun KIM**, odonata@korea.ac.kr, Cha Young Lee, Lak Jung Choe, Hyo Jeong Kang, Min Jeong Baek and Yeon Jae Bae, Korea Univ., Seoul, South Korea

8:36 0875 Dispersal of the wheat stem sawfly (*Cephus cinctus*). **Christopher McCullough**, ctmccull@cord.edu[1], Jeffrey Bradshaw[2] and Gary Hein[1], [1]Univ. of Nebraska, Lincoln, NE, [2]Univ. of Nebraska, Scottsbluff, NE

8:48 0876 Genetic diversity analysis of S*ogatella furcifera* by using novel microsatellite markers. **Hwa Yeun Nam**, jessienam@snu.ac.kr[1], Brad Coates[2], Kyung Seok Kim[2], Marana Park[1] and Joon-Ho Lee[1], [1]Seoul National Univ., Seoul, South Korea, [2]USDA - ARS, Ames, IA

9:00 0877 Seasonal dispersal and population genetics of soybean aphid (*Aphis glycines*) occurring in Wisconsin. **Michael S. Crossley**, mcrossley3@gmail.com and David B. Hogg, Univ. of Wisconsin, Madison, WI

9:12 0878 Population genetic diversity patterns of bumble bee (*Bombus*) communities in the wild lands of the Pacific Northwest. **Jonathan Koch**, kochj@biology.usu.edu[1], and James Strange[2], [1]Utah State Univ., Logan, UT, [2]USDA - ARS, Logan, UT

9:24 0879 Tag, you're it! Tracking pollinators on the prairie with radio telemetry. **Shelly Wiggam**, wiggie@ksu.edu, Gregory Zolnerowich and Brian McCornack, Kansas State Univ., Manhattan, KS

9:36 Break

9:48 0880 The effect of honey bee (*Apis mellifera*) inter-colony distance on the spread of the parasitic Mite, *Varroa destructor*. **Maxcy Nolan IV**, maxcypnolaniv@gmail.com[1], and Keith Delaplane[2], [1]Univ. of Georgia, Watkinsville, GA, [2]Univ. of Georgia, Athens, GA

10:00 0881 Seasonal movement patterns of *Halyomorpha halys* Stål (Hemiptera: Pentatomidae) nymphs on wild and tree fruit hosts at the orchard-woodland interface. **Angelita Acebes-Doria**, aacebes@vt.edu[1], Tracy C. Leskey[2] and J. Christopher Bergh[1], [1]Virginia Polytechnic Institute and State Univ., Winchester, VA, [2]USDA - ARS, Kearneysville, WV

10:12 0882 Effects of phytosanitation treatment on walnut twig beetle (*Pityophthorus juglandis*) colonization of black walnut logs. **Jackson Audley**, jaudley@utk.edu[1], Albert Mayfield[2], Scott W. Myers[3] and Adam M. Taylor[1], [1]Univ. of Tennessee, Knoxville, TN, [2]USDA - Forest Service, Asheville, NC, [3]USDA - APHIS - PPQ - CPHST, Buzzards Bay, MA

10:24 0883 Use of alternative host fruit and overwintering biology of spotted wing Drosophila (*Drosophila suzukii)* in California. **Thomas Stewart**, tjstewar@mail.fresnostate.edu[1], Kent M. Daane[1], Xin-geng Wang[1] and Gülay Kaçar[1,2], [1]Univ. of California, Berkeley, CA, [2]Abant Izzet Baysal University, Bolu, Turkey

10:36 0884 Border vegetation alters Kentucky soybean pest immigration and subsequent movements. **Hannah J. Penn**, hannahjpenn@gmail.com and James D. Harwood, Univ. of Kentucky, Lexington, KY

10:48 0885 Trapping the rusty grain beetle, *Cryptolestes ferrugineus* (Stephens) (Coleoptera: Laemophloeidae), near and far from grain storage bins. **Stephen Mychal Losey**, slosey88@ksu.edu and Thomas Phillips, Kansas State Univ., Manhattan, KS

11:00 0886 Incidence of maize mosaic virus and maize chlorotic mottle virus in corn, in relation to within-field activity of their vector insects in corn as influenced by sunn hemp intercropping. **Roshan Manandhar**, manandharr@lincolnu.edu[1], and Mark Wright[2], [1]Lincoln Univ., Jefferson City, MO, [2]Univ. of Hawai'i, Honolulu, HI

11:12 0887 Implications of non-vector herbivores for management of plant viruses in agricultural systems. **Paul Chisholm**, paul.chisholm@email.wsu.edu and David Crowder, Washington State Univ., Pullman, WA

19 - Graduate Student Ten-Minute Paper Competition: P-IE

E141-142 (Oregon Convention Center)

Moderator: Christopher Sansone, Bayer CropScience, Research Triangle Park, NC

7:55 Introductory Remarks

8:00 0888 Population genomics of biotype adaptation in soybean aphid (*Aphis glycines*). **Jacob A. Wenger**, wenger.93@osu.edu and Andrew P. Michel, The Ohio State Univ., Wooster, OH

8:12 0889 Interacting effects of arbuscular mycorrhizae fungi in rice: Do F interactions change the resistance of rice plants to pests? **Lina Bernaola**, lbernaola@agcenter.lsu.edu and Michael J. Stout, Louisiana State Univ., Baton Rouge, LA

8:24 0890 Induced host plant resistance effects on insecticide efficacy. **Abigail Cox**, acox21@tigers.lsu.edu, Jeffrey A. Davis and Xuan Chen, Louisiana State Univ., Baton Rouge, LA

8:36 0891 Field evaluation of soybean genotypes for resistance to the invasive kudzu bug, *Megacopta cribraria*. **Bradley Fritz**, bjfritz@ncsu.edu[1], Dominic Reisig[2], Clyde E. Sorenson[1] and Thomas Carter[3], [1]North Carolina State Univ., Raleigh, NC, [2]North Carolina State Univ., Plymouth, NC, [3]USDA - ARS, Raleigh, NC

8:48 0892 Using resource- and phytohormone-stress phenotypes to identify ash biomarkers of resistance to emerald ash borer (*Agrilus planipennis*). **David Showalter**, showalter.53@osu.edu[1], Robert Hansen[2], Daniel A. Herms[2] and Pierluigi Bonello[1], [1]The Ohio State Univ., Columbus, OH, [2]The Ohio State Univ., Wooster, OH

9:00 0893 Emerald ash borer (*Agrilus planipennis*) larval development on blue ash (*Fraxinus quadrangulata*) and green ash (*F. pennsylvanica*): Field and laboratory experiments. **Donnie Peterson**, peter207@purdue.edu[1], Jian J. Duan[2], Steve Yaninek[1] and Clifford S. Sadof[1], [1]Purdue Univ., West Lafayette, IN, [2]USDA - ARS, Newark, DE

9:12 0894 Characterization of a putative poplar E3 RING-H2 ubiquitin ligase that when over-expressed is correlated with negative impacts on feeding and development of the whitemarked tussock moth, *Orgyia leucostigma*. **Justin Burum**, justin.burum@email.und.edu[1], Danqiong Huang[2], Brett Gross[1], Ben Mohr[1], Jennifer Neva[1], Garrett Welle[1], Matthew J. Flom[1], Cintia Ribiero[3], Sharon Regan[4], Wenhao Dai[2], Matias Kirst[3] and Steven Ralph[1], [1]Univ. of North Dakota, Grand Forks, ND, [2]North Dakota State Univ., Fargo, ND, [3]Univ. of Florida, Gainesville, FL, [4]Queen's Univ., Kingston, ON, Canada

9:24 0895 Evaluation of lepidopteran population densities in selected cranberry varieties. **Erin McMahan**, emcmahan@wisc.edu and Christelle Guédot, Univ. of Wisconsin, Madison, WI

9:36 Break

9:48 0896 Comparing host-plant resistance to herbivory between domesticated and wild highbush blueberry populations in southern New Jersey. **Matthew Strom**, m.cliffstrom@gmail.com[1], and Cesar Rodriguez-Saona[2], [1]Rutgers, The State Univ. of New Jersey, New Brunswick, NJ, [2]Rutgers, The State Univ. of New Jersey, Chatsworth, NJ

10:00 0897 Productivity of tomato lines resistant to tomato yellow leaf curl virus and tomato spotted wilt virus for suitability in Hawaii. **Amber P.K. Tateno**, atateno@hawaii.edu, Leyla V. Kaufman, Mark Wright, Jari Sugano, Theodore Radovich and Jensen Uyeda, Univ. of Hawai'i, Honolulu, HI

10:12 0898 The transcriptional responses of switchgrass (*Panicum virgatum* L.) to yellow sugarcane aphid (*Sipha flava* (Forbes)) herbivory. **Travis J. Prochaska**, Travis.Prochaska@gmail.com[1], Kyle G. Koch[1], Teresa Donze-Reiner[1], Tiffany Heng-Moss[1], Gautam Sarath[2] and Jeffrey Bradshaw[3], [1]Univ. of Nebraska, Lincoln, NE, [2]USDA - ARS, Lincoln, NE, [3]Univ. of Nebraska, Scottsbluff, NE

10:24 0899 Impact of nitrogen fertilization on Mexican rice borer (Lepidoptera: Crambidae) injury in bioenergy sorghum. **Matthew T. VanWeelden**, mvanwe2@lsu.edu[1], Blake E. Wilson[1], Julien M. Beuzelin[1], T. E. Reagan[1] and M.O. Way[2], [1]Louisiana State Univ., Baton Rouge, LA, [2]Texas A&M Univ., Beaumont, TX

10:36 0900 Effect of silicon augmentation on rice water weevil (*Lissorhoptrus oryzophilus*) in California rice. **Mohammad-Amir Aghaee**, maghaee@ucdavis.edu, Daniel Klittich, Larry D. Godfrey and Michael P. Parrella, Univ. of California, Davis, CA

10:48 0901 Novel sources of soybean aphid resistance in early maturing soybean germplasm. **Anthony Hanson**, hans4022@umn.edu, James Orf and Robert Koch, Univ. of Minnesota, Saint Paul, MN

11:00 0902 Does induced susceptibility occur between virulent and avirulent soybean aphids on resistant soybean? **Adam J. Varenhorst**, ajv@iastate.edu, Michael T. McCarville and Matthew E. O'Neal, Iowa State Univ., Ames, IA

11:12 0903 Transgenerational effect of inbreeding and herbivory on *Manduca sexta* caterpillar preference and performance on horsenettle (*Solanum carolinense*). **Chad Nihranz**, ctn118@psu.edu and Andrew G. Stephenson, Pennsylvania State Univ., Univ. Park, PA

20 - Graduate Student Ten-Minute Paper Competition: P-IE

E143-144 (Oregon Convention Center)

Moderator: Walt Mullins, Bayer CropScience, Collierville, TN

7:55 Introductory Remarks

8:00 0904 Foliar application of *Cis*-jasmone affects oviposition behavior and feeding of *Spodoptera exigua* (Lepidoptera: Noctuidae). **Joseph Disi**, jod0003@auburn.edu, Simon Zebelo and Henry Fadamiro, Auburn Univ., Auburn, AL

8:12 0905 Frass happens: Caterpillar frass manipulates plant defense responses. **Swayamjit Ray**, szr146@psu.edu, Gary Felton and Dawn Luthe, Pennsylvania State Univ., Univ. Park, PA

8:24 0906 Tritrophic interactions on a sticky plant: Indirect defense and hostplant farming by predators. **Billy Krimmel**, wkrimmel@gmail.com[1], Ian S. Pearse[2], George Zaragoza[3] and Kathy Eaton[1], [1]Univ. of California, Davis, CA, [2]Illinois Natural History Survey, Champaign, IL, [3]Bayer CropScience, Davis, CA

8:36 0907 Effects of soybean looper and jasmonic acid induction on green peach aphid feeding behavior in soybean. **John Dryburgh**, jdrybu1@tigers.lsu.edu and Jeffrey A. Davis, Louisiana State Univ., Baton Rouge, LA

8:48 0908 Tomato (*Solanum lycopersicum*) volatiles prime defenses against *Manduca sexta* in the field. **Elizabeth Rowen**, erowen@purdue.edu, Michael Gutensohn, Natalia Doudareva and Ian Kaplan, Purdue Univ., West Lafayette, IN

9:00 0909 Ants are less attracted to the extrafloral nectar of plants with symbiotic, nitrogen-fixing rhizobia. **Adrienne Godschalx**, adrg@pdx.edu[1], Martin Schädler[2], Julie Trisel[1], Mehmet Balkan[1] and Daniel J. Ballhorn[1], [1]Portland State Univ., Portland, OR, [2]Helmholtz-Centre for Environmental Research – UFZ, Halle, Germany

9:12 0910 Mind your neighbors: Intra-varietal interactions drive the influence of crop genotypic diversity on herbivore populations. **Ian M. Grettenberger**, img103@psu.edu, and John Tooker, Pennsylvania State Univ., State College, PA

9:24 0911 Timing is key: How pea aphid populations change with warming at different times of day. **Joseph V. Alfonso**, jv1089@gmail.com and Jason P. Harmon, North Dakota State Univ., Fargo, ND

9:36 Break

9:48 0912 Urban warming leads to higher abundance of two key herbivores and reduces tree ecosystem services. **Emily K. Meineke**, emily.meineke@gmail.com, Rob R. Dunn and Steven D. Frank, North Carolina State Univ., Raleigh, NC

10:00 0913 Sizzling cities: Native bee community composition and thermal tolerances related to urban heat. **April Hamblin**, alhambli@ncsu.edu, North Carolina State Univ., Raleigh, NC and Steven D. Frank, Univ. of Maryland, College Park, MD

10:12 0914 Pathogen incidence varies with warming and moisture: The effects of abiotic conditions on a fungal entomopathogen-grasshopper system. **Erica J. Kistner**, ekistner@nd.edu, Univ. of Notre Dame, South Bend, IN

10:24 0915 Insect pests in a changing climate: Implications for pest management in apple orchards. **Jolene Swain**, jswain@sfu.ca, Simon Fraser Univ., Vancouver, BC, Canada and Jenny Cory, Simon Fraser Univ., Burnaby, BC, Canada

10:36 0916 Management strategies for tarnished plant bug (*Lygus lineolaris)* in the Mid-South cotton belt. **Scott Graham**, sg595@msstate.edu[1], Angus Catchot[1], Jeff Gore[2], Don Cook[2], Darrin Dodds[1] and Fred R. Musser[1], [1]Mississippi State Univ., Mississippi State, MS, [2]Mississippi State Univ., Stoneville, MS

10:48 0917 Effect of deposition aids on insecticide penentration into crop canopies. **Chase Samples**, CSamples@pss.msstate.edu[1], Darrin Dodds[1], Angus Catchot[1], Trent Irby[1], J. Copeland[1], Drew Denton[1] and Greg Kruger[2], [1]Mississippi State Univ., Mississippi State, MS, [2]Univ. of Nebraska, North Platte, NE

11:00 0918 Critical time period in flowering cotton that yield loss due to tarnished plant bug, *Lygus lineolaris* (Palisot de Beauvois), occurs. **Clinton Wood**, wwood@drec.msstate.edu[1], Jeff Gore[2], Angus Catchot[3], Don Cook[2], Darrin Dodds[3] and Jason Krutz[2], [1]Mississippi State Univ., Cleveland, MS, [2]Mississippi State Univ., Stoneville, MS, [3]Mississippi State Univ., Mississippi State, MS

11:12 0919 Comparisions of two populations of tarnished plant bugs (*Lygus lineolaris*) from Mississippi. **Daniel Fleming**, def18@msstate.edu[1], Richard Roehrdanz[2] and Fred R. Musser[1], [1]Mississippi State Univ., Mississippi State, MS, [2]USDA - ARS, Fargo, ND

21 - Graduate Student Ten-Minute Paper Competition: P-IE

E145 (Oregon Convention Center)

Moderator: Katherine Parys, USDA - ARS, Stoneville, MS

7:55 Introductory Remarks

8:00 0920 The impact of corn earworm, *Helicoverpa zea* (Boddie), and fall armyworm, *Spodoptera frugiperda* J.E. Smith, on grain sorghum yields. **Chris Dobbins**, cdobbins@drec.msstate.edu[1], Jeff Gore[1], Angus Catchot[2], Don Cook[1], Fred R. Musser[2] and Bryan Olivi[1], [1]Mississippi State Univ., Stoneville, MS, [2]Mississippi State Univ., Mississippi State, MS

8:12 0921 Predicting infestations of corn earworm (*Helicoverpa zea*) in sweet corn based on pheromone trap catch, plant stage and environmental factors. **Daniel Olmstead**, dlo6@cornell.edu, Cornell Univ., Geneva, NY

8:24 0922 Evaluation of yellow un-baited sticky traps for corn rootworm (*Diabrotica* spp.) monitoring, capture rates and utility to ag professionals and growers. **Trisha Leaf**, trisha.franz@gmail.com and Kenneth Ostlie, Univ. of Minnesota, Saint Paul, MN

8:36 0923 Barley residue and herbicide management practices: Effects on insects and weeds in soybean. **Armando Rosario-Lebron**, arosario@umd.edu, Guihua Chen and Cerruti RR Hooks, Univ. of Maryland, College Park, MD

8:48 0924 Seasonal occurrence of Mid-South pests of soybeans. **Nicholas R. Bateman**, nickbateman@msstate.edu[1], Angus Catchot[2], Jeff Gore[3], Fred R. Musser[2], Don Cook[3] and Trent Irby[2], [1]Mississippi State Univ., Starkville, MS, [2]Mississippi State Univ., Mississippi State, MS, [3]Mississippi State Univ., Stoneville, MS

9:00 0925 Roles of environmental factors in shaping soybean aphid populations. **Erin McLean**, erin.mclean@ndsu.edu, Jason P. Harmon and Deirdre Prischmann-Voldseth, North Dakota State Univ., Fargo, ND

9:12 0926 Detection of soybean aphid (Hemiptera: Aphididae) feeding using plant spectral reflectance. **Tavvs Alves**, alves011@umn.edu, Ian MacRae and Robert Koch, Univ. of Minnesota, Saint Paul, MN

9:24 0927 Organic foliar MilStop shows efficacy against soybean aphid (*Aphis glycines*) on soybean (*Glycine max)*. **Philip Rozeboom**, parozeboom@jacks.sdstate.edu[1], Kelley Tilmon[1] and Louis Hesler[2], [1]South Dakota State Univ., Brookings, SD, [2]USDA - ARS, Brookings, SD

9:36 Break

9:48 0928 Impact of tillage and ground coverage on *Megacopta cribraria* in soybean fields. **Alejandro Del Pozo**, aidelpoz@ncsu.edu[1], Dominic Reisig[2], Jack S. Bacheler[1] and Chris Reberg-Horton[1], [1]North Carolina State Univ., Raleigh, NC, [2]North Carolina State Univ., Plymouth, NC

10:00 0929 Effect of planting date and maturity group on soybean yield response to injury by the kudzu bug, *Megacopta cribraria* F. **Joni L. Blount**, jonilb@uga.edu[1], David Buntin[1] and Phillip Roberts[2], [1]Univ. of Georgia, Griffin, GA, [2]Univ. of Georgia, Tifton, GA

10:12 0930 Studying the dectes stem borer (*Dectes texanus*) in Nebraska. **Zach Rystrom**, zrystro@hotmail.com and Robert Wright, Univ. of Nebraska, Lincoln, NE

10:24 0931 Using spectral response properties to identify and characterize infestations of *Dectes texanus* in soybean. **Alice Harris**, alice3@k-state.edu and Brian McCornack, Kansas State Univ., Manhattan, KS

10:36 0932 Residual efficacy and systemic nature of the diamide insecticides. **Andrew Adams**, aadams@entomology.msstate.edu[1], Jeff Gore[2], Angus Catchot[1], Fred R. Musser[1] and Don Cook[2], [1]Mississippi State Univ., Mississippi State, MS, [2]Mississippi State Univ., Stoneville, MS

10:48 0933 Evaluating green stink bug damage to edamame soybeans. **Benjamin Thrash**, bcthrash@uark.edu[1], Gus Lorenz[2] and Nicki Taillon[2], [1]Univ. of Arkansas, Fayetteville, AR, [2]Univ. of Arkansas, Lonoke, AR

11:00 0934 Evaluating threecornered alfalfa hopper (*Spissistilus festinus*) as a pest in Mississippi soybeans. **Jeff Ramsey**, jtr98@msstate.edu[1], Angus Catchot[1], Fred R. Musser[1], Don Cook[2] and Jeff Gore[2], [1]Mississippi State Univ., Mississippi State, MS, [2]Mississippi State Univ., Stoneville, MS

11:12 0935 Determining pest status of threecornered alfalfa hopper in peanuts. **Brendan Beyer**, brenman7@uga.edu[1], Mark R. Abney[2] and Rajagopalbabu Srinivasan[2], [1]Univ. of Georgia, Athens, GA, [2]Univ. of Georgia, Tifton, GA

22 - Graduate Student Ten-Minute Paper Competition: P-IE

E146 (Oregon Convention Center)

Moderator: Mark E. Whalon, Michigan State Univ., East Lansing, MI

7:55 Introductory Remarks

8:00 0936 Assessing the impact of alfalfa leafcutting bee (*Megachile rotundata*) foraging on gene flow in alfalfa seed fields. **Natalie Boyle**, nboyle@wsu.edu and Doug Walsh, Washington State Univ., Prosser, WA

8:12 0937 Predicting the evolutionary fate of a virus resistant transgene in wild populations of *Cucurbita pepo*. **Jacquelyn Harth**, joh5313@psu.edu, Matthew Ferrari and Andrew G. Stephenson, Pennsylvania State Univ., Univ. Park, PA

8:24 0938 Establishing a test system for *Drosophila melanogaster* to assess the non-target effects of genetically engineered plants. **Simone Haller**, simone.haller@agroscope.admin.ch, Michael Meissle and Jörg Romeis, Agroscope, Institute for Sustainability Sciences, Zurich, Switzerland

8:36 0939 Transfer of insecticidal Cry proteins from stacked Bt crops along the food chain. **Zdenka Svobodova**, svobodova@entu.cas.cz[1,2,3,4], Jörg Romeis[2,3], Oxana Skokova Habustova[4] and Michael Meissle[2], [1]South Bohemian University, Ceske Budejovice, Czech Republic, [2]Agroscope, Institute for Sustainability Sciences, Zurich, Switzerland, [3]University of Bern, Bern, Switzerland, [4]Institute of Entomlogy, Ceske Budejovice, Czech Republic

8:48 0940 Evaluating the role of soybean in the natural refuge system within the Mid-South. **Taylor Dill**, tdd169@msstate.edu[1], Angus Catchot[1], Jeff Gore[2], Fred R. Musser[1], Michael Caprio[1] and Don Cook[2], [1]Mississippi State Univ., Mississippi State, MS, [2]Mississippi State Univ., Stoneville, MS

9:00 0941 Effect of pollen movement in different proportions of seed mix conditions of non-Bt and pyramided Bt corn on survival and development of corn earworm. **Fei Yang**, fyang@agcenter.lsu.edu[1], David L. Kerns[2], B. Rogers Leonard[1], Graham P. Head[3], Ying Niu[1], Vikash Dangal[1], Ronnie Levy[4] and Fangneng Huang[1], [1]Louisiana State Univ., Baton Rouge, LA, [2]Louisiana State Univ., Winnsboro, LA, [3]Monsanto Company, St. Louis, MO, [4]Louisiana State Univ., Alexandria, LA

9:12 0942 Estimating the critical level of kernel damage to impact field corn yield. **Bryan Olivi**, bmo32@msstate.edu[1], Don Cook[1], Jeff Gore[1], Angus Catchot[2], Fred R. Musser[2] and Chris Dobbins[1], [1]Mississippi State Univ., Stoneville, MS, [2]Mississippi State Univ., Mississippi State, MS

9:24 0943 Picky caterpillars: Feeding choices and adaptation to Bt crops by cotton bollworm (*Helicoverpa zea*). **Robert Orpet**, rorpet@email.arizona.edu, Xianchun Li, Bruce Tabashnik and Yves Carriere, Univ. of Arizona, Tucson, AZ

9:36 0944 Interplant signaling and its effects on *Bt* toxin expression in corn rootworm-targeting transgenic corn. **Stephanie L. Gorski**, slgorski@ncsu.edu and Yasmin Cardoza, North Carolina State Univ., Raleigh, NC

9:48 Break

10:00 0945 Tolerance of eCry3.1Ab in reciprocal cross offspring of eCry3.1Ab-selected and control western corn rootworm colonies. **Ryan Winslow Geisert**, rwg5h8@mail.missouri.edu[1], and Bruce Hibbard[2], [1]Univ. of Missouri, Columbia, MO, [2]USDA - ARS, Columbia, MO

10:12 0946 Monitoring the effectiveness of Bt corn hybrids against corn rootworm in South Dakota. **David Ordosch**, david.ordosch@sdstate.edu and Adrianna Szczepaniec, South Dakota State Univ., Brookings, SD

10:24 0947 Cry3Bb1 resistant western corn rootworm populations: Potential effect of adult emergence timing on susceptibility to Cry3Bb1 and fitness of Cry3Bb1 survivors. **David S. Wangila**, sindanidavid@yahoo.com and Lance Meinke, Univ. of Nebraska, Lincoln, NE

10:36 0948 Effect of crop management on root injury and adult abundance of western corn rootworm. **Mike W. Dunbar**, dunbar@iastate.edu, Matthew E. O'Neal and Aaron Gassmann, Iowa State Univ., Ames, IA

10:48 0949 Effect of Bt corn expressing Cry34/35Ab1, Cry3Bb1, and Cry3Bb1 plus Cry34/35Ab1 on western corn rootworm (*Diabrotica virgifera virgifera*) field emergence. **Andrea Hitchon**, ahitchon@uoguelph.ca, Jocelyn L. Smith and Arthur W. Schaafsma, Univ. of Guelph, Ridgetown, ON, Canada

11:00 0950 Matings between western corn rootworms from refuge and Bt corn are not evenly distributed in cornfields with structured refuges. **Sarah Hughson**, hughson2@illinois.edu and Joseph Spencer, Univ. of Illinois, Urbana, IL

11:12 0951 Fitness costs of Cry1F resistance in fall armyworm, *Spodoptera frugiperda*, collected from Florida. **Vikash Dangal**, vikash2043@gmail.com, Louisiana State Univ., Baton Rouge, LA

11:24 0952 Allele frequency of resistance to Cry2Ab2 corn in field populations of fall armyworm in the south region of the United States. **Ying Niu**, yniu@agcenter.lsu.edu[1], Robert L. Meagher[2], Jawwad A. Qureshi[3], Xinzhi Ni[4], Xiangbing Yang[5], Graham P. Head[6], David L. Kerns[7], D. Henne[5], R. Levy[1], Fei Yang[1], Vikash Dangal[1] and Fangneng Huang[1], [1]Louisiana State Univ., Baton Rouge, LA, [2]USDA - ARS, Gainesville, FL, [3]Univ. of Florida, Immokalee, FL, [4]USDA - ARS, Tifton, GA, [5]Texas A&M Univ., Weslaco, TX, [6]Monsanto Company, St. Louis, MO, [7]Louisiana State Univ., Winnsboro, LA

23 - Graduate Student Ten-Minute Paper Competition: P-IE

E147-148 (Oregon Convention Center)

Moderator: K. Clint Allen, USDA - ARS, Stoneville, MS

7:55 Introductory Remarks

8:00 0953 Efficacy of rotation programs against western flower thrips, *Frankliniella occidentalis,* that include entomopathogenic fungi. **Jessica Kivett**, jmg4@ksu.edu, Raymond Cloyd and Nora Bello, Kansas State Univ., Manhattan, KS

8:12 0954 Geographic variation of phosphine resistance in the red flour beetle, *Tribolium castaneum*. **Aaron Cato**, cato@ksu.edu and Thomas Phillips, Kansas State Univ., Manhattan, KS

8:24 0955 Spatio-temporal distribution of red flour beetle, *Tribolium castaneum* (Coleoptera: Tenebrionidae), in rice mills in northeast Arkansas. **Martine Bowombe Toko**, martine.bowombet@smail.astate.edu, Laura Starkus, Rachel Hampton, Brook Hale and Tanja McKay, Arkansas State Univ., State Univ., AR

8:36 0956 Chemical cues associated with ant mediated seed dispersal. **Selina Ruzi**, ruzi2@illinois.edu, Camilo Zalamea, James Dalling and Andrew V. Suarez, Univ. of Illinois, Urbana, IL

8:48 0957 Olfactory mediated responses to host and non-host plant volatiles by female grape berry moths (*Paralobesia viteana)*. **Michael Wolfin**, msw266@cornell.edu, Gregory Loeb and Charles E. Linn, Cornell Univ., Geneva, NY

9:00 0958 Factors contributing to variation in cuticular hydrocarbon profiles of two species of longhorned beetles (Coleoptera: Cerambycidae). **Christina A. Silliman**, sillima2@life.illinois.edu[1], Matthew Ginzel[2] and Lawrence M. Hanks[1], [1]Univ. of Illinois, Urbana, IL, [2]Purdue Univ., West Lafayette, IN

9:12 0959 A GC-EAD analysis of interspecific pheromone perception in Ithomiine butterflies. **Adrea Susan Gonzalez-Karlsson**, adrea@ucla.edu, Univ. of California, Los Angeles, CA

9:24 Break

9:36 0960 Host plant suitability and chemistry of virgin tiger moth, *Grammia virgo* L. (Erebidae: Arctiinae). **Katherine Hernandez** and Rebecca B. Simmons, Univ. of North Dakota, Grand Forks, ND

9:48 0961 Potential tradeoffs of pheromone-based mate location and enhancing host-plant defenses. **Anjel Helms**, amh468@psu.edu, Mark Mescher, John Tooker and Rosalie Sowers, Pennsylvania State Univ., Univ. Park, PA

10:00 0962 Chemical ecology of the Florida rosemary grasshopper, *Schistocerca ceratiola*. **Cody Gale**, codyg@knights.ucf.edu and Hojun Song, Univ. of Central Florida, Orlando, FL

10:12 0963 Adult attraction and resulting larval mortality of *Pieris virginiensis* on the novel host garlic mustard (*Alliaria petiolata*). **Samantha Davis**, Davis.598@wright.edu and Don Cipollini, Wright State Univ., Dayton, OH

10:24 0964 Rhythms of volatile release from female and male sea buckthorn plants and electrophysiological response of sea buckthorn carpenter moths, *Holcocerus hippophaecolus*. **Rong Wang**, wangrongbl0501@126.com, Beijing Forestry Univ., Beijing, China

10:36 0965 Medicinal effects of plant chemistry on the immune system of *Manduca sexta* (Lepidoptera: Sphingidae). **Michael Garvey**, garveym@purdue.edu[1], Curtis Creighton[2] and Ian Kaplan[1], [1]Purdue Univ., West Lafayette, IN, [2]Purdue Univ., Hammond, IN

10:48 0967 Effects of floral nectar on longevity and nutrient levels of *Drosophila suzukii*. **Samantha L. Tochen**, Samantha.Tochen@oregonstate.edu[1], Jana C. Lee[2] and Vaughn Walton[1], [1]Oregon State Univ., Corvallis, OR, [2]USDA - ARS, Corvallis, OR

24 - Graduate Student Ten-Minute Paper Competition: P-IE

Oregon Ballroom (Oregon Convention Center)

Moderator: Jon M. Babcock, Dow AgroSciences, LLC, Indianapolis, IN

8:20 Introductory Remarks

8:24 0968 Effect of host plant resistance and seed treatments on soybean aphids and natural enemies. **Devi R. Kandel**, devi.kandel@sdstate.edu, Kelley Tilmon and Tiana L. Shuster, South Dakota State Univ., Brookings, SD

8:36 0969 The non-target impacts of neonicotinoid seed treatments on beneficial insects in sunflower fields. **Mike Bredeson**, mmbredeson@jacks.sdstate.edu[1] and Jonathan Lundgren[2], [1]South Dakota State Univ., Brookings, SD, [2]USDA - ARS, Brookings, SD

8:48 0970 Limited translocation of clothianidin in seed treated maize: Implications for IPM. **Adam Alford**, AdamMAlford@gmail.com and Christian Krupke, Purdue Univ., West Lafayette, IN

9:00 0971 Effects of neonicotinoid seed treatments and drought stress on abundance and fecundity of spider mites on soybean plants. Adrianna Szczepaniec and **Karly Regan**, karly.henry@sdstate.edu, South Dakota State Univ., Brookings, SD

9:12 0972 Efficacy of neonicotinoid seed treatments on thrips in cotton. **Lauren Harrell**, laurenkateharrell@tamu.edu[1], Apurba Barman[1], Megha N. Parajulee[1], Greg Sword[2] and Gaylon Morgan[2], [1]Texas A&M Univ., Lubbock, TX, [2]Texas A&M Univ., College Station, TX

9:24 0973 Evaluation of pre herbicide and seed treatment on thrips infestation in cotton. **Drake Copeland**, jdc872@msstate.edu[1], Darrin Dodds[1], Angus Catchot[1], Jeff Gore[2], Davie Wilson[3], Daniel Reynolds[1], Chase Samples[1] and Drew Denton[1], [1]Mississippi State Univ., Mississippi State, MS, [2]Mississippi State Univ., Stoneville, MS, [3]Monsanto Company, Chesterfield, MO

9:36 0974 Combined effects of drought stress and neonicotinoid seed treatment on Banks grass mite (*Oligonychus pratensis*) in corn. **Alice Ruckert**, alice.ruckert@usu.edu and Ricardo A. Ramirez, Utah State Univ., Logan, UT

9:48 0975 Determining pest and pesticide interactions as a means to optimize soybean yield. **Eric H. Clifton**, eclifton@iastate.edu, Erin W. Hodgson, Gregory L. Tylka and Aaron Gassmann, Iowa State Univ., Ames, IA

10:00 0976 Variations in olefin concentrations among different size hemlock trees: Implications for management of hemlock woolly adelgid. **Elizabeth P. Benton**, ebenton3@utk.edu[1], R. Jesse Webster[2], Carla I. Coots[1], Richard Cowles[3], Anthony Lagalante[4] and Jerome F. Grant[1], [1]Univ. of Tennessee, Knoxville, TN, [2]National Parks Service, Gatlinburg, TN, [3]Connecticut Agricultural Experiment Station, Windsor, CT, [4]Villanova Univ., Villanova, PA

10:12 Break

10:24 0977 The use of systemic insecticide affects parasitoids differently within the same feeding guild. **Sally Taylor**, svtaylor@ncsu.edu and Clyde E. Sorenson, North Carolina State Univ., Raleigh, NC

10:36 0978 Economic benefits of neonicotinoids in Mid-South row crop systems. **John North**, jhn39@msstate.edu[1], Angus Catchot[1], Jeff Gore[2], Don Cook[2], Fred R. Musser[1] and Darrin Dodds[1], [1]Mississippi State Univ., Mississippi State, MS, [2]Mississippi State Univ., Stoneville, MS

10:48 0979 Susceptibility of tobacco thrips, *Frankliniella fusca,* to the neonicotinoid class of insecticides in Mid-South region. **Chelsie Darnell**, chd102@msstate.edu, Angus Catchot and Fred R. Musser, Mississippi State Univ., Mississippi State, MS

11:00 0980 Spatial variation in thiamethoxam detections in groundwater resources in Wisconsin's Central Sands vegetable production region. **Benjamin Bradford**, bbradford@wisc.edu, Univ. of Wisconsin, Madison, WI

11:12 0981 Geographic distribution of imidacloprid tolerance in North Carolina. **H. Alejandro Merchán**, hamercha@ncsu.edu and Hannah Burrack, North Carolina State Univ., Raleigh, NC

11:24 0982 Potential neonicotinoid impact on honey bees (*Apis mellifera)* in cantaloupe production. **Kira L. Nixon**, klalbrig@purdue.edu, Purdue Univ., West Lafayette, IN

11:36 0983 Assessing exposure routes of neonicotinoids to wild pollinators in non-crop systems. **Morgan Lucke**, mlucke@purdue.edu and Christian Krupke, Purdue Univ., West Lafayette, IN

11:48 0984 Drift and deposition of neonicotinoid contaminated seed lubricants on wild flowers. **Adam Whalen**, daw153@msstate.edu[1], Angus Catchot[1], Jeff Gore[2], Gus Lorenz[3], Scott D. Stewart[4], Don Cook[2], Fred R. Musser[1] and Jeffrey W. Harris[5], [1]Mississippi State Univ., Mississippi State, MS, [2]Mississippi State Univ., Stoneville, MS, [3]Univ. of Arkansas, Lonoke, AR, [4]Univ. of Tennessee, Jackson, TN, [5]USDA - ARS, Baton Rouge, LA

25 - Graduate Student Ten-Minute Paper Competition: P-IE

F150 (Oregon Convention Center)

Moderator: Gary D. Thompson, Dow AgroSciences, Omaha, AR

7:55 Introductory Remarks

8:00 0985 Multiple mesohabitats and genera of Chironomidae in monitoring assessment protocols of two Ozark streams. **Rachel L.S. Heth**, rlhtz8@mail.missouri.edu and Robert W. Sites, Univ. of Missouri, Columbia, MO

8:12 0986 Invertebrate communities of reclaimed and undisturbed Atlantic Rim gas well pads. **Megan Wilson**, mwilso39@uwyo.edu, Univ. of Wyoming, Laramie, WY

8:24 0987 Measuring the importance of neighbors: Using a model system to understand how neighboring plants and herbovire density influence herbivore damage. **Andrew Merwin**, acmerwin@ucdavis.edu, Nora Underwood and Brian Inouye, Florida State Univ., Tallahassee, FL

8:36 0988 Silicon supplementation: Its effects on chrysanthemum growth and *Liriomyza trifolii* population. **Danny Klittich**, dsklittich@ucdavis.edu and Michael P. Parrella, Univ. of California, Davis, CA

8:48 0989 Reducing oviposition, development and damage of Mexican bean beetle (*Epilachna varivestis*) on snap beans (*Phaseolus vulgaris*) using reflective plastic mulches. **Louis Nottingham**, louisn@vt.edu, Virginia Tech, Blacksburg, VA

9:00 0990 Monitoring stink bug density in pecans to predict percentage nut damage. **Brian Cowell**, cowell@uark.edu, Donn T. Johnson and M. Garcia, Univ. of Arkansas, Fayetteville, AR

9:12 0991 Efficacy of three classes of insecticide for managing adult stink bugs (Hemiptera: Pentatomidae) in cotton. **Brian Little**, balittle@uga.edu and Michael Toews, Univ. of Georgia, Tifton, GA

9:24 0992 Assessment of *Anthonomus signatus* (Say) in southeastern plasticulture strawberry production. **Douglas McPhie**, drmcphie@ncsu.edu and Hannah Burrack, North Carolina State Univ., Raleigh, NC

9:36 Break

9:48 0993 Investigating the thrips species complex in the major strawberry growing area of Florida. Oscar Liburd and **Tamika Garrick**, tgarrick09@ufl.edu, Univ. of Florida, Gainesville, FL

10:00 0994 Developing an insecticide based attract and kill tactic for the Japanese beetle. **Anthony Lienert**, lienerta@msu.edu and Matthew Grieshop, Michigan State Univ., East Lansing, MI

10:12 0995 Abundance of American serpentine leafminer, *Liriomyza trifolii* (Diptera: Agromyzidae), and its parasitoids on five vegetable crops grown in south Florida. **Shashan Devkota**, devkotasashan@ufl.edu[1], Dakshina Seal[1], Oscar Liburd[2], J. Scott Ferguson[3] and Christine Waddill[1], [1]Univ. of Florida, Homestead, FL, [2]Univ. of Florida, Gainesville, FL, [3]Atlantic Turf &Ornamental Consulting, Vero Beach, FL

10:24 0996 Walnut husk fly (*Rhagoletis completa*): Patterns of emergence in California. **Sara Elizabeth Emery**, semery@berkeley.edu and Nicholas J Mills, Univ. of California, Berkeley, CA

10:36 0997 Factors influencing host fruit preference and cultural management of *Drosophila suzukii* (Matsumura). **Lindsy Iglesias**, liglesias@ufl.edu and Oscar Liburd, Univ. of Florida, Gainesville, FL

10:48 0998 Application strategies for reducing insecticides in *Drosophila suzukii* management. **Jimmy Klick**, klickj@hort.oregonstate.edu[1], Wei Q. Yang[2], Jana C. Lee[3], and Denny Bruck[4]. [1]Oregon State Univ., Corvallis, OR, [2]Oregon State Univ., Aurora, OR, [3]USDA - ARS, Corvallis, OR, [4]DuPont Pioneer, Johnston, IA

11:00 0999 *Drosophila suzukii* infestation in ripe and ripening caneberries. **Katharine Swoboda Bhattarai**, kaswobod@ncsu.edu and Hannah Burrack, North Carolina State Univ., Raleigh, NC

11:12 1000 Effect of landscape on spotted wing Drosophila (*Drosophila suzukii)* infestation in raspberry. **Emma Pelton**, pelton@wisc.edu, Claudio Gratton and Christelle Guédot, Univ. of Wisconsin, Madison, WI

26 - Graduate Student Ten-Minute Paper Competition: P-IE

F151 (Oregon Convention Center)

Moderator: Frank B. Peairs, Colorado State Univ., Fort Collins, CO

7:55 Introductory Remarks

8:00 1001 Landscape-level evaluation of the effect of winter temperatures on summer trap catches of male gypsy moths (*Lymantria dispar)*. **Marissa Streifel**, strei154@umn.edu[1], Brian Aukema[1] and Patrick Tobin[2], [1]Univ. of Minnesota, Saint Paul, MN, [2]USDA - Forest Service, Morgantown, WV

8:12 1002 Selection for increased cold tolerance in *Epiphyas postvittana* (Lepidoptera: Tortricidae) late instars. **Amy C. Morey**, morey041@umn.edu[1], Robert Venette[2] and William Hutchison[1], [1]Univ. of Minnesota, Saint Paul, MN, [2]USDA - Forest Service, St. Paul, MN

8:24 1003 Tradeoff in two winter-active wolf spiders: Increased mortality for increased growth. **Thomas D. Whitney**, thomas.whitney@uky.edu[1], James D. Harwood[1] and Benjamin N. Philip[2], [1]Univ. of Kentucky, Lexington, KY, [2]Rivier Univ., Nashua, NH

8:36 1004 The effects of temperature on the chronological distribution of *Lobesia botrana* life stages from egg to eclosion. **Cindy Preto**, crpreto@ucdavis.edu, Univ. of California, Sacramento, CA

8:48 1005 Estimating stage-specific demographic rates using a hidden Markov model for juvenile stages in *Anaea aidea* (Nymphalidae). **Robert McElderry**, rmcelderry@bio.miami.edu, Univ. of Miami, Coral Gables, FL

9:00 1006 The effects of temperature on the development of polyphagous shot hole borer (*Euwallacea sp.*). **Colin Umeda**, cumed001@ucr.edu, Univ. of California, Riverside, CA

9:12 1007 Cold tolerance of walnut twig beetle (Coleoptera: Scolytidae) from northern California. **Andrea Hefty**, hefty012@umn.edu[1], Steven Seybold[2], Brian Aukema[1] and Robert Venette[3], [1]Univ. of Minnesota, Saint Paul, MN, [2]USDA - Forest Service, Davis, CA, [3]USDA - Forest Service, St. Paul, MN

9:24 1008 Winter moth (*Operophtera brumata*) development and survival on seven different host plants. **Kaitlyn O'Donnell**, kaitlyn.odonnell@umit.maine.edu and Eleanor Groden, Univ. of Maine, Orono, ME

9:36 1009 Impacts of basal area on subcortical insect assemblages in longleaf pine (*Pinus palustris)* of southwest Georgia. **Courtney Brissey**, clbris14@uga.edu[1], Lindsay Boring[2] and Kamal Gandhi[1], [1]Univ. of Georgia, Athens, GA, [2]J. W. Jones Ecological Research Center, Newton, GA

9:48 Break

10:00 1010 Preserving new ash regeneration and stable age structure by protecting mature ash during the emerald ash borer invasion. **Erin M. O'Brien**, obrien.501@osu.edu and Daniel A. Herms, The Ohio State Univ., Wooster, OH

10:12 1011 The biology and prey of C*erceris fumipennis* and its use for bio-surveillance of the emerald ash borer. **Morgan Dube**, morgan.dube@agr.nh.gov, Univ. of New Hampshire, Durham, NH

10:24 1012 Presentation Withdrawn

10:36 1013 Tephritid fruit flies below the radar: How sub-detectable populations persist and spread in California. James R. Carey[1], **Caroline Larsen**, carwright@ucdavis.edu[1], Richard E. Plant[1] and Nikos Papadopoulos[2], [1]Univ. of California, Davis, CA, [2]Univ. of Thessaly, N. Ionia, Greece

10:48 1014 Preference and performance of juniper hairstreak (*Callophyrs gryneus*) in expanding Juniper woodlands of the Intermountain West. **Nick Pardikes**, nickpardikes@gmail.com, Univ. of Nevada, Reno, NV

11:00 1015 The effects of trampling on soil invertebrate fauna communities in coast live oak forests (*Quercus agrifolia*) in southern California. **Emily Ferrill**, eferrill@gmail.com and Dessie L. A. Underwood, California State Univ., Long Beach, CA

11:12 1016 Bottom-up effects of alder-associated Frankia bacteria on red alder flea beetle (*Altica ambiens*). **Brett Younginger**, b.younginger@pdx.edu, Portland State Univ., Portland, OR

11:24 1017 Collapse of local adaptation in Florida soapberry bugs (*Jadera haematoloma*). **Meredith Cenzer**, mlcenzer@ucdavis.edu, Univ. of California, Davis, CA

27 - Graduate Student Ten-Minute Paper Competition: P-IE

F152 (Oregon Convention Center)

Moderator: John Fitt, Dow AgroSciences, LLC, Indianapolis, IN

7:55 Introductory Remarks

8:00 1018 Biology of rugose spiraling whitefly: Fecundity, survival, and parthenogenesis on *Strelitzia nicolai*. **Siavash Taravati**, siavashtaravati@ufl.edu and Catharine M. Mannion, Univ. of Florida, Homestead, FL

8:12 1019 Comparing larval performance traits on known host vs. novel host. Is dragon fruit a host for *Cactoblastis cactorum*? **Angela Galette**, angela.galette@ars.usda.gov[1], Stephen Hight[2], and James E. Carpenter[3], [1]Florida A&M Univ., Tallahassee, FL, [2]USDA - ARS, Tallahassee, FL, [3]USDA - ARS, Tifton, GA

8:24 1020 Expansion of the Mexican rice borer (Lepidoptera: Crambidae) into rice and sugarcane in Louisiana. **Blake Wilson**, bwils26@tigers.lsu.edu[1], T. Hardy[2], Julien M. Beuzelin[1], Matthew T. VanWeelden[1], T. E. Reagan[1], Michael J. Stout[1] and Christopher E. Carlton[1], [1]Louisiana State Univ., Baton Rouge, LA, [2]Louisiana Deparment of Agriculture & Forestry, Baton Rouge, LA

8:36 1021 Ant communities in a selenium-contaminated habitat. **Deborah De La Riva**, ddela005@ucr.edu and John T. Trumble, Univ. of California, Riverside, CA

8:48 1022 Presentation Withdrawn

9:00 1023 How do sap-feeding insects modify the trophic ecology of ants? Examining the community-level consequences of a food-for-protection mutualism. **Robert Clark**, rclark@wesleyan.edu and Michael S. Singer, Wesleyan Univ., Middletown, CT

9:12 1024 Invasional meltdown: Are Argentine ants facilitating the invasion of Asian citrus psyllid, *Diaphorina citri* (Hemiptera: Liviidae), in Southern California? **Kelsey Schall**, kelseyschall@gmail.com and Mark S. Hoddle, Univ. of California, Riverside, CA

9:24 1025 The innate immune system of the Asian citrus psyllid (*Diaphorina citri*). **Alex Arp**, aarp@ufl.edu[1], Wayne B. Hunter[2] and Kirsten S Pelz-Stelinski[1], [1]Univ. of Florida, Lake Alfred, FL, [2]USDA - ARS, Ft. Pierce, FL

9:36 1026 Systemic insecticides and reflective mulch for Asian citrus psyllid (*Diaphorina citri*) control in new citrus plantings. **Scott D. Croxton**, croxtsd@ufl.edu and Philip A. Stansly, Univ. of Florida, Immokalee, FL

9:48 Break

10:00 1027 Comparison of transcriptomes of viruliferous and nonviruliferous, tobacco thrips, *Frankliniella fusca* (Hinds). **Anita Shrestha**, anita25@uga.edu[1], Donald Champagne[2], Albert K. Culbreath[1], Gaelen Burke[2], Dorith Rotenberg[3], Anna E. Whitfield[3] and Rajagopalbabu Srinivasan[1], [1]Univ. of Georgia, Tifton, GA, [2]Univ. of Georgia, Athens, GA, [3]Kansas State Univ., Manhattan, KS

10:12 1028 Transmission of potato virus Y strains from single, two-way, and three-way strain mixtures by the aphid vector *Myzus persicae* (Sulzer) on potato. **Shaonpius Mondal**, mond4500@vandals.uidaho.edu[1], Erik Wenninger[2], Pamela J.S. Hutchinson[3], Sanford D. Eigenbrode[1], Nilsa A. Bosque-Pérez[1], Deepak Shrestha[1] and Jonathan L. Whitworth[4], [1]Univ. of Idaho, Moscow, ID, [2]Univ. of Idaho, Kimberly, ID, [3]Univ. of Idaho, Aberdeen, ID, [4]USDA - ARS, Aberdeen, ID

10:24 1029 Effects of deficit irrigation on wheat curl mite, A*ceria tosichella*, abundance and disease severity in the Texas panhandle. **Angela Simmons**, Angela.Simmons@ag.tamu.edu[1], Bonnie B. Pendleton[2], Fekede Workneh[3], Susan O'Shaughnessy[4], and Charles Rush[5],[1]West Texas A&M Univ., Amarillo, TX, [2]West Texas A&M Univ., Canyon, TX, [3]Texas A&M Univ., West Amarillo, TX, [4]USDA, Bushland, TX, [5]Texas A&M Univ., Amarillo, TX

10:36 1030 Window of risk for pre-harvest volunteer during the heading stages of wheat. **Anthony J. McMechan**, justin.mcmechan@gmail.com and Gary Hein, Univ. of Nebraska, Lincoln, NE

10:48 1031 Presentation Withdrawn

11:00 1032 Do facultative endosymbionts alter stylet-born virus transmission by aphids? **Gina M. Angelella**, GAngelel@purdue.edu[1], Punya Nachappa[2], Vamsi Nalam[2], Jennifer White[3] and Ian Kaplan[1], [1]Purdue Univ., West Lafayette, IN, [2]Indiana Univ.-Purdue Univ., Fort Wayne, IN, [3]Univ. of Kentucky, Lexington, KY

11:12 1033 Integrated management of *Bemisia tabaci* and tomato yellow leaf curl virus in tomatoes in Georgia. **Meredith Dempsey**, mmd1019@uga.edu[1], David Riley[2] and Rajagopalbabu Srinivasan[2], [1]Univ. of Georgia, Athens, GA, [2]Univ. of Georgia, Tifton, GA

11:24 1034 Quantifying the number of spores of the thousand cankers disease pathogen, *Geosmithia morbida*, on individual walnut twig beetles, *Pityophthorus juglandis*, within California. **Stacy Hishinuma**, smhishin@ucdavis.edu[1], Mary Louise Flint[1], Tatiana Roubstova[1], Samantha Mapes[1], Richard M. Bostock[1] and Steven Seybold[2], [1]Univ. of California, Davis, CA, [2]USDA - Forest Service, Davis, CA

28 - Graduate Student Ten-Minute Paper Competition: SysEB

Portland Ballroom 251 (Oregon Convention Center)

Moderators: John Wenzel[1] and Matthew L. Buffington[2], [1]Carnegie Museum of Natural History, Rector, PA, [2]USDA - ARS, Washington, DC

8:45 Introductory Remarks

8:48 1035 The phylogeny of Odonata: An update. **Haley Cahill Wightman**, haleyw@gmail.com, Anton Suvorov and Seth M. Bybee, Brigham Young Univ., Provo, UT

9:00 1036 A scheme of schisms: Toward a systematic revision of the largest litter bug genus, *Schizoptera* (Heteroptera: Schizopteridae). **Stephanie Leon**, Sleon002@ucr.edu and Christiane Weirauch, Univ. of California, Riverside, CA

9:12 1037 A taxonomic revision of the genus *Chinannus* Wygodzinsky (Hemiptera: Schizopteridae) with a phylogenetic analysis of the Ogeriinae. **Alexander Knyshov**, aknys001@ucr.edu, Rochelle Hoey-Chamberlain, Stephanie Leon and Christiane Weirauch, Univ. of California, Riverside, CA

9:24 1038 The *Pectinariophyes* problem: A morphological examination of an apparent polyphyletic genus. **Adam J. Bell**, abell@albany.edu[1], and Jason Cryan[2], [1]State Univ. of New York, Albany, NY, [2]North Carolina Museum of Natural Sciences, Raleigh, NC

9:36 1039 Phylogeny of subterranean termites (Isoptera: Rhinotermitidae). **Elida Espinoza**, elida.espinoza@agnet.tamu.edu, Texas A&M Univ., College Station, TX

9:48 1040 Taxonomic vandalism is an emerging problem for biodiversity science: A case study in the Rutelini (Coleoptera: Scarabaeidae: Rutelinae). **Matthew Moore**, mrmoore19@ufl.edu[1], Mary Liz Jameson[2], and Aura Paucar-Cabrera[3], [1]Univ. of Florida, Gainesville, FL, [2]Wichita State Univ., Wichita, KS, [3]Univ. of Nebraska, Lincoln, NE

10:00 1041 Molecular, morphological and fossil data reveal the Cyrtoquediina (Coleoptera: Staphylinidae: Staphylinini), a new subtribe of rove beetles with multiple biogeographic disjunctions. **A.J. Brunke**, adam.brunke@snm.ku.dk[1], Stylianos Chatzimanolis[2] and Alexey Solodovnikov[1], [1]Natural History Museum of Denmark, Copenhagen, Denmark, [2]Univ. of Tennessee, Chattanooga, TN

10:12 1042 Phylogenomic data resolve the higher-level phylogeny of Curculionoidea (weevils) and yield new insights into the evolution of weevil megadiversity. **Alex Aitken**, aaitken@memphis.edu[1], and Duane D. McKenna[2], [1]Univ. of Memphis, Ripley, TN, [2]Univ. of Memphis, Memphis, TN

10:24 Break

10:36 1043 Sand dune speciation: Exploring the evolutionary history of *Trogloderus* leconte (Coleoptera: Tenebrionidae). **M. Andrew Johnston**, ajohnston@asu.edu, Arizona State Univ., Tempe, AZ

10:48 1044 The evolution of aquatic wood-borers: A morphological and molecular phylogenetic study of the travertine beetles (Coleoptera: Lutrochidae). **Crystal Maier**, crystal.maier@gmail.com, Univ. of Kansas, Lawrence, KS

11:00 1045 Puppets in amber: Phylogenetics and divergence time estimation within the Aderidae (Coleoptera: Tenebrionoidea). **Traci L. Grzymala**, mala@berkeley.edu, Univ. of California, Berkeley, CA

11:12 1046 Phylogeny of North American *Aphaenogaster* species (Hymenoptera: Formicidae) reconstructed with morphological and DNA data. **Bernice DeMarco**, demarc10@msu.edu and Anthony I. Cognato, Michigan State Univ., East Lansing, MI

11:24 1047 Early caddisfly (Insecta: Trichoptera) evolution and phylogenetics. **Paul B. Frandsen**, paul.frandsen@rutgers.edu[1], Xin Zhou[2] and Karl M. Kjer[1], [1]Rutgers, The State Univ. of New Jersey, New Brunswick, NJ, [2]Beijing Genomics Institute, Shenzhen, China

11:36 1048 Phylogeny of the dagger moths (Lepidoptera: Noctuidae: Acronictinae: *Acronicta*) and the evolution of caterpillar defenses. **Brigette Zacharczenko**, brigette.zacharczenko@uconn.edu[1], David Wagner[1], Jadranka Rota[2] and Niklas Wahlberg[2], [1]Univ. of Connecticut, Storrs, CT, [2]Univ. of Turku, Turku, Finland

11:48 1049 Molecular systematics of the parasitoid subfamily Phasiinae (Diptera: Tachinidae). **Jeremy D. Blaschke**, jeremy.blaschke@gmail.com[1], Isaac S. Winkler[2], John O. Stireman III[2], James E. O'Hara[3], Pierfilippo Cerretti[4] and John K. Moulton[1], [1]Univ. of Tennessee, Knoxville, TN, [2]Wright State Univ., Dayton, OH, [3]Canadian National Collection of Insects Agriculture and Agri-Food Canada, Ottawa, ON, Canada, [4]Sapienza Universita di Roma, Verona, Italy

29 - Graduate Student Ten-Minute Paper Competition: SysEB

Portland Ballroom 256 (Oregon Convention Center)

Moderators: David Wagner[1] and John M. Heraty[2], [1]Univ. of Connecticut, Storrs, CT, [2]Univ. of California, Riverside, CA

8:45 Introductory Remarks

8:48 1050 Exploring the murky waters: The systematics of *Testudacarus* (Acari: Torrenticolidae). **Joseph O'Neill**, joneill@uark.edu, Ashley Dowling and Andrea Radwell, Univ. of Arkansas, Fayetteville, AR

9:00 1051 Preliminary next-gen phylogeny of *Philodoria* (Lepidoptera: Gracillariidae), the endangered leaf miners of Hawaii. **Chris A. Johns**, johns.chris.a@gmail.com[1], Daniel Rubinoff[2], and Akito Y. Kawahara[3], [1]Florida Museum of Natural History, Gainesville, FL, [2]Univ. of Hawai'i, Honolulu, HI, [3]Univ. of Florida, Gainesville, FL

9:12 1052 Molecular systematics of nearctic madicolous midges in the genus *Andreprosopa* Mik (Diptera: Thaumaleidae). **Robert J. Pivar**, rpivar@vols.utk.edu[1], Bradley J. Sinclair[2] and John K. Moulton[1], [1]Univ. of Tennessee, Knoxville, TN, [2]Canadian Food Inspection Agency, Ottawa, ON, Canada

9:24 1053 Transcriptome based phylogenetics of schizophoran flies. **Keith M. Bayless**, kmbayles@ncsu.edu[1], Michelle Trautwein[2], Malte Petersen[3], Karen Meusemann[4] and Brian M. Wiegmann[1], [1]North Carolina State Univ., Raleigh, NC, [2]California Academy of Sciences, San Francisco, CA, [3]Zoologisches Forschungsmuseum Alexander Koenig, Bonn, Germany, [4]CSIRO, Canberra, Australia

9:36 1054 Phylogenomic analysis of yellowjackets and hornets (Hymenoptera, Vespidae). **Federico Lopez Osorio**, flopezos@uvm.edu[1], Kurt Pickett[1], J. M. Carpenter[2], Bryan Ballif[1] and Ingi Agnarsson[1], [1]Univ. of Vermont, Burlington, VT, [2]American Museum of Natural History, New York, NY

9:48 1055 Evolutionary patterns and relationships in a group of eucharitid ant parasitoids (Hymenoptera: Chalcidoidea). **Elizabeth Murray**, emurr001@ucr.edu and John Heraty, Univ. of California, Riverside, CA

10:00 1056 Systematics and host relationships of North American ant parasitoids in the genus *Orasema*. **Austin Baker**, bakerau73@gmail.com and John M. Heraty, Univ. of California, Riverside, CA

10:12 1057 Illuminating the Lampyridae: A step towards a large-scale molecular phylogeny of the fireflies. **Gavin J. Martin**, gmartin33@live.com[1], Michael Swindle[1], Yelena Pacheco[1], Taylor King[1], Marc A. Branham[2], Michael F. Whiting[1] and Seth M. Bybee[1], [1]Brigham Young Univ., Provo, UT, [2]Univ. of Florida, Gainesville, FL

10:24 Break

10:36 1058 Beetle trophic groups show differential effects of phylogeny and environment along a successional gradient. **Nicholas Fountain-Jones**, jonesnm@utas.edu.au[1], Christopher Burridge[1], Susan Baker[2] and Gregory Jordan[1], [1]Univ. of Tasmania, Hobart, Australia, [2]Forestry Tasmania, Hobart, Australia

10:48 1059 Systematics and biogeography of the Cychrines, with particular reference to the North American genus *Scaphinotus*: Preliminary results and future directions. **Meghan Culpepper**, mculpepper@berkeley.edu, Univ. of California, Berkeley, CA

11:00 1060 Historical Biogeography of the enigmatic Chyphotid *w*asps (Hymenoptera: Chyphotidae). **Emily A. Sadler**, sadler.e@gmail.com and James P. Pitts, Utah State Univ., Logan, UT

11:12 1061 Phylogeography of the genus *Amblyomma* Koch, 1844. **Matthew Seabolt**, ms09348@georgiasouthern.edu and Lorenza Beati, Georgia Southern Univ., Statesboro, GA

11:24 1062 A global biogeographic history of the ogre-faced spider *Deinopis*. **Anne McHugh**, akmchugh@gmail.com[1], Lisa Chamberland[1], Ann Howard[1], Greta Binford[2], J. Coddington[3], Mark S. Harvey[4], Matjaz Kuntner[5] and Ingi Agnarsson[1], [1]Univ. of Vermont, Burlington, VT, [2]Lewis & Clark College, Portland, OR, [3]National Museum of Natural History, Smithsonian Institution, Washington, DC, [4]Western Australian Museum, Perth, Western Australi, Australia, [5]Slovenian Academy of Sciences and Arts, Ljubljana, Slovenia

11:36 1063 Evolution and Island biogeography in the continental tropics: Reconstructing timing and patterns of diversification in endemic Neotropical cloud forest bess beetles (Passalidae: Proculini). **Cristian Beza-Beza**, cfbeza@memphis.edu and Duane D. McKenna, Univ. of Memphis, Memphis, TN

11:48 1064 Presentation Withdrawn

30 - Graduate Student Ten-Minute Paper Competition: SysEB

Portland Ballroom 252 (Oregon Convention Center)

Moderators: Raul Medina[1] and Andrea Lucky[2], [1]Texas A&M Univ., College Station, TX, [2]Univ. of Florida, Gainesville, FL

8:45 Introductory Remarks

8:48 1065 The biological traits explaining the occurrence of host-associate differentiation: A meta-analysis. **Kyle Harrison**, kharrison@tamu.edu and Raul Medina, Texas A&M Univ., College Station, TX

9:00 1066 Genetic differentiation of host-associated populations of cotton fleahopper (*Pseudatomoscelis seriatus*) in Texas. **Josephine Antwi**, jossyantwi@tamu.edu, Gregory Sword and Raul Medina, Texas A&M Univ., College Station, TX

9:12 1067 Evolution in a bark beetle-fungal symbiosis: A phylogenomic and population genetic analysis of the mutualistic symbionts of western pine beetle. **Ryan Bracewell**, ryan.bracewell@umontana.edu, Jeff Good and Diana Six, Univ. of Montana, Missoula, MT

9:24 1068 Characterizing hybrids using genome-wide single nucleotide polymorphisms across the *Papilio machaon* species group of swallowtail butterflies. **Julian Dupuis**, jrdupuis@ualberta.ca and Felix A. H. Sperling, Univ. of Alberta, Edmonton, AB, Canada

9:36 1069 Genomic analysis of a hybrid zone between spruce budworm species in western Canada. **Bryan Brunet**, bbrunet@ualberta.ca and Felix A. H. Sperling, Univ. of Alberta, Edmonton, AB, Canada

9:48 1070 Genetic characterization and host associations of central Ohio turf infesting Crambinae larvae. **Devon Rogers**, rogers.781@osu.edu[1], David Shetlar[1] and Steven Passoa[2], [1]The Ohio State Univ., Columbus, OH, [2]USDA - APHIS - PPQ, Columbus, OH

10:00 1071 The genetic structure of *Ixodes scapularis* Say 1821 revisited. **John Ludwig**, jl02142@georgiasouthern.edu[1], Cynthia Chan[2], Isis M. Kuczaj[3] and Lorenza Beati[1], [1]Georgia Southern Univ., Statesboro, GA, [2]Univ. of Georgia, Athens, GA, [3]Michigan State Univ., East Lansing, MI

10:12 1072 Comparison of potato psyllid (*Bactericera cockerelli*) populations from North America and Central America. **Amalia Lopez**, amalia8@gmail.com, Daymon Hail and Blake R. Bextine, Univ. of Texas, Tyler, TX

10:24 Break

10:36 1073 Using next generation sequencing to uncover population structure and species boundaries in *Bactrocera dorsalis* and its sister species. **Michael San Jose**, mdsjose@hawaii.edu[1], Luc Leblanc[1], Scott Geib[2], Norman Barr[3] and Daniel Rubinoff[1], [1]Univ. of Hawai'i, Honolulu, HI, [2]USDA - ARS, Hilo, HI, [3]USDA - APHIS, Edinburg, TX

10:48 1074 From pavement to population genetics: Using citizen science data and ddRADseq to characterize the long-established pavement ant, *Tetramorium caespitum*, in North America. **Tyler Vitone**, tvitone@ufl.edu[1], Rob R. Dunn[2] and Andrea Lucky[1], [1]Univ. of Florida, Gainesville, FL, [2]North Carolina State Univ., Raleigh, NC

11:00 1075 Alternative preservatives of insect DNA for citizen science and other low-cost applications. **Sedonia Steininger**, m.sedonia@ufl.edu, Jiri Hulcr, Caroline Storer and Andrea Lucky, Univ. of Florida, Gainesville, FL

11:12 1076 Solving the case of *Monochamus clamator*: Preliminary evidence. **Patrick Scott Gorring**, psg7@cornell.edu and Brian D. Farrell, Harvard Univ., Cambridge, MA

11:24 1077 *Orchesella celsa*: A hyper-variable species or a loosely defined species group? **Catherine Smith**, csmit278@vols.utk.edu, Kevin Moulton and Ernest C. Bernard, Univ. of Tennessee, Knoxville, TN

11:36 1078 A new record of *Aphis punicae* Parsserini, 1863 (Hemiptera: Aphididae) from Korea. **Yerim Lee**, yleeii@snu.ac.kr[1], Wonhoon Lee[2], Hyojoong Kim[3] and Seunghwan Lee[1], [1]Research Institute for Agricultural and Life Sciences, Seoul, South Korea, [2]Animal and Plant Agency, Busan, South Korea, [3]Animal Phylogeny and Systematics Laboratory, Kunsan, South Korea

11:48 1079 Phylogeography of cryptic species of *Heleocoris* (Heteroptera: Naucoridae) in Southeast Asia. **Jessica Warwick**, jmwx86@mail.missouri.edu, Lori Eggert and Robert W. Sites, Univ. of Missouri, Columbia, MO

12:00 1080 Genetic diversity in the cave beetle genus *Darlingtonea*: Phylogeography and species limits. **Olivia Boyd**, olivia.boyd081@topper.wku.edu and T. Keith Philips, Western Kentucky Univ., Bowling Green, KY

31 - Graduate Student Ten-Minute Paper Competition: SysEB

Portland Ballroom 253 (Oregon Convention Center)

Moderators: Micky Eubanks[1] and Stephen Yanoviak[2], [1]Texas A&M Univ., College Station, TX, [2]Univ. of Louisville, Louisville, KY

8:45 Introductory Remarks

8:48 1081 Canopy connectivity enhances arboreal ant communities. **Benjamin Adams**, benjamin.adams@louisville.edu and Stephen Yanoviak, Univ. of Louisville, Louisville, KY

9:00 1082 Gene expression and colony-level variation in fire ant foraging behavior. **Alison A. Bockoven**, abockoven@tamu.edu, Craig J. Coates and Micky Eubanks, Texas A&M Univ., College Station, TX

9:12 1083 Evolution of behavior and host preferences of gracillariid leafminers (Lepidoptera: Gracillariidae). **David Plotkin**, dplotkin@ufl.edu[1], and Akito Y. Kawahara[2], [1]Univ. of Florida, Gainesville, FL, [2]Florida Museum of Natural History, Gainesville, FL

9:24 1084 The ant social parasite *Protomognathus americanus* and its effect on foraging rates of its host species, *Temnothorax longispinosus*. **Kevin Purce**, kevin.purce@gmail.com[1], and David J. Lohman[2], [1]Drexel Univ., Philadelphia, PA, [2]City College of New York, New York, NY

9:36 1085 Eavesdropping parasitoid flies (Sarcophagidae: *Emblemasoma erro*) alter the communication signals of their host cicadas (Cicadidae: *Tibicen dorsatus*). **Brian Stucky**, stuckyb@colorado.edu, Univ. of Colorado, Boulder, CO

9:48 1086 Competition induced stress and soldier caste-dependent stress resistance in a termite. **Li Tian**, litian617@uky.edu, Kenneth F. Haynes and Xuguo Zhou, Univ. of Kentucky, Lexington, KY

10:00 1087 Know when you're beaten: Efficient cooperative transport requires either a directional bias or that outnumbered individuals give up more quickly. **Helen McCreery**, helen.mccreery@colorado.edu, Univ. of Colorado, Boulder, CO

10:12 1088 Individual personalities in the insect colony: From molecules to societies. **Alexander Walton**, awalton@iastate.edu and Amy L. Toth, Iowa State Univ., Ames, IA

10:24 1089 Obeying the zeitgebers: Circadian rhythms of forest leaf litter arthropod communities. **Derek Hennen**, derhennen@gmail.com and Ashley Dowling, Univ. of Arkansas, Fayetteville, AR

10:36 Break

10:48 1090 Effect of trap height on capture of ceramycid beetles with fermenting baits. **Thomas Schmeelk**, Tomschmeelk@yahoo.com and Lawrence M. Hanks, Univ. of Illinois, Urbana, IL

11:00 1091 Colony provisioning affects use of leaf-piles in *Atta cephalotes*. **Courtney Rockenbach**, c.rockenbach@rutgers.edu[1], Chris Reid[2], Cameron Currie[3] and Simon Garnier[2], [1]Rutgers, The State Univ. of New Jersey, Newark, NJ, [2]New Jersey Institute of Technology, Newark, NJ, [3]Univ. of Wisconsin, Madison, WI

11:12 1092 Avoidance of mud by ants: Predator-free space? **Casey Rowley**, rowleyc1@msu.edu and James R. Miller, Michigan State Univ., East Lansing, MI

11:24 1093 Comparison of courtship songs in *Cotesia* (Hymenoptera: Braconidae). **Justin Bredlau**, bredlauj@vcu.edu and Karen Kester, Virginia Commonwealth Univ., Richmond, VA

11:36 1094 Stay cool: Exploring proximate social cues in a group-performed thermoregulatory behavior in honeybees. **Chelsea N. Cook**, chelsea.cook@colorado.edu, Univ. of Colorado, Boulder, CO

11:48 1095 Postmortem chemical cues in differential undertaking behavior of a lower termite. **Qian Sun**, qian.sun@uky.edu, Kenneth Haynes and Xuguo Zhou, Univ. of Kentucky, Lexington, KY

12:00 1096 Tracking movement of ground predators using an immuno-labeling technique. **Caitlin Race**, cirace@email.uark.edu[1], TJ. Kring[1], James Hagler[2], Scott A. Machtley[2] and Robert N. Wiedenmann[1], [1]Univ. of Arkansas, Fayetteville, AR, [2]USDA - ARS, Maricopa, AZ

32 - Graduate Student Ten-Minute Paper Competition: SysEB

Portland Ballroom 254 (Oregon Convention Center)

Moderators: Chris Reid[1] and Carol D. von Dohlen[2], [1]New Jersey Institute of Technology, Newark, NJ, [2]Utah State Univ., Logan, UT

8:45 Introductory Remarks

8:48 1097 Dosage compensation of a fused neo-Z sex chromosome in codling moth (*Cydia pomonella)*. **Liuqi Gu**, lg356@cornell.edu and Douglas Knipple, Cornell Univ., Geneva, NY

9:00 1098 Annotation of the Toll and IMD Pathways in *Anopheles stephensi*. **Victoria Davidson**, victorea@ksu.edu[1], Robert Waterhouse[2], Jake Tu[3], Igor V. Sharakhov[3] and Kristin Michel[1], [1]Kansas State Univ., Manhattan, KS, [2]Massachusetts Institute of Technology, Cambridge, MA, [3]Virginia Tech, Blacksburg, VA

9:12 1099 Genome-wide rates of molecular evolution are higher in mutualistic plant-nesting ants. **Benjamin Rubin**, brubin@fieldmuseum.org and Corrie Moreau, Field Museum of Natural History, Chicago, IL

9:24 1100 Sources of protection against a parasitoid wasp: Are symbiont-based and aphid encoded resistance additive? **Adam J. Martinez**, adamjmtz@uga.edu and Kerry M. Oliver, Univ. of Georgia, Athens, GA

9:36 1101 Comparative genomics of the diverse obligate symbionts of Adelgidae (Hemiptera: Aphidoidea). **Kathryn Weglarz**, kathryn.weglarz@usu.edu[1], John McCutcheon[2], Nathan Havill[3], Robert Foottit[4] and Carol D. von Dohlen[1], [1]Utah State Univ., Logan, UT, [2]Univ. of Montana, Missoula, MT, [3]USDA - Forest Service, Hamden, CT, [4]Agriculture & Agri-Food Canada, Ottawa, ON, Canada

9:48 1102 Analysis of *Triatoma gerstaeckeri* microbiota next-generation sequencing data. **Chissa-Louise Rivaldi**, crivaldi@patriots.uttyler.edu[1], Blake R. Bextine[1], Chris M. Powell[1] and G. Schuster[2], [1]Univ. of Texas, Tyler, TX, [2]Texas A&M Univ., Kingsville, TX

10:00 1103 Functional adaptation of W*olbachia* to novel hosts. **Amelia Lindsey**, alind005@ucr.edu and Richard Stouthamer, Univ. of California, Riverside, CA

10:12 1104 Trypanosomatids and the dynamics of multiple infection in *Drosophila*. **Phineas Hamilton**, phin.hamilton@gmail.com, Nathan Bird and Steve J. Perlman, Univ. of Victoria, Victoria, BC, Canada

10:24 Break

10:36 1105 Endosymbiotic *Wolbachia* infection in solitary bee communities. **Abiya Saeed**, abiyasaeed@gmail.com and Jennifer White, Univ. of Kentucky, Lexington, KY

10:48 1106 Virus transmission as an evolutionary adaptation of aphids. **Patricia Pinheiro**, pvp23@cornell.edu, Cornell Univ., Ithaca, NY and Michelle Cilia, USDA - ARS, Ithaca, NY

11:00 1107 Ground beetle response to forest disturbance: A test of the competition-colonization trade-off model. **Kayla I. Perry**, perry.1864@osu.edu[1], Kimberly F. Wallin[2], John Wenzel[3] and Daniel A. Herms[1], [1]The Ohio State Univ., Wooster, OH, [2]USDA - Forest Service, South Burlington, VT, [3]Carnegie Museum of Natural History, Rector, PA

11:12 1108 Interspecific competition effects on survival of American burying beetle (*Nicrophorus americanus* Olivier) in eastern Oklahoma. **Thomas Ferrari**, thomas.ferrari@okstate.edu, Oklahoma State Univ., Stillwater, OK

11:24 1109 More is not always merrier: Does increased parasitoid community complexity disrupt biological control of giant whitefly *Aleurodicus dugesii* (Hemiptera: Aleyrodidae) in California? **Erich Schoeller**, escho002@ucr.edu and Richard A. Redak, Univ. of California, Riverside, CA

11:36 1110 Burrowing aquatic invertebrates increase phosphorus uptake by aquatic sediments in drainage ditches. **Alan Leslie**, aleslie@umd.edu and William O. Lamp, Univ. of Maryland, College Park, MD

33 - Graduate Student Ten-Minute Paper Competition: SysEB

Portland Ballroom 255 (Oregon Convention Center)

Moderators: Bryan N. Danforth[1] and Richard Brown[2], [1]Cornell Univ., Ithaca, NY, [2]Mississippi State Univ., Mississippi State, MS

8:45 Introductory Remarks

8:48 1111 First description of the pupa of the biting midge *Culicoides sonorensis* (Diptera: Ceratopogonidae), vector of Bluetongue. **Phillip Shults**, phillip.shults@ag.tamu.edu[1], and Art Borkent[2], [1]Texas A&M Univ., College Station, TX, [2]Royal British Columbia Museum, Salmon Arm, BC, Canada

9:00 1112 Parasitoid wasp ovipositor morphology (Ichneumonoidea). **Kyle Burks**, kyleburks@gmail.com, Pennsylvania State Univ., Univ. Park, PA

9:12 1113 Revising our vision of ant biodiversity: Male ants of the New World (Hymenoptera: Formicidae). **Brendon Boudinot**, boudinotb@gmail.com, Univ. of California, Davis, CA

9:24 1114 Microclimate and body size affect thermal tolerance among Neotropical army ants (Ecitoninae). **Kaitlin Baudier**, kmb478@drexel.edu and Sean O'Donnell, Drexel Univ., Philadelphia, PA

9:36 1115 Preliminary study of aposematic coloration and mid-dorsal abdominal glands in Pyrgomorphidae (Orthoptera: Caelifera). **Ricardo Mariño-Pérez**, pselliopus@yahoo.com.mx and Hojun Song, Univ. of Central Florida, Orlando, FL

9:48 1116 The relationship between wing venation and wing patterning in Micropterigidae. **Sandra Schachat**, schachatsr@si.edu and Richard Brown, Mississippi State Univ., Mississippi State, MS

10:00 1117 Warning signals are seductive: Relative contributions of color and pattern to predator avoidance and mate attraction in *Heliconius* butterflies. **Susan D. Finkbeiner**, sfinkbei@uci.edu[1], Adriana D. Briscoe[1] and Robert Reed[2], [1]Univ. of California, Irvine, CA, [2]Cornell Univ., Ithaca, NY

10:12 1118 The detection of colors by red imported fire ant, *Solenopsis invicta*. **Jason R. Carbaugh**, jcarbaugh@tamu.edu and S. Bradleigh Vinson, Texas A&M Univ., College Station, TX

10:24 Break

10:36 1119 Community responses of litter dwelling ants to removal and exclosure of invasive Amur honeysuckle (*Lonicera maackii*) and white-tailed deer (*Odocoileus virginianus*). **Kaitlin U. Campbell**, uppstrka@miamioh.edu and Thomas O. Crist, Miami Univ., Oxford, OH

10:48 1120 Neotropical *Meteorus* Haliday (Hymenoptera: Braconidae): Current knowledge and ongoing research. **Helmuth Aguirre-Fernandez**, haguirre@uwyo.edu and Scott R. Shaw, Univ. of Wyoming, Laramie, WY

11:00 1121 The importance of sampling intensity for documenting braconid wasp diversity. **Katherine Nesheim**, katherinenesheim@gmail.com[1], and Robert Kula[2], [1]The Ohio State Univ., Columbus, OH, [2]USDA - ARS, Washington, DC

11:12 1122 Adult emergence phenology of nine endemic insects of the Monahans sandhills in western Texas. **Samuel Discua Duarte**, samuel.discua@ttu.edu[1], Scott Longing[1], James Cokendolpher[2] and Justin Scott[1], [1]Texas Tech Univ., Lubbock, TX, [2]Museum of Texas Tech Univ., Lubbock, TX

11:24 1123 Estimating the population density of American burying beetle (*Nicrophorus americanus*) on the McAlester Army Ammunition Plant in southeastern Oklahoma. **Kyle Risser**, kyle.risser@okstate.edu[1], Kris Giles[1] and Carmen Greenwood[2], [1]Oklahoma State Univ., Stillwater, OK, [2]Murray State Univ., Murray, KY

11:36 1124 Sex and native lady beetle decline: Do field parameters match predictions from lab studies? **Leo Stellwag**, lms296@cornell.edu and John Losey, Cornell Univ., Ithaca, NY

11:48 1125 The impact of an insect-themed environmental science course on undergraduate students' feelings about insects. **Amanda R. Lorenz**, lorenzam@msu.edu, Julie Libarkin and Gabriel Ording, Michigan State Univ., East Lansing, MI

Calling All New ESA Members!

Join us for our Meet & Greet!

If you are new to ESA this year, please stop by our New Members Meet & Greet Reception.

Mingle with other new members, ESA leaders and staff, and learn about ESA benefits and the Entomology 2014 Annual Meeting. The New Member Meet & Greet takes place on Sunday, November 16 from 4:30–5:15 PM in Meeting Room D133 of the Oregon Convention Center. Refreshments will be served. You should have received a special invitation to the reception in the mail— bring it and exchange it for a special ESA welcome gift!

MONDAY, NOVEMBER 17, 2014, AFTERNOON

Lunch and Learn: Career Vs. Job – What Can You Do with Your Entomology Degree Besides Looking at Bugs?

Portland Ballroom 254 (Oregon Convention Center)

Moderator and Organizer: Janet A. Hurley[1], Robert Davis[2], John Carlson[3], and Allie Taisey[4], [1]Texas A&M Univ., Dallas, TX, [2]BASF Corp., Pflugerville, TX, [3]Tulane Univ., New Orleans, LA, [4]Northeast IPM Center, Southborough, MA

12:45 - 1:45

Lunch and Learn: Eat, Drink and be Merry for Tomorrow We Die: Odyssey in Amber

Portland Ballroom 255 (Oregon Convention Center)

Moderators and Organizers: George Poinar and Sujaya Rao, Oregon State Univ., Corvallis, OR

12:45 - 1:45

Organized Meeting: Plant-Insect Ecosystem (P-IE) Section Networking and Business Session

Portland Ballroom 251 (Oregon Convention Center)

Moderators and Organizers: John J. Adamczyk[1] and Sujaya Rao[2], [1]USDA - ARS, Poplarville, MS, [2]Oregon State Univ., Corvallis, OR

2:00 P-IE networking/business session overview, awards and committee reports. **John J. Adamczyk**, USDA, Poplarville, MS

3:15 Learning session - grand challenges in integrated pest management (IPM)

3:20 1126 Future of RNAi to manage insects and other arthropods. **Wayne B. Hunter**, wayne.hunter@ars.usda.gov[1], and Eduardo Andrade[2],[1]USDA - ARS, Ft. Pierce, FL, [2]EMBRAPA, Brazil, Fort Pierce, FL

3:40 1127 Developing strategies to manage the invasive brown marmorated stink bug through cooperative, collaborative and integrated initiatives. **Tracy C. Leskey**, tracy.leskey@ars.usda.gov, USDA - ARS, Kearneysville, WV

4:00 1128 Making sense of Stern et al. (1959) in the corn and soybean transgenic era. **Michael Gray**, megray@illinois.edu, Univ. of Illinois, Urbana, IL

4:20 Q&A and panel discussion

4:30 Networking and refreshments: P-IE, drinks and more!

5:00 Prize drawing for volunteers and members (must be present to win!)

5:30 Networking conclusion

Organized Meeting: PBT Networking Section

Portland Ballroom 252 (Oregon Convention Center)

Moderators and Organizers: Jeffrey J. Stuart[1] and Qisheng Song[2], [1]Purdue Univ., West Lafayette, IN, [2]Univ. of Missouri, Columbia, MO

1:30 Welcoming Remarks

1:35 1129 PBT plenary 1: The role of insect physiology, biochemistry and toxicology in the rapidly changing landscape of entomology. **Subba Reddy Palli**, rpalli@email.uky.edu, Univ. of Kentucky, Lexington, KY

2:20 SP1130 PBT selected ten-minute paper 1: Mechanisms of hypoxic adaptation in a storage insect pest, *Callosobruchus maculatus*. **Keyan Zhu-Salzman**, ksalzman@tamu.edu, Texas A&M Univ., College Station, TX

2:32 SP1131 PBT selected ten-minute paper 2: G protein-coupled receptors mediated insecticide resistance in mosquitoes. **Ting Li**, litingwinner@gmail.com and Nannan Liu, Auburn Univ., Auburn, AL

2:44 Break

3:00 Business Meeting

4:00 1132 PBT plenary 2: Transformative technologies from knowledge of plant virus – aphid vector interaction. **Bryony Bonning**, bbonning@iastate.edu, Iowa State Univ., Ames, IA

4:45 Concluding Remarks

4:50 Reception

Organized Meeting: SysEB Section Meeting

Portland Ballroom 253 (Oregon Convention Center)

Moderators and Organizers: Jessica Ware[1] and Hojun Song[2], [1]American Museum of Natural History, New York, NY, [2]Univ. of Central Florida, Orlando, FL

1:30 Introductory Remarks

1:50 1133 Travel award recipients. **Jessica Ware**, jware@amnh.org[1], Ricardo Mariño-Pérez[2] and William R. Kuhn[1], [1]Rutgers, The State Univ. of New Jersey, Newark, NJ, [2]Univ. of Central Florida, Orlando, FL

2:35 1134 NSF report. **Jessica Ware**, jware@amnh.org, Rutgers, The State Univ. of New Jersey, Newark, NJ

3:05 1135 Snodgrass Memorial Award recipient.

3:50 1136 Committee reports. **Jessica Ware**, jware@amnh.org, Rutgers, The State Univ. of New Jersey, Newark, NJ

4:35 1137 Speaker. Jessica Ware[1], and **Jeffrey Feder** jfeder@nd.edu[2], [1]Rutgers, The State Univ. of New Jersey, Newark, NJ, [2]Univ. of Notre Dame, Notre Dame, IN

Organized Meeting: Highlights of Medical, Urban and Veterinary Entomology in 2014

Portland Ballroom 256 (Oregon Convention Center)

Moderators and Organizers: Wes Watson[1] and Faith M. Oi[2], [1]North Carolina State Univ., Raleigh, NC, [2]Univ. of Florida, Gainesville, FL

1:30 Introductory Remarks

1:35 1138 Highlights of veterinary entomology. **Dana Nayduch**, dana.nayduch@ars.usda.gov, USDA - ARS, Manhattan, KS

2:10 1139 Highlights of urban entomology. **Grzegorz Buczkowski**, gbuczkow@purdue.edu, Purdue Univ., West Lafayette, IN

2:45 1140 Highlights of medical entomology. **Gabriel Hamer**, ghamer@tamu.edu, Texas A&M Univ., College Station, TX

3:15 MUVE reception

4:00 MUVE preliminary business meeting

MONDAY, NOVEMBER 17, 2014, EVENING

Student Competition Social Hour with Poster Presenters

Exhibit Hall C (Oregon Convention Center)

5:30 - 6:30

MONDAY, NOVEMBER 17, 2014, POSTERS

01 - Undergraduate Student Poster Competition: MUVE/PBT

Exhibit Hall C (Oregon Convention Center)

D3000 *Dermacentor* tick exposure risk assessment and host variability on four types of recreational trails. **Heather Frady**, heather.frady@eagles.ewu.edu[1], and Krisztian Magori[2], [1]Eastern Washington Univ., Spokane, WA, [2]Eastern Washington Univ., Cheney, WA

D3001 Correlation between toluene exposure of *Drosophila melanogaster* adults and toxicity effects on larval morphology. **Gina Duong**, gduong@stthom.edu, Cecilia Dao, Luke Hebert, Katie Fisher, Heidi Reinhardt, Quy Lam, Elmer Ledesma and Rosemarie Rosell, Univ. of St. Thomas, Houston, TX

D3002 Population management of Formosan subterranean termite (Isoptera: Rhinotermitidae) colonies in Louis Armstrong Park. **Eric Guidry**[1], Nan-Yao Su[2] and Claudia Riegel[1], [1]City of New Orleans Mosquito, Termite, and Rodent Control Board, New Orleans, LA, [2]Univ. of Florida, Davie, FL

D3003 Emerge-ncy: The effects of non-traditional IGR's on *Aedes albopictus* and *Aedes aegypti*. **Kristen Donovan**, kcdonovan93@ufl.edu, Univ. of Florida, Gainesville, FL

D3004 Characterization of several putative genes potentially involved in diuresis in yellow fever mosquito, *Aedes aegypti*. **Florence Schoderbek**, floscho4@nmsu.edu, David P. Price, Hannah Drumm, Lisa L. Drake, Stacy D. Rodriguez and Immo A. Hansen, New Mexico State Univ., Las Cruces, NM

D3005 A trap for the continuously collecting sarcosaprophagous flies. **James R. Willett**, jrw023@SHSU.EDU[1], Michelle L. Lewis[1], Natalie K. Lindgren[1] and Sibyl R. Bucheli[2], [1]Sam Houston State Univ., Huntsville, TX, [2]The Ohio State Univ., Columbus, OH

D3006 *Bacillus thuringiensis* search as an alternative for the biological control of *Aedes aegypti (Diptera: Culicidae)* in Valledupar - Colombian Caribbean. **Pedro Fragoso Castilla**, pfragosoc@unicartagena.edu.co[1], Juan Venegas Hermosilla[2], Gittith Sánchez Padilla[3], Gustavo Mora García[4], Margarita Ochoa Diaz[4], Yessika De Leon Benito-Revollo[4], Francisco Rojas Sarria[4] and Doris Gómez Camargo[4], [1]Universidad Popular del Cesar, Valledupar, Colombia, [2]Universidad de Chile, Santiago, Chile, [3]Programa de Genética Humana, Instituto de Ciencias Biomédicas, Santiago de Chile, Chile, [4]Universidad de Cartagena, Cartagena, Colombia

D3007 How to kill bed bugs in portable items: Unconventional non-chemical approaches. **Alex Tyrpak**, tyrpak.3@buckeyemail.osu.edu, Susan C. Jones and Joshua Bryant, The Ohio State Univ., Columbus, OH

D3008 How to kill bed bugs in portable items: Over-the-counter chemical approaches. **Olimpia Ferguson**, ferguson.732@buckeyemail.osu.edu, Susan C. Jones and Joshua Bryant, The Ohio State Univ., Columbus, OH

D3009 Behavioral responses of bed bug (*Cimex lectularius L.*) to the botanical insecticides eugenol and geraniol. **Maria Gonzalez-Morales**, maria.gonzalez63@upr.edu[1], and Alvaro Romero[2], [1]Univ. of Puerto Rico, Maunabo, PR, [2]New Mexico State Univ., Las Cruces, NM

02 - Undergraduate Student Poster Competition: P-IE

Exhibit Hall C (Oregon Convention Center)

D3010 Relationships between butterfly foraging and local and landscape floral coverage. **Sarah Cunningham**, cunninghams93@gmail.com and Shalene Jha, Univ. of Texas, Austin, TX

D3011 Determining the mechanism of Colorado potato beetle (*Leptinotarsa decemlineata*) resistance to neonicotinoid insecticides by real time PCR. **Katherine Demeuse**, demeusek@msu.edu and Zsofia Szendrei, Michigan State Univ., East Lansing, MI

D3012 Investigating options for the integrated pest management of celery leaftier (*Udea rubigalis*). **Jessica Kansman**, kansmanj@msu.edu and Zsofia Szendrei, Michigan State Univ., East Lansing, MI

D3013 Reproductive biology and diapause patterns of *Oobius agrili*, an egg parasitoid of emerald ash borer. **Jackie Hoban**, jhoban@udel.edu[1], and Jian Duan[2], [1]Univ. of Delaware, Newark, DE, [2]USDA - ARS, Newark, DE

D3014 Searching for bacterial endosymbionts of sugarcane aphid *Melanaphis sacchari*. **Kathryne Fryer**, katefryer@neo.tamu.edu, Josephine Antwi and Raul Medina, Texas A&M Univ., College Station, TX

D3015 Role of adipokinetic hormone in the circadian locomotory activity rhythms of *Drosophila melanogaster*. **Matthew Thorn**, mjt152@msstate.edu[1], John Guyton[2] and Natraj Krishnan[2], [1]Mississippi State Univ., Starkville, MS, [2]Mississippi State Univ., Mississippi State, MS

D3016 Detection of phytoplasma in plant and insect hosts causing Lethal Yellow and Texas Phoenix Palm decline in Florida. **Mikayla Adkison**, madkison@patriots.uttyler.edu, Univ. of Texas, Tyler, TX

D3017 Cannibalistic oophagy in brown marmorated stink bug (*Halyomorpha halys*) colonies. **Jaana Iverson**, jaana.iverson@gmail.com, Theresa M. Cira, Eric C. Burkness and William Hutchison, Univ. of Minnesota, Saint Paul, MN

D3018 Analysis of soybean aphid feeding behavior on drought-stressed plants using electrical penetration graphs. **Peter Saya**, sayapm01@students.ipfw.edu, Christopher Culkin, Punya Nachappa and Vamsi Nalam, Indiana Univ.-Purdue Univ., Fort Wayne, IN

D3019 Substrate roughness affects ant foraging speed. **Haileigh White**, haileighmw@gmail.com and Stephen Yanoviak, Univ. of Louisville, Louisville, KY

D3020 Stream restoration effects on detritus matter and macroinvertebrates. **Sara Lukunich**, sarajane78@comcast.net and John R. Wallace, Millersville Univ., Millersville, PA

D3021 Confrontation bioassay between entomopathogenic fungi: Behavior and growth. **Celso Morales-Reyes**, vardenhevrer@hotmail.com, Fernando Sanchez-Pedraza, Jose Rodriguez-Contreras and Sergio Sanchez-Peña, Universidad Autónoma Agraria Antonio Narro, Saltillo, Mexico

D3022 Eavesdropping parasites: Do blue orchard bee (*Osmia liganria*) nest volatiles attract parasites? **Sonja Glasser**, skglasser@ucdavis.edu and Shahla Farzan, Univ. of California, Davis, CA

03 - Undergraduate Student Poster Competition: SysEB

Exhibit Hall C (Oregon Convention Center)

D3023 Diversity of butterflies (Papilionoidea and Hesperioidea) in three locations of Sierra de Huautla Morelos, México. Carlos Coyote, Universidad Autónoma del Estado de Morelos, Cuernavaca, Mexico and **Ventura Rosas-Echeverria**, mvrosase@gmail.com, Universidad Autónoma del Estado de Morelos, Jujutla, Mexico

D3024 Biodiversity in an urban setting: Arthropod abundance and diversity on an extensive green roof. **Suzy Hiskey**, shiskey@msudenver.edu, Jennifer Jennings, Ted Heron, Levi Coleman and Robert Hancock, Metropolitan State Univ., Denver, CO

D3025 Entiminae diversity (Curculionidae: Coleoptera) from three localities in the Sierra de Morelos Huautlla. **Karen Santillan**, karen_santillanv@hotmail.com[1], and Ventura Rosas-Echeverria[2], [1]Universidad Autónoma del Estado de Morelos, Cuernavaca, Mexico, [2]Universidad Autónoma del Estado de Morelos, Jojutla, Mexico

D3026 Population survey of St. Anthony Dunes tiger beetle, *Cicindela arenicola*. John T. Zenger and **Austin Fife**, fiferworks@gmail.com, Brigham Young Univ., Rexburg, ID

D3027 Autotomy and the dorsoventral righting reflex in purple shore crabs (*Hemigrapsus nudus*). **Timothy Luethke**, luethke13@up.edu and Tara Maginnis, Univ. of Portland, Portland, OR

D3028 Impacts of stream restoration on macroinvertebrate community structure and adult stream insect colonization on Big Spring Run, Lancaster County, PA. **Emily Neideigh**, ecneidei@millersville.edu[1], Robert Smith[2], Alex M. Rittle[3] and John R. Wallace[1], [1]Millersville Univ., Millersville, PA, [2]Univ. of Massachusetts, Amherst, MA, [3]Univ. of Kentucky, Lexington, KY

D3029 The effects of cheliped regeneration on aggression in purple shore crab (*Hemigrapsus nudus*). **Matt Ortman**, ortman_matt@yahoo.com and Tara Maginnis, Univ. of Portland, Portland, OR

D3030 Microbial community analysis of painted bug (*Bagrada hilaris*) populations. **MacKenzie F. Patton**, mpatton3@patriots.uttyler.edu[1], Chris Powell[1], Darcy A. Reed[2], Thomas M. Perring[2] and Blake R. Bextine[1], [1]Univ. of Texas, Tyler, TX, [2]Univ. of California, Riverside, CA

D3031 Burning issues in conservation biology: The effect of reproductive season prescribed fire on an endangered insect species, *Nicrophorus americanus* (Coleoptera: Silphidae). **Kenzie Lee**, kklee12@ole.augie.edu, Daniel Howard and Carrie Hall, Augustana College, Sioux Falls, SD

D3032 Jewels in the rough: A first molecular phylogeny of the charismatic beetle family Buprestidae. **Preston Arnold**, preston.arnold02@gmail.com, Nathan P. Lord and Seth M. Bybee, Brigham Young Univ., Provo, UT

D3033 Daily activity patterns and circadian rhythm in a nicrophorine burying beetle (*Nicrophorus marginatus*). **Lauren Yares**, lkyares12@ole.augie.edu, Leah Hiller, April Parsons, Carrie Hall and Daniel Howard, Augustana College, Sioux Falls, SD

D3034 The ant-parasitic Eucharitidae (Hymenoptera: Chalcidoidea) of Africa and Madagascar. **Scott Heacox**, sheac001@ucr.edu, Krissy Dominguez and John M. Heraty, Univ. of California, Riverside, CA

D3035 Alpha diversity of Salticidae (Arachnida: Araneae) in a tropical dry forest in south Morelos, Mexico. **Miguel Menéndez-Acuña**, menendezmigue@gmail.com[1], Oscar Dorado[2], César Durán-Barrón[3], and Ventura Rosas-Echeverria[4], [1]Universidad Autónoma del Estado de Morelos, Cuernavaca, Mexico, [2]Centro de Educación Ambiental e Investigación Sierra de Huautla, Cuernavaca, Mexico, [3]Universidad Nacional Autónoma de México, Distrito Federal, Mexico, [4]Universidad Autónoma del Estado de Morelos, Jojutla, Mexico

D3036 A taxonomic revision of the cryptic plate-nosed ants of Africa (Formicidae: Proceratiinae: *Discothyrea* Roger). **Zachary Lieberman**, zelieberman@gmail.com and Francisco Hita-Garcia, California Academy of Sciences, San Francisco, CA

04 - Graduate Student Poster Competition: MUVE

Exhibit Hall C (Oregon Convention Center)

D3037 Effects of larval competition on adult immune traits in *Aedes aegypti* and *Aedes albopictus* (Diptera: Culicidae). **Allison Parker**, aparker9@illinois.edu[1], Brian F. Allan[1] and Ephantus J. Muturi[2], [1]Univ. of Illinois, Urbana, IL, [2]Univ. of Illinois, Champaign, IL

D3038 Evaluating potential effects of climate change on off-host tick ecology in Panama. **Erin Welsh**, ecwels2@gmail.com and Brian F. Allan, Univ. of Illinois, Urbana, IL

D3039 Species diversity, seasonal phenology of ticks (Acarina) in Southeast Kansas, and rates of infection by selected pathogenic *Rickettsia*. **Ali Hroobi**, alihroobi@gus.pittstate.edu[1], David Gordon[1] and Ram Raghavan[2], [1]Pittsburg State Univ., Pittsburg, KS, [2]Kansas State Univ., Manhattan, KS

D3040 Dung beetle and fire ant (*Solenopsis invicta*) interactions within dung microhabitats. **Christen Steele**, steele@knights.ucf.edu, Univ. of Central Florida, Orlando, FL

D3041 Trapping mold mites, *Tyrophagus putrescentiae* (Schrank) (Acari: Acaridae) for IPM decisions in country ham facilities: Effects of trap placement and trap design. **Barbara Amoah**, bamoah@ksu.edu and Thomas Phillips, Kansas State Univ., Manhattan, KS

D3042 Production of stable flies (*Stomoxys calcitrans*) from straw bedding packs and sawdust compost barns, two alternative cold winter housing systems for dairy cows. **Anna Hansen**, hans4863@umn.edu[1], Roger Moon[1], Marcia Endres[1], Bradley Heins[2], Craig Sheaffer[1], Ulrike Sorge[1], Robert King[1] and Sharon Weyers[3], [1]Univ. of Minnesota, Saint Paul, MN, [2]Univ. of Minnesota, Morris, MN, [3]USDA - ARS, Morris, MN

D3043 Phosphine resistance in populations of *Cryptolestes ferrugineus* (Stephens) (Coleoptera: Laemophloeidae) in Oklahoma. **Nisha Bajracharya**, nisha.shakya10@okstate.edu, George P. Opit and Charles Konemann, Oklahoma State Univ., Stillwater, OK

D3044 A blood-free diet to sustain the Dengue vector, *Aedes aegypti* colonies. **Kristina Gonzales**, gonza720@nmsu.edu, Hitoshi Tsujimoto and Immo A. Hansen, New Mexico State Univ., Las Cruces, NM

D3045 The effects of colony age and *Wolbachia* as they relate to quality and fitness of *Spalangia cameroni* (Hymenoptera: Pteromalidae). **Erika Machtinger**, irishtangerine@ufl.edu[1], Eric LoVullo[2], Christopher J. Geden[2], Dana Johnson[2] and Paul Shirk[2], [1]Univ. of Florida, Gainesville, FL, [2]USDA - ARS, Gainesville, FL

D3046 Argentine ant (*Linepithema humile*) invasion on California's Channel Islands. **Korie Merrill**, kmerrill@mail.sdsu.edu, Univ. of California, Riverside, CA

D3047 Using citizen scientists to evaluate light traps for catching brown marmorated stink bugs (*Halyomorpha halys)* in homes in Virginia. **John D. Aigner**, daigner@vt.edu and Thomas P. Kuhar, Virginia Polytechnic Institute and State Univ., Blacksburg, VA

05 - Graduate Student Poster Competition: MUVE

Exhibit Hall C (Oregon Convention Center)

D3048 Utility of ozone as a fumigant for bed bug (*Cimex lectularius* L.) control. **James Feston**, jfeston@purdue.edu, Linda J. Mason and Ameya D. Gondhalekar, Purdue Univ., West Lafayette, IN

D3049 Development of trapping methods to control stinging wasps (Hymenoptera: Vespidae). **Jenny Finitzer**, jennifer.finitzer@email.wsu.edu, Washington State Univ., Pullman, WA

D3050 Ecological modeling helps to dissect local temporal variation in entomology-basedI estimates. **Ashleigh Faris**, ashmfaris@gmail.com, Hsiao-Hsuan Wang, William Grant and Aaron Tarone, Texas A&M Univ., College Station, TX

D3051 RNA interferance: Potato/tomato psyllid, *Bactericera cockerelli,* oral delivery of double–stranded RNAi constructs. **Bijaya Sharma**, sharmabijaya1@gmail.com[1], Blake R. Bextine[1] and Wayne B. Hunter[2], [1]Univ. of Texas, Tyler, TX, [2]USDA - ARS, Ft. Pierce, FL

D3052 Application of Gal4/UAS System and MicroRNA Decoy Technology: Deciphering the Target of MicroRNA-275 in *Aedes aegypti*. **Bo Zhao**, bzhao002@ucr.edu, Univ. of California, Riverside, CA

D3053 Variation of *Culex quinquefasciatus* cytochromes P450 (CYP6AA7, CYP4C52v1, CYP6BY3, CYP9J34, CYP9M10, CYP9J40, CYP9AL1, CYP6P14 and CYP9J45) genes sequence from many cities of Nuevo Leon (state), México. **Iram Rodriguez**, iramrodriguez@gmail.com, Adriana Flores, Gustavo Garcia and Laura Martinez, Universidad Autónoma de Nuevo León, San Nicolas de los Garza, Mexico

D3054 Genetic analysis of recently established *Ixodes scapularis* populations in North Dakota. **Michael Dougherty**, michael.dougherty@my.und.edu, Jefferson Vaughan and John Kryda, Univ. of North Dakota, Grand Forks, ND

D3055 Expression and functional characterization of aquaporins in yellow fever mosquito, *Aedes aegypti*. **Lisa L. Drake**, drlisa@nmsu.edu, Stacy D. Rodriguez and Immo A. Hansen, New Mexico State Univ., Las Cruces, NM

D3056 Presentation Withdrawn

D3057 Manipulation of *Solenopsis invicta* virus-1 titers by RNA interference in red imported fire ant (*Solenopsis invicta*). **Patrick Rydzak**, rydzakp@gmail.com and Blake R. Bextine, Univ. of Texas, Tyler, TX

D3058 Characterization and manipulation of the bacterial microbiome of *Dermacentor andersoni*. **Cory Gall**, cgall@vetmed.wsu.edu[1], Katie Clayton[1], Glen Scoles[2] and Kelly Brayton[1], [1]Washington State Univ., Pullman, WA, [2]USDA - ARS, Pullman, WA

D3059 The eco-epidemiology of Chagas disease in Panama: A preliminary study. **Erin Allmann**, erinallmann@gmail.com, Univ. of Illinois, Urbana, IL

06 - Graduate Student Poster Competition: PBT

Exhibit Hall C (Oregon Convention Center)

D3060 Families of ubiquitin E3-ligase mimicking effector proteins in the genome of Hessian fly (*Mayetiola destructor*). **Lucio Navarro**, lucionavarroe@gmail.com[1], Chaoyang Zhao[2], Ming-Shun Chen[3], Stephen Richards[4] and Jeffrey J. Stuart[1], [1]Purdue Univ., West Lafayette, IN, [2]The Ohio State Univ., Wooster, OH, [3]USDA - ARS, Manhattan, KS, [4]Baylor Univ., Houston, TX

D3061 Geographic variation in amounts of the aggregation pheromone 4,8-dimethyldecanal produced by males from North American populations of red flour beetle, *Tribolium castaneum* (Herbst) (Coleoptera: Tenebrionidae). **Michael J. Aikins**, mja8338@k-state.edu and Thomas Phillips, Kansas State Univ., Manhattan, KS

D3062 Transcriptome analysis and screening for potential target genes for RNAi-mediated pest control of corn earworm, *Helicoverpa zea*. **Jinda Wang**, jw588@cornell.edu[1], Liuqi Gu[2] and Douglas Knipple[2], [1]Nanjing Agricultural Univ., Nanjing, China, [2]Cornell Univ., Geneva, NY

D3063 Identification of multiple mutations on the voltage-gated sodium channel gene of house flies, *Musca domestica*. **Xuechun Feng**, XZF0005@auburn.edu and Nannan Liu, Auburn Univ., Auburn, AL

D3064 20-hydroxyecdysone (20E) plays a role in the regulation of juvenile hormone synthesis in the mosquito *Aedes aegypti*. **Maria Areiza**, mareiza@gmail.com, Marcela Nouzova, Crisalejandra Rivera-Perez and Fernando Noriega, Florida International Univ., Miami, FL

D3065 Juvenile hormone biosynthesis in male *Aedes aegypti* mosquitoes. **Elizabeth LeBlanc**, elebl001@fiu.edu, Florida International Univ., Miami, FL

D3066 Dopaminergic regulation of circadian locomotor activity and resistance to oxidative stress in *Drosophila melanogaster*. **Marley Hanna**, meh324@msstate.edu[1], Andrea Bednarova[2], Kuntol Rakshit[3] and Natraj Krishnan[1], [1]Mississippi State Univ., Mississippi State, MS,

[2]South Bohemian Univ., Ceske Budejovice, Czech Republic, [3]Univ. of California, Los Angeles, CA

D3067 RNA interference in *halyomorpha halys,* brown marmorated stink bug. **Priyanka Mittapelly**, mittapelly.1@buckeyemail.osu.edu and Andrew P. Michel, The Ohio State Univ., Wooster, OH

D3068 RNA-seq analysis of pregnancy and milk production in the viviparous cockroach, *Diploptera punctata*. **Emily C. Jennings**, jenninec@mail.uc.edu and Joshua B. Benoit, Univ. of Cincinnati, Cincinnati, OH

D3069 Common molecular underpinnings of insect diapause: The role of PEPCK. **Drew Spacht**, spacht.2@osu.edu and David Denlinger, The Ohio State Univ., Columbus, OH

07 - Graduate Student Poster Competition: PBT

Exhibit Hall C (Oregon Convention Center)

D3070 Regulation of worker reproduction in the polydomous ant *Aphaenogaster (Novomessor) cockerelli*. **Jessica Ebie**, jebie@asu.edu, Bert Hoelldobler and Juergen Liebig, Arizona State Univ., Tempe, AZ

D3071 The chemical ecology of host specialization in the *Apocephalus miricauda*-species group (Phoridae). **Katherine Noble**, k.g.noble@utah.edu, Univ. of Utah, Salt Lake City, UT

D3072 Structural analysis of the haller's organ sensor found in males and females of the hard ticks (Acari: Ixodidae): Ixodes scapularis, Amblyomma americanum, and Dermacentor variabilis. **Tanya Josek**, tanyajosek@gmail.com, Marianne Alleyne and Brian F. Allan, Univ. of Illinois, Urbana, IL

D3073 Olfactory responses of southern house mosquito, *Culex quinquefasciatus,* to human odorants. **Zi Ye**, zzy0011@auburn.edu, Feng Liu and Nannan Liu, Auburn Univ., Auburn, AL

D3074 Bacteria induced alteration in the antibacterial defense of the eastern subterranean termite, *Reticulitermes flavipes*. **Yuan Zeng**, yzz0015@auburn.edu, Xing Ping Hu and Sang-Jin Suh, Auburn Univ., Auburn, AL

D3075 Small mosquitoes - large implications: Comparison of the fat body transcriptome and metabolome of adult *aedes aegypti* from larvae raised under different nutrition and crowding regimens. **David P. Price**, dave.p.price@gmail.com and Immo A. Hansen, New Mexico State Univ., Las Cruces, NM

D3076 Larvae of the small white butterfly, *Pieris rapae*, express a novel serotonin receptor. **Yixiang Qi**, qiyixiang19880922@163.com[1], Renying Xia[1], Yasu Wu[1], David W. Stanley[2], Jia Huang[1] and Gongyin Ye[1], [1]Zhejiang Univ., Hangzhou, China, [2]USDA - ARS, Columbia, MO

D3077 Juvenile hormone alone is insufficient in developmental programing for supernumerary larva under crowded condition in the beetle species *Zophobas atratus* and *Tribolium freemani*. **Krissana Ruangrit**, krissana@ksu.edu, Kansas State Univ., Manhattan, KS

D3078 Sexual dimorphism in polygalacturonase expression and activity in the salivary gland of *Pyrrhocoris apterus* L. **Andrea Bednarova**, bednarovaandrea@centrum.cz[1], Natraj Krishnan[2] and Dalibor Kodrik[1], [1]South Bohemian Univ., Ceske Budejovice, Czech Republic, [2]Mississippi State Univ., Mississippi State, MS

D3079 Vitellogenesis in potato psyllid, *Bactericera cockerelli*. **Freddy Ibanez**, fibanez@neo.tamu.edu and C. Tamborindeguy, Texas A&M Univ., College Station, TX

D3080 Comparative analysis of brain and brain component size in different honeybee species. **Vishwas Gowda**, vishwas@email.arizona.edu and Wulfila Gronenberg, Univ. of Arizona, Tucson, AZ

08 - Graduate Student Poster Competition: PBT

Exhibit Hall C (Oregon Convention Center)

D3081 Contact toxicity of deltamethrin against R*hyzopertha dominica* (F.), S*itophilus oryzae* (L.), and T*ribolium castaneum* (Herbst) adults. **Sulochana Paudyal**, sulochana.paudyal@okstate.edu, George P. Opit and Sandipa G. Gautam, Oklahoma State Univ., Stillwater, OK

D3082 Are cases of resistance to Cry1Fa corn in diverse populations of *Spodoptera frugiperda* due to the same mechanism? **Rahul Banerjee**, rbanerje@utk.edu[1], Siva R. K. Jakka[2], Fangneng Huang[3] and Juan Luis Jurat-Fuentes[1], [1]Univ. of Tennessee, Knoxville, TN, [2]Iowa State Univ., Ames, IA, [3]Louisiana State Univ., Baton Rouge, LA

D3083 Acute toxicity of six flower/fruit thinners to *Apis mellifera*, *Bombus terrestris* (Hymenoptera: Apidae) and *Osmia cornifrons* (Hymenoptera: Megachilidae) in laboratory bioassays. **Dongwon Kim**, k4869@hanmail.net, Andong National Univ., Andong, South Korea

D3084 Co-expression of CYP9M10 and NADPH cytochrome P450-reductase in baculovirus expression system: Revealing the role of CYP9M10 in permethrin resistance in *Culex quinquefasciatus*. **Youhui Gong**, yzg0016@auburn.edu and Nannan Liu, Auburn Univ., Auburn, AL

D3085 Monitoring and mechanisms of resistance to insecticides in the Asian citrus psyllid populations in south Florida. **Julius Eason**, jeason21@gmail.com[1], Lambert H. B. Kanga[1] and Jawwad A. Qureshi[2], [1]Florida A&M Univ., Tallahassee, FL, [2]Univ. of Florida, Immokalee, FL

D3086 Montoring of resistance allele frequencies in glassy-wing sharpshooter *Homalodisca vitripennis,* the destructive pest of grape. **Gunasegaran Chelliah**, cgsegaran369@gmail.com and Lambert H. B. Kanga, Florida A&M Univ., Tallahassee, FL

D3087 Effects of commonly used agrochemicals and their interactions on honey bee (*Apis mellifera*) colony health. **Stephanie Parreira**, parreirastephanie@gmail.com and Ramesh Sagili, Oregon State Univ., Corvallis, OR

D3088 Molecular characterization and expression profiles of nicotinic acetylcholine receptor genes in rice striped stem borer, *Chilo suppressalis*. **Gang Xu**, xugang0318@gmail.com, Qi Fang, Jia Huang and Gongyin Ye, Zhejiang Univ., Hangzhou, China

D3089 Characterization of chlorpyrifos resistance in western tarnished plant bug, *Lygus hesperus* knight (Hemiptera: Miridae). **Herma Amalia**, herma.amalia@email.wsu.edu[1], Mark Lavine[1], Doug Walsh[2] and Laura Corley Lavine[1], [1]Washington State Univ., Pullman, WA, [2]Washington State Univ., Prosser, WA

D3090 *Drosophila* CG12796 encodes a novel muscarinic acetylcholine receptor. **Renying Xia**, xiary1990@163.com, Yixiang Qi, Yasu Wu, Jia Huang and Gongyin Ye, Zhejiang Univ., Hangzhou, China

D3091 Presentation Withdrawn

D3092 Evaluation of laboratory bioassays using oral exposure of the neonicotinyl insecticide imidacloprid to honey bees (*Apis mellifera*) and bumble bees (*Bombus impatiens*). **Judy Wu-Smart**, wuxxx941@umn.edu, Univ. of Minnesota, Falcon Heights, MN and Marla Spivak, Univ. of Minnesota, Saint Paul, MN

09 - Graduate Student Poster Competition: P-IE

Exhibit Hall C (Oregon Convention Center)

D3093 Direct and indirect impact of selected insecticides to *Delphastus Delphastus* (Coleoptera: Coccinellidae) a biological control agent of whiteflies *Bemisia tabaci* biotype B. **Amr Badawy**, badawy.5@osu.edu[1], Luis A. Cañas[2], Nuris Acosta[2], Mohamed Aly[1] and Khaled Osman[1], [1]South Valley Univ., Qena, Egypt, [2]The Ohio State Univ., Wooster, OH

D3094 Interactions between native predators and an introduced parasitoid in the control of the invasive geometrid winter moth (*Operophtera brumata*) in northeastern U.S. **Hannah Broadley**, hbroadley@cns.umass.edu and Joseph Elkinton, Univ. of Massachusetts, Amherst, MA

D3095 Undercover predators: A meta-analysis of structural refuge impacts on invertebrate and vertebrate weed seed predation. **Carmen K. Blubaugh**, blubaugh@purdue.edu and Ian Kaplan, Purdue Univ., West Lafayette, IN

D3096 Identifying arthropod predators of Asian citrus psyllid (Diaphorina citri) in California. **Aviva Goldmann**, agoldmann@gmail.com, Richard Stouthamer and Paul F. Rugman-Jones, Univ. of California, Riverside, CA

D3097 Parasitism rate of bird cherry-oat aphid and cabbage aphid (Hemiptera: Aphididae) by *Diaeretiella rapae* (M'Intosh) (Hymenoptera:Braconidae) in an experienced versus a novel environment. **Beth Ferguson**, beth.ferguson@okstate.edu[1], Tom Royer[1], Kris Giles[1], Norman Elliott[2] and Mark Payton[1], [1]Oklahoma State Univ., Stillwater, OK, [2]USDA - ARS, Stillwater, OK

D3098 Functional response of the assassin bug, *Zelus tetracanthus,* on larger tamarisk beetle *Diorhabda carinata*. **J. Sunny Evans**, ejessis@okstate.edu and Tom Royer, Oklahoma State Univ., Stillwater, OK

D3099 Developing a potential biological control measure for a new exotic soft scale insect on croton. **Netalie Francis**, nfrancis232@gmail.com[1], Catharine M. Mannion[2] and Lambert H. B. Kanga[1], [1]Florida A&M Univ., Tallahassee, FL, [2]Univ. of Florida, Homestead, FL

D3100 Effect of intraguild predation between two species of wolf spiders on the biological control of cotton bollworm *Helicoverpa armigera*. **Dalila Rendon**, Dalila.rendon-castaneda@csiro.au[1], Mary Whitehouse[1] and Phillip W. Taylor[2], [1]CSIRO, Narrabri, Australia, [2]Macquarie Univ., Sydney, Australia

D3101 Are caterpillars more attractive to parasitoids after feeding on host plants? Effect of diet on the attractiveness of *Heliothis virescens* to *Microplitis croceipes*. **Tolulope Morawo**, tom0002@auburn.edu and Henry Fadamiro, Auburn Univ., Auburn, AL

D3102 Monitoring for parasitoids of spotted wing drosophila (*Drosophila suzukii*) in Virginia fruit crops. **James C. E. Wahls** and Douglas G. Pfeiffer, Virginia Tech, Blacksburg, VA

D3103 Development of sampling protocol on ground beetle assemblages (Coleoptera: Carabidae): Case studies on trap placement, trap size, and trapping period in Korea. **Jong Kook Jung**, jk82811@snu.ac.kr, Seung Tae Kim, Sue Yeon Lee, Sun Kyung Lee, Byungin Sohn, Jae Seong Im and Joon-Ho Lee, Seoul National Univ., Seoul, South Korea

10 - Graduate Student Poster Competition: P-IE

Exhibit Hall C (Oregon Convention Center)

D3104 Neonicotinoid seed treatments and effects on earthworms in conventional maize systems. **Madeline Spigler**, mspigler@purdue.edu, Purdue Univ., West Lafayette, IN

D3105 Stink bug species associated with Missouri soybean production. **Brittani Alexander**, alexanderbn@mail.missouri.edu, Univ. of Missouri, Columbia, MO

D3106 Growth of the *Sirex*-parasitc nematode *Deladenus siricidicola* on strains of symbiotic fungi. **Isis Caetano**, ial26@cornell.edu, Cornell Univ., Ithaca, NY

D3107 Can pheromones and host volatiles induce *Monochamus* species (Cerambycidae:Lamiinae) to colonize healthy shortleaf pines? **Matthew Ethington**, mwething@uark.edu, Larry D. Galligan and Fred M. Stephen, Univ. of Arkansas, Fayetteville, AR

D3108 Citizen science in entomology: Establishing and maintaining insect detection networks in at-risk habitats. **Lesley Tylczak**, latylczak@gmail.com[1], David A. Andow[1], Terrance Hurley[1], Eugene Borgida[2] and Eli Sagor[1], [1]Univ. of Minnesota, Saint Paul, MN, [2]Univ. of Minnesota, Minneapolis, MN

D3109 Evaluating the effect of foliar insecticides on populations of suspected Bt-resistant western corn rootworm beetles in rotated soybean. **Alexandra McMillan**, amcmill2@illinois.edu, Nicholas Tinsley, Ronald Estes, Michael Gray and Joseph Spencer, Univ. of Illinois, Urbana, IL

D3110 Evaluation of mustard biofumigation for management of stem nematode (*Ditylenchus dipsaci*) and clover root curculio (*Sitona hispidulus*) in alfalfa. **Steven Price**, bugmanprice@hotmail.com, Ricardo A. Ramirez and Erica P. Stephens, Utah State Univ., Logan, UT

D3111 Corn rootworms in North Dakota: A state-wide survey and a comparison of two sticky traps for monitoring adult activity. **Veronica Calles Torrez**, veronica.callestorre@my.ndsu.edu, Janet Knodel, Mark A. Boetel and Patrick Beauzay, North Dakota State Univ., Fargo, ND

D3112 The effects of temperature and rice fractions on red flour beetle (*Tribolium castaneum*) development. **Rachel Hampton**, rachel.hampton@smail.astate.edu[1], Brook Hale[1], Laura Starkus[1], Tanja McKay[1], Frank H. Arthur[2] and James Campbell[2], [1]Arkansas State Univ., State Univ., AR, [2]USDA - ARS, Manhattan, KS

D3113 A cyber-age approach to manage barley yellow dwarf virus in winter wheat on a global scale. **Joseph Walls III**, jtw201@psu.edu[1], Cristina Rosa[1], Piero Caciagli[2], John F. Tooker[1], Joe Russo[3], Beth Gugino[1], Clare Hinrichs[1], Kristin Babbie[1] and Edwin Rajotte[1], [1]Pennsylvania State Univ., Univ. Park, PA, [2]National Research Council of Italy, Turin, Italy, [3]Zedx, Inc., Hamburg, PA

D3114 Integration of alternatives to carbamate and organophpsphate insecticides with newly released peanut cultivars for thrips and *tomato spotted wilt virus* management. **Pin-Chu Lai**, pclai@uga.edu, Mark R. Abney, Albert K. Culbreath and Rajagopalbabu Srinivasan, Univ. of Georgia, Tifton, GA

11 - Graduate Student Poster Competition: P-IE

Exhibit Hall C (Oregon Convention Center)

D3115 Factors affecting vertical movement of *Rhyzopertha dominica* (Coleoptera: Bostrichidae), lesser grain borer, in the grain mass. **Erick Cordeiro**, cordeiro.emg@gmail.com[1], James F. Campbell[2] and Thomas Phillips[1], [1]Kansas State Univ., Manhattan, KS, [2]USDA - ARS, Manhattan, KS

D3116 Quantifying insect prey preferences of North American breeding birds across mesic and xeric environments. **Ashley C. Kennedy**, kennedya@udel.edu and Douglas W. Tallamy, Univ. of Delaware, Newark, DE

D3117 System-level effects on arthropod communities in conventional and organic crop fields. **Paul Adams III**, pradams2@ncsu.edu, Michelle Schroeder-Moreno, Dolly Watson, D. Wes Watson, David Orr and Yasmin Cardoza, North Carolina State Univ., Raleigh, NC

D3118 Do detoxification enzymes enable generalism by Japanese beetles *Popillia japonica* Newman? **Adekunle Adesanya**, awa0004@tigermail.auburn.edu, Nannan Liu and David Held, Auburn Univ., Auburn, AL

D3119 Occupancy modelling of nine endemic insects from the Monahans Sandhills in western Texas. **Scott Longing**, scott.longing@ttu.edu[1], James Cokendolpher[2] and Samuel Discua Duarte[1], [1]Texas Tech Univ., Lubbock, TX, [2]Museum of Texas Tech Univ., Lubbock, TX

D3120 Superinfecting symbionts: Interactions between two defensive mutualists and their aphid host, *Acyrthosiphon pisum*. **Stephanie Weldon**, srweldon@uga.edu and Kerry M. Oliver, Univ. of Georgia, Athens, GA

D3121 Structure of insect-plant networks across broad environmental gradients. **Ellen Welti**, elwelti@k-state.edu and Anthony Joern, Kansas State Univ., Manhattan, KS

D3122 First record of a sawfly, *Sphacophilus* sp. (Hymenoptera:Argidae), feeding on chipilín, *Crotalaria longirostrata* (Fabaceae) in Chiapas, México. **José Monjarás-Barrera**, irving_032@hotmail.com[1], Celso Morales-Reyes[1] and David Smith[2], [1]Universidad Autónoma Agraria Antonio Narro, Saltillo, Mexico, [2]National Museum of Natural History, Washington, DC

D3123 Cryptic killer or indulgent insect? *Matsucoccus macrocicatrices* and its relationship with *pinus strobus* in the southern Appalachian mountains. **Ashley Schulz**, anschulz@uga.edu[1], Christopher Asaro[2], David R. Coyle[1], Michelle Cram[3], Rima Lucardi[3], Angela M. Mech[1] and Kamal J.K. Gandhi[1], [1]Univ. of Georgia, Athens, GA, [2]Virginia Dept. of Forestry, Charlottesville, VA, [3]USDA - Forest Service, Athens, GA

D3124 Abundance and distribution of *Farallonphilus cavernicolus* on the Southeast Farallon Island. **Michael Valainis**, mtvalainis@gmail.com, San Jose State Univ., San Jose, CA

D3125 Corn plant and seedling insect complex interactions with seed-applied and in-furrow insecticides. **Forrest Howell**, fchowell@ncsu.edu[1], and Dominic Reisig[2], [1]North Carolina State Univ., Raleigh, NC, [2]North Carolina State Univ., Plymouth, NC

D3126 Reduction in male progeny of *Frankliniella occidentalis* (Pergande) in the presence of competitor *Frankliniella intonsa* (Trybom): demonstration on potted bean plant. **Mohammad M.H. Bhuyain**, mosharofhstu77@gmail.com and Un Taek Lim, Dept. of Bioresource Sciences, Andong, South Korea

12 - Graduate Student Poster Competition: P-IE

Exhibit Hall C (Oregon Convention Center)

D3127 Putting insect pheromones to use: New strategies for engineering trap crops? **Jason Lancaster**, jlancas7@vt.edu[1], Dawn E. Gundersen-Rindal[2], Donald C Weber[2] and Dorothea Tholl[1], [1]Virginia Tech, Blacksburg, VA, [2]USDA - ARS, Beltsville, MD

D3128 Facultative mutualism between navel orangeworm (*Amyelois transitella*) and *Aspergillus flavus* and its effects on commercial orchards. **Daniel Bush**, dsbush2@illinois.edu and May R. Berenbaum, Univ. of Illinois, Urbana, IL

D3129 Presentation Withdrawn

D3130 Top down and bottom up: Herbivore performance is determined by diet breadth, plant defenses and natural enemies. **Caitlin Kelly**, caitlin.a.kelly@colorado.edu, Univ. of Colorado, Boulder, CO

D3131 Assessing fertility between haplotypes of the psyllid *Bactericera cockerelli*. **Tariq Mustafa**, tariq.mustafa@wsu.edu[1], David Horton[2], William Rodney Cooper[2], Richard Zack[1] and Joseph Munyaneza[2], [1]Washington State Univ., Pullman, WA, [2]USDA - ARS, Wapato, WA

D3132 Plasticity of response to host plant volatiles in two parasitic wasp species. **Matthew Burrows**, Tolulope Morawo and Henry Fadamiro, Auburn Univ., Auburn, AL

D3133 Behavioral responses of *Chrysoperla externa* (Neuroptera: Chrysopidae) in a rose–aphid–coriander complex interaction. **Jordano Salamanca**, jordanosalamanca@gmail.com[1], Martin Pareja[1], Cesar Rodriguez-Saona[2], André Luis Resende[1] and Brígida Souza[1], [1]Universidade Federal de Lavras, Lavras, Brazil, [2]Rutgers, The State Univ. of New Jersey, Chatsworth, NJ

D3134 The role of volatiles from brown marmorated stink bug, *Halyomorpha halys*, on host location and egg predation by minute pirate bug, *Orius insidiosus*. **Diego F. Fraga**, diegoffraga@gmail.com[1], Cesar Rodriguez-Saona[2], George C. Hamilton[3], Anne L. Nielsen[4] and Antonio Carlos Busoli[1], [1]Universidade Estadual Paulista, Jaboticabal, Brazil, [2]Rutgers, The State Univ. of New Jersey, Chatsworth, NJ, [3]Rutgers, The State Univ. of New Jersey, New Brunswick, NJ, [4]Rutgers, The State Univ. of New Jersey, Bridgeton, NJ

D3135 Discrimination of *Anoplophora glabripennis* (Coleoptera: Cerambycidae) host and non-host tree species by antennally active volatiles. **Laura Hansen**, lehans01@syr.edu[1], Tian Xu[1], Jacob D. Wickham[2], Sarah Pocock[1] and Stephen Teale[1], [1]State Univ. of New York, ESF, Syracuse, NY, [2]Institute of Chemistry, Chinese Academy of Sciences, Zhongguancun, China

D3136 Lifecycle and CO1 gene analysis of black oak gall wasp (*Callirhytis ceropteroides*) on Cape Cod and Martha's Vineyard. **Monica Davis**, mjdavis@eco.umass.edu and Joseph Elkinton, Univ. of Massachusetts, Amherst, MA

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Exhibit Hall C (Oregon Convention Center)

D3137 Physiological and molecular mechanisms of drought stress in soybean: Impacts on soybean aphid populations and virus infection. **Christopher Culkin**, culkc01@ipfw.edu, Peter Saya, Vamsi Nalam and Punya Nachappa, Indiana Univ.-Purdue Univ., Fort Wayne, IN

D3138 Evaluation of plant-based Western corn rootworm bioassays for cost effectiveness and detection of resistance to Bt traits. **Dalton Ludwick**, dclmrd@mail.missouri.edu[1], Lisa Meihls[2], Thomas A. Coudron[2] and Bruce Hibbard[2], [1]Univ. of Missouri, Columbia, MO, [2]USDA - ARS, Columbia, MO

D3139 Bird cherry-oat aphid (*Rhopalosiphum padi L.*) resistance in wheat. **Dayna Collett**, dayna.collett@okstate.edu, Kris Giles, Brett Carver and Ali A. Zarrabi, Oklahoma State Univ., Stillwater, OK

D3140 *Helianthus annus* resistance: Evaluation and enhancement of insect pest resistance against sunflower head moth, *Homoesoma electellum* (*Hulst*). **D. Sikora**, dsikora1@utk.edu[1], Jeffrey Bradshaw[1], Jarrad Prasifka[2] and Gary Brewer[3], [1]Univ. of Nebraska, Scottsbluff, NE, [2]USDA - ARS, Fargo, ND, [3]Univ. of Nebraska, Lincoln, NE

D3141 Influence of soybean aphid biotypes on chlorophyll loss of various soybean genotypes. **Predeesh Chandran**, predeesh@ksu.edu[1], John C. Reese[1], Brian W. Diers[2], Dechun Wang[3] and William T. Schapaugh[1], [1]Kansas State Univ., Manhattan, KS, [2]Univ. of Illinois, Urbana, IL, [3]Michigan State Univ., East Lansing, MI

D3142 Inheritance and fitness costs associated with resistance to Bt corn by western corn rootworm (*Diabrotica virgifera virgifera* LeConte). **Aubrey Paolino**, apaolino@iastate.edu and Aaron Gassmann, Iowa State Univ., Ames, IA

D3143 Strong teeth are needed to eat tough food: Caterpillar mandible durability in response to plant feeding. **Flor E. Acevedo**, fea5007@psu.edu, Michelle Peiffer, Dawn Luthe and Gary Felton, Pennsylvania State Univ., Univ. Park, PA

D3144 Feeding behavior of European corn borer, *Ostrinia nubilalis* (Hübner), on a range of host plants. **Kelsey Fisher**, kefisher@udel.edu and Charles E. Mason, Univ. of Delaware, Newark, DE

D3145 Presentation Withdrawn

D3146 White ash survival in forested sites in the core of the EAB invasion. **Molly Robinett**, robine18@msu.edu and Deborah G. McCullough, Michigan State Univ., East Lansing, MI

14 - Graduate Student Poster Competition: P-IE

Exhibit Hall C (Oregon Convention Center)

D3147 A comparative study of ITS2 metabarcoding and traditional microscopic palynology as methods of identifying taxonomic origins of bee collected pollen. **Rodney Richardson**, richardson.827@osu.edu[1], Chia-Hua Lin[1], Juan Quijia Pillajo[2], Douglas B. Sponsler[2], Karen Goodell[3] and Reed Johnson[2], [1]The Ohio State Univ., Columbus, OH, [2]The Ohio State Univ., Wooster, OH, [3]The Ohio State Univ., Newark, OH

D3148 Squash bug (*Anasa tristis* DeGeer) egg, nymph, and associated egg parasitoid fate: a reduced risk insecticide screening. **James M. Wilson**, jamesmw3@vt.edu, Thomas P. Kuhar and Troy D. Anderson, Virginia Tech, Blacksburg, VA

D3149 How does coal mine reclamation influence bumble bee colony success and pollen use? **Jessie Wallace**, wallace.677@osu.edu, The Ohio State Univ., Columbus, OH and Karen Goodell, The Ohio State Univ., Newark, OH

D3150 Development of image based detection methods for twospotted spider mite, *Tetranychus urticae* Koch, on strawberries. **Christopher Crockett**, crockettcd@ufl.edu[1], Oscar Liburd[1] and Amr Abd-Elrahman[2], [1]Univ. of Florida, Gainesville, FL, [2]Univ. of Florida, Plant City, FL

D3151 Effect of integrating *Lindorus lopanthae* and select insecticides for control of pine needle scale (*Chionaspis pinifoliae*). **Carlos Quesada**, cquesand@purdue.edu and Clifford S Sadof, Purdue Univ., West Lafayette, IN

D3152 Kaolin clay application as a deterrent for ambrosia beetle (Curculionidae: Scolytinae) attack at ornamental nurseries. **Chris Werle**, chris.werle@ars.usda.gov[1], Karla Addesso[2], Blair Sampson[3] and John J. Adamczyk[3], [1]Louisiana State Univ., Baton Rouge, LA, [2]Tennessee State Univ., McMinnville, TN, [3]USDA - ARS, Poplarville, MS

D3153 The shift in pollinator community composition from bees to flies along the C. Hart Merriam elevation gradient of the San Francisco Peaks, Arizona. **Lindsie Abbott**, lma243@nau.edu, Northern Arizona Univ., Flagstaff, AZ

D3154 Investigating the effects of tallgrass prairie habitat restoration and forb diversity on the diversity and composition of pollinator communities. **Kathy Roccaforte**, rocca@ku.edu, Anna Tatarko and Bryan Foster, Kansas Biological Survey, Lawrence, KS

D3155 Linking pollinator behavior to selfing rate and pollen discounting for three distinct pollinators of alfalfa. **Emmanuel Santa-Martinez**, santamartnez@wisc.edu[1], and Johanne Brunet[2], [1]Univ. of Wisconsin, Madison, WI, [2]USDA - ARS, Madison, WI

D3156 Convergent morphology and divergent phenology: Competition avoidance in two long-tongued bumble bee species (Hymenoptera: Apidae: *Bombus*). **Amber D. Tripodi**, atripodi@uark.edu and Allen L. Szalanski, Univ. of Arkansas, Fayetteville, AR

D3157 Effectiveness of supplementing honey bees with *Bombus impatiens* (Hymenoptera: Apidae) for pollination of highbush blueberry (*Vaccinium corymbosum*). **Knute Gundersen**, gundersenknute@gmail.com, Jason Gibbs, Erin Treanore and Rufus Isaacs, Michigan State Univ., East Lansing, MI

D3158 Effects of floral visitation frequency and time of day on cumulative pollen deposition by bee assemblages in southern California watermelon crops. **Jacob Cecala**, jmcecala@csupomona.edu and Joan Leong, California State Polytechnic Univ., Pomona, CA

D3159 Techniques for incorporating flowers into turf lawns to improve pollinator forage opportunities. **Ian Lane**, lanex173@umn.edu, Univ. of Minnesota, Saint Paul, MN

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Exhibit Hall C (Oregon Convention Center)

D3160 Comparison of host searching behavior of *Ooencyrtus nezarae* Ishii and *Gryon japonicum* (Ashmead), egg parasitoids of *Riptortus pedestris* (Fabricius). **Dongmok Kim**, easteyeo@gmail.com[1], and Un Taek Lim[2], [1]Andong National Univ., Andong, South Korea, [2]Dept. of Bioresource Sciences, Andong, South Korea

D3161 Interactions between territorial soldier beetles (*Chauliognathus basalis*) and bees visiting sunflowers (*Helianthus petiolaris*). **Collin Schwantes**, Collin.Schwantes@colorado.edu and M. Deane Bowers, Univ. of Colorado, Boulder, CO

D3162 Responses of catalpa sphinx and its primary parasitoid to varying levels of host plant iridoid glycosides. **Jessica Bray**, brayjl@vcu.edu[1], M. Deane Bowers[2] and Karen Kester[1], [1]Virginia Commonwealth Univ., Richmond, VA, [2]Univ. of Colorado, Boulder, CO

D3163 Comparison of inherent and learned responses to plant cues in males and females of *Cotesia congregata* (Hymenoptera: Braconidae). **Megan Ayers**, ayersme@vcu.edu and Karen Kester, Virginia Commonwealth Univ., Richmond, VA

D3164 Electrical penetration analysis of feeding by western flower thrips (*Frankliniella occidentalis*) on tomatoes systemically treated with cyantraniliprole. **Damon A. D'Ambrosio**, dadambro@ncsu.edu, Alana L. Jacobson and George G. Kennedy, North Carolina State Univ., Raleigh, NC

D3165 Visual learning may influence host selection in Asian citrus psyllid, *Diaphorina citri* (Hemiptera: Liviidae). **Dara Stockton**, Dara.stockton@ufl.edu, Xavier Martini, Angelique Hoyte and Lukasz Stelinski, Univ. of Florida, Lake Alfred, FL

D3166 Differences in fitness traits between E and Z pheromone races of European corn borer, *Ostrinia nubilalis* (Hübner), on a range of host plants. **Holly Lynn Johnson**, hollylyn83@gmail.com and Charles E. Mason, Univ. of Delaware, Newark, DE

D3167 Host preference and growth response of melonworm, *Diaphania hyalinata* L. (Lepidoptera: Crambidae) in cucurbits in south Florida. **Babu Panthi**, panthibabu@ufl.edu, Univ. of Florida, Homestead, FL

D3168 Behavioral change of *Riptortus pedestris* (Fabricius) female during reproductive diapause. **M. Mahbubur Rahman**, pintu_bau@yahoo.com and Un Taek Lim, Dept. of Bioresource Sciences, Andong, South Korea

D3169 Host plant effects on captures of grape berry moth, *Paralobesia viteana* Clemens (Lepidoptera: Tortricidae), in pheromone traps. **Keith Mason**, masonk@msu.edu and Rufus Isaacs, Michigan State Univ., East Lansing, MI

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Exhibit Hall C (Oregon Convention Center)

D3170 Predator contributions to above- and below-ground responses to warming. **Audrey Maran**, amaran@bgsu.edu and Shannon Pelini, Bowling Green State Univ., Bowling Green, OH

D3171 First report of the invasive leafhopper *Balclutha rubrostriata* in Oklahoma. **Sharon Andreason**, sharon.andreason@okstate.edu, Mary Gard and Astri Wayadande, Oklahoma State Univ., Stillwater, OK

D3172 Variation in worker C:N:P stoichiometry and energy storage across a climate gradient in the *Aphaenogaster rudis* species complex. **Katie A. Miller**, miller.katie777@gmail.com[1], Clint Penick[2], Andrew Nguyen[1], Aaron M. Ellison[3], Nicholas J. Gotelli[1] and Sara Helms Cahan[1], [1]Univ. of Vermont, Burlington, VT, [2]North Carolina State Univ., Raleigh, NC, [3]Harvard Univ., Petersham, MA

D3173 Seasonal movement of *Halyomorpha halys* (Hemiptera: Pentatomidae) in organic farming systems. **Jakob Goldner**, jgoldner@mix.wvu.edu and Yong-Lak Park, West Virginia Univ., Morgantown, WV

D3174 Cold tolerance of non-cold acclimated spotted wing drosophila (Diptera:Drosophilidae). **Amanda R. Stephens**, steph310@umn.edu[1], Robert Venette[2], Mark K. Asplen[3] and William Hutchison[1], [1]Univ. of Minnesota, Saint Paul, MN, [2]USDA - Forest Service, St. Paul, MN, [3]Metropolitan State Univ., Saint Paul, MN

D3175 Reproductive status of *Megacopta cribraria* (Hemiptera: Plataspidae) sampled with cross-vane traps and sweep nets in soybean. **Francesca Stubbins**, sstubbi@clemson.edu[1], Francis Reay-Jones[2] and Jeremy K. Greene[1], [1]Clemson Univ., Blackville, SC, [2]Clemson Univ., Florence, SC

D3176 Phenological changes in the bean bug (*Riptortus pedestris*) as a result of climate change. **Hyoseok Lee**, blueorange23@snu.ac.kr[1], Jong Kook Jung[1], Jae Seong Im[1], Sun Kyung Lee[1], JinGu Lee[2], Kyung-Hee Choi[3] and Joon-Ho Lee[1], [1]Seoul National Univ., Seoul, South Korea, [2]Gyeonggi-do Agricultural Research and Extension Services, Gyeonggi-do, South Korea, [3]Apple Research Station, National Institute of Herbal and Horticultural science, Gyeongsangbuk-do, South Korea

D3177 Interspecific competition between *Drosophila suzukii* and *Zaprionus indianus* larvae in rearing medium and grapes. **Meredith Shrader**, mcassell@vt.edu and Douglas G. Pfeiffer, Virginia Tech, Blacksburg, VA

D3178 Spatial distributions of the European woodwasp (*Sirex noctilio*) and native mortality agents at a pine plantation in the Adirondacks. **Christopher Jon Foelker**, cjfoelke@syr.edu, Dylan Parry, Christopher M. Whipps and Melissa K. Fierke, State Univ. of New York, ESF, Syracuse, NY

D3179 Effects of a climate-mediated stress on cereal leaf beetle (*Oulema melanopus*) and the host plant wheat (*Triticum aestivum*): Implications for an insect-plant interaction under drought. **Nathaniel E. Foote**, foot2969@vandals.uidaho.edu, Sanford D. Eigenbrode, Nilsa A. Bosque-Pérez and Thomas S. Davis, Univ. of Idaho, Moscow, ID

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Exhibit Hall C (Oregon Convention Center)

D3180 A survey of the conoderine weevils (Coleoptera: Curculionidae) of Panama with notes on their behavior, natural history, and taxonomy. **Salvatore S. Anzaldo**, sanzaldo@asu.edu and Nico Franz, Arizona State Univ., Tempe, AZ

D3182 Development of molecular markers to assess status of native lady beetles in the Midwest. **Alice M. Vossbrinck**, vossbri2@illinois.edu, Mary M. Gardiner and Andrew P. Michel, The Ohio State Univ., Wooster, OH

D3183 Preliminary investigation of the fossorial fore legs of Gryllotalpidae (Orthoptera). **Kylee Kleiner**, knk007@shsu.edu, Sibyl Bucheli, Justin Williams and Carlos Santamaria, Sam Houston State Univ., Huntsville, TX

D3184 Genome size variation within and among the sexual and asexual generations of the gall wasp *Belonocnema treatae*, and the putative role of tannins: Further comparisons of sexual and asexual forms. **Carl Hjelmen**, cehjelmen09@neo.tamu.edu[1], Scott Egan[2], J. Spencer Johnston[1] and James R. Ott[3], [1]Texas A&M Univ., College Station, TX, [2]Rice Univ., Houston, TX, [3]Texas State Univ., San Marcos, TX

D3185 Genetic variation in *Chelinidea vittiger* Uhler (Hemiptera: Coreidae). **Clinton E. Trammel**, cetrammel@uark.edu, Allen L. Szalanski and Amber D. Tripodi, Univ. of Arkansas, Fayetteville, AR

D3186 Community structure of Gamasid mites, free-living soil predatory mites on different habitats in Korea. **Eunsun Keum**, kog592486@naver.com and Chuleui Jung, Andong National Univ., Andong, South Korea

D3187 Visualizing biodiversity data with web applications. **Julia Janicki**, jhjanicki@gmail.com, Univ. of Wisconsin, Madison, WI

D3188 Arthropods at the Four Seasons Hotel: The correlation between seasonality and diversity of arthropod communities in leaf litter. **Fredericka Hamilton**, fbhamilt@uark.edu and Ashley Dowling, Univ. of Arkansas, Fayetteville, AR

D3189 Springtail composition and soil chemical properties at the Saemangeum Reclaimed Land in Korea. **Hak-seo Kim**, goodkimseo@hanmail.net, Chonbuk National Univ., Jeonju, South Korea

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Exhibit Hall C (Oregon Convention Center)

D3190 Unraveling phallic complexities in scrub-lovin' grasshoppers: Does shape matter? (Acrididae: *Melanoplus*: The Puer Group). **Derek A. Woller**, asilid@gmail.com and Hojun Song, Univ. of Central Florida, Orlando, FL

D3191 Quantitative assay demonstrates continuous variation in aggregative tendency within and between pine sawfly species (genus *Neodiprion*). **John Terbot, II**, jwterb2@uky.edu and Catherine Linnen, Univ. of Kentucky, Lexington, KY

D3192 Higher-level phylogenetics and character evolution of the millipede assassin bugs (Heteroptera: Reduviidae: Ectrichodiinae). **Michael Forthman**, mfort001@ucr.edu and Christiane Weirauch, Univ. of California, Riverside, CA

D3193 Leafminer fly *Liriomyza* spp. (Diptera: Agromyzidae) and their natural enemies on potato crop in Korea. **Rameswor Maharjan**, mrameswor@hotmail.com and Chuleui Jung, Andong National Univ., Andong, South Korea

D3194 Effect of agricultural management on the biodiversity of soil microarthropod communities in apple orchards. **Jiwon Kim**, kjw99341018@daum.net, Eunsun Keum and Chuleui Jung, Andong National Univ., Andong, South Korea

D3195 Spatial and temporal genetic structure of *Laodelphax striatellus* Fallén (Hemiptera: Delphacidae) on 2013 populations in South Korea. **Byungin Sohn**, qnodl@snu.ac.kr, Marana Park, Jong Kook Jung, Jae Seong Im, Sun Kyung Lee and Joon-Ho Lee, Seoul National Univ., Seoul, South Korea

D3196 Evolution of eusociality in the Australian arid-zone bee genus *Exoneurella*. **Rebecca Dew**, rebecca.rmd@hotmail.com[1], and Michael P. Schwarz[2], [1]Flinders Univ. of South Australia, Adelaide, Australia, [2]Flinders Univ. of South Australia, Bedford Park, Australia

D3197 The impact of forest successional status on the abundance, diversity, and host specificity of neotropical cerambycid beetles (Cerambycidae). **Lin Li**, lincarrieli@gmail.com, City College of New York, New York, NY

D3198 Stalking an insect metropolis: Natural history and evolution of the termite assassin bugs (Reduviidae:Salyavatinae). **Eric Gordon**, erg55@cornell.edu and Christiane Weirauch, Univ. of California, Riverside, CA

D3199 Developing the gestalt: Nestmate recognition cues in the red harvester ant, *Pogonomyrmex barbatus*. **Elizabeth Cash**, Elizabeth.Cash@asu.edu and Jürgen Gadau, Arizona State Univ., Tempe, AZ

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Exhibit Hall C (Oregon Convention Center)

D3200 Morphology-based phylogeny of seed beetle *Ctenocolum* Kingsolver and Whitehead (Coleoptera: Chysomelidae: Bruchinae), a specialist on the host *Lonchocarpus* Kunth (Fabaceae: Papilionoideae: Millettieae). **Daiara Manfio**, daiaramanfio@gmail.com, and Cibele Ribeiro-Costa, Universidade Federal do Paraná, Curitiba, BC, Brazil

D3201 Cladistic analysis and host plant use of the American seed beetle genus *Sennius* Bridwell (Coleoptera, Chrysomelidae, Bruchinae). **Cibele Ribeiro-Costa**, cibele.ribeirocosta@gmail.com and Jéssica Viana, Universidade Federal do Paraná, Curitiba, Brazil

D3202 Phylogenetics of *Aphelinus* inferred from next-generation sequencing data. **Xanthe Shirley**, xanthe23@neo.tamu.edu[1], James Woolley[2], and Keith R. Hopper[3], [1]Texas A&M Univ., Bryan, TX, [2]Texas A&M Univ., College Station, TX, [3]USDA - ARS, Newark, DE

D3203 New species of parasitoid that attacks walnut twig beetle, *Pityophthorus juglandis* Blackman (Coleoptera: Curculionidae: Scolytinae). **Crystal McEwen**, clmcewen@gmail.com, Univ. of Maryland, College Park, MD

D3204 Morphology of the ovipositor in the genus *Neoplea*, Esaki and China, 1928 (Hemiptera: Heteroptera: Pleidae), including an evaluation of its taxonomic importance. Jerry L. Cook and **Clayton A. Sublett**, csublett@shsu.edu, Sam Houston State Univ., Huntsville, TX

D3205 Taxonomic utility of environmental niche models for species delineation: a case study in *Anthophora* (Hymenoptera: Apidae). **Michael Orr**, michael.christopher.orr@gmail.com[1], Jonathan Koch[1], James P. Pitts[1] and Terry L. Griswold[2], [1]Utah State Univ., Logan, UT, [2]USDA - ARS, Logan, UT

D3206 New species of *Lucifotychus* Park & Wagner, *Pselaptrichus* Brendel, and *Tychus* Leach (Coleoptera: Staphylinidae: Pslephinae) from Mt. Rainier National Park, including an annotated checklist of known Pselaphinae from Mt. Rainier. **Brittany Owens**, brittanyeownes@gmail.com and Christopher E. Carlton, Louisiana State Univ., Baton Rouge, LA

D3207 Toxin-swilling and millipede-killing: Natural history and systematics of the genus M*yriophora* (Diptera: Phoridae). **John Hash**, jhash001@ucr.edu, Univ. of California, Riverside, CA

D3208 Phylogenetic placement of the ant *Lasius atopus* with implications for the evolution and subgeneric classification of the genus. **Marek L. Borowiec**, mlborowiec@ucdavis.edu, Brendon Boudinot and Matthew Prebus, Univ. of California, Davis, CA

D3209 Partial genome capture helps resolve the long-enigmatic higher phylogeny of longhorned beetles (Coleoptera: Cerambycidae). **Stephanie Haddad**, stephanyhaddad@gmail.com[1], Alan Lemmon[2] and Duane D. McKenna[1], [1]Univ. of Memphis, Memphis, TN, [2]Florida State Univ., Tallahassee, FL

D3210 A comprehensive phylogenetic analysis of *Cremnops* (Hymenoptera: Braconidae). **Erika Tucker**, erika.tucker@uky.edu and Michael J. Sharkey, Univ. of Kentucky, Lexington, KY

D3211 Two new species of the genus *Onychiurus* (Collembola, Onychiuridae) from Korea. **Lee Inea**, annarium@gmail.com, Chonbuk National Univ., Jeonju, South Korea

Student Virtual Poster Competition: Graduate

Exhibit Hall C (Oregon Convention Center)

VP0001 Genetically modified corn on *Spodoptera frugiperda* and *Helicoverpa zea* control in Sinaloa, Mexico. **Luis Aguirre-Uribe**, luisaguirreu@yahoo.com.mx, Agustín Hernández-Juárez, Gustavo Frías-Treviño, Mariano Flores-Dávila, Ernesto Cerna-Chávez and Jerónimo Landeros-Flores, Universidad Autónoma Agraria Antonio Narro, Saltillo, Mexico

VP0002 Galls induced by *Calophya latiforceps* (Hemiptera: Calophyidae) reduce photosynthesis, chlorophyll and leaf growth of Brazilian peppertree saplings. **Patricia Prade**, patriciaprade@gmail.com[1], Rodrigo Diaz[2], Marcelo D. Vitorino[3], James P. Cuda[4], and William A. Overholt[2], [1]Universidade Regional de Blumenau, Blumenau, Brazil, [2]Univ. of Florida, Ft. Pierce, FL, [3]Univ. of Blumenau, Blumenau, Santa Catarina, Brazil, [4]Univ. of Florida, Gainesville, FL

VP0003 Managing Cotton whitefly and Future Approach to solve the dilemma. **Asifa Hameed**, asifa_hameed_sheikh@yahoo.com, and Saghir Ahmad, Cotton Research Station Multon, Multan, Pakistan

VP0004 Soybean generalist predator community responses to landscape composition, drought, and temperature stress in the Midwest US. **Kaitlin Stack Whitney**, whitney3@wisc.edu[1], Timothy D. Meehan[1], Krista Hamilton[2] and Claudio Gratton[1], [1]Univ. of Wisconsin-Madison, Madison, WI, [2]Wisconsin Dept. of Trade, Agriculture, and Consumer Protection, Madison, WI

VP0005 Temperature responses of a plant-herbivore-parasitoid system using the 'Food-Web Performance' approach. **Sandra Flores-Mejia**, sandra.flores-mejia.1@ulaval.ca, Valèrie Fournier and Conrad Cloutier, Univ. Laval, Québec, QC, Canada

VP0006 Natural Enemies of Cereal Aphids in Michigan Wheat: Aphid Suppression and Relative Importance of Ground-dwelling and Foliar-foraging Predators. **Shahlo Safarzoda**, safarzodsh@gmail.com, Aaron Fox, Christie Bahlai and Douglas A. Landis, Michigan State Univ., East Lansing, MI

TUESDAY, NOVEMBER 18, 2014, MORNING

Program Symposium: Beyond the Horizon: Unraveling the Novel Complexity of Insect-Plant Interactions

Portland Ballroom 251 (Oregon Convention Center)

Moderators and Organizers: Gary Felton and Kelli Hoover, Pennsylvania State Univ., Univ. Park, PA

8:00 Welcoming Remarks

8:05 1141 The hidden microbial contribution to plant-insect interactions. **Wilhelm Boland**, Boland@ice.mpg.de, Max Planck Institute for Chemical Ecology, Jena, Germany

8:30 1142 Host plant defenses disrupt insect-microbial interactions in the Asian longhorned beetle. **Kelli Hoover**, kxh25@psu.edu[1], Erin Scully[2], Scott Geib[3], Ming Tien[4], Chung-Jui Tsai[5], Scott Harding[5] and Cristina Rosa[1], [1]Pennsylvania State Univ., Univ. Park, PA, [2]USDA - ARS, Lincoln, NE, [3]USDA - ARS, Hilo, HI, [4]Pennsylvania State Univ., State College, PA, [5]Univ. of Georgia, Athens, GA

8:55 1143 GroEL from the endosymbiont *Buchnera aphidicola* betrays the aphid by triggering plant defense. **Isgouhi Kaloshian**, isgouhi.kaloshian@ucr.edu[1], Ritu Chaudhary[1], Hagop Atamian[1], Zhouxin Shen[2] and Steven Briggs[2], [1]Univ. of California, Riverside, CA, [2]Univ. of California, La Jolla, CA

9:20 1144 Role of insect symbiont small RNAs in host-plant interactions. **Allison Hansen**, akh@illinois.edu, Univ. of Illinois, Urbana, IL

9:45 Intermission

10:05 1145 Insect symbionts manipulate plant defenses. **Seung Ho Chung**, szc154@psu.edu, Cristina Rosa, Michelle Peiffer, Kelli Hoover and Gary Felton, Pennsylvania State Univ., Univ. Park, PA

10:30 1146 Mutli-trophic interactions above and below ground shaping our interpretation of plant signaling. **Jared Ali**, jaredali@cns.msu.edu, Michigan State Univ., East Lansing, MI

10:55 1147 Meaningful casual relationships: How bacteria mediate gypsy moth - aspen interactions. **Charles Mason**, cjmason@wisc.edu and Kenneth Raffa, Univ. of Wisconsin, Madison, WI

11:20 1148 The role of ethylene in vector-virus mutualisms. **Clare Casteel**, clc269@cornell.edu, Univ. of California, Davis, CA

11:45 Concluding Remarks

SysEB Section Symposium: Out of the Field and Into the Lab: The State of the Art in Sorting Biodiversity Samples and Processing to Publication

Portland Ballroom 256 (Oregon Convention Center)

Moderators and Organizers: István Mikó[1] and Andy Boring[2], [1]Pennsylvania State Univ., Univ. Park, PA, [2]Oklahoma Univ., Norman, OK

8:00 1149 Biodiversity on a budget: how to get the most out of your available resources. **Andy Boring**, andy.boring@ou.edu, Oklahoma Univ., Norman, OK

8:15 1150 Recreating biomes one label at a time. **Katja C. Seltmann**, enicospilus@gmail.com, The American Museum of Natural History, New York, NY

8:30 1151 Sampling the aerial plankton of the Midwest with focus on aphids. **Doris M. Lagos**, dlagos@illinois.edu, Univ. of Illinois, Urbana, IL

8:45 1152 An accidental harvest: managing the yield of 1000 trappers. **Chris Looney**, clooney@agr.wa.gov, Washington State Dept. of Agriculture, Olympia, WA

9:00 1153 The intersection of biodiversity and genomics research: ensuring high quality DNA and RNA samples from the field to the lab. **Barbara J. Sharanowski**, Barb.Sharanowski@gmail.com, Univ. of Manitoba, Winnipeg, MB, Canada

9:15 1154 From field to genome and beyond: new approaches to collecting and preserving insects for biodiversity research. **Matthew Buffington**, matt.buffington@ars.usda.gov and Michael Gates, USDA - ARS, Washington, DC

9:45 Intermission

9:55 1155 Bad hair days, blow dryers and bees: problems and solutions for surveying bees. **Cory Sheffield**, sheffield@yorku.ca, York Univ., Toronto, ON, Canada

10:10 1156 Leaf litter, the poor man's tropics: dealing with the microarthropod diversity in temperate forests. **Michael Skvarla**, MSkvarla36@gmail.com and Ashley Dowling, Univ. of Arkansas, Fayetteville, AR

10:25 1157 Taming Malagasy Ceraphronidae: an essay on high resolution wet sample imaging. **István Mikó**, istvan.miko@gmail.com[1], and Andrew R Deans[2], [1]North Carolina State Univ., Raleigh, NC, [2]Pennsylvania State Univ., Univ. Park, PA

10:40 1158 Moving digitization to the field and data to iDigBio. **Gil Nelson**, gnelson@bio.fsu.edu, Florida State Univ., Tallahassee, FL

10:55 Break

11:05 1159 Data before specimens: workflows for digital management and sharing of field notes and images. **Andrew Short**, aezshort@ku.edu, Univ. of Kansas, Lawrence, KS

11:20 1160 Specimen highway from Costa Rican forest to Smithsonian bowels for additional digestion. **Daniel H. Janzen**, djanzen@sas.upenn.edu and Winnie Hallwachs, Univ. of Pennsylvania, Philadelphia, PA

Member Symposium: Insect Life Tables: Theory, Data Analysis, and Application

Portland Ballroom 253 (Oregon Convention Center)

Moderators and Organizers: Hsin Chi[1], Remzi Atlihan[2], Angsumarn Chandrapatya[3], Qingjun Wu[4], [1]National Chung Hsing Univ., Taichung, Taiwan, [2]Univ. of Yuzuncu Yil, Van, Turkey, [3]Kasetsart Univ., Bangkok, Thailand, [4]Chinese Academy of Agricultural Sciences, Beijing, China

8:00 1161 Age-stage, two-sex life table: Theory, data analysis, and application. **Hsin Chi**, hsinchi@dragon.nchu.edu.tw[1], and Cecil L. Smith[2], [1]National Chung Hsing Univ., Taichung, Taiwan, [2]Georgia Natural History Museum, Athens, GA

8:17 1162 Population growth of pear bedstraw aphid, *Dysaphis pyri*, on different pear cultivars. **Remzi Atlihan**, ratlihan@yyu.edutr[1], Bora Kaydan[2], İsmail Kasap[3] and Evin Polat Akköprü[1], [1]Univ. of Yuzuncu Yil, Van, Turkey, [2]Univ. of Çukurova, Adana, Turkey, [3]Univ. of Çanakkale Onsekiz Mart, Çanakkale, Turkey

8:34 1163 Comparison of the consumption process and capacity for leaves by *Octodonta nipae* (Coleoptera: Chrysomelidae) on three palm species based on the age-stage, two-sex life table. **Youming Hou**, ymhou@fafu.edu.cn, Yunxin Miao and Zhiyong Zhang, Fujian Agriculture and Forestry Univ., Fuzhou, China

8:51 1164 Effect of temperature on biology and life table of *Luciaphorus perniciosus* Rack infesting the tropical white rot fungus, *Lentinus squarrosulus* Mont. in Thailand. **Angsumarn Chandrapatya**, agramc@ku.ac.th[1], Prapassorn Bussaman[2] and Chirayu Sa-uth[2], [1]Kasetsart Univ., Bangkok, Thailand, [2]Mahasarakham Univ., Maha Sarakham, Thailand

9:08 1165 Life tables of cotton aphid (*Aphis gossypii* Glover) fed on three cucurbit varieties and the effect of host plant transferral. **Wenfeng Hsiao**, wfhsiao@mail.ncyu.edu.tw and Yi-Chun Wang, National Chiayi Univ., Chiayi, Taiwan

9:25 1166 Life table of *Paederus fuscipes* (Coleoptera: Staphylinidae). Lee-Jin Bong[1], Kok-Boon Neoh[1], Zairi Jaal[2] and **Chow-Yang Lee**, chowyang@mac.com[2], [1]Kyoto Univ., Kyoto, Japan, [2]Universiti Sains Malaysia, Minden, Penang, Malaysia

9:42 Break

SD1167 Thrips diversity in the Ziban (Low Sahara of Algeria) and their economic importance. **Sabah Razi**, sabah_razi@yahoo.fr, Agriculture, Batna, Algeria

SD1168 You are what you eat: Fitness tradeoffs induced by nymphal diet of kudzu bugs (*Megacopta cribraria*). **James Murphy**, jtmurph@uga.edu, Univ. of Georgia, Athens, GA

9:57 1169 Fitness costs and reduced feeding in spinosad resistant *Frankliniella occidentalis*. Minmin Zhang, Fei Li and **Qingjun Wu**, wuqingjun@caas.cn, Chinese Academy of Agricultural Sciences, Beijing, China

10:14 1170 Oxidative effects of tarragon (*Artemisia dracunculus* L.) on different stages of *Drosophila melanogaster*. **Eda Güneş**, dnapolimeraz@gmail.com and Ferhan Nızamlioğlu, Univ. of Necmettin Erbakan, Konya, Turkey

10:31 1171 Two-sex life table and predation rate of *Chrysoperla carnea* (Stephen) (Neuroptera: Chrysopidae) fed on *Panaphis juglandis* (Goeze) (Hemiptera: Callaphididae). **Evin Polat Akköprü**, evinpolat@yyu.edu.tr and Remzi Atlihan, Univ. of Yuzuncu Yil, Van, Turkey

10:48 1173 Effect of heat shock on life parameters of *Frankliniella occidentalis* (Thysanoptera: Thripidae) offspring. **Chang-Ying Zheng**, zhengcy67@qau.edu.cn, Shan Jiang, and Bin Zhang, Qingdao Agricultural Univ., Qingdao, China

11:05 1174 A comparison of host diets on second and third generation of *Habrobracon hebetor* (Hymenoptera: Braconidae) based on life table characteristics. Zahra Mehdinasab, Parviz Shishehbor and **Hajar Faal-Mohammad-Ali**, hajar.faal@gmail.com, Shahid Chamran Univ., Ahvaz, Iran

11:22 1175 Life table analyses of aphids: Examples of applications in greenhouse pest management. Sarah Jandricic[1], Adam Dale[1], Steven D. Frank[1], John P. Sanderson[2] and **Stephen P. Wraight**, spw4@cornell.edu[3], [1]North Carolina State Univ., Raleigh, NC, [2]Cornell Univ., Ithaca, NY, [3]USDA - ARS, Ithaca, NY

Member Symposium: Control and Eradication of Invasive Social Hymenoptera

Portland Ballroom 254 (Oregon Convention Center)

Moderators and Organizers: David Foote[1], Cause Hanna[2] and Christina Boser[3], [1]U.S. Geological Survey, Hawai'i National Park, HI, [2]Univ. of California, Berkeley, CA, [3]The Nature Conservancy, Ventura, CA

8:00 Introduction and overview

8:05 1176 Social insect eradication efforts: Are they worth it? **David Holway**, dholway@ucsd.edu, Univ. of California, La Jolla, CA

8:22 1177 Impacts of invasive social hymenoptera on plant-pollinator mutualisms. **Cause Hanna**, cause.hanna@csuci.edu, California State Univ., Camarillo, CA

8:34 1178 The decision to eradicate: Case studies on Santa Cruz Island. **Christina Boser**, cboser@tnc.org, The Nature Conservancy, Ventura, CA

8:46 1179 Argentine ant management and monitoring on Santa Cruz Island. **Ida Naughton**, naughton.ida@gmail.com, Univ. of California, San Diego, CA

8:58 1180 Detecting Argentine ants at low densities on California's Channel Islands. **Korie Merrill**, koriecm@gmail.com, Univ. of California, Riverside, CA

9:10 1181 Approaching eradication of invasive *Anoplolepis gracilipes* on Johnston Atoll. **Sheldon Plentovich**, Sheldon_Plentovich@fws.gov, U.S. Fish & Wildlife Service, Honolulu, HI

9:22 1182 Advances in invasive ant management and room for improvement. **Benjamin D Hoffmann**, Ben.Hoffmann@csiro.au, CSIRO, Winnellie, Australia

9:34 Break

9:54 1183 Ecology of invasive Vespula wasps in New Zealand. **Jacqueline Beggs**, j.beggs@auckland.ac.nz, Univ. of Auckland, Auckland, New Zealand

10:11 1184 Proximity of feral honey bees and the overwintering success of invasive western yellowjacket wasps in Hawaii. **Erin Wilson**, erin.wilson@ucr.edu, Univ. of California, Riverside, CA

10:23 1185 Functional genetics, genomics, and the control of invasive insects. **Neil Tsutsui**, ntsutsui@berkeley.edu, Univ. of California, Berkeley, CA

10:35 1186 Population genetics of invasive yellowjacket wasps. **Michael Goodisman**, michael.goodisman@biology.gatech.edu, Georgia Institute of Technology, Atlanta, GA

10:47 1187 The roles of pathogens in the decline of the invasive yellow crazy ant (*Anoplolepis gracilipes*) in Arnhem Land, Australia. **Meghan Cooling**, meghan.cooling@gmail.com, Victoria Univ., Wellington, New Zealand

10:59 1188 Ants and scale outbreaks on Pisonia islands of Pacific. **Robert Peck**, bwpeck@usgs.gov, Univ. of Hawai'i, Hawai'i National Park, HI

11:11 1189 Community-level ant eradication to remove incipient populations of Wasmania in Hawaii. **Cas Vanderwoude**, casperv@hawaii.edu, Univ. of Hawai'i, Hilo, HI

11:23 1190 Integrating management of invasive predators in Hawaii Volcanoes National Park. **David Foote**, dfoote@usgs.gov, U.S. Geological Survey, Hawai'i National Park, HI

11:35 Concluding Remarks

P-IE Section Symposium: Entomology-A Foundational Discipline for Integrated Plant Health Training

Portland Ballroom 252 (Oregon Convention Center)

Moderators and Organizers: Amanda C. Hodges[1] and Gary Hein[2], [1]Univ. of Florida, Gainesville, FL, [2]Univ. of Nebraska, Lincoln, NE

8:00 Welcoming Remarks

8:10 Introduction by S. Ramaswamy of USDA, NIFA, Washington, D.C.

8:30 1191 The benefits of multidisciplinary studies for students in regulatory and applied fields. **John Payne**, John.H.Payne@aphis.usda.gov, USDA - APHIS, College Park, MD

8:50 1192 Consulting in agriculture: Careers in integrated plant health and crop production. **James Steffel**, jim@labservices.com, LABServices, Hamburg, PA

9:10 1193 The benefits of multidisciplinary training for industry. **Joe E. Eger**, jeeger@dow.com, Dow AgroSciences, Tampa, FL

9:30 1194 The University of Georgia's MPPPM Program: Lessons learned and success stories. **Dan L. Horton**, dlhorton@uga.edu, Univ. of Georgia, Athens, GA

9:50 1195 Successes and future challenges for the Master's in Plant Health Management Program at Ohio State University: An entomologist's perspective. **David Shetlar**, shetlar.1@osu.edu[1], Luis A. Cañas[2], Anne Dorrance[2] and Sarah Williams[2], [1]The Ohio State Univ., Columbus, OH, [2]The Ohio State Univ., Wooster, OH

10:10 Break

10:25 1196 The University of Florida's DPM Program: 15 years of plant doctor education. **Amanda C. Hodges**, achodges@ufl.edu, Univ. of Florida, Gainesville, FL

10:40 1197 The University of Nebraska's DPH Program: Professional leadership for sustainable plant production systems. **Gary L. Hein**, GHEIN1@unl.edu, Univ. of Nebraska, Lincoln, NE

10:55 1198 Role of plant doctors in Cooperative Extension services. **Raghuwinder Singh**, Louisiana State Univ., Baton Rouge, LA

11:15 1199 How did I get here? From entomology to plant health to Africa. **Tara Wood**, Tara.Wood@ag.tamu.edu, Texas A&M Univ., College Station, TX

11:35 1200 Student internship and learning opportunities in the DPM Program. **Eric LeVeen**, Univ. of Florida, Gainesville, FL

11:45 1201 Challenges, opportunities, and career outlook: A student's perspective. **Anthony J. McMechan**, justin.mcmechan@gmail.com, Univ. of Nebraska, Lincoln, NE

11:55 Concluding Remarks

P-IE Section Symposium: The Return of the American Bollworm: A Grand Challenge to the New World on the Horizon and Beyond

Portland Ballroom 255 (Oregon Convention Center)

Moderators and Organizers: Myron Zalucki[1] and William D. Hutchison[2], [1]Univ. of Queensland, Brisbane, Australia, [2]Univ. of Minnesota, Saint Paul, MN

8:00 Welcoming Remarks

8:05 1202 *Helicoverpa armigera*: a global perspective on the species population genetics. **Tom Walsh**, tom.walsh@csiro.au, CSIRO, Canberra, Australia

8:25 1203 Cotton bollworm, *Helicoverpa armigera* in India: bio-ecology and management in relation to changes in cropping patterns and the environment. **Hari Sharma**, h.sharma@cgiar.org, International Crops Research Institute for the Semiarid Tropics, Andhra Pradesh, India

8:45 1204 Migration and dispersal of *Helicoverpa armigera* in China: implications for management. **Baoping Zhai**, bpzhai@njau.edu.cn, Nanjing Agricultural Univ., Nanjing, China

9:05 1205 The Australian experience: from on farm IPM to landscape level change. **Gary Fitt**, Gary.Fitt@csiro.au[1], Sharon Downes[2], and Peter Gregg[3], [1]CSIRO, Brisbane, Australia, [2]CSIRO, Narrabri, Australia, [3]Univ. of New England, Armidale, Australia

9:25 1206 Muscling in on local: Comparative biology and ecology of *H.zea* and *H.armigera* in Brazil. Graham Head[1], Samuel Martinelli[1], **Renato A. de Carvalho**, renato.a.carvalho@monsanto.com[2] and Patrick Dourado[2], [1]Monsanto Company, St. Louis, MO, [2]Monsanto do Brasil Ltda., São Paulo, Brazil

9:45 1207 What do we know about *Helicoverpa armigera* in Brazil and what we need to know. **Silvana de Paula-Moraes**, silvana.moraes@embrapa.br[1], Alexandre Specht[1] and Daniel Sosa-Gómez[2], [1]Empresa Brasileira de Pesquisa Agropecuária (EMBRAPA) Cerrados, Planaltina, Brazil, [2]Embrapa Soja, Londrina, Brazil

10:05 Break

10:25 1208 The potential distribution of invading *Helicoverpa armigera* in the americas: it is just a matter of time? **Darren Kriticos**, Darren.Kriticos@csiro.au[1], William Hutchison[2], and Myron Zalucki[3], [1]CSIRO, Canberra, Australia, [2]Univ. of Minnesota, Saint Paul, MN, [3]Univ. of Queensland, Brisbane, Australia

10:45 1209 Premonitions of a brave new world: How *Helicoverpa armigera* has met the challenges of insecticides, *Bacillus thuringiensis* and hostplant defences in the old world. **David G. Heckel**, heckel@ice.mpg.de, Max Planck Institute for Chemical Ecology, Jena, Germany

11:05 1210 IRM for *Helicoverpa armigera* in Brazilian agricultural landscapes. **Celso Omoto**, celso.omoto@usp.br, Univ. of São Paulo, Piracicaba, Brazil

11:25 1211 *Helicoverpa armigera* IPM in the US: Are we prepared for the known unknowns? **Gregory Sword**, Gasword@tamu.edu[1], and Charles Allen[2], [1]Texas A&M Univ., College Station, TX, [2]Texas A&M Univ., San Angelo, TX

11:45 Concluding Remarks

P-IE Section Symposium: Exploring Complex Interactions among Non-Native Bark and Ambrosia Beetles (Coleoptera: Scolytinae), their Associated Fungi, and Naïve Hosts

D133-134 (Oregon Convention Center)

Moderators and Organizers: Christopher Ranger[1] and Jiri Hulcr[2], [1]USDA - ARS, Wooster, OH, [2]Univ. of Florida, Gainesville, FL

8:00 Welcoming Remarks

8:05 1212 Non-native bark and ambrosia beetles established in North America. **Robert Rabaglia**, brabaglia@fs.fed.us, USDA - Forest Service, Washington, DC

8:23 1213 Genetic variation of non-native introduced ambrosia beetles (Scolytinae: Xyleborini). **Anthony Cognato**, cognato@msu.edu, Michigan State Univ., East Lansing, MI

8:41 1214 Incredible invaders: how haplo-diploidy and inbreeding in common and pest ambrosia beetles contributes to their biological success. **Caroline Storer**, cgstorer@gmail.com and Jiri Hulcr, Univ. of Florida, Gainesville, FL

8:59 1215 Non-native ambrosia beetles as indicators of living, but weakened trees. **Christopher Ranger**, christopher.ranger@ars.usda.gov[1], Peter B. Schultz[2], Steven D. Frank[3], Michael E. Reding[1], Patrick Tobin[4], Jason B. Oliver[5] and Karla Addesso[5], [1]USDA - ARS, Wooster, OH, [2]Virginia Tech, Virginia Beach, VA, [3]North Carolina State Univ., Raleigh, NC, [4]USDA - Forest Service, Morgantown, WV, [5]Tennessee State Univ., McMinnville, TN

9:17 1216 Integrating novel strategies into managing ambrosia beetles in nurseries. **Peter B. Schultz**, schultzp@vt.edu, Virginia Tech Univ., Virginia Tech, VA

9:35 1217 Intra-regional invasions: an opportunity to assess risks and devise control methods based on ecological strategies. **Jean-Claude Grégoire**, jcgregoi@ulb.ac.be, Marceau Louis and François Mayer, Lutte biologique et Ecologie spatiale - LUBIES, Bruxelles, Belgium

9:53 Break

10:03 1218 Redbay ambrosia beetle and laurel wilt: biology, population trends and potential for control in southern forests. **James L. Hanula**, jhanula@fs.fed.us[1], Albert Mayfield[2] and Stephen W. Fraedrich[1], [1]USDA - Forest Service, Athens, GA, [2]USDA - Forest Service, Asheville, NC

10:21 1219 Redbay ambrosia beetle: basic and applied chemical ecology. **Paul E. Kendra**, paul.kendra@ars.usda.gov, Wayne S. Montgomery, Jerome Niogret, Elena Q. Schnell and Nancy D. Epsky, USDA - ARS, Miami, FL

10:39 1220 Recent invasion of the "Polyphagous Shot Hole Borer" *Euwallacea fornicatus* or near *fornicatus* in Southern California. **Richard Stouthamer**, richard.stouthamer@ucr.edu[1], Paul Rugman-Jones[1], Akif Eskalen[1] and Miriam Cooperband[2], [1]Univ. of California, Riverside, CA, [2]USDA - APHIS - PPQ - CPHST, Buzzards Bay, MA

10:57 1221 Protecting american pine forests: are unknown pathogens hiding in asia? **Craig Bateman**, batemanc@gmail.com[1], Bo Wang[2], Wisut Sittichaya[3] and Jiri Hulcr[1], [1]Univ. of Florida, Gainesville, FL, [2]Chinese Academy of Sciences, Beijing, China, [3]Prince of Songkla Univ., Hat Yai, Thailand

11:15 1222 The mysteries of the super-generalist bark beetles (Scolytinae: Cryphalini: Hypothenemus). **Andrew Johnson**, ajj@ufl.edu, Matthew Moore, Matthew Smith and Jiri Hulcr, Univ. of Florida, Gainesville, FL

11:33 1223 Interactions of the walnut twig beetle, *Pityophthorus juglandis*, with its hosts in the Juglandacae. **Steven Seybold**, sjseybold59@gmail.com[1], Paul L. Dallara[2], Andrew D. Graves[3] and Stacy M. Hishinuma[2], [1]USDA - Forest Service, Davis, CA, [2]Univ. of California, Davis, CA, [3]USDA - Forest Service, Albuquerque, NM

11:51 Concluding Remarks

P-IE Section Symposium: The Larry L. Larson Symposium: The Grand Challenge of Exploration and Use of Advanced Technologies Beyond the Horizon for Insect Management and Control

D137-138 (Oregon Convention Center)

Moderators and Organizers: Mike Tolley and Luis Gomez, Dow AgroSciences, Indianapolis, IN

8:00 Introductory Remarks

8:10 1224 Current capabilities in the transgenic manipulation of invertebrate species. **Malcolm J. Fraser**, fraser.1@nd.edu, Univ. of Notre Dame, Notre Dame, IN

8:35 1225 Use of transgenesis for insect and disease control. **Thomas A. Miller**, Thomas.miller@ucr.edu, Univ. of California, Riverside, CA

9:00 1226 Introduction to RNAi in insects: identifying gene function and novel target sites. **Blair Siegfried**, bsiegfried1@unl.edu[1], Chitvan Khajuria[2], and Kenneth Narva[3], [1]Univ. of Nebraska, Lincoln, NE, [2]Monsanto Company, Chesterfield, MO, [3]Dow AgroSciences, Indianapolis, IN

9:25 1227 RNAi-mediated insect control: challenges and opportunities. **James A. Baum**, james.a.baum@monsanto.com, Monsanto Company, Chesterfield, MO

9:50 Break

10:10 1228 Cry toxins 101: what are they and how they work. **Juan Luis Jurat-Fuentes**, jurat@utk.edu, Univ. of Tennessee, Knoxville, TN

10:35 1229 Bt-mediated insect control via transgenic crops. **Kenneth Narva**, knarva@dow.com, Nicholas Storer and Tom Meade, Dow AgroSciences, Indianapolis, IN

11:00 1230 Nanoscale science and engineering for agriculture: basics and applications. **Norman Scott**, nrs5@cornell.edu, Cornell Univ., Ithaca, NY

11:25 1231 Size matters: particle size and performance. **Darren Anderson**, danderson@vivecrop.com, Caleigh Irwin, Jordan Dinglasan and Anjan Das, Vive Crop Protection, Toronto, ON, Canada

11:50 Concluding Remarks

Member Symposium: Stored Product Entomology: Making Significant Contributions to Clarify and Solve Important Challenges

D139-140 (Oregon Convention Center)

Moderators and Organizers: Blaine Timlick[1] and George P. Opit[2], [1]Canadian Grain Commission, Winnipeg, MB, Canada, [2]Oklahoma State Univ., Stillwater, OK

8:00 1232 IPM for organic grain storage and processing. **Ahmed Abdelghany**, ahmed.abdelghany@agr.gc.ca, Agriculture and Agri-Food Canada, Winnipeg, MB, Canada

8:20 1233 Protective packaging and stored product insects: Safeguarding the food supply. **Frank Arthur**, frank.arthur@ars.usda.gov, USDA-ARS, Manhattan, KS

8:40 1234 Stored product entomology research at South Carolina State University: Challenges and accomplishments. **Rizana M. Mahroof**, rmahroof@scsu.edu, South Carolina State Univ., Orangeburg, SC

9:00 1235 Alternatives to managing stored-product pests as challenges to fumigation dominate the horizon. **Thomas Phillips**, twp1@ksu.edu, Kansas State Univ., Manhattan, KS

9:20 Break

9:40 1236 Efficacy of Cyfluthrin for control of red flour beetles (*Tribolium castaneum*) in rice mills. **Tanja McKay**, tmckay@astate.edu, Arkansas State Univ., State Univ., AR

10:00 1237 Developing mating disruption programs for Indianmeal moth in retail stores. **James Campbell**, james.campbell@ars.usda.gov, USDA-ARS Center for Grain and Animal Health Research, Manhattan, KS

10:20 1238 Resistance frequencies and levels of resistance in *Tribolium castaneum* (Herbst) and *Plodia interpunctella* (Hübner) populations in almond storage facilities in California. **Sandipa G. Gautam**, sandipa.gautam@okstate.edu, Oklahoma State Univ., Stillwater, OK

10:40 1239 Update on stored product fumigation research at USDA-ARS. **Spencer Walse**, spencer.walse@ars.usda.gov, USDA - ARS, Parlier, CA

11:00 1240 PCR markers reveal geographic variation in genes for resistance to phosphine in grain beetles. **Zhaorigetu Chen**, jorigtoo@ksu.edu and Thomas Phillips, Kansas State Univ., Manhattan, KS

P-IE Section Symposium: Broadening the Horizons for Pollination of U.S. Specialty Crops

E141-142 (Oregon Convention Center)

Moderators and Organizers: Cory Stanley-Stahr[1] and Theresa L. Pitts-Singer[2], [1]Univ. of Florida, Gainesville, FL, [2]USDA - ARS, Logan, UT

8:00 1241 Integrated Crop Pollination: From Concept to Reality. **Theresa L. Pitts-Singer**, Theresa.Pitts-Singer@ars.usda.gov, USDA - ARS, Logan, UT

8:15 1242 Inventory of Bees on the Farm. **Jason Gibbs**, jason.gibbs@cornell.edu, Michigan State Univ., East Lansing, MI

8:36 1243 Use of non-*Apis* managed pollinators. **Cory Stanley-Stahr**, coryss@ufl.edu, Univ. of Florida, Gainesville, FL

8:57 1244 Choosing where to enhance habitat for pollinators on farms. **Claire Brittain**, cabrittain@ucdavis.edu, Univ. of California, Davis, CA

9:18 1245 Challenges of Adding Forage for Bees in Cucurbit Crops. **Kristal Watrous**, kwatrous@gmail.com[1], Mark Otieno[1], C. Sheena Sidhu[2], Cory Stanley-Stahr[3], Rachael Troyer[1] and Shelby J. Fleischer[1], [1]Pennsylvania State Univ., Univ. Park, PA, [2]Univ. of California, Riverside, CA, [3]Univ. of Florida, Gainesville, FL

9:39 1246 Mixing It Up: Using Blue Orchard Bees as Supplemental Pollinators to Honey Bees for Almond Pollination. **Derek R. Artz**, Derek.Artz@ars.usda.gov, USDA - ARS, Logan, UT

10:00 Break

10:10 1247 Contributions of managed and wild bumble bees to blueberry pollination. **Elizabeth Elle**, eelle@sfu.ca, Simon Fraser Univ., Burnaby, BC, Canada

10:31 1248 Pumpkin pollinators on small diversified farms. **C. Sheena Sidhu**, cssidhu@ucr.edu, Univ. of California, Riverside, CA

10:52 1249 Status, Trends, and Uncertainty Assessment of Native Bee Habitat across the Conterminous United States. **Insu Koh**, ikoh@uvm.edu, Univ. of Vermont, Burlington, VT

11:13 1250 Using communication networks to support management innovations & integrated crop pollination. **Kelly Garbach**, kgarbach@luc.edu, Loyola Univ., Chicago, IL

11:34 1251 Outreach for project ICP: Face-to-face to Facebook. **Jennifer L. Hopwood**, jennifer@xerces.org and Mace Vaughan, The Xerces Society for Invertebrate Conservation, Portland, OR

Member Symposium: Human-Mediated Spread of Invasive Alien Insects: New Assessment Approaches and Data Needs

E145 (Oregon Convention Center)

Moderators and Organizers: Frank Koch[1] and Denys Yemshanov[2], [1]USDA - Forest Service, Research Triangle Park, NC, [2]Natural Resources Canada, Canadian Forest Service, Sault Ste. Marie, ON, Canada

8:00 Introductory Remarks

8:10 1252 Invasive species pathway modeling: From the port and beyond. **Daniel Borchert**, Daniel.M.Borchert@aphis.usda.gov, USDA - APHIS - PPQ - CPHST, Raleigh, NC

8:32 1253 Novel anthropogenic activity datasets and predicting long range introductions of invasive pests. **Gericke Cook**, Gericke.L.Cook@aphis.usda.gov[1], Marla Downing[2], Lisa Kennaway[1], John Withrow[3], Ian Leinwand[3], Catherine Jarnevich[4], Andrew M. Liebhold[5], Frank Koch[6] and Denys Yemshanov[7], [1]USDA - APHIS - PPQ - CPHST, Fort Collins, CO, [2]USDA - Forest Service, Ft. Collins, CO, [3]Cherokee National Technologies, Fort Collins, CO, [4]U.S. Geological Survey, Fort Collins, CO, [5]USDA - Forest Service, Morgantown, WV, [6]USDA - Forest Service, Research Triangle Park, NC, [7]Natural Resources Canada, Canadian Forest Service, Sault Ste. Marie, ON, Canada

8:54 1254 Potential establishment areas of exotic pests in the U.S. in relation to host availability and freight transportation patterns. **Manuel Colunga-Garcia**, colunga@msu.edu, Michigan State Univ., East Lansing, MI

9:16 1255 A two-step approach to modeling urban host tree distributions for forest insects. **Frank Koch**, fkoch@fs.fed.us[1], Mark Ambrose[2], Denys Yemshanov[3], and P. Eric Wiseman[4], [1]USDA - Forest Service, Research Triangle Park, NC, [2]North Carolina State Univ., Research Triangle Park, NC, [3]Natural Resources Canada, Canadian Forest Service, Sault Ste. Marie, ON, Canada, [4]Virginia Polytechnic Institute and State Univ., Blacksburg, VA

9:38 SP1256 Temporal distribution of damages are critical determinants of the economic valuation of invasive species impacts. **Andrew M. Liebhold**, aliebhold@fs.fed.us[1], and Rebecca Epanchin-Niell[2], [1]USDA - Forest Service, Morgantown, WV, [2]Resources for the Future, Washington, DC

9:50 Break

10:10 1257 Integrated analytic spatial framework to manage invasive species. **Yu Takeuchi**, yu_takeuchi@ncsu.edu, North Carolina State Univ., Raleigh, NC

10:32 1258 New modeling approaches to improve the surveillance of long-distance human-mediated spread of invasive pests. **Denys Yemshanov**, dyemshan@NRCan.gc.ca[1], Frank Koch[2], Robert G. Haight[3], Barry Lyons[1], Robert A. Haack[4], Taylor Scarr[5], Krista Ryall[1] and Bo Lu[1], [1]Natural Resources Canada, Canadian Forest Service, Sault Ste. Marie, ON, Canada, [2]USDA - Forest Service, Research Triangle Park, NC, [3]USDA - Forest Service, St. Paul, MN, [4]USDA - Forest Service, East Lansing, MI, [5]Ontario Ministry of Natural Resources, Sault Ste. Marie, ON, Canada

10:54 1259 Estimating the probability of establishment and spread of biological organisms using limited data and novel models. **Brian Leung**, brian.leung2@mcgill.ca, Corey Chivers and Johanna Bradie, McGill Univ., Montreal, QC, Canada

11:16 SP1260 Pathway analysis of recently established alien terrestrial arthropods in Hawai'i. **Francis G. Howarth**, fhowarth@bishopmuseum.org[1], Bernarr Kumashiro[2], and Janis Matsunaga[2], [1]Bishop Museum, Honolulu, HI, [2]Hawai'i Dept. of Agriculture, Honolulu, HI

11:28 Concluding Remarks

Member Symposium: Challenges of Emerging and Resilient Insect Pests for IPM Implementation

F150 (Oregon Convention Center)

Moderators and Organizers: Suhas Vyavhare[1], Raul Medina[1], Juliana Rangel[1] and M.O. Way[2], [1]Texas A&M Univ., College Station, TX, [2]Texas A&M Univ., Beaumont, TX

8:00 Welcoming Remarks

8:05 1261 Breeding, transfer and use of Varroa-resistant honey bees. **Robert Danka**, rdanka@ars.usda.gov, USDA - ARS, Baton Rouge, LA

8:25 1262 *Nosema ceranae*: Is there a need to treat? **Brenna E. Traver**, traverb@vt.edu, Virginia Polytechnic Institute and State Univ., Blacksburg, VA

8:45 1263 Utilizing honey bee behaviors to manage Varroa mite infestation. **Jennifer M. Tsuruda**, jmtsuruda@gmail.com, Clemson Univ., Clemson, SC

9:05 1264 IPM treatments for Varroa mites in east Texas apiaries. **Juliana Rangel**, jrangel@tamu.edu, Texas A&M Univ., College Station, TX

9:25 1265 The impact of spotted wing drosophila in blueberries. **Cesar Saona-Rodriguez**, CRodriguez@aesop.rutgers.edu[1], and Dean Polk, [1]Rutgers, The State Univ. of New Jersey, New Brunswick, NJ, [2]Rutgers, The State Univ. of New Jersey, Chatsworth, NJ

9:45 Break

9:55 1266 Redbanded stink bug: An emerging soybean pest in the southern region. **Suhas Vyavhare**, suhas.vyavhare@yahoo.com[1], M.O. Way[2] and Raul Medina[1], [1]Texas A&M Univ., College Station, TX, [2]Texas A&M Univ., Beaumont, TX

10:15 1267 An integrated regional response to an invasive aphid pest of sorghum. **Michael J. Brewer**, mjbrewer@ag.tamu.edu[1], David L. Kerns[2], M.O. Way[3], Raul Villanueva[4], Stephen Biles[5], and James Woolley[6], [1]Texas A&M Univ., Corpus Christi, TX, [2]Louisiana State Univ., Winnsboro, LA, [3]Texas A&M Univ., Beaumont, TX, [4]Texas A&M Univ., Weslaco, TX, [5]Texas A&M Univ., Port Lavaca, TX, [6]Texas A&M Univ., College Station, TX

10:35 1268 Current status of *Megacopta cribraria,* a new rapidly invasive pest of soybeans. **Dominic Reisig**, dominic_reisig@ncsu.edu, North Carolina State Univ., Plymouth, NC

10:55 1269 Caught in the middle: Challenges with addressing BMSB movement from the north and kudzu bug from the south. **Ames Herbert**, herbert@vt.edu, Virginia Polytechnic Institute and State Univ., Blacksburg, VA

11:15 1270 Plant pathogen vector potential of *Piezodorus guildinii*. **Jeffrey A. Davis**, jeffdavis@agcenter.lsu.edu, Louisiana State Univ., Baton Rouge, LA

11:35 Concluding Remarks

Member Symposium: Merging the Ecological and Systematic Knowledge of Carabid Beetles

B110-112 (Oregon Convention Center)

Moderators and Organizers: Kipling Will[1], Jonathan Lundgren[2] and Meghan Culpepper[1], [1]Univ. of California, Berkeley, CA, [2]USDA - ARS, Brookings, SD

8:00 Introductory Remarks

8:05 1271 Systematics and evolution of life history traits of Australian Pterostichine carabids. **Kipling Will**, kipwill@berkeley.edu, Univ. of California, Berkeley, CA

8:25 1272 Next-gen sequencing...the next generation of cross-discipline thinking in Carabidology. **Meghan Culpepper**, mculpepper@berkeley.edu, Univ. of California, Berkeley, CA

8:45 1273 Islands up high and down low: Molecular phylogenetics and insight into the origins of the ground beetle genus *Rhadine*. **R. Antonio Gomez**, ragomez@email.arizona.edu, Univ. of Arizona, Tucson, AZ

9:05 1274 Novel habitats and habits in the Lachnophorini, a diverse and global tribe of Carabidae that has had little taxonomic and ecological attention (Insecta: Coleoptera). **Terry Erwin**, erwint@si.edu and Laura Zamorano, National Museum of Natural History, Smithsonian Institution, Washington, DC

9:25 1275 The *leistus* (Coleoptera: Carabidae: Nebriini) fauna of Taiwan: Exploring previously unknown diversity and species complexity. **David H. Kavanaugh**, dkavanaugh@calacademy.org, California Academy of Sciences, San Francisco, CA

9:45 1276 Elucidating an extirpated lowland carabid beetle assemblage from Kauai, Hawaiian Islands. **James Liebherr**, JKL5@cornell.edu, Cornell Univ., Ithaca, NY

10:05 Break

10:15 1277 Returning to the sea: Morphological convergence in independent bembidiine ground beetle lineages entering intertidal and other near-ocean environments (Coleoptera: Carabidae). **David Maddison**, david.maddison@science.oregonstate.edu, Oregon State Univ., Corvallis, OR

10:35 1278 Where do carabid beetles fit within soil arthropod communities used for biological control in agroecosystems. **Jonathan Lundgren**, jgl.entomology@gmail.com, USDA - ARS, Brookings, SD

10:55 1279 Habitat dependent shifts in boreal carabid assemblages is associated with climate change: Its not cool to be dry. **John Spence**, jspence@ualberta.ca, Univ. of Alberta, Edmonton, AB, Canada

11:15 SP1280 Are harvest residuals repository for ground beetle biodiversity. **Kamal J.K. Gandhi** kgandhi@warnell.uga.edu, Univ. of Georgia, Athens, GA

11:27 1281 NEON's use of ground beetles as sentinels of ecological change. **David Hoekman**, dhoekman@neoninc.org, NEON, Lafayette, CO

11:47 Concluding Remarks

SysEB Section Symposium: Genetic and Behavioral Mechanisms of Social Complexity: Current Challenges and Future Horizons

B113-114 (Oregon Convention Center)

Moderators and Organizers: Sandra Rehan[1] and Brendan Hunt[2], [1]Univ. of New Hampshire, Durham, NH, [2]Univ. of Georgia, Griffin, GA

8:00 Welcoming Remarks

8:05 1282 Exploring the role of 'hub' genes in the regulation of animal personalities. **Mark Fitzpatrick**, mark.fitzpatrick@utoronto.ca, Univ. of Toronto, Toronto, ON, Canada

8:25 1283 Molecular genetic influences on parenting in *Nicrophorus vespilloides*. **Allen J. Moore**, ajmoore@uga.edu, Univ. of Georgia, Athens, GA

8:45 1284 Genetic and behavioral mechanisms of social complexity in the small carpenter bees. **Sandra Rehan**, sandra.rehan@unh.edu, Univ. of New Hampshire, Durham, NH

9:05 1285 Evolution of eusociality with historical climate change in the arid-zone bee genus *Exoneurella*. **Rebecca Dew**, rebecca.dew@flinders.edu.au, Flinders Univ. of South Australia, Adelaide, Australia

9:25 1286 Synergism between brood and adult traits drive colony-level responses to environmental change. **Clint Penick**, capenick@ncsu.edu, North Carolina State Univ., Raleigh, NC

9:45 Break

10:00 1287 Behavioral architecture of social groups. **Diane Wiernasz**, dwiernasz@uh.edu, Univ. of Houston, Houston, TX

10:20 1288 Mechanisms underlying individual variation in social behavior. **Christina M. Grozinger**, cmgrozinger@psu.edu, Pennsylvania State Univ., Univ. Park, PA

10:40 1289 The genetic basis of reproductive division of labor: insights from genetic caste determination in harvester ants. **Sara Helms Cahan**, scahan@uvm.edu, Univ. of Vermont, Burlington, VT

11:00 1290 Evolution of regulatory networks influencing social behaviour in honey bee workers. **Amro Zayed**, zayed@yorku.ca, York Univ., Toronto, ON, Canada

11:20 1291 DNA methylation, caste bias, and maternal behavior in paper wasps: epigenomic insights into social evolution. **Amy L. Toth**, amytoth@iastate.edu, Iowa State Univ., Ames, IA

11:40 1292 Evolution of DNA methylation in Hymenoptera. **Brendan Hunt**, huntbg@uga.edu, Univ. of Georgia, Griffin, GA

MUVE Section Symposium: Beyond Pesticides: The Conundrum of Bed Bugs

B115-116 (Oregon Convention Center)

Moderators and Organizers: Jennifer Gordon, Mark H. Goodman, Sydney Crawley, and Jeffrey E. Noland, Univ. of Kentucky, Lexington, KY

8:00 Welcoming Remarks

8:05 1293 Bed bugs and infectious disease: How can we end the speculation? **Zach N. Adelman**, zachadel@vt.edu, Virginia Tech, Blacksburg, VA

8:25 1294 Survivorship and transstadial transmission of orally-ingested *Trypanosoma cruzi* in bed bugs. **Brittny Blakely**, brittnyb@nmsu.edu, Stephen J. Hanson and Alvaro Romero, New Mexico State Univ., Las Cruces, NM

8:37 1295 Bed bugs and microbes. **Mark H. Goodman**, mark.goodman@uky.edu, Univ. of Kentucky, Lexington, KY

8:57 1296 Conversations we can't hear: The chemical ecology of bed bugs. **Sydney Crawley**, sydney19@gmail.com, Univ. of Kentucky, Lexington, KY

9:17 1297 Host searching and orientation behavior of the bed bug (*Cimex lectularius)*. **Narinderpal Singh**, nsingh@aesop.rutgers.edu, Changlu Wang and Richard Cooper, Rutgers, The State Univ. of New Jersey, New Brunswick, NJ

9:29 1298 The effect of aggregation composition on the population dynamics of bed bugs. **Margie P. Lehnert**, melehne@clemson.edu, Clemson Univ., Clemson, SC

9:49 Break

9:56 1299 Been down this road before (sort of): Lessons of the past. **Michael F. Potter**, mpotter@uky.edu, Univ. of Kentucky, Lexington, KY

10:16 1300 Role of semiochemicals in the control of common bed bug, *Cimex lectularius* L, (Hemiptera: Cimicidae). **Yasmin Akhtar**, yasmin.akhtar@ubc.ca[1], Michael Gilbert[2] and Murray B. Isman[1], [1]Univ. of British Columbia, Vancouver, BC, Canada, [2]Semiosbio, Vancouver, BC, Canada

10:28 1301 Focusing your resources: Why monitoring and inspection is necessary. **Allison Taisey**, aat25@cornell.edu, Cornell Univ., Southborough, MA

10:48 1302 Public perceptions and cooperation: Why people will always be a factor in bed bug research. **Molly L. Stedfast**, msted14@vt.edu, Virginia Tech, Blacksburg, VA

11:08 1303 Lowering the cost and increasing the efficacy of bed bug (*Cimex lectularius* L.) management in multi-unit housing. **Dini M. Miller**, dinim@vt.edu, Virginia Tech, Blacksburg, VA

11:20 1304 The anatomy of a bed bug lawsuit. **Jeff Lipman**, magistratelipman@aol.com, Lipman Law Firm, Des Moines, IA

11:40 Panel Discussion

11:55 Concluding Remarks

Member Symposium: Meeting the Challenge: New Horizons in Entomology Engagement

B117-119 (Oregon Convention Center)

Moderators and Organizers: Andrine A. Shufran[1], Martha Rosett Lutz[2] and Marianne Shockley-Cruz[3], [1]Oklahoma State Univ., Stillwater, OK, [2]Bluegrass Community and Technical College, Lexington, KY, [3]Univ. of Georgia, Athens, GA

8:00 Welcoming Remarks

8:05 1305 The Entomological Foundation: Your foundation for exciting young people about science through insects!. **Thomas A. Green**, ipmworks@ipminstitute.org, IPM Institute of North America, Madison, WI

8:25 1306 Bed bugs and book bags program. **Rebecca Baldwin**, baldwinr@ufl.edu, Univ. of Florida, Gainesville, FL

8:50 1307 Utilizing the new national 4-H entomology curriculum. **Andrine A. Shufran**, andrine@okstate.edu, Oklahoma State Univ., Stillwater, OK

9:10 1308 Tots science camps: Teaching our youngest scientists. **Natalie T. Cervantes**, NTCervantes@ag.tamu.edu, Texas A&M Univ., San Antonio, TX

9:35 1309 Broadening your impact. **Catherine Dana**, cdana2@illinois.edu and Christina A. Silliman, Univ. of Illinois, Urbana, IL

10:00 Break

10:05 1310 Rearing entomologists on an organic diet: A comprehensive outreach program. **John Guyton**, jguyton@ext.msstate.edu, Mississippi State Univ., Mississippi State, MS

10:30 1311 The OSUTeach program: Graduating new science educators. **Kristen Baum**, kristen.baum@okstate.edu, Oklahoma State Univ., Stillwater, OK

10:55 1312 Scouting for bugs: Success with the BSA Insect Study merit badge. **Cade G. Morris**, cadem@okstate.edu, Oklahoma State Univ., Stillwater, OK

11:15 1313 Beekeeping Basics: Increasing bee awareness and populations through backyard beekeeping programs. **Molly E. Keck**, mekeck@ag.tamu.edu, Texas A&M Univ., San Antonio, TX

11:40 1314 Effective ways to engage entomologists in public outreach. **Bonnie Eamick**, Bonnie.Eamick@naturalsciences.org and Kari Wouk, North Carolina Museum of Natural Sciences, Raleigh, NC

Ten-Minute Papers, MUVE Section: Ants and Termites

A106 (Oregon Convention Center)

Moderators: Robert Puckett[1] and Michelle S. Smith[2], [1]Texas A&M Univ., College Station, TX, [2]Dow AgroSciences, Indianapolis, IN

8:00 Introductory Remarks

8:12 1315 The reproductive flight phenology of *Nylanderia fulva* (Hymenoptera:Formicidae). **Danny McDonald**, dlmcdonald@shsu.edu and Jerry L. Cook, Sam Houston State Univ., Huntsville, TX

8:24 1316 Strategies for management of tawny crazy ants (*Nylanderia fulva* Mayr) in urban environments. **Robert Puckett**, rpuck@tamu.edu and Roger Gold, Texas A&M Univ., College Station, TX

8:36 1317 Food lure preferences of *Brachymyrmex patagonicus* Mayr (Hymenoptera: Formicidae). **Tony Keefer**, tckeefer@tamu.edu and Roger Gold, Texas A&M Univ., College Station, TX

8:48 1318 Exotic pest ants (*Myrmica rubra, Linepithema humile*) introduced into the Pacific Northwest. **Laurel Hansen**, LaurelH@spokanefalls.edu, Spokane Falls Community College, Spokane, WA

9:00 1319 *Solenopsis invicta* virus 3: Pathogenesis and stage specificity in the red imported fire ant (*Solenopsis invicta*). **Steven M. Valles**, steven.valles@ars.usda.gov[1], Sanford D. Porter[1] and Andrew Firth[2], [1]USDA - ARS, Gainesville, FL, [2]Univ. of Cambridge, Cambridge, United Kingdom

9:12 Break

9:24 1321 Presentation Withdrawn

9:36 1322 Evaluation of the reduced risk product, Altriset® termiticide, to control Formosan subterranean termites (Isoptera: Rhinotermitidae) in trees. **Carrie Cottone**, cbcottone@nola.gov[1], Clay Scherer[2] and Barry P. Yokum[1], [1]City of New Orleans Mosquito, Termite, and Rodent Control Board, New Orleans, LA, [2]Syngenta Plant Protection, Jensen Beach, FL

9:48 1323 Laboratory evaluation of fluid baits for remedial control of subterranean termites. **Nan-Yao Su**, nysu@ufl.edu, Univ. of Florida, Davie, FL

10:00 1324 New above-ground station design for the Sentricon® system. **Joe DeMark**, jjdemark@dow.com[1], Barb Nead-Nylander[2], and Joe Eger[3],[1]Dow AgroSciences, Fayetteville, AR, [2]Dow AgroSciences, Rancho Santa Margarita, CA, [3]Dow AgroSciences, Tampa, FL

10:12 1325 Laboratory performance of multi-year field aged Recruit® HD bait on subterranean termites (Isoptera: Rhinotermitidae). **Neil Spomer**, naspomer@dow.com[1], Joe DeMark[2], Joe Eger[3], Eva Chin-Heady[1] and Ronda Hamm[1], [1]Dow AgroSciences, Indianapolis, IN, [2]Dow AgroSciences, Fayetteville, AR, [3]Dow AgroSciences, Tampa, FL

10:24 1326 Florida Department of Agriculture and Consumer Services' invasive conehead termite (*Nasutitermes corniger*) eradication effort. **Michael Page**, Michael.Page@FreshFromFlorida.com[1], and Barbara L. Thorne[2], [1]Florida Dept. of Agriculture and Consumer Services, Tallahassee, FL, [2]Univ. of Maryland, College Park, MD

Ten-Minute Papers, MUVE Section: Sand Flies and Gnats

A105 (Oregon Convention Center)

Moderator: Lee Cohnstaedt, USDA - ARS, Manhattan, KS

8:00 Introductory Remarks

8:12 1327 Development of a economic and effective trap for the adult eye gnat (*Liohippelates collusor*). **Bryan Vander Mey**, bvandermey@ucdavis.edu and James A. Bethke, Univ. of California, San Marcos, CA

8:24 1328 Attraction of *Forcipomyia taiwana* by visible light and anti-larvae activity of essential oil from indigenous plant in Taiwan. I-Yun Chang[1], Chia-Hung Tsai[1], Sen-Sung Cheng[2] and **Kun-Hsien Tsai**, kunhtsai@ntu.edu.tw[1], [1]National Taiwan Univ., Taipei, Taiwan, [2]The Experimental Forest, National Taiwan Univ., Nan-Tou Hsien, Taiwan

8:36 1329 New records of biting midges of the genus *Culicoides* Latreille from the southeastern United States (Diptera: Ceratopogonidae). **Stacey Vigil**, svigil@uga.edu[1], William Grogan[2], John Wlodkowski[1], Joshua Parris[1], Suzanne Edwards de Vargas[1], David Shaw[1], Christopher Cleveland[1] and Joseph Corn[1], [1]Univ. of Georgia, Athens, GA, [2]Florida Dept. of Agriculture and Consumer Services, Gainesville, FL

8:48 1330 Gene discovery and differential expression analysis of humoral immune response elements in female *Culicoides sonorensis* (Diptera: Ceratopogonidae). **Dana Nayduch**, dana.nayduch@ars.usda.gov[1], Christopher A. Saski[2], [1]USDA - ARS, Manhattan, KS, [2]Clemson Univ. Genomics and Computational Biology Laboratory, Clemson, SC

9:00 Break

9:12 1331 Novel detection method of epizootic hemorrhagic disease virus from midge (*Culicoides sonorensis)* expectorate. **Elin Maki**, Elin.Maki@ars.usda.gov, Mark Ruder, Dana Nayduch, Dane Jasperson and Lee Cohnstaedt, USDA - ARS, Manhattan, KS

9:24 1332 Sex pheromones of members of the *Lutzomyia longipalpis* species complex maintain species isolation in the wild. **Gordon Hamilton**, j.g.c.hamilton@keele.ac.uk, Keele Univ., Keele, Staffordshire, United Kingdom

9:36 1333 Polar cuticular lipids differ in male and female sand flies (*Phlebotomus papatasi*). **Robert Renthal**, Robert.Renthal@UTSA.edu[1], Andrew Y. Li[2], Xiaoli Gao[1] and Adalberto A. Perez de Leon[2], [1]Univ. of Texas, San Antonio, TX, [2]USDA - ARS, Kerrville, TX

Ten-Minute Papers, SysEB Section: Endosymbionts and Gut Flora/Fauna

A103-104 (Oregon Convention Center)

Moderators: Julie Urban and Jason Cryan, North Carolina Museum of Natural Sciences, Raleigh, NC

8:00 Introductory Remarks

8:02 1334 Exploring the functional ecology of pea aphid symbiont strain diversity. **Andrew H. Smith**, ahs55@drexel.edu[1], Jacob Russell[1] and Kerry M. Oliver[2], [1]Drexel Univ., Philadelphia, PA, [2]Univ. of Georgia, Athens, GA

8:14 1335 Low symbiont diversity and *Buchnera* abundance in natural populations of *Toxoptera citricida* by metagenomic analysis. **Aline Guidolin**, alinesguidolin@gmail.com, and Fernando L Cônsoli, Univ. of São Paulo, Piracicaba, Brazil

8:26 1336 Strain-level diversity of parasitoid-protective endosymbionts of aphids: Looking for correlations between phenotypes and genotypes. **Piotr Lukasik**, pl356@drexel.edu[1], Stephanie Weldon[2], Julia Ferrari[1], Charles Godfray[1], Kerry M. Oliver[2] and Jacob Russell[3], [1]Oxford Univ., Oxford, United Kingdom, [2]Univ. of Georgia, Athens, GA, [3]Drexel Univ., Philadelphia, PA

8:38 1337 What deep sequencing reveals about bacterial and fungal symbionts of the planthoppers (Hemiptera: Fulgoriodea). **Julie Urban**, julie.urban@naturalsciences.org[1], Jason Cryan[1] and Charles Bartlett[2], [1]North Carolina Museum of Natural Sciences, Raleigh, NC, [2]Univ. of Delaware, Newark, DE

8:50 Break

9:05 1338 Molecular characterization and ecological survey of *Wolbachia* in Florida *Diaphorina citri* (Hemiptera: Liviidae) populations. **Mark Hoffmann**, mark.hoffmann@ufl.edu, Monique Coy, Calum W Russell and Kirsten S Pelz-Stelinski, Univ. of Florida, Lake Alfred, FL

9:17 1339 The occurrence of the endosymbiont *Wolbachia* in *Bactrocera dorsalis* in Pakistan. **Bilal Rasool**, bilalisb2001@yahoo.com[1], Hannes Schuler[2], Naureen Qureshi[1] and Christian Stauffer[2], [1]Government College Univ., Faisalabad, Pakistan, [2]Boku, Univ. of Natural Resources & Applied Life Sciences, Vienna, Austria

9:29 1340 Distribution and potential impact of *Wolbachia* in *Solenopsis* - *Pseudacteon* host-parasitoid system. **Clara Malouines**, clara.malouines@utexas.edu, Robert Plowes and Nathan Jones, Univ. of Texas, Austin, TX

9:41 1341 The role of host genetics on the maternal transmission of *Wolbachia* bacteria in the wasp, *Urolepis rufipes* (Pteromalidae). **Kevin Floate**, Kevin.Floate@agr.gc.ca and Paul Coghlin, Agriculture & Agri-Food Canada, Lethbridge, AB, Canada

9:53 1342 Global infection of a highly derived *Wolbachia* lineage in *Pentalonia* aphids. **Clesson Higashi**, clessonh@hawaii.edu, Univ. of Hawai'i, Honolulu, HI

10:05 Concluding Remarks

Ten-Minute Papers, SysEB Section: Systematics and Evolutionary Biology

A107-109 (Oregon Convention Center)

Moderators: Torsten Dikow[1] and Jennifer Zaspel[2], [1]National Museum of Natural History, Smithsonian Institution, Washington, DC, [2]Purdue Univ., West Lafayette, IN

8:00 Introductory Remarks

8:02 1343 Systematics of Haimbachiini with focus on *Eoreuma* Ely. **James Hayden**, james.hayden@freshfromflorida.com, Florida Dept. of Agriculture and Consumer Services, Gainesville, FL

8:14 1344 Complete mitochondrial genome of the atlas moth, *Attacus atlas* (Lepidoptera: Saturniidae) and the phylogenetic relationship of Saturniidae species. **Yanqun Liu**, liuyanqun@syau.edu.cn and Yuping LI, Shenyang Agricultural Univ., Shenyang, China

8:26 1345 The evolution of wing pattern elements in tiger moths (Lepidoptera: Erebidae: Arctiinae). **Rebecca Simmons**, rebecca.simmons@email.und.edu[1], Heidi Connahs[1], Katherine Hernandez[1], Jennifer Zaspel[2], Diane Darland[1] and Susan J. Weller[3], [1]Univ. of North Dakota, Grand Forks, ND, [2]Purdue Univ., West Lafayette, IN, [3]Univ. of Minnesota, Minneapolis, MN

8:38 1346 Systematics and the evolution of chemical and acoustic communication in tiger moths (Lepidoptera: Erebidae: Arctiinae). **Jennifer Zaspel**, jzaspel@purdue.edu[1], Clare Scott[1], Rebecca B. Simmons[2] and Susan J. Weller[3], [1]Purdue Univ., West Lafayette, IN, [2]Univ. of North Dakota, Grand Forks, ND, [3]Univ. of Minnesota, Minneapolis, MN

8:50 1347 Variation in the structure of the female genitalia in Asian genera of tribe Halyini (Heteroptera: Pentatomidae: Pentatominae). **Nasreen Memon**, nasreen_kousarbks@hotmail.com, Univ. of Sindh, Jamshoro, Pakistan

9:02 1348 New insights into the evolutionary history of Hemiptera. **John Moeller Leavengood**, tokay@ufl.edu[1], Eric G Chapman[1], Xuguo Zhou[1] and Wan-Zhi Cai[2], [1]Univ. of Kentucky, Lexington, KY, [2]China Agricultural Univ., Beijing, China

9:14 Break

9:29 1349 Presentation Withdrawn

9:41 1350 Molecular phylogenetics of the Oraseminae (Hymenoptera: Chalcidoidea), parasitoid jewels of the ant empires. **Jason Mottern**, jmott002@ucr.edu and John Heraty, Univ. of California, Riverside, CA

9:53 1351 Molecular phylogeny of Pompilinae (Hymenoptera: Pompilidae): Evidence for rapid diversification and host shifts in spider wasps. **Juanita Rodriguez**, juanitarodrigueza@gmail.com[1], James P. Pitts[2], Jason Bond[1] and Carol D. von Dohlen[2], [1]Auburn Univ., Auburn, AL, [2]Utah State Univ., Logan, UT

10:05 1352 Review and phylogenetic placement of Asilidae (Diptera) in Tertiary: Eocene ambers. **Torsten Dikow**, dikowt@si.edu, National Museum of Natural History, Smithsonian Institution, Washington, DC

10:17 1353 Evolution of resistance to antimalarial drugs: The impact of vector factors. **Mathieu Legros**, mathieu.legros@env.ethz.ch and Sebastian Bonhoeffer, ETH Zürich, Zürich, Switzerland

10:29 1354 The eve of revolution: Molecular data reshuffle Paederinae. **Andrea Schomann**, andrea.schomann@gmail.com, Statens Naturhistoriske Museum, Copenhagen, Denmark

10:41 1355 Insights into the phylogeny of diurnal raptors from their feather lice. **Therese A. Catanach**, tacatanach@tamu.edu[1], and Kevin P. Johnson[2], [1]Texas A&M Univ., College Station, TX, [2]Univ. of Illinois, Champaign, IL

10:53 1356 Morphology systematics and evolution: A review of Indian *Phlebotomous* Phlebotominae (Diptera: Psychodidae) with a description of one new species. **Prakash Salunkhe**, salunkhepr.niv@gmail.com, National Institute of Virology, Pune, India

11:05 1357 Investigating imperfect mimicry through the large North American velvet ant Mullerian mimicry complex. **Joseph S. Wilson**, joeswilson@gmail.com, Utah State Univ., Tooele, UT

11:17 Concluding Remarks

Ten-Minute Papers, PBT Section: Genetics, Genomics and Molecular Biology

C124 (Oregon Convention Center)

Moderators: Jeffrey J. Stuart[1] and Margaret L. Allen[2], [1]Purdue Univ., West Lafayette, IN, [2]USDA - ARS, Stoneville, MS

8:00 Welcoming Remarks

8:12 1358 Expression profile by RNA-sequencing of western corn rootworm (*Diabrotica virgifera virgifera*) neonates exposed to the Cry3Bb1 toxin. **Leslie Rault**, leslie.rault@huskers.unl.edu, Univ. of Nebraska, Lincoln, NE

8:24 1359 Transcriptome analysis of Cry1F resistance in European corn borer (*Ostrinia nubilalis*). **Neetha Nanoth Vellichirammal**, neetha@unl.edu, Univ. of Nebraska, Lincoln, NE

8:36 1360 Expression profiles of gene transcripts during bollworm embryonic development. **Omaththage P. Perera**, op.perera@ars.usda.gov, USDA - ARS, Stoneville, MS

8:48 1361 Metatranscriptomic profiles of Eastern subterranean termites, *Reticulitermes flavipes* (Kollar), fed on second generation feedstocks. **Swapna Priya Rajarapu**, prajarapu@purdue.edu[1], Jacob Shreve[2], Ketaki Bhide[1], Jyothi Thimmapuram[1] and Michael E. Scharf[1], [1]Purdue Univ., West Lafayette, IN, [2]Pennsylvania State Univ., Univ. Park, PA

9:00 1362 Gene trap technology in the Asian malaria mosquito, *Anopheles stephensi* Liston. **William R. Reid**, wreid1@umd.edu, David O'Brochta, Kristina Pilitt, Robert A. Harrell, Channa Aluvihare and Robert Alford, Univ. of Maryland, Rockville, MD

9:12 1363 Progress toward a genomic sequence of the flesh fly, *Sarcophaga crassipalpis*. **Karl H. Joplin**, joplin@etsu.edu, Michelle Duffourc and Nicole Lewis, East Tennessee State Univ., Johnson City, TN

9:24 1364 Progress report on lady beetle genetics. **Margaret L. Allen**, meg.allen@ars.usda.gov, USDA - ARS, Stoneville, MS

9:36 1365 Nuclear-mitochondrial interactions and gene expression in hybrid honey bees (*Apis mellifera*). **Joshua Gibson**, gibson85@purdue.edu[1], Sarah D. Kocher[2], Jennifer M. Tsuruda[3] and Greg J. Hunt[1], [1]Purdue Univ., West Lafayette, IN, [2]Harvard Univ., Cambridge, MA, [3]Clemson Univ., Clemson, SC

9:48 Break

10:00 1366 Cytochrome P450 signatures in the red palm weevil (*Rhynchophorus ferrugineus*), an exotic invasive insect pest. **Praveen Mamidala**, pmamidala@gmail.com[1], and Raman Bansal[2], [1]Telangana Univ., Nizamabad, India, [2]The Ohio State Univ., Wooster, OH

10:12 1367 Molecular cloning and expression profiling of cytochrome P450 monooxygenase gene *CYP4CE1* in *Nilaparvata lugens* (Homoptera: Delphacidae). **Jun Chen**, celljun@163.com[1], and Zhifan Yang[2],[1]Wuhan Univ. of Science and Technology, Wuhan, China, [2]Hubei Univ., Wuhan, China

10:24 1368 cDNA cloning and expression of two novel cytochrome P450 genes *CYP6CS1* and *CYP6CW1* in *Nilaparvata lugens*. **Zhifan Yang**, sailyangzhf@gmail.com[1], and Jun Chen[2], [1]Hubei Univ., Wuhan, China, [2]Wuhan Univ. of Science and Technology, Wuhan, China

10:36 1369 Evolution of osmoregulation genes in phloem-feeding insects. **Xiangfeng Jing**, xj43@cornell.edu, Tom White, Georg Jander and Angela E. Douglas, Cornell Univ., Ithaca, NY

10:48 1370 Molecular characterization and functional divergence of glutathione s-transferase from *Locusta migratoria*. **Enbo Ma**, maenbo2003@sxu.edu.cn, Shanxi Univ., Taiyuan, Shanxi, China

11:00 1371 A chitinase gene (*LmCht10*) from *Locusta migratoria*: Biological functions and regulations during metamorphosis. **Jianzhen Zhang**, zjz@sxu.edu.cn, Shanxi Univ., Taiyuan, Shanxi, China

11:12 1372 Mutagenesis analysis of the partial hinge insertion of the reactive center loop of an insect serpin from *Anopheles gambiae*. **Xin Zhang**, xz65@ksu.edu[1], Scott Lovell[2] and Kristin Michel[1], [1]Kansas State Univ., Manhattan, KS, [2]Univ. of Kansas, Lawrence, KS

11:24 Concluding Remarks

Ten-Minute Papers, PBT Section: Toxicology

C123 (Oregon Convention Center)

Moderators: Zhu Kun Yan[1] and Amit Sethi[2], [1]Kansas State Univ., Manhattan, KS, [2]DuPont Pioneer, Johnston, IA

8:00 Welcoming Remarks

8:05 1373 Potential of the non-nutritive sweet alcohol erythritol as a human-safe insecticide. **Sean O'Donnell**, so356@drexel.edu, Daniel Marenda and Kaitlin Baudier, Drexel Univ., Philadelphia, PA

8:17 1374 Potential for pyrethroid resistance: Characterization of the *Diaphorina citri* Kuwayama voltage-gated sodium channel. **Monique Coy**, mrcoy@ufl.edu[1], Bin Liu[2] and Lukasz L. Stelinksi[1], [1]Univ. of Florida, Lake Alfred, FL, [2]Southwest Univ. of China, Chongqing, China

8:29 1375 Multiple single nucleotide polymorphisms in the *para*-sodium channel gene lead to pyrethroid resistance in *Rhipicephalus microplus* ticks from North America. **Nathan E. Stone**, nathan.stone@nau.edu[1], Pia Olafson[2], Ronald B. Davey[3], Greta Buckmeier[2], Deanna M. Bodine[2], Roberta Duhaime[4], Robert J. Miller[3], Juan Mosqueda[5], David M. Wagner[1] and Joseph D. Busch[1], [1]Northern Arizona Univ., Flagstaff, AZ, [2]USDA - ARS, Kerrville, TX, [3]USDA - ARS, Edinburg, TX, [4]USDA - APHIS - VS, Austin, TX, [5]Universidad Autónoma de Querétaro, Querétaro, Qro., Mexico

8:41 1376 Termite control through antiprotozone chemicals: An invivo study on flagellates of two selected species of termite. **Muhammad Qureshi**, qureshienv@yahoo.com, G.C. Univ., Lahore, Pakistan

8:53 1377 Biological attributes of a novel acrylonitrile acaricide from BASF. **Anil Menon**, anil.menon@basf.com, BASF Corporation, Research Triangle Park, NC

9:05 1378 Relationship between toxicity of certain pesticides to the honey bee, *Apis mellifera* L. (Hymenoptera: Apidea) foragers and their hemolymph amino acids. **Nadia Hassona**, nadia.hassona@yahoo.com, Alexandria Univ., Alexandria, Egypt

9:17 Break

9:29 1379 PCR markers reveal geographic variation in genes for resistance to phosphine in grain beetles. **Zhaorigetu Chen**, jorigtoo@k-state.edu[1], David Schlipalius[2] and Thomas Phillips[1], [1]Kansas State Univ., Manhattan, KS, [2]Agri-Science Queensland, Brisbane, Australia

9:41 1380 Baseline susceptibility of three cell lines to activated Cry1Ac and Cry2Ab. **Jizhen Wei**, Lxc@Ag.arizona.edu[1], Xianchun Li[1] and Gemei Liang[2], [1]Univ. of Arizona, Tucson, AZ, [2]Chinese Academy of Agricultural Sciences, Beijing, China

9:53 1381 Progress toward understanding Cry3Bb1 resistance mechanisms in western corn rootworm. **Krishnareddy Bayyareddy**, krishnareddy.bayyareddy@monsanto.com, Monsanto Company, St. Louis, MO

10:05 1382 Western corn rootworm, *Diabrotica virgifera virgifera* LeConte, adult susceptibility to MON 87411 tissues. **Jennifer Fridley**, jennifer.m.fridley@monsanto.com[1], Thomas Clark[2], Mao Chen[2], Autumn Nance[1], Adam Schapaugh[1] and William Moar[1], [1]Monsanto Company, St. Louis, MO, [2]Monsanto Company, Chesterfield, MO

10:17 1383 Psychrotolerance as a driver for the development of novel Bt-based insecticides. Brahim Soufiane, **Charles Vincent**, Charles.Vincent@agr.gc.ca and Jean-Charles Côté, Agriculture & Agri-Food Canada, Saint-Jean-sur-Richelieu, QC, Canada

10:29 1384 Dopamine receptors as targets in a "Genome-to-Lead" insecticide discovery pipeline. **Andrew Nuss**, nuss8@purdue.edu, Karin F. K. Ejendal, Jason Meyer, Jason Conley, Trevor Doyle, Emma Lang, Val J. Watts and Catherine Hill, Purdue Univ., West Lafayette, IN

10:41 1385 Changes in indoxacarb susceptibility following laboratory selection in the German cockroach (*Blattella germanica* L.). **Ameya D. Gondhalekar**, ameyag@purdue.edu, Jesse Hoteling and Michael E. Scharf, Purdue Univ., West Lafayette, IN

10:53 Concluding Remarks

Ten-Minute Papers, P-IE Section: Semiochemicals

D135 (Oregon Convention Center)

Moderators: William R. Morrison[1] and Nandi Nagaraj[2], [1]USDA - ARS, Kearneysville, WV, [2]Dow AgroSciences, Indianapolis, IN

8:00 1386 Antennal and behavioral response of the Asian citrus psyllid (*Diaphorina citri* Kuwayama) to degradation products of citrus volatiles. **Justin George**, Justin.George@ars.usda.gov, Paul S. Robbins and Stephen L. Lapointe, USDA - ARS, Ft. Pierce, FL

8:12 1387 Response of adult plum curculios (*Conotrachelus nenuphar*) to contrasts in color and illuminance, suggesting push-pull strategies for monitoring and management. **Roger Duncan Selby**, selbyrog@msu.edu, Mark E. Whalon and Joshua Iamurri, Michigan State Univ., East Lansing, MI

8:24 1388 Presentation Withdrawn

8:36 1389 Manipulating the behavior of the brown marmorated stink bug (Hemiptera: Pentatomidae) using pheromonal stimuli in the field: Attraction, retention and active space. **William R. Morrison**, morri362@msu.edu and Tracy C. Leskey, USDA - ARS, Kearneysville, WV

8:48 1390 Optimization of a 4-component chemical attractant for spotted wing drosophila isolated from fermented bait headspace. **Dong H. Cha**, dong.cha@ars.usda.gov[1], Todd B. Adams[2], Helmuth W. Rogg[2] and Peter J. Landolt[1], [1]USDA - ARS, Wapato, WA, [2]Oregon Dept. of Agriculture, Salem, OR

9:00 1391 Release of host plant derived cyanide during feeding determines attraction of mating partners in *Gynandrobrotica guerreroensis* (Chrysomelidae). **Daniel J. Ballhorn**, ballhorn@pdx.edu and Stefanie Kautz, Portland State Univ., Portland, OR

9:12 1392 Influence of kairomones on attraction of cerambycid beetles to their pheromones. **Joseph Wong**, wong62@life.uiuc.edu, Judy A. Mongold-Diers and Lawrence M. Hanks, Univ. of Illinois, Urbana, IL

9:24 1393 High-dosage codling moth, *Cydia pomonella* L., aerosol pheromone emitters enhance rather than disrupt attraction. **Peter S. McGhee**, mcghee@msu.edu, Larry Gut and James R. Miller, Michigan State Univ., East Lansing, MI

9:36 1394 Phytochemical male attractants are 'Red Bull'® for *Bactrocera* fruit flies (Diptera: Tephritidae): Trascriptome evidences for male competitive ability. **Kumaran Nagalingam**, kumaran.nagalingam@gmail.com, Peter Prentis and Anthony R. Clarke, Queensland Univ. of Technology, Brisbane, Australia

9:48 1395 Behavioral assays for attractants of *Lycoriella mali*. **Stefanos Andreadis**, ssa18@psu.edu[1], Thomas C. Baker[2] and Kevin Cloonan[1], [1]Pennsylvania State Univ., State College, PA, [2]Pennsylvania State Univ., Univ. Park, PA

10:00 Break

10:12 1396 Vectrax: A long lasting ATSB formulation for efficient insect vector control. **Agenor Mafra-Neto**, president@iscatech.com[1], Woodbridge Foster[2], Babak Ebrahimi[2], Edgar Rowton[3], Jessica Self[1], Michael Reinke[1] and Rafael Borges[4], [1]ISCA Technologies, Inc., Riverside, CA, [2]The Ohio State Univ., Columbus, OH, [3]Walter Reed Army Institute of Research, Silver Spring, MD, [4]ISCA Tecnologias Ltda, Ijui, RS, Brazil

10:24 1397 Developing a repellent for *Drosophila suzukii*: Laboratory bioassays and methods for field dispersal. **Justin Renkema**, renkemaj@uoguelph.ca[1], Rose Buitenhuis[2] and Rebecca Hallett[1], [1]Univ. of Guelph, Guelph, ON, Canada, [2]Vineland Research and Innovation Centre, Vineland Station, ON, Canada

10:36 1398 The application of Nasonov-based dispensers to enhance pollination in apples, cherries and blueberries. **Julie Adams**, adamsju6@gmail.com, Larry Gut and Rufus Isaacs, Michigan State Univ., East Lansing, MI

10:48 1399 Insecticidal effects of turmeric powder and derivatives from *Curcuma longa* (Zingiberaceae) rhizomes against the cabbage looper, *Trichoplusia ni* (Lepidoptera: Noctuidae) in the laboratory and greenhouse. Wagner Tavares[1], Yasmin Akhtar[2], José Zanuncio[1] and **Murray B. Isman**, murray.isman@ubc.ca[2], [1]Federal Univ. of Viçosa, Viçosa, Brazil, [2]Univ. of British Columbia, Vancouver, BC, Canada

11:00 1400 NOCTOVI an effective food based attractant for lepidopteran pests. **Rafael Borges**, rafael@isca.com.br[1], Michael Reinke[2], Rodrigo Oliveira da Silva[2], Carmem Bernardi[2], William Urrutia[2] and Agenor Mafra-Neto[2], [1]ISCA Tecnologias Ltda, Ijui, RS, Brazil, [2]ISCA Technologies, Inc., Riverside, CA

11:12 1401 Partitioning of the pheromone channel among sympatric species of longhorned beetles (Cerambycinae: Lamiinae). **Linnea Meier**, lrmeier2@life.uiuc.edu[1], Judy A. Mongold-Diers[1], Jocelyn G. Millar[2] and Lawrence M. Hanks[1], [1]Univ. of Illinois, Urbana, IL, [2]Univ. of California, Riverside, CA

11:24 1402 Aggregation behavior and a putative sex pheromone in the sugar beet root maggot fly, *Tetanops myopaeformis*. **Erik Wenninger**, erikw@uidaho.edu[1], Susan Emmert[2], Kelly Tindall[3], Hongjian Ding[4], Mark Boetel[5] and Sanford Eigenbrode[2], [1]Univ. of Idaho, Kimberly, ID, [2]Univ. of Idaho, Moscow, ID, [3]DuPont Pioneer, Union City, TN, [4]Food and Drug Administration, Jefferson, AR, [5]North Dakota State Univ., Fargo, ND

11:36 1403 Murgantiol as a strong synergistic attractant for the brown marmorated stink bug (*Halyomorpha halys*). **Qing-He Zhang**, qing-he@rescue.com, Doreen Hoover, Guiji Zhou, Armen Margaryan, Paul Bryant, Neil Michaelson and Rod G. Schneidmiller, Sterling International, Inc, Spokane, WA

Ten-Minute Papers, P-IE Section: Environmental Entomology A

E146 (Oregon Convention Center)

Moderators: Kevin Steffey[1] and Steven Naranjo[2], [1]Dow AgroSciences, LLC, Indianapolis, IN, [2]USDA - ARS, Maricopa, AZ

8:00 1404 Red queen on a treadmill: Insecticide resistance as a co-evolutionary phenomenon. **Andrei Alyokhin**, andrei.alyokhin@umit.maine.edu, Univ. of Maine, Orono, ME

8:12 1405 Phylogeography of native and introduced Colorado potato beetle (*Leptinotarsa decemlineata*) in North America. **Tara Madsen-Steigmeyer**, tmadmeyer@gmail.com[1], Victor Izzo[2] and Yolanda H. Chen[2], [1]Univ. of California, Berkeley, CA, [2]Univ. of Vermont, Burlington, VT

8:24 1406 Evaluation of residual toxicity of insecticides against the khapra beetle, *Trogoderma granarium* Everts (Coleoptera: Dermestidae). **Mukti N. Ghimire**, mukti@ksu.edu[1], Scott W. Myers[2], Frank H. Arthur[3] and Thomas Phillips[1], [1]Kansas State Univ., Manhattan, KS, [2]USDA - APHIS - PPQ - CPHST, Buzzards Bay, MA, [3]USDA - ARS, Manhattan, KS

8:36 1407 Effects of sweetpotato weevil infestation on aphid feeding behavior. **Jeffrey A. Davis**, jeffdavis@agcenter.lsu.edu and M. J. Murray, Louisiana State Univ., Baton Rouge, LA

8:48 1408 Susceptibility of tarnished plant bug to select insecticides and development of diagnostic doses. **Moneen Jones**, jonesmon@missouri.edu, Univ. of Missouri, Portageville, MO

9:00 1409 Timing of thrips infestation pressure and cotton development interact to drive plant damage potential. **Thomas Chappell**, tmchappe@ncsu.edu and George G. Kennedy, North Carolina State Univ., Raleigh, NC

9:12 1410 Selectivity of methoxyfenozide to non-target arthropods. **Brian Bret**, blbret@dow.com[1], Vincent J. Kramer[2] and Jennifer Hughes[2], [1]Dow AgroSciences, Roseville, CA, [2]Dow AgroSciences, Indianapolis, IN

9:24 1411 An international perspective on a global challenge: Investigating *Potato virus Y* transmission in the U.S. and Europe. **Alexzandra F. Murphy**, Alexzandra.Murphy@oregonstate.edu[1], Aranzazu Moreno[2], Alberto Fereres[2] and Silvia Rondon[1], [1]Oregon State Univ., Hermiston, OR, [2]Instituto de Ciencias Agrarias, Centro de Ciencias Medioambientales (CCMA-CSIC), Madrid, Spain

9:36 1412 Evaluation of artificial diets for use in western corn rootworm bioassays. **Lisa Meihls**, LNM2M9@mail.missouri.edu[1], Dalton Ludwick[2], Thomas A. Coudron[1] and Bruce Hibbard[1], [1]USDA - ARS, Columbia, MO, [2]Univ. of Missouri, Columbia, MO

9:48 1413 Impacts of field-aged insecticide residues on the generalist predator *Deraeocoris brevis* (Hemiptera: Miridae). **Kaushalya G. Amarasekare**, kaushalya.amarasekare@oregonstate.edu, Preston H. Brown and Peter W. Shearer, Oregon State Univ., Hood River, OR

10:00 Break

10:12 1414 Direct effects of insecticides on plants: Neonicotinoids alter transcriptomic profiles of cotton and corn. **Jason Wulff**, jason.wulff@ag.tamu.edu[1], Adrianna Szczepaniec[2] and Micky Eubanks[1], [1]Texas A&M Univ., College Station, TX, [2]South Dakota State Univ., Brookings, SD

10:24 1415 Susceptibility of *Bemisia tabaci* biotype B to Group 4 insecticides in Florida. **Hugh A. Smith**, hughasmith@ufl.edu[1], Curtis Nagle[1] and Charles MacVean[2], [1]Univ. of Florida, Wimauma, FL, [2]Saint Francis Univ., Loretto, PA

10:36 1416 Development of diagnostic tools for monitoing insecticide resistance in California populations of the Asian citrus psyllid, *Diaphorina citri*. **Frank J. Byrne**, frank.byrne@ucr.edu, Bradley White, Elizabeth E. Grafton-Cardwell and Joseph G. Morse, Univ. of California, Riverside, CA

10:48 1417 Novel mode of action of flonicamid inducing abnormal behavior in insect pests. **Yuya Noshiro**, y-noshiro@iskweb.co.jp[1], Hiroshi Shikama[1], Kiyomitsu Yoshida[1] and Tomohisa Ishikawa[2], [1]Ishihara Sangyo Kaisha, Ltd., Kusatsu, Shiga, Japan, [2]Shizuoka Prefecture Univ., Shizuoka, Shizuoka, Japan

11:00 1418 Abamectin resistance in twospotted spider mites in the Midsouth. **Sebe Brown**, SBrown@agcenter.lsu.edu[1], David L. Kerns[1], James Ottea[2] and T. Shelby Williams[1], [1]Louisiana State Univ., Winnsboro, LA, [2]Louisiana State Univ., Baton Rouge, LA

11:12 1419 Artificial diet for adults of the non-native woodboring beetle *Anoplophora glabripennis* (Cerambycidae). **Jason Hansen**, jahanse2@ncsu.edu[1], Allen C. Cohen[2], Hannah Nadel[3] and David Lance[3], [1]North Carolina State Univ., Buzzards Bay, MA, [2]North Carolina State Univ., Raleigh, NC, [3]USDA - APHIS - PPQ - CPHST, Buzzards Bay, MA

11:24 1420 Beneficial or not? Carnivore trophic position under the lens of amino acid isotopic analysis. **Shawn Steffan**, shawn.steffan@ars.usda.gov[1], Yoshito Chikaraishi[2], David Horton[3], Eugene Miliczky[3], Juan Zalapa[1] and Vincent Jones[4], [1]USDA - ARS, Madison, WI, [2]Japan Agency for Marine-Earth Science & Technology, Yokosuka, Japan, [3]USDA - ARS, Wapato, WA, [4]Washington State Univ., Wenatchee, WA

11:36 1421 Effect of the erythrina gall wasp and erythrina seed bruchid on seed production and germination of the native *Erythrina sandwicensis* in Hawaii. **Leyla V. Kaufman**, leyla@hawaii.edu[1], Juliana A. Yalemar[2], Cynthia B. A. King[3] and Mark G. Wright[1], [1]Univ. of Hawai'i, Honolulu, HI, [2]Hawai'i Dept. of Agriculture, Honolulu, HI, [3]State of Hawai'i, Honolulu, HI

11:48 1422 Diets for rearing and not rearing laboratory colonies of *Solenopsis* fire ants and other generalist ants. Jenny Gavilanez-Slone and **Sanford Porter**, sanford.porter@ars.usda.gov, USDA - ARS, Gainesville, FL

TUESDAY, NOVEMBER 18, 2014, AFTERNOON

Lunch and Learn: "Don't Bury the Lede:" How to Unlearn All the Terrible Writing Habits you Developed in Academia

Portland Ballroom 252 (Oregon Convention Center)

Moderator and Organizer: Gwen Pearson, Get Your Nature Geek On, Toledo, OH

12:15–1:15

Lunch and Learn: ICE 2016: Networking Internationally to Maximize Your Professional Connections

Portland Ballroom 255 (Oregon Convention Center)

Moderators and Organizers: Debi Sutton[1], David Denlinger[2], George C. Hamilton[3] and Murray B. Isman[4], [1]Entomological Society of America, Annapolis, MD, [2]The Ohio State Univ., Columbus, OH, [3]Rutgers, The State Univ. of New Jersey, New Brunswick, NJ, [4]Univ. of British Columbia, Vancouver, BC, Canada

12:15 Panel Discussion

Program Symposium: Social Insects as Models for Biological Complexity: Lessons Learned and Challenges on the Horizon

Portland Ballroom 251 (Oregon Convention Center)

Moderators and Organizers: Simon Garnier[1] and Zachary Shaffer[2], [1]New Jersey Institute of Technology, Newark, NJ, [2]Arizona State Univ., Tempe, AZ

1:30 Introductory Remarks

1:35 1423 Presentation Withdrawn

1:52 1424 Investigating the self-organized living architectures of *Eciton* army ants. **Chris Reid**, chrisreidresearch@gmail.com, New Jersey Institute of Technology, Newark, NJ

2:09 1425 Fire ants as self-healing materials. **David Hu**, hu@me.gatech.edu, Georgia Institute of Technology, Atlanta, GA

2:26 1426 Adaptive foraging strategies and group leadership in ants. **Claire Detrain**, cdetrain@ulb.ac.be and Bertrand Collignon, Univ. Libre de Bruxelles, Bruxelles, Belgium

2:43 1427 Diversity of collective decision-making patterns resulting from gregarious behavior. **Jean-Louis Deneubourg**, jldeneub@ulb.ac.be, Univ. Libre de Bruxelles, Brussels, Belgium

3:00 1428 Coordinating foraging in insect societies: Why are multiple information signals used? **Francis Ratnieks**, f.ratnieks@sussex.ac.uk, Univ. of Sussex, Brighton, United Kingdom

3:17 Break

3:29 1429 The interplay of abiotic and biotic factors in driving diversification in the ants. **Corrie Moreau**, cmoreau@fieldmuseum.org, Field Museum of Natural History, Chicago, IL

3:46 1430 The evolutionary genetic basis of social regulation of caste development. **Timothy A. Linksvayer**, tlinks@sas.upenn.edu, Univ. of Pennsylvania, Philadelphia, PA

4:03 1431 Regulation of work in ant colonies. Laurent Keller and **Danielle Mersch**, danielle.mersch@gmail.com, Univ. of Lausanne, Lausanne, Switzerland

4:20 1432 Green brain: Computational modelling of the honeybee brain. **James Marshall**, james.marshall@sheffield.ac.uk, Univ. of Sheffield, Sheffield, United Kingdom

4:37 1433 The hidden demographics of distributed information processing: The role of intermediates in a social-insect colony. **Theodore Pavlic**, tpavlic@asu.edu, Arizona State Univ., Tempe, AZ

4:54 1434 Chemically armed ants pillage and protect fungus-farming societies. **Rachelle Adams**, rmmadams@gmail.com, Univ. of Copenhagen, Copenhagen, Denmark

5:11 1435 The ecology of collective behavior in ants. **Deborah M. Gordon**, dmgordon@stanford.edu, Stanford Univ., Stanford, CA

5:28 Concluding Remarks

Member Symposium: Honoring the Career and Contributions of Veterinary Entomologist Donald A. Rutz

Portland Ballroom 253 (Oregon Convention Center)

Moderators and Organizers: Laura Harrington[1] and Phillip E. Kaufman[2], [1]Cornell Univ., Ithaca, NY, [2]Univ. of Florida, Gainesville, FL

1:30 Introductory Remarks

1:40 1436 Don Rutz: Undergraduate through graduate school. **Daniel Kline**, dan.kline@ars.usda.gov, USDA - ARS, Gainesville, FL

2:00 1437 Schwardt lab in 1987-1992: Lessons learned and later developments. **Chris Geden**, chris.geden@ars.usda.gov, USDA - ARS, Gainesville, FL

2:20 1438 Livestock and poultry IPM: From North Carolina to New York and back. **D. Wes Watson**, wwatson@ncsu.edu, North Carolina State Univ., Raleigh, NC

2:40 1439 Genome of the house fly (*Musca domestica* L), a global vector of diseases with adaptations to a septic environment. **Jeffrey G. Scott**, jgs5@cornell.edu, Cornell Univ., Ithaca, NY

3:00 1440 Wrapping it all up: Pulling together 30+ years of work to deliver IPM to New York livestock producers. **Phillip E. Kaufman**, pkaufman@ufl.edu, Univ. of Florida, Gainesville, FL

3:20 Poster session and reception

SD1441 Density dependent interactions betweeen stable flies (*Stomoxys calcitrans* L) and growing dairy heifer calves. **Roger D. Moon**, rdmoon@umn.edu[1], Hugh Chester-Jones[2] and David Ziegler[2], [1]Univ. of Minnesota, Saint Paul, MN, [2]Southern Research & Outreach Center, Waseca, MN

SD1442 Survey to assess fly management strategies used by Washington dairy producers. **Holly Ferguson**, hferguson@wsu.edu[1], Sally O'Neal[1], Kit Galvin[2], Michael Yost[2] and Douglas Walsh[1], [1]Washington State Univ., Prosser, WA, [2]Univ. of Washington, Seattle, WA

SD1443 To kill a fly: A 50-year history of evolving poultry IPM approaches in California. **Bradley Mullens**, bradley.mullens@ucr.edu, Alec Gerry and Amy C. Murillo, Univ. of California, Riverside, CA

SD1444 Establishing collaborations with Chinese scientists on issues of filth flies. **Phillip E. Kaufman**, pkaufman@ufl.edu, Univ. of Florida, Gainesville, FL, Andrew Y. Li, USDA - ARS, Kerrville, TX, Xing Ping Hu, Auburn Univ., Auburn, AL and Jerome A. Hogsette, USDA - ARS, Gainesville, FL

SD1445 Seven years in the making: The Cow-Vac removes pasture flies from dairy cattle. **Steve Denning**, Steve_Denning@ncsu.edu and D. Wes Watson, North Carolina State Univ., Raleigh, NC

SD1446 NYS dairy cattle Integrated Pest Management: Research and outreach addressing dairy industry needs. **J. Waldron**, jkw5@cornell.edu[1], K. L. Wise[1] and Donald A. Rutz[2], [1]NYS IPM Program, Geneva, NY, [2]Cornell Univ., Ithaca, NY

SD1447 Navy entomology activities and services in Pacific Coast states. **Roxanne Burrus**, roxanne.burrus@med.navy.mil, Navy Environmental Preventive Medicine Unit 5, San Diego, CA

PBT Section Symposium: Highlighting a Career of Defining and Meeting Grand Challenges in Entomology: A Symposium in Honor of David L. Denlinger

Portland Ballroom 256 (Oregon Convention Center)

Moderators and Organizers: Daniel A. Hahn[1] and Spencer T. Behmer[2], [1]Univ. of Florida, Gainesville, FL, [2]Texas A&M Univ., College Station, TX

1:30 1448 Divergent roads taken: Career choices, diapause, and cuticle. **Judy Willis**, jhwillis@uga.edu, Univ. of Georgia, Athens, GA

1:55 1449 Cellular and molecular physiology of environmental stress tolerance: How basic principles can inform novel pest control strategies. **Nicholas M. Teets**, n.teets@ufl.edu, Univ. of Florida, Gainesville, FL

2:20 1450 Links between the circadian clock, stress, and aging. **Jadwiga Giebultowicz**, giebultj@science.oregonstate.edu, Oregon State Univ., Corvallis, OR

2:45 1451 The JIP years (1993-2012): An influential and strong guiding hand. **Spencer T. Behmer**, s-behmer@tamu.edu, Texas A&M Univ., College Station, TX

3:05 Break

3:25 1452 Development of mimetic analogs of Pyrokinin/Diapause Hormone neuropeptides to disrupt insect physiology/behavior. **Ronald J. Nachman**, ron.nachman@ars.usda.gov, USDA - ARS, College Station, TX

3:50 1453 Influence of David L. Denlinger on tsetse fly research: Early career highlights to completion of the first Glossina genome. **Joshua B. Benoit**, joshua.benoit@yale.edu, Univ. of Cincinnati, Cincinnati, OH

4:15 1454 Rapid cold-hardening in insects: Our collaborations with maggots. **Richard E. Lee**, leere@muohio.edu, Miami Univ., Oxford, OH

4:40 1455 Adaptation of overwintering physiology plays a central role in rapid genomic differentiation during host race formation. **Gregory Ragland**, Kansas State Univ., Manhattan, KS

5:05 1456 Dave Denlinger's impact as chair of The Ohio State University Department of Entomology. **Susan Fisher**, fisher.14@osu.edu, The Ohio State Univ., Columbus, OH

Member Symposium: IPM: An International Organic Farming Strategy on Invasive Insect Species

Portland Ballroom 254 (Oregon Convention Center)

Moderators and Organizers: Aziz Ajlan[1] and Khalid Alhudaib[2], [1]President of IB-ESA (2014), Hofuf, Alhasa, Saudi Arabia, [2]King Faisal Univ., Hofuf, Saudi Arabia

1:30 Introductory Remarks

1:35 SP1457 Genetic structuring of three types of *Hyphantria* moths (Lepidoptera: Arctiidae) inferred from the mitochondrial COI sequence analysis. **Muhammad Tufail**, mtufail@ksu.edu.sa[1], Eriko Kawabata[2], Makio Takeda[2], Khawaja Ghulam Rasool[1] and Abdulrahman Saad Aldawood[1], [1]King Saud Univ., Riyadh, Saudi Arabia, [2]Kobe Univ., Kobe, Japan

1:47 SP1458 Differential protein expression profiling in date palm stem infested with red palm weevil (*Rhynchophorus ferrugineus*) using 2-D differential gel electrophoresis and MALDI-TOF/TOF. **Khawaja Ghulam Rasool**, krasool@ksu.edu.sa[1], Abdulrahman Saad Aldawood[1], Muhammad Tufail[1], Muhammad Mukhtar[2] and Makio Takeda[3], [1]King Saud Univ., Riyadh, Saudi Arabia, [2]Islamia Univ. of Bahawalpur, Bahawalpur, Pakistan, [3]Kobe Univ., Kobe, Japan

1:59 SP1459 The biological control of *Opuntia stricta* var. *dillenii* (balas) in the Jizan Emirate of Saudi Arabia. **Abdulrahman Saad Aldawood**, aldawood@ksu.edu.sa, King Saud Univ., Riyadh, Saudi Arabia and Hani Tuwariqi, Ministry of Agriculture and Water, Riyadh, Saudi Arabia

2:11 SP1460 Age-dependent male ejaculate investment in the West Indian sweet potato weevil, *Euscepes postfasciatus*. **Norikuni Kumano**, nrkumano@gmail.com[1], Kaori Tsurui[1], Takashi Matsuyama[1], Keiko Shiromoto[2] and Tetsuya Toyosato[2], [1]Okinawa Prefectural Plant Protection Center, Naha, Okinawa, Japan, [2]Ryukyu-Sankei Co. Ltd, Naha, Okinawa, Japan

2:23 SP1461 Not my host? Does phylogenetic distance influence repulsion for the specialist swede midge (*Contarinia nasturtii*)? **Chase Stratton**, castratt@uvm.edu, Univ. of Vermont, Burlington, VT

2:35 Break

SD1462 Mass trapping *Anthonomus rubi* and *Lygus rugulipennis* in strawberries. **Lene Sigsgaard**, les@plen.ku.dk[1], Nina Trandem[2], Michelle Fountain[3], Anna-Karin Borg-Karlson[4], David Hall[5], Jerry Cross[3], Baiba Ralle[6], Catherine Baroffio[7] and Atle Wibe[8], [1]Univ. of Copenhagen, Frederiksberg, Denmark, [2]Bioforsk, Ås, Norway, [3]East Malling Research, Kent, United Kingdom, [4]KTH Royal Institute of Technology, Stockholm, Sweden, [5]Natural Resources Institute, Kent, United Kingdom, [6]Latvian Plant Protection Research Centre, Riga, Latvia, [7]Agroscope, Conthey, Switzerland, [8]Bioforsk, Tingvoll, Norway

SD1463 Biological reaction of migrated the brown planthopper, *Nilaparvata lugens* Stål, on resistant rice varieties in Korea. **Nakjung Choi**, njchoi@korea.kr, Rural Development Association, Suwon, South Korea

SD1464 Implementing an integrated pest management program for coffee berry borer in a specialty coffee plantation in Colombia. **Luis Aristizabal**, larist@ufl.edu[1], Steven P. Arthurs[1] and Olga Lara[2], [1]Univ. of Florida, Apopka, FL, [2]Inversiones Perla, Neiva, Colombia

SD1465 Identification of feeding deterrent/repellent for the brown marmorated stink bug. **Manguang Liu**, manguang.liu@ars.usda.gov[1], Sitra Abubeker[1], Kevin R. Ulrich[2], Mark F. Feldlaufer[1] and Aijun Zhang[1], [1]USDA - ARS, Beltsville, MD, [2]Univ. of Maryland, College Park, MD

SD1466 Using harmonic radar to measure the retention capacity of trap crops for the invasive brown marmorated stink bug (Hemiptera: Pentatomidae) in organic pepper plantings. **William R. Morrison**, morri362@msu.edu, Clarissa Mathews and Tracy C. Leskey, USDA - ARS, Kearneysville, WV

SD1467 Effects of soil enrichment on soil nutrition, and sugarcane physiochemistry, yield, and injury caused by Mexican rice borer (*Eoreuma loftini*). **Allan Showler**, allan.showler@ars.usda.gov, USDA - ARS, Kerrville, TX

SD1468 Chemical control combined with transgenic Bt maize to control *Spodoptera frugiperda* (JE Smith) (Lepidoptera: Noctuidae). **Mauricio Masson**, mauricio_masson@hotmail.com[1], Taís da Silva[2], Murilo Litholdo[1], Bruno Arroyo[3], Bruna Zanatto[4], Michele Berigo[5], Alexandre Pinto[3], Antonio C. Santos[6] and Luiz Henrique Marques[7], [1]Centro Universitário Moura Lacerda, Ribeirão Preto - SP, Brazil, [2]Centro Universitário Moura Lacerda, Sertãozinho SP, Brazil, [3]BUG-Agentes Biológicos, Piracicaba, Brazil, [4]Centro Universitário Moura Lacerda, São Simão SP, Brazil, [5]Centro Universitário Moura Lacerda, Luiz Antonio -SP, Brazil, [6]Dow AgroSciences, Indianapolis, IN, [7]Dow AgroSciences, Mogi Mirim, Brazil

SD1469 Comparison of transgenic Bt corn to control *Spodoptera frugiperda* field. **Alexandre Pinto**, aspinn@uol.com.br[1], Mauricio Masson[2], Bruno Arroyo[1], Murilo Litholdo[2], José dos Reis[2], Luís Rodrigues[3], Antonio C. Santos[4] and Luiz Henrique Marques[5], [1]BUG-Agentes Biológicos, Piracicaba, Brazil, [2]Centro Universitário Moura Lacerda, Ribeirão Preto - SP, Brazil, [3]Centro Universitário Moura Lacerda, Sertãozinho SP, Brazil, [4]Dow AgroSciences, Indianapolis, IN, [5]Dow AgroSciences, Mogi Mirim, Brazil

SD1470 Transgenic Bt maize to control ear corn pests. **Fernando Vinha**, fernandobevi@hotmail.com[1], Eduardo Ivan[2], Michele Berigo[3], Mauricio Masson[4], Alexandre Pinto[5], Antonio C. Santos[6], and Luiz Henrique Marques[7], [1]Centro Universitário Moura Lacerda, Sertãozinho SP, Brazil, [2]Biocontrol, Cajuru- SP, Brazil, Bruna Zanatto, Centro Universitário Moura Lacerda, São Simão SP, Brazil, [3]Centro Universitário Moura Lacerda, Luiz Antonio -SP, Brazil, [4] Centro Universitário Moura Lacerda, Ribeirão Preto - SP, Brazil, [5]BUG- Agentes Biológicos, Piracicaba, Brazil, [6]Dow AgroSciences, Indianapolis, IN, [7]Dow AgroSciences, Mogi Mirim, Brazil

3:35 SP1472 *Pulicaria undulata*, an arid plant, afforded extracts with potential to manage red palm weevil, *Rhynchophorus ferrugineus* Oliv. **Paraj Shukla**, parajshukla@gmail.com[1], MM. Abdel-Azim[1], Saleh A. Aldosari[1], Samy Ibrahim[1] and Muraleedharan Nair[2], [1]King Saud Univ., Riyadh, Saudi Arabia, [2]Michigan State Univ., East Lansing, MI

3:47 SP1473 Presentation Withdrawn

3:59 SP1474 Progress towards organic management of the exotic invasive stink bug *Bagrada hilaris*. **Tessa R. Grasswitz**, tgrasswi@nmsu.edu, New Mexico State Univ., Los Lunas, NM

4:11 SP1475 Employing attract and kill to manage brown marmorated stink bug, *Halyomorpha halys* (Stål), in NY's Hudson Valley tree fruit and vegetable production systems. **Peter J. Jentsch**, pjj5@cornell.edu, Cornell Univ., Highland, NY

4:23 SP1476 Management of Asian citrus psyllid (*Diaphorina citri*) in organic and conventional citrus. **Jawwad A. Qureshi**, jawwadq@ufl.edu and Philip A. Stansly, Univ. of Florida, Immokalee, FL

4:35 SP1477 A participatory approach to assessing landscape complexity impacts on specialist pests: Can traditional Andean fallow farming reduce the establishment of Guatemalan potato moth (*Tecia solanivora*)? **Carlo R. Moreno**, morenocr@utpa.edu[1], and Stephen R. Gliessman[2], [1]Univ. of Texas, Edinburg, TX, [2]Univ. of California, Santa Cruz, CA

4:47 Concluding Remarks

P-IE Section Symposium: Roles of Biotic Interactions in Invasion Biology

Portland Ballroom 255 (Oregon Convention Center)

Moderators and Organizers: Shu-Sheng Liu[1] and Stuart Reitz[2], [1]Zhejiang Univ., Hangzhou, China, [2]Oregon State Univ., Ontario, OR

1:30 Welcoming Remarks

1:35 1478 Emerging themes in our understanding of species displacements. **Stuart Reitz**, Stuart.Reitz@oregonstate.edu[1], and Yulin Gao[2], [1]Oregon State Univ., Ontario, OR, [2]Chinese Academy of Agricultural Sciences, Beijing, China

2:00 1479 The role of mutualisms in invasions. **Micky Eubanks**, m-eubanks@tamu.edu, Texas A&M Univ., College Station, TX

2:25 1480 Biotic interactions limit the invasiveness of the western flower thrips *(Frankliniella occidentalis)* in Florida. **Joe Funderburk**, jef@ufl.edu, Univ. of Florida, Quincy, FL

2:50 1481 Mechanisms underlying plant-mediated whitefly–begomovirus interactions. **Junbo Luan**, jl2957@cornell.edu, Cornell Univ., Ithaca, NY

3:15 Break

SD1482 Feeding on a begomovirus-infected plant enhances fecundity via increased expression of an insulin-like peptide in the whitefly, MEAM1. **Qi Fang**, fangqi@zju.edu.cn[1], Jianyang Guo[2], Lu Cheng[1] and Gongyin Ye[1], [1]Zhejiang Univ., Hangzhou, China, [2]Chinese Academy of Agricultural Sciences, Beijing, China

SD1483 Behavior of *Digithontophagus gazella* and native dung beetles (Coleoptera: Scarabaeinae) in silvopastoral systems in the Caribbean region of Colombia. **Carolina Giraldo**, carolina@fun.cipav.org.co, CIPAV Foundation, Cali, Colombia

SD1484 Insights into mealybug-parasitoid food webs in Vietnamese cassava fields affected by *Phenacoccus manihoti*. **Nhung Le**, nhung0274@yahoo.com[1], and Kris Wyckhuys[2], [1]Plant Protection Research Institute, HaNoi, Vietnam, [2]International Center for Tropical Agriculture CIAT, Hanoi, Vietnam

SD1485 Herbivore community associated with an invasive mustard, *Brassica tournefortii*. **Rebeccah A. Waterworth**, rebeccah.waterworth@ucr.edu, Thomas Prentice and Richard A. Redak, Univ. of California, Riverside, CA

SD1486 Transcriptomic Profiles of Virulent and Avirulent Diuraphis noxia feeding on D. noxia-Resistant and Susceptible Wheat. Deepak Kumar Sinha[1], and **C. Michael Smith**, cmsmith@ksu.edu[2],[1]International Centre for Genetic Engineering and Biotechnology, New Delhi, India, [2]Kansas State Univ., Manhattan, KS

SD1487 Spatial distribution and pattern of hemlock woolly adelgid (*Adelges tsugae*) induced hemlock mortality in the Southern Appalachians. Robert Coulson, **Tuula Kantola**, tuulak@neo.tamu.edu and Maria Tchakerian, Texas A&M Univ., College Station, TX

3:35 1488 The role of new host associations in the success of *Cactoblastis cactorum* as both a biological control agent and invasive species. **Stephen Hight**, stephen.hight@ars.usda.gov[1], James E. Carpenter[2], Guillermo Logarzo[3], and Laura Varone[3], [1]USDA - ARS, Tallahassee, FL, [2]USDA - ARS, Tifton, GA, [3]USDA - ARS, Hurlingham, Buenos Aires, Argentina

4:00 1489 Genetic variation in secondary metabolites in native and invasive populations of *Bunias orientalis*: implications for trophic interactions. **Jeff Harvey**, J.Harvey@nioo.knaw.nl, Netherlands Institute of Ecology, Wageningen, Netherlands

4:25 1490 Sexual behavioural interactions underlying competitive displacement in whiteflies. **Shu-Sheng Liu**, shshliu@zju.edu.cn, Zhejiang Univ., Hangzhou, China

4:50 1491 Apparent competition among an invasive and native plant mediated by an invasive insect. **Sarah O'Neill**, sdave001@ucr.edu, Richard A. Redak and Matt Daugherty, Univ. of California, Riverside, CA

5:02 SP1492 Exploring The Role Of Symbiotic Fungus Derived Volatiles In The Host-Finding Behavior Of the invasive *Sirex noctilio* And native *Sirex nigricornis* (Hymenoptera: Siricidae). **Mark A. Sarvary**, mas245@cornell.edu[1], Ann E. Hajek[1], Katalin Boroczky[1], Miriam Cooperband[2] and Robert Raguso[1], [1]Cornell Univ., Ithaca, NY, [2]USDA - APHIS - PPQ - CPHST, Buzzards Bay, MA

5:14 SP1493 Niche evolution speeds invasion by the cinnabar moth: the role of climate, hosts, and enemies. **Peter McEvoy**, mcevoyp@science.oregonstate.edu[1], Evrim Karacetin[2] and Linda P. Buergi[1], [1]Oregon State Univ., Corvallis, OR, [2]Erciyes Univ., Kayseri, Turkey

P-IE Section Symposium: Forest Entomology: Beyond Saving Trees

D133-134 (Oregon Convention Center)

Moderators and Organizers: Richard Hofstetter[1], Kimberly F. Wallin[2], and Nathan Havill[3], [1]Northern Arizona Univ., Flagstaff, AZ, [2]USDA - Forest Service, South Burlington, VT, [3]USDA - Forest Service, Hamden, CT

1:30 1494 Battling the emerging ambrosia beetle pests: what works and what does not. **Jiri Hulcr**, hulcr@ufl.edu, Univ. of Florida, Gainesville, FL

2:00 1495 The ecology of yeasts in the bark beetle holobiont. **Thomas Seth Davis**, tsdavis1@gmail.com, Univ. of Idaho, Moscow, ID

2:30 1496 Carolina hemlock, hemlock woolly adelgid, and genetic resource conservation: the grand challenge of planning for species restoration under novel environmental conditions. **Robert M. Jetton**, robert_jetton@ncsu.edu[1], Lia Campbell[1], Kevin M. Potter[2] and Albert Mayfield[3], [1]North Carolina State Univ., Raleigh, NC, [2]North Carolina State Univ., Research Triangle Park, NC, [3]USDA - Forest Service, Asheville, NC

3:00 1497 Emerald ash borer: is it all bad news? **Deborah G. McCullough**, mccullo6@msu.edu, Michigan State Univ., East Lansing, MI

3:30 Break

3:30 1498 Complexities of predicting forest insect impacts in a changing climate. **Barbara J. Bentz**, bj.bentz@gmail.com, USDA - Forest Service, Logan, UT

4:00 1499 Insect biodiversity following windstorm and salvage harvest disturbance in northeastern mixed deciduous forests. **Sarah Pears** and Kimberly F. Wallin, Univ. of Vermont, Burlington, VT

4:30 1500 The physiology of direct climate stress on tree mortality: where do insects fit in? **Henry Adams**, adamshd@lanl.gov[1], Sanna Sevanto[1], Lee Dickman[2], Monica Gaylord[3], Jennifer Plaut[2], Nathan McDowell[1], William Pockman[2], David Breshears[4] and Travis Huxman[5], [1]Los Alamos National Laboratory, Los Alamos, NM, [2]Univ. of New Mexico, Albuquerque, NM, [3]Northern Arizona Univ., Flagstaff, AZ, [4]Univ. of Arizona, Tucson, AZ, [5]Univ. of California, Irvine, CA

5:00 1501 The stone cell defense of Sitka spruce against white pine weevil: Transcriptome and functional analyses. **Justin G. A. Whitehill**, whiteh5@msl.ubc.ca[1], Hannah Henderson[1], Macaire Yuen[1], Matthias Schuetz[1], Alex Skyba[1], Jennifer Bryan[1], A. Lacey Samuels[1], Shawn Mansfield[1], Barry Jaquish[2], Alvin D. Yanchuk[3] and Joerg Bohlmann[1], [1]Univ. of British Columbia, Vancouver, BC, Canada, [2]British Columbia Ministry of Forests, Vernon, BC, Canada, [3]British Columbia Ministry of Forests, Victoria, BC, Canada

Member Symposium: Thinking Outside the Box: Entomopathogens in IPM Programs

D136 (Oregon Convention Center)

Moderators and Organizers: Steven P. Arthurs[1], Surendra K. Dara[2] and Robert W. Behle[3], [1]Univ. of Florida, Apopka, FL, [2]Univ. of California, San Luis Obispo, CA, [3]USDA - ARS, Peoria, IL

1:30 Welcoming Remarks

1:35 1502 Mission of the Biopesticide Industry Alliance (BPIA). **William Stoneman**, billstoneman@wfstoneman.com, Biopesticide Industry Alliance, McFarland, WI

1:45 1503 Overview of microbial biopesticides in IPM programs. **Pamela Marrone**, pmarrone@marronebio.com, Marrone Bio Innovations, Inc, Davis, CA

2:00 1504 *Bacillus*-based insecticide products: Still thriving after 40+ years. **Randy Martin**, randy.martin@valentbiosciences.com, Valent Biosciences, Libertyville, IL

2:15 1505 'IPM Microbiome': Our evolving understanding of the role of microbial control agents in crop protection. **Michael Dimock**, mdimock@certisusa.com, Certis USA, Columbia, MD

2:30 1506 Real world examples of integrating entomopathogenic fungi into IPM Systems: Met52 as an example. **Jarrod Leland**, jrrl@novozymes.com, Novozymes Biologicals, Inc, Salem, VA

2:45 Break

3:00 1507 Using insect pathogenic fungi to manage insect pests: Where are we going? **Stefan T. Jaronski**, stefan.jaronski@ars.usda.gov, USDA - ARS, Sidney, MT

3:15 1508 Integrating insect pathogens into the management of turfgrass pests. **Olga Kostromytska**, kolgaent@rci.rutgers.edu and Albrecht Koppenhöfer, Rutgers, The State Univ. of New Jersey, New Brunswick, NJ

3:30 1509 Applying F52 microsclerotia within hydromulch: Formulation success or superfluous? **Tarryn Goble**, tazgoble@gmail.com and Ann Hajek, Cornell Univ., Ithaca, NY

3:45 1510 History of microbial control in orchards. **Lerry Lacey**, lerrylacey@yahoo.com, IP Consulting International, Yakima, WA

4:00 Intermission

4:15 1511 Brewing entomopathogenic fungi to fight insect pests. **Gabriel Mascarin**, gmmascar@gmail.com[1], Mark A. Jackson[2] and Robert W. Behle[2], [1]Embrapa Rice and Beans, Santo Antonio de Goias, Brazil, [2]USDA - ARS, Peoria, IL

4:30 1512 *Beauveria bassiana* as a key player in strawberry IPM in California. **Surendra Dara**, skdara@ucdavis.edu, Univ. of California, San Luis Obispo, CA

4:45 1513 Mixing it up for success: Opportunities and options in Canadian greenhouse production systems. **Michael Brownbridge**, michael.brownbridge@vinelandresearch.com, Vineland Research and Innovation Centre, Vineland Station, ON, Canada

5:00 Concluding Remarks and Discussion

P-IE Section Symposium: Classical Biological Control of Invasive Plants: Complex Challenges, Semiochemical Solutions

D137-138 (Oregon Convention Center)

Moderators and Organizers: Alexander Gaffke[1], and Sharlene Sing[2], [1]Montana State Univ., Bozeman, MT, [2]USDA - Forest Service, Bozeman, MT

1:30 1514 Semiochemical themes in classical biological control of weeds research: accomplishments and future directions. **Sharlene Sing**, ssing@fs.fed.us[1], Alexander Gaffke[2] and David K. Weaver[2], [1]USDA - Forest Service, Bozeman, MT, [2]Montana State Univ., Bozeman, MT

1:50 1515 Identification and development of *Diorhabda carinulata* semiochemicals for use in the in tamarisk biological control program. **Dan W. Bean**, dan.bean@state.co.us[1], Allard Cossé[2], and Tom Dudley[3], [1]Colorado Dept. of Agriculture, Palisade, CO, [2] USDA - ARS, Peoria, IL, [3]Univ. of California, Santa Barbara, CA

2:10 1516 Using aggregation compounds to optimize biological control of invasive weeds: deploying existing formulation technologies to strategically focus *Diorhabda carinulata* herbivory on *Tamarix* spp. **Alexander Gaffke**, alexander.gaffke@msu.montana.edu[1], David K. Weaver[1] and Sharlene Sing[2], [1]Montana State Univ., Bozeman, MT, [2]USDA - Forest Service, Bozeman, MT

2:30 1517 Effect of mechanical damage of plant leaves on emission of volatile organic compounds and implications for testing host plant specificity. **Lincoln Smith**, link.smith@ars.usda.gov and John Beck, USDA - ARS, Albany, CA

2:50 1518 Predicting the host range of *Nystalea ebalea*: secondary plant chemistry and host selection by a surrogate biological control agent of *Schinus terebinthifolia*. **Gregory S. Wheeler**, greg.wheeler@ars.usda.gov, USDA - ARS, Ft Lauderdale, FL

3:10 Break

3:25 1519 When classical biological control of weeds is confounded by hybridization: the *Linaria – Mecinus* case study. Charles Hubbard[1], **David K. Weaver**, weaver@montana.edu[1], Sarah Ward[2], John Gaskin[3], André Gassmann[4], Ivo Tosevski[4] and Sharlene Sing[5], [1]Montana State Univ., Bozeman, MT, [2]Colorado State Univ., Fort Collins, CO, [3]USDA - ARS, Sidney, MT, [4]CABI, Delémont, Switzerland, [5]USDA - Forest Service, Bozeman, MT

3:45 1520 The effects of plant volatile organic compounds and conspecific body odors on the host location of the seed feeding weevil, *Mogulones borraginis*. **Ikju Park**, park0563@vandals.uidaho.edu, Mark Schwarzlaender and Sanford Eigenbrode, Univ. of Idaho, Moscow, ID

4:05 1521 Induced resistance in invasive plants: implications for biocontrol. **Amanda Buchanan**, abuchana@umd.edu, Univ. of Maryland, College Park, MD

4:25 1522 Volatile patterns for locoweed exposed to simulated herbivory – the role of the endophyte producing toxic swainsonine. Barbera Keith, **Tracy Sterling**, tracy.sterling@montana.edu, Megan Hofland and David K. Weaver, Montana State Univ., Bozeman, MT

4:45 1523 The Role of Insect Secondary metabolites in the Eastern Hemlock System. **Anne Jones**, acj152@psu.edu, Pennsylvania State Univ., State College, PA

5:05 Panel Discussion

Member Symposium: Practical Implementation of Conservation Biological Control

D139-140 (Oregon Convention Center)

Moderator and Organizer: Jonathan Lundgren, USDA - ARS, Brookings, SD

1:30 Introduction to Implementing Conservation Biological Control: The Goals of the Working Group

1:55 1524 The conservation of edaphic biological control. **Jeffrey Bradshaw**, jbradshaw2@unl.edu, Univ. of Nebraska, Scottsbluff, NE

2:20 1525 Incorporating conservation biological control into field crop production while minimally influencing farming logistics. **John Tooker**, tooker@psu.edu, Pennsylvania State Univ., Univ. Park, PA

2:45 1526 Mixing it up: Impacts of within field plant diversity on conservation biological control. **Julie Peterson**, julie.peterson@unl.edu[1], and Brett R. Blaauw[2], [1]Univ. of Nebraska, North Platte, NE, [2]Rutgers, The State Univ. of New Jersey, Bridgeton, NJ

3:35 Break

3:45 1527 Landscape approaches to conservation biological control: Progress to date and identification of key knowledge gaps. **Tatyana Rand**, tatyana.rand@ars.usda.gov, USDA - ARS, Sidney, MT

4:10 1528 The economics of conservation biological control. **Steven Naranjo**, steve.naranjo@ars.usda.gov[1], Peter C. Ellsworth[2], and George Frisvold[3], [1]USDA - ARS, Maricopa, AZ, [2]Univ. of Arizona, Maricopa, AZ, [3]Univ. of Arizona, Tucson, AZ

4:35 1529 Farming with beneficial insects: Translating conservation biocontrol science into mainstream farm practice. **Eric Mader**, eric@xerces.org[1], Jennifer L. Hopwood[2] and Mace Vaughn[1], [1]The Xerces Society for Invertebrate Conservation, Portland, OR, [2]Univ. of Kansas, Lawrence, KS

5:00 1530 Landscape ecosystem services: European perspectives. **Lene Sigsgaard**, les@plen.ku.dk, Univ. of Copenhagen, Frederiksberg, Denmark

5:25 Concluding Remarks

P-IE Section Symposium: New Frontiers in Honey Bee Health Economics: Incorporating Entomological Research and Knowledge into Economic Assessments

E141-142 (Oregon Convention Center)

Moderators and Organizers: Elizabeth Hill[1], Clayton Myers[1], Jennifer Bond[2], Kathy Baylis[3], TJ Wyatt[1] and Kristy Plattner[2], [1]Environmental Protection Agency, Washington, DC, [2]USDA - ERS, Washington, DC, [3]Univ. of Illinois, Urbana, IL

1:30 Welcoming Remarks

1:35 Introductory Remarks

1:45 1531 A cross-pollination of entomological to economic methods to explore pollinator health, land management practices, and the value of ecosystem services. Jennifer Bond[1], Clint Otto[2] and **Kristy Plattner**, kplattner@ers.usda.gov[1], [1]USDA - ERS, Washington, DC, [2]U.S. Geological Survey, Jamestown, ND

2:00 1532 The effects of landscape factors on honey bee morbidity. **Kathy Baylis**, baylis@illinois.edu, Univ. of Illinois, Urbana, IL

2:15 1533 New methods in integrated analyses at U.S. EPA to account for the benefits of managed pollinators to U.S. Agriculture. **Elizabeth Hill**, izzy@izzyhill.com and Clayton Myers, Environmental Protection Agency, Washington, DC

2:30 Discussion

Senior Member Symposium and Challenges Beyond the Horizon: Hops, Breweries, Pest Management and Native Bee Pollinators in the Pacific Northwest

E141-142 (Oregon Convention Center)

Moderators and Organizers: Kenneth A. Sorensen[1], William Stephen[2], [1]North Carolina State Univ., Raleigh, NC, [2]Oregon State Univ., Corvallis, OR

3:30 Introductory Remarks

3:35 1534 Breweries and roses in Portland. **Tim Mongin**, tim@travelportland.com, TravelPortland, Portland, OR

3:50 1535 Hoppy hops: The history of hops in beer. **Kenneth Pruess**, kpruess2@unl.edu, Univ. of Nebraska, Lincoln, NE

4:05 1536 Integrated management of arthropod pests on Pacific Northwest hops. **Douglas Walsh**, dwalsh@wsu.edu, Washington State Univ., Prosser, WA

4:20 1537 Beer production, breweries and behind the scenes in Portland. **Van Havig**, info@GiGanticBrewing.com, GiGantic Brewing Company, Portland, OR

4:35 1538 Hops hopping native pollinating bees. **William Stephen**, wpstephen@oregonstate.edu, Oregon State Univ., Corvallis, OR

4:50 Questions/discussion

5:05 Senior member ESA open business session

5:25 Concluding Remarks

P-IE Section Symposium: Managing Arthropod Resistance in a Changing Landscape, IRAC US Symposium Series: No. 10

E143-144 (Oregon Convention Center)

Moderators and Organizers: Graham P. Head[1], Tim Ksander[2], Hector E. Portillo[3], Bradley W. Hopkins[4], Christopher Sansone[5] and Caydee Savinelli[6], [1]Monsanto Company, St. Louis, MO, [2]Cheminova, Yuba City, CA, [3]DuPont Crop Protection, Newark, DE, [4]Dow AgroSciences, Westerville, OH, [5]Bayer CropScience, Research Triangle Park, NC, [6]Syngenta Plant Protection, Greensboro, NC

1:30 Introductory Remarks

1:40 1539 The changing seed and farm landscape: What are the implications for managing resistance? **Terrance Hurley**, tmh@umn.edu, Univ. of Minnesota, Saint Paul, MN

1:59 1540 Discovering the new tools for IRM – prospects and challenges in an evolving landscape. **Thomas C. Sparks**, tcsparks@dow.com, Dow AgroSciences, Indianapolis, IN

2:18 1541 Neonicotinoid seed treatments in field crops: the foundation of modern IPM? **Christian Krupke**, ckrupke@purdue.edu, Purdue Univ., West Lafayette, IN

2:37 1542 Resistance as a landscape concept: The case for gaming in farmer education. **Peter C. Ellsworth**, peterell@ag.arizona.edu[1], and Al Fournier[2], [1]Univ. of Arizona, Maricopa, AZ, [2]Univ. of Arizona, Tucson, AZ

2:56 1543 Spotted wing drosophila insecticide resistance: The threat is real. **Peter W. Shearer**, peter.shearer@oregonstate.edu[1], Frank Zalom[2], Denny Bruck[3], Jana C. Lee[4], Lynell K. Tanigoshi[5], Joanna Chiu[2], Preston H. Brown[1], Kelly Hamby[2], Adam Cave[4] and Hollis G. Spitler[5], [1]Oregon State Univ., Hood River, OR, [2]Univ. of California, Davis, CA, [3]DuPont Pioneer, Johnston, IA, [4]USDA - ARS, Corvallis, OR, [5]Washington State Univ., Mt. Vernon, WA

3:15 Break

3:25 1544 Citrus Health Management Areas: An area-wide approach to managing Asian citrus psyllid and pesticide resistance in Florida citrus. **Michael Rogers**, mrgrs@ufl.edu and Brandon Page, Univ. of Florida, Lake Alfred, FL

3:44 1545 Strategies for delaying resistance as Asian Citrus Psyllid and Huanglongbing invade California. **Elizabeth E. Grafton-Cardwell**, eegraftoncardwell@ucanr.edu, Univ. of California, Riverside, CA

4:03 1546 Insecticide resistance in mid-southern row crops: current management and future needs. **Angus Catchot**, acatchot@entomology.msstate.edu, Mississippi State Univ., Mississippi State, MS

4:22 1547 PestWatch and Lepidopterans: Tracking populations and management implications. **Shelby J. Fleischer**, sjf4@psu.edu[1], Rodney Nagoshi[2], Robert L. Meagher[2], John K. Westbrook[3], John Tooker[1], Eric Bohnenblust[1] and Stephen Crawford[1], [1]Pennsylvania State Univ., Univ. Park, PA, [2]USDA - ARS, Gainesville, FL, [3]USDA - ARS, College Station, TX

4:41 1548 Managing Fall Armyworm In Puerto Rico: Challenges of intensive production in an island agro-ecosystem. **Hector E. Portillo**, hector.e.portillo@usa.dupont.com[1], Gary D. Thompson[2], Alejandro Segarra Carmona[3], Hipolito Ofarril[3], Henry Teran Santofimio[4], Jaime Sanchez[4] and Joshua Temple[5], [1]DuPont Crop Protection, Newark, DE, [2]Dow AgroSciences, Omaha, AR, [3]Univ. of Puerto Rico, Mayagüez, PR, [4]Pioneer Hi-Bred International Inc., Salinas, PR, [5]DuPont Crop Protection, Bradenton, FL

5:00 1549 Landscape-level challenges for managing Bt resistance in corn rootworm. **Graham P. Head**, graham.p.head@monsanto.com[1], Matthew W. Carroll[1], Alan Willse[1], Shilpa Swarup[2] and Lex Flagel[3], [1]Monsanto Company, St. Louis, MO, [2]Monsanto Company, Creve Coeur, MO, [3]Monsanto Company, Chesterfield, MO

5:19 Concluding Remarks

Organized Meeting: Spotted Wing Drosophila: Developing Solutions for a Challenging Pest

E147-148 (Oregon Convention Center)

Moderators and Organizers: Cesar Rodriguez-Saona[1] and Christelle Guédot[2], [1]Rutgers, The State Univ. of New Jersey, New Brunswick, NJ, [2]USDA - ARS, Wapato, WA

1:30 Welcoming Remarks

1:35 1550 Seasonal phenology and population dynamics of *Drosophila suzukii* in Oregon. **Peter W. Shearer**, peter.shearer@oregonstate.edu[1], and Vaughn Walton[2], [1]Oregon State Univ., Hood River, OR, [2]Oregon State Univ., Corvallis, OR

1:55 1551 SWD overwintering biology and use of wild host plants in the Northeast US. **Gregory M. Loeb**, gme1@cornell.edu, Anna Wallingford, Johanna Elsensohn and Stephen P. Hesler, Cornell Univ., Geneva, NY

2:15 1552 Trap, trap, trap those spotted wing drosophila: Challenges and improvements. **Jana C. Lee**, jana.lee@ars.usda.gov, USDA - ARS, Corvallis, OR

2:35 1553 *Drosophila suzukii* population estimation and development of a real-time risk model. **Vaughn Walton**, waltonv@hort.oregonstate.edu[1], Daniel T. Dalton[1], Nik G. Wiman[1], Samantha L. Tochen[1], Betsey Miller[1], Hannah J. Burrack[2], Kent M Daane[3], Xin-geng Wang[3], Peter W. Shearer[4], Claudio Ioriatti[5], Gianfranco Anfora[5], Alberto Grassi[5] and Markus Neteler[6], [1]Oregon State Univ., Corvallis, OR, [2]Univ. of California, Davis, CA, [3]Univ. of California, Berkeley, CA, [4]Oregon State Univ., Hood River, OR, [5]Fondazione Edmund Mach, San Michele all'Adige (TN), Italy, [6]Research and Innovation Centre - Fondazione Edmund Mach, S. Michele all'Adige, Italy

2:55 1554 Comparing the attractiveness of homemade baits and synthetic lures for monitoring *Drosophila suzukii* (Diptera: Drosophilidae) in host crops. **Hannah J. Burrack**, hjburrac@ncsu.edu[1], Mark K. Asplen[2], Brian W. Bahder[3], Frank Drummond[4], Christelle Guédot[5], Rufus Isaacs[6], Donn Johnson[7], Anna K Kirk[6], Jana C. Lee[8], Gregory M. Loeb[9], Cesar Rodriguez-Saona[10] and Steven Van Timmeren[6], [1]Univ. of California, Davis, CA, [2]Metropolitan State Univ., Saint Paul, MN, [3]Washington State Univ., Prosser, WA, [4]Univ. of Maine, Orono, ME, [5]USDA - ARS, Wapato, WA, [6]Michigan State Univ., East Lansing, MI, [7]Univ. of Arkansas, Fayetteville, AR, [8]USDA - ARS, Corvallis, OR, [9]Cornell Univ., Geneva, NY, [10]Rutgers, The State Univ. of New Jersey, New Brunswick, NJ

3:15 Break

3:30 1555 Degree day modeling of *Drosophila suzukii* spring phenology. **Amy Dreves**, Amy.Dreves@oregonstate.edu[1], Leonard Coop[1], Amanda Ohrn[1] and Thomas Peerbolt[2], [1]Oregon State Univ., Corvallis, OR, [2]Peerbolt Crop Management, Inc, Portland, OR

3:50 1556 Evaluation of crop protectants for minimizing SWD infestation in berries. **Rufus Isaacs**, isaacsr@msu.edu[1], Hannah J. Burrack[2], John C. Wise[1], Cesar Rodriguez-Saona[3] and Steven Van Timmeren[1], [1]Michigan State Univ., East Lansing, MI, [2]Univ. of California, Davis, CA, [3]Rutgers, The State Univ. of New Jersey, New Brunswick, NJ

4:10 1557 Developing behaviorally based tools for management of spotted wing drosophila. **Tracy C. Leskey**, tracy.leskey@ars.usda.gov[1], Brent Short[1] and Cesar Rodriguez-Saona[2], [1]USDA - ARS, Kearneysville, WV, [2]Rutgers, The State Univ. of New Jersey, New Brunswick, NJ

4:30 1558 Behavioral control and mass trapping: Lessons learned in blueberries. **Richard Cowles**, Richard.Cowles@po.state.ct.us[1], Steven Alm[2] and Heather Faubert[2], [1]Connecticut Agricultural Experiment Station, Windsor, CT, [2]Univ. of Rhode Island, Kingston, RI

4:50 1559 Prospects for classical biological control of *Drosophila suzukii*. **Kim A. Hoelmer**, khoelmer@ars-ebcl.org[1], Kent M Daane[2], Xin-geng Wang[2], Vaughn Walton[3], Emilio Guerrieri[4] and Massimo Giorgini[4], [1]USDA - ARS, Montferrier, France, [2]Univ. of California, Berkeley, CA, [3]Oregon State Univ., Corvallis, OR, [4]National Research Council of Italy, Portici, Italy

5:10 Concluding Remarks

Member Symposium: Tree Fruit IPM from a Dream to Its Realization: Honoring the Career of Jay Brunner

F150 (Oregon Convention Center)

Moderators and Organizers: Ash Ahmad[1] and Vincent P. Jones[2], [1]Univ. of Georgia, Athens, GA, [2]Washington State Univ., Wenatchee, WA

1:30 Welcoming Remarks

1:35 1560 Jay Brunner: The early years. **Elizabeth H. Beers**, ebeers@wsu.edu, Washington State Univ., Wenatchee, WA

1:55 SP1561 You can get from here to there, and here's how: The legacy of Jay Brunner in tree fruit IPM. **Vincent Jones**, vpjones@wsu.edu, Washington State Univ., Wenatchee, WA

2:07 1562 Don't give up and you will reap the harvest. **Jim McFerson**, mcferson@treefruitresearch.com, Washington Tree Fruit Research Commission, Wenatchee, WA

2:27 1563 Reflections on a colleague and a friend: IPM and beyond. **Mike Willette**, Willett@nwhort.org, Northwest Horticultural Council, Yakima, WA

2:47 Break

3:07 1564 Exploring the sublethal effects of ecdysone agonists on the reproduction and behavior of tortricid moth pests of apple. **Bruce A. Barrett**, barrettb@missouri.edu, Univ. of Missouri, Columbia, MO

3:27 1565 10 years later: Lessons learned from the Jay Brunner/Wenatchee experience. **Christian Krupke**, krupk@purdue.edu, Purdue Univ., West Lafayette, IN

3:47 1566 It pays to be proactive: Lets manage susceptibility not resistance. **Ash Ahmad**, ashsial@uga.edu, Univ. of Georgia, Athens, GA

4:07 1567 Pheromone-based technologies for managing tree fruit pests: A forty year journey. **Larry Gut**, gut@msu.edu, Michigan State Univ., East Lansing, MI

4:27 1568 Mating disruption in tree crops: Building the selective platform for IPM. **Stephen C. Welter**, swelter@mail.sdsu.edu, San Diego State Univ., San Diego, CA

4:47 Concluding Remarks

Member Symposium: Utilizing Orthopteroid Insects to Overcome Grand Challenges in an Ever-Evolving World

B113-114 (Oregon Convention Center)

Moderators and Organizers: Derek A. Woller[1], Tyler Raszick[2], Ricardo Mariño-Pérez[1], JoVonn Hill[3], [1]Univ. of Central Florida, Orlando, FL, [2]Texas A&M Univ., College Station, TX, [3]Mississippi State Univ., Mississippi State, MS

1:30 1569 Know your orthopteroids: An introduction to the subjects of this symposium. **Tyler Raszick**, tjraszick@gmail.com, Texas A&M Univ., College Station, TX

1:35 1570 Faster than cichlids? Rapid diversification in *Neoconocephalus*. **Katy Frederick-Hudson**, khf891@mizzou.edu, Univ. of Missouri, Columbia, MO

1:50 1571 Systematics of Sphenariina (Orthoptera; Pyrgomorphidae). **Oscar Salomon Sanabria-Urban**, sanabria_os@comunidad.unam.mx, UNAM FES Iztacala, Tlanepatla, Mexico

2:05 1572 What we could learn from a phylogeny of Blaberoidea. **Dominic Evangelista**, dominicev@gmail.com, Rutgers, The State Univ. of New Jersey, Newark, NJ

2:20 SP1573 Some like it hot, some like it cold: Thermal tolerance in Australian alpine grasshoppers. **Rachel Slatyer**, rslatyer@student.unimelb.edu.au, Michael Nash and Ary Hoffmann, Univ. of Melbourne, Parkville, Australia

2:32 1574 Edible orthopteroids: The Mexican case. **Ricardo Mariño-Pérez**, pselliopus@yahoo.com.mx, Univ. of Central Florida, Orlando, FL

2:47 1575 Combining nutrition and community ecology of grasshoppers to benefit ecosystems and people. **Paul Lenhart**, palenhart@gmail.com, Univ. of Kentucky, Lexington, KY

3:07 1576 Talking back to the night: Vibrational communication in the New Zealand Giant Weta (Anostostomatidae: *Deinacrida*). **Daniel R. Howard**, daniel.howard@augie.edu, Augustana College, Sioux Falls, SD

3:27 Intermission

3:37 1577 Project Mantodea: An update on the phylogeny and revision of two praying mantis clades (Earless Neotropicals and the Hymenopodidae). **Gavin J. Svenson**, gsvenson@cmnh.org, Cleveland Museum of Natural History, Cleveland, OH

3:57 SP1578 DNA barcoding to determine the diets of prairie grasshoppers. **John Barone**, barone_john@columbusstate.edu[1], Kevin Burgess[1], Scott Whitley[1] and JoVonn Hill[2], [1]Columbus State Univ., Columbus, GA, [2]Mississippi State Univ., Mississippi State, MS

4:09 1579 Cryptic diversity within the North American Jerusalem crickets (Orthoptera: Stenopelmatidae): Influences of acoustic signaling and habitat heterogeneity. **Amy Vandergast**, avandergast@usgs.gov, U.S. Geological Survey, San Diego, CA

4:29 1580 Lessons from the embiopteran silk road. **Janice Edgerly-Rooks**, jedgerlyrooks@scu.edu[1], and Bennett Addison[2], [1]Santa Clara Univ., Santa Clara, CA, [2]Arizona State Univ., Tempe, AZ

4:49 1581 Acoustic communication in *Neoconocephalus*: From ion channels to phylogenetics. **Johannes Schul**, schulj@missouri.edu, Univ. of Missouri, Columbia, MO

Member Symposium: Board Certified Entomologist's (BCE) Symposium: Bed Bugs, *Cimex lectularius*, Fighting a Nuclear War with Bows and Arrows

B115-116 (Oregon Convention Center)

Moderators and Organizers: Stuart Mitchell[1], Ted Granovsky[2], Jeff Lipman[3], [1]PestWest Environmental, Sarasota, FL, [2]Granovsky Associates, Inc, Bryan, TX, [3]Lipman Law Firm, Des Moines, IA

1:30 1582 Benefits of certification: Become an ACE or BCE! **Pat Copps**, pcopps@rollins.com, Orkin Pest Control Inc, Atlanta, GA

1:50 1583 Bed bug liability: Fighting a nuclear war with bows and arrows. **Stuart Mitchell**, doc.mitchell@pestwest.com, PestWest USA, Des Moines, IA

2:35 1584 The entomology side of an expert witness in bed bug litigation. **Gail Getty**, InsectConsulting@gmail.com, Insect Consulting, La Crescenta, CA

3:20 1585 Sampling bed bugs for DNA and forensic evidence to protect from conflicts or litigations. **Shripat Kamble**, skamble1@unl.edu, Univ. of Nebraska, Lincoln, NE

3:50 Break

4:00 1586 Running on empty in an environment of changing regulations, fewer tools, and increased bed bug litigation. **Bill Melville**, bmelville4455@gmail.com, Escarpment Consulting Group, Thorold, ON, Canada

4:30 1587 Are we barking up the wrong tree? The challenges and opportunities associated with canine scent detection as a bed bug inspection tool. **Jim Fredericks**, jfredericks@pestworld.org, National Pest Management Association, Fairfax, VA

5:00 1588 Regulating service without regulations. **Ted Granovsky**, tag@granovsky.com, Granovsky Associates, Inc, Bryan, TX

Member Symposium: Six Legs, Many Panels: Entomological Comics and Their Importance in Education and Culture

C123 (Oregon Convention Center)

Moderators and Organizers: Carly M. Tribull[1], Ainsley E. Seago[2] and Sibyl, R. Bucheli[3], [1]American Museum of Natural History, New York, NY, [2]CSIRO, Canberra, Australia, [3]Sam Houston State Univ., Huntsville, TX

1:30 Welcoming Remarks: So you want to draw comics!

1:50 1589 Comics in the context of natural history museums: The romance of ants and beyond. **Alexandra Westrich**, awestrich@fieldmuseum.org, Field Museum of Natural History, Chicago, IL

2:15 1590 The horrors of entomology: Fear, loathing, and arthropods. **Ainsley E. Seago**, ainsley.seago@csiro.au, CSIRO, Canberra, Australia

2:45 Break

2:50 1591 From creepy to cute with character design: An insect image makeover. **Esabelle Ryngin**, esabelleryngin@gmail.com, National Museum of Natural History, Washington, DC

3:10 1592 Ants speak for themselves: Using science comics to convey topics in entomology and give insects their own voice. **Katie McKissick**, Katie.mckissick@gmail.com, Scientific American, Washington, DC

3:35 Intermission

3:45 Workshop 1: Giving insects their own voice: Format and content design in scientific comics

4:30 Workshop 2: Cute to creepy, but still educational: Insect character design

5:15 Panel Discussion

Member Symposium: Common Challenges and Learning Opportunities for Latin American and U.S. Entomologists: 2nd Latin American/Hispanic Symposium

C124 (Oregon Convention Center)

Moderators and Organizers: Silvia Rondon[1], Raul Medina[2], Ana Legrand[3] and Erik Echegaray[1], [1]Oregon State Univ., Hermiston, OR, [2]Texas A&M Univ., College Station, TX, [3]Univ. of Connecticut, Storrs, CT

1:30 1593 Welcoming remarks and recap of the 1st Latin American/Hispanic Symposium. **Raul Medina**, rfmedina@tamu.edu[1], Ana Legrand[2], Erik Echegaray[3] and Silvia Rondon[3], [1]Texas A&M Univ., College Station, TX, [2]Univ. of Connecticut, Storrs, CT, [3]Oregon State Univ., Hermiston, OR

1:35 1594 From insect ecology to IPM, melding research and extension. **Ricardo A. Ramirez**, ricardo.ramirez@usu.edu, Utah State Univ., Logan, UT

1:55 1595 My career as an insect ecologist: Roots to shoots. **Yasmin Cardoza**, yasmin_cardoza@ncsu.edu, North Carolina State Univ., Raleigh, NC

2:15 1596 Mentoring Latin American students in far-flung places and just down the road. **Robert Marquis**, robert_marquis@umsl.edu, Univ. of Missouri, St. Louis, MO

2:35 1597 Studying pollination services in Costa Rica: An interdisciplinary, graduate student perspective. **Sara M. Galbraith**, sara.marie.galbraith@gmail.com, Univ. of Idaho, Moscow, ID

2:55 1598 Latin American entomological collaborative work and the lessons learned from the Ohio State - Zamorano program. **Luis A. Cañas**, canas.4@osu.edu, The Ohio State Univ., Wooster, OH

3:15 Break

3:25 1599 Expanding global partnerships through research in El Salvador. **Andrea Joyce**, ajoyce2@ucmerced.edu, Univ. of California, Merced, CA

3:45 1600 Public-sector entomologists in Latin America: Challenges in a global economy. **Erik Echegaray**, erik.echegaray@oregonstate.edu, Oregon State Univ., Hermiston, OR

4:05 1601 Opportunities for Latin Americans within the private industry. **Claudia Kuniyoshi**, chkuniyoshi@dow.com, Dow AgroSciences, Fresno, CA

4:25 1602 IPM research in Latin America and other places: Do we need new economic thresholds? **Juan M. Alvarez**, juan.m.alvarez@usa.dupont.com, DuPont Crop Protection, Newark, DE

4:45 1603 Innovation processes to disseminate potato IPM in Peru: RED MIPapa. **Veronica Cañedo**, v.canedo@cgiar.org, International Potato Center (CIP), Lima, Peru

5:05 Concluding Remarks

Student Debates

Portland Ballroom 252 (Oregon Convention Center)

Moderators and Organizers: Tamra Reall Lincoln[1], Rebecca Schmidt[2], Alejandro Del Pozo[3], [1]Univ. of Missouri, Columbia, MO, [2]Washington State Univ., Wenatchee, WA, [3]North Carolina State Univ., Raleigh, NC

1:30 1604 Management Strategies: Solutions to Grand Challenges. **Tamra Reall Lincoln**, trfy9f@mail.missouri.edu, Univ. of Missouri, Columbia, MO

1:40 1605 Unbiased introduction, University of Missouri, Topic 1: The call for the end of invasion biology are justified; this field should be replaced by the ecology of species redistribution. **Jessica Warwick**, jmwx86@mail.missouri.edu, Univ. of Missouri, Columbia, MO

1:45 1606 Pro Team: Washington State University (faculty advisor–David Crowder), Topic 1. **Elizabeth D'Auria**, elizabeth.dauria@email.wsu.edu, **Karol Krey**, karol.krey@wsu.edu and **Robert Orpet**, Washington State Univ., Pullman, WA

1:52 Cross-Examination by Con Team for Topic 1

1:55 1607 Con Team: Louisiana State University (faculty advisor–Kristen Healy), Topic 1. **Emily Kraus**, EKraus@agcenter.lsu.edu, **Matthew T. Van Weelden**, mvanwe2@lsu.edu, **Nathan Mercer**, nhmercer13@gmail.com, and **Monique Ferrira**, Louisiana State University, Baton Rouge, LA

2:02 Cross-Examination by Pro Team for Topic 1

2:05 First Rebuttal by Con Team for Topic 1

2:08 First Rebuttal by Pro Team for Topic 1

2:11 Second Rebuttal by Con Team for Topic 1

2:14 Second Rebuttal by Pro Team for Topic 1

2:17 Questions from Judges and Audience for Topic 1

2:27 Break

2:37 1608 Unbiased introduction, Washington State University, Topic 2: Neonicotinoids are causing the death of bees essential for pollinating our food crops. The use of neonicotinoids should end. **Alix Whitener**, alix.crilly@email.wsu.edu, Washington State Univ., Pullman, WA

2:42 1609 Pro Team: Auburn University (faculty advisor–David Held), Topic 2. **Olufemi Ajayi**, osa0001@auburn.edu, **Adekunle**

Adesanya, awa0004@tigermail.auburn.edu, **Julian Golec**, JRG0027@auburn.edu, **Matthew Burrows**, mmb0034@auburn.edu, **Carl Clem**, csc0013@tigermail.auburn.edu and Zi Ye, Auburn Univ., Auburn, AL

2:49 Cross-Examination by Con Team for Topic 2

2:52 1610 Con Team: University of California–Davis (faculty advisor–Mike Parrella), Topic 2. **Mohammad-Amir Aghaee**, maghaee@ucdavis.edu[1], **Daniel Klittich**, **Margaret Scampavia**, mrscampavia@ucdavis.edu[2] and **Ralph Washington**[1], [1]Univ. of California, Davis, CA, [2]Univ. of California, Oakland, CA

2:59 Cross-Examination by Pro Team for Topic 2

3:02 First Rebuttal by Con Team for Topic 2

3:05 First Rebuttal by Pro Team for Topic 2

3:08 Second Rebuttal by Con Team for Topic 2

3:11 Second Rebuttal by Pro Team for Topic 2

3:14 Questions from Judges and Audience for Topic 2

3:24 Break

3:34 1611 Unbiased introduction, University of Arkansas, Topic 3: What is the single best tool to reduce malaria cases throughout the world? **Jessica Hartshorn**, jhartsho@uark.edu, Univ. of Arkansas, Fayetteville, AR

3:39 1612 Team 1: Florida A&M University (faculty advisor–Raymond Hix), Topic 3. **Julius Eason**, jeason21@gmail.com[1], **Whitley Stewart**, **Edidiong Inyang**, **Netalie Francis**, nfrancis232@gmail.com[1] and **Tavia Gordon**, taviagordon@yahoo.com[2], [1]Florida A&M Univ., Tallahassee, FL, [2]Center for Biological Control, Tallahassee, FL

3:46 Cross-Examination of Team 1 by Team 2 for Topic 3

3:49 1613 Team 2: Kansas State University (faculty advisor–John Ruberson), Topic 3. **Shelly Wiggam**, wiggie@ksu.edu, **Aaron Cato**, cato@ksu.edu, **Bettina Jancke**, and **Dinesh Erram**, derram@ksu.edu, Kansas State Univ., Manhattan, KS

3:56 Cross-Examination of Team 2 by Team 1 for Topic 3

3:59 First Rebuttal by Team 2 for Topic 3

4:02 First Rebuttal by Team 1 for Topic 3

4:05 Second Rebuttal by Team 2 for Topic 3

4:08 Second Rebuttal by Team 1 for Topic 3

4:11 Questions from Judges and Audience for Topic 3

4:21 Concluding Remarks

Ten-Minute Papers, SysEB Section: Insect Ecology

A103-104 (Oregon Convention Center)

Moderators: Nate Hardy[1] and Keith R. Hopper[2], [1]Auburn Univ., Auburn, AL, [2]USDA - ARS, Newark, DE

1:30 Introductory Remarks

1:32 1614 Niche partitioning in Hawaiian web-building *Tetragnatha* spiders. **Susan Kennedy**, fourjaws@berkeley.edu[1], Joanne Clavel[2] and Rosemary Gillespie[1], [1]Univ. of California, Berkeley, CA, [2]Univ. Paris 6, Paris, France

1:44 1615 Arthropod food-web development during early stages of primary succession. **Daniela Sint**, daniela.sint@uibk.ac.at, Lorna Raso, Rebecca Mayer, Ruediger Kaufmann and Michael Traugott, Univ. of Innsbruck, Innsbruck, Austria

1:56 1616 Differences in host specificity and gene sequences between closely related species of aphid parasitoids. **Keith R. Hopper**, khopper@udel.edu, USDA - ARS, Newark, DE

2:08 1617 Can a vertical stratification sampling approach uncover functional diversity in cloud forest insect communities? **Guinevere Z. Jones**, gjones9@uwyo.edu and Timothy Collier, Univ. of Wyoming, Laramie, WY

2:20 1618 Look before you toss: The importance of by-catch, broadly training students, and other lessons from a project in mass sampling. **Michael Skvarla**, MSkvarla36@gmail.com, Ray Fisher and Ashley Dowling, Univ. of Arkansas, Fayetteville, AR

2:32 1619 The role of *Cardinium*-induced cytoplasmic incompatibility and hybrid incompatibilities in the reproductive isolation between two closely related *Encarsia* (Hymenoptera: Aphelinidae) species. **Marco Gebiola**, marco.gebiola@gmail.com[1], Suzanne E. Kelly[1], Massimo Giorgini[2] and Martha S. Hunter[1], [1]Univ. of Arizona, Tucson, AZ, [2]National Research Council of Italy, Portici, Italy

2:44 1620 First report of the family Micropterigidae (Lepidoptera) from Central America with descriptions of two new genera and five new species. **David L. Wagner**, david.wagner@uconn.edu[1], and Donald R. Davis[2], [1]Univ. of Connecticut, Storrs, CT, [2]National Museum of Natural History, Smithsonian Institution, Washington, DC

2:56 1621 Evolutionary ecology of the social parasite *Tamalia inquilinus* (Hemiptera: Aphididae). **Donald G. Miller**, dgmiller@csuchico.edu[1], Sarah P. Lawson[2], Heather Estby[2] and Patrick Abbot[2], [1]California State Univ., Chico, CA, [2]Vanderbilt Univ., Nashville, TN

3:08 Break

3:23 1622 Testing effects of plant community diversity on host breadth evolution in armored scales. **Nate Hardy**, nbhardy@gmail.com[1], Benjamin Normark[2] and Daniel Peterson[2], [1]Auburn Univ., Auburn, AL, [2]Univ. of Massachusetts, Amherst, MA

3:35 1623 The relationship between climate and cooperative breeding in *Polistes* wasps depends on the scale of analysis. **Michael Sheehan**, msheehan@berkeley.edu[1], Tory Hendry[1], Brian Sedio[2] and Elizabeth Tibbetts[2], [1]Univ. of California, Berkeley, CA, [2]Univ. of Michigan, Ann Arbor, MI

3:47 1624 Epigenetic maternal effects on caste development in paper wasps (*Polistes fuscatus*). **Jennifer M. Jandt**, jjandt2@gmail.com[1], Robert L. Jeanne[2], John Hermanson[3] and Amy L. Toth[1], [1]Iowa State Univ., Ames, IA, [2]Univ. of Wisconsin, Madison, WI, [3]USDA - Forest Service, Madison, WI

3:59 1625 Long-term (1992-2014) ecological studies of burying beetles (*Nicrophorus*) reveal species range shifts, overwinter emergence patterns, and drivers of population dynamics. **Rosemary J. Smith**, smitrose@isu.edu, Idaho State Univ., Pocatello, ID

4:11 1626 Community structure of the parasitic *Philornis* fly on Trinidad. **Mariana Bulgarella**, mbulgare@umn.edu and George Heimpel, Univ. of Minnesota, Saint Paul, MN

4:23 1627 Consequences for mortality by fire: The effect of pupation location of the frosted elfin, *Callophrys irus* Godart (Lepidoptera: Lycaenidae). **Matthew Thom**, matt.thom@ars.usda.gov[1], Jaret C. Daniels[2], Leda Kobziar[2] and Jonathan Colburn[3], [1]USDA - ARS, Morris, MN, [2]Univ. of Florida, Gainesville, FL, [3]Florida Museum of Natural History, Gainesville, FL

4:35 1628 Social flexibility in the sweat bee *Megalopta genalis*. **Adam Smith**, adam_smith@gwu.edu, George Washington Univ., Washington, DC

4:47 1629 Food protein-carbohydrate ratio affects the trade-off between reproduction and lifespan in the wing-polymorphic cricket *Gryllus firmus*. **Rebecca Clark**, r11clark@gmail.com[1], Anthony J. Zera[2] and Spencer T. Behmer[1], [1]Texas A&M Univ., College Station, TX, [2]Univ. of Nebraska, Lincoln, NE

4:59 Concluding Remarks

Ten-Minute Papers, SysEB Section: Species Delimitation and Biogeography

A105 (Oregon Convention Center)

Moderators: Christopher Beatty[1] and Olivia Evangelista[2], [1]Santa Clara Univ., Santa Clara, CA, [2]Museu de Zoologia da Universidade de São Paulo, São Paulo, Brazil

1:30 Introductory Remarks

1:32 1630 Africanization of a feral honey bee (*Apis mellifera*) population in Texas: Does a decade make a difference? **Juliana Rangel**, jrangel@tamu.edu, Texas A&M Univ., College Station, TX

1:44 1631 Predicting species distributions for the bee genus *Ptiloglossa* Smith (Colletidae: Diphaglossinae). **Rita Velez-Ruiz**, rita.velez@sdstate.edu, South Dakota State Univ., Brookings, SD

1:56 1632 Pairwise genetic comparisons of an emergent plant-antagonist interaction. **Rebecca F. Hazen**, rhazen@tulane.edu, Tulane Univ., New Orleans, LA

2:08 1633 Combined molecular and morphological analysis of two morphs of *Argia apicalis* (Odonata: Coenagrionidae) for species delineation. **Melissa S. Sisson**, sisson@shsu.edu, Jerry L. Cook, Tamara J. Cook and Autumn J. Smith-Herron, Sam Houston State Univ., Huntsville, TX

2:20 1634 Life history, biogeography, and the potential for allochronic diversification in the relict dragonfly *Tanypteryx hageni* (Odonata: Petaluridae). **Christopher Beatty**, beattych@yahoo.com[1], Jessica Ware[2], Melissa Sanchez Herrera[2] and Katie Harding[3], [1]Santa Clara Univ., Santa Clara, CA, [2]Rutgers, The State Univ. of New Jersey, Newark, NJ, [3]Pioneer Hi-Bred International Inc., Hayward, CA

2:32 1635 Habitat suitability, not dispersal ability, limits the distribution of a group of Hawaiian moths (Lepidoptera: Xyloryctidae: *Thyrocopa*). **Matthew J. Medeiros**, matt.j.medeiros@gmail.com[1], Isidor Goldberg[2] and Rosemary Gillespie[1], [1]Univ. of California, Berkeley, CA, [2]Urban School of San Francisco, San Francisco, CA

2:44 Break

2:59 1636 Gene trees, species trees and male infidelity in a Holarctic Moth (*Syndemis*, Tortricidae). **Daniel Rubinoff**, rubinoff@hawaii.edu[1], Jerry A. Powell[2] and Michael San Jose[1], [1]Univ. of Hawai'i, Honolulu, HI, [2]Univ. of California, Berkeley, CA

3:11 1637 Phylogeography of a Holarctic defoliator, the gypsy moth (*Lymantria dispar*, Lepidoptera: Erebidae), inferred from microsatellite data. **Yunke Wu**, yw578@cornell.edu[1], John Molongoski[2], Richard Harrison[3], David R. Lance[1] and Victor C. Mastro[1], [1]USDA - APHIS - PPQ - CPHST, Buzzards Bay, MA, [2]USDA - APHIS, Otis ANGB, MA, [3]Cornell Univ., Ithaca, NY

3:23 1638 Ten years of soil flotation: Biogeography of Californian leptotyphlines (Coleoptera: Staphylinidae). **Vladimir Gusarov**, vladimir.gusarov@nhm.uio.no, Univ. of Oslo, Oslo, Norway

3:35 1639 Pre-copulatory sexual isolation and its contribution to ecological speciation in *Strauzia* flies (Tephritidae). **Andrew Forbes**, andrew-forbes@uiowa.edu[1], Alaine Hippee[1] and Marty A. Condon[2], [1]Univ. of Iowa, Iowa City, IA, [2]Cornell College, Mount Vernon, IA

3:47 1640 Examining the Gondwanan distribution of the areodine scarabs: Evidence from the African genus *Xenoproctis* (Coleoptera: Scarabaeidae). **Oliver Keller**, okeller@svsu.edu[1], Matthew Moore[1], Beulah Garner[2] and Mary Liz Jameson[3], [1]Univ. of Florida, Gainesville, FL, [2]Natural History Museum, London, United Kingdom, [3]Wichita State Univ., Wichita, KS

3:59 1641 Taxonomic revision and species delimitation within *Bembidion* (Carabidae) sub groups in North America. **John Sproul**, johnssproul@gmail.com and David Maddison, Oregon State Univ., Corvallis, OR

4:11 1642 Historical biogeography of Staphylinini rove beetles of New Zealand (Coleoptera: Staphylinidae). **Alexey Solodovnikov**, asolodovnikov@snm.ku.dk and A.J. Brunke, Natural History Museum of Denmark, Copenhagen, Denmark

4:23 1643 Predicting distributions of tortoise-beetles (Chrysomelidae, Coleoptera) using niche modeling and cost surfaces with remote sensing images. **Marianna V. P. Simões**, marianna_simoes1@ku.edu, Univ. of Kansas, Lawrence, KS

4:35 1644 One species or 100? Tackling large under-studied groups like riffle-dwelling water mites (Torrenticolidae: *Torrenticola*). **Ray Fisher**, JRFisher@uark.edu and Ashley Dowling, Univ. of Arkansas, Fayetteville, AR

4:47 1645 Morphological diversification in the cryptic and sexually dimorphic Heteronotus delineatus species complex. **Olivia Evangelista**, olivia_evangelista@yahoo.com.br[1], Marcio R. Pie[2], Julie Urban[3] and Jason Cryan[3], [1]Museu de Zoologia da Universidade de São Paulo, São Paulo, Brazil, [2]Universidade Federal do Paraná, Curtiba, PR, Brazil, [3]North Carolina Museum of Natural Sciences, Raleigh, NC

4:59 Concluding Remarks

Ten-Minute Papers, SysEB Section: Phylogenetic and Phylogenomic Methodology

A107-109 (Oregon Convention Center)

Moderators: Nico Franz[1] and Christopher L. Owen[2], [1]Arizona State Univ., Tempe, AZ, [2]George Washington Univ., Ashburn, VA

1:30 Introductory Remarks

1:35 1646 Genome wide sequencing in *Ceratitis capitata* to identify informative molecular markers. **Sheina Sim**[1], Scott Geib[1], Norman Barr[2], Raul Ruiz[2] and Daniel Z. Rubinoff[3], [1]USDA - ARS, Hilo, HI, [2]USDA - APHIS, Edinburg, TX, [3]Univ. of Hawai'i, Honolulu, HI

1:47 1647 Genetic basis of polyphagy in scale insects (Hemiptera: Coccoidea) explored via RNA-Seq. **Alex Van Dam**, vandama01@gmail.com[1], Daniel Peterson[2], Nate Hardy[3], Bent Petersen[1], Simon Rasmussen[1], Marlene Dalgaard[1], Thomas Sicheritz Pontén[1],

Benjamin Normark[2], Uffe Mortensen[1] and Rasmus Frandsen[1], [1]Denmark Technical Univ., Kgs. Lyngby, Denmark, [2]Univ. of Massachusetts, Amherst, MA, [3]Auburn Univ., Auburn, AL

1:59 1648 Phylogenomic estimation of the Hemiptera phylogeny and their co-diversification with plants. **Christopher Owen**, christopherlowen@yahoo.com, George Washington Univ., Ashburn, VA

2:11 1649 Ultraconserved elements provide new insights into the phylogeny and evolution of Hymenoptera. **Michael Branstetter**, mgbranstetter@gmail.com[1], Brant Faircloth[2], Bryan N. Danforth[3], James P. Pitts[4], Philip S. Ward[5], and Seán Brady[1], [1]National Museum of Natural History, Smithsonian Institution, Washington, DC, [2]Univ. of California, Los Angeles, CA, [3]Cornell Univ., Ithaca, NY, [4]Utah State Univ., Logan, UT, [5]Univ. of California, Davis, CA

2:23 Break

2:38 1650 Comparison of the transcriptomes of the two species of whiteflies after reassembly. **Yu-Jun Wang**, wangyujun@zju.edu.cn, Shu-Sheng Liu and Xiao-Wei Wang, Zhejiang Univ., Hangzhou, China

2:50 1651 Aligning insect phylogenies: *Perelleschus* and other cases. **Nico Franz**, nico.franz@asu.edu[1], Bertram Ludaescher[2], Mingmin Chen[2], Shizhuo Yu[2] and Shawn Bowers[3], [1]Arizona State Univ., Tempe, AZ, [2]Univ. of California, Davis, CA, [3]Univ. of Washignton, Spokane, WA

3:02 1652 Phylogenomics provides strong evidence for relationships of butterflies and moths. **Akito Y. Kawahara**, kawahara@flmnh.ufl.edu[1], and Jesse Breinholt[2], [1]Florida Museum of Natural History, Gainesville, FL, [2]Univ. of Florida, Gainesville, FL

3:14 1653 Phylogenomic analysis of cold and heat stress responses in ice-crawlers (Grylloblattidae). **Sean Schoville**, sean.schoville@gmail.com, Univ. of Wisconsin, Madison, WI

3:26 1654 Inferring species phylogenies using reduced-representation genomics. **Brian Wray**, bwray@fieldmuseum.org, Benjamin Rubin and Corrie Moreau, Field Museum of Natural History, Chicago, IL

3:38 1655 High-throughput sequencing of museum specimens and its implication for phylogenetic studies. **Kojun Kanda**, kandak@science.oregonstate.edu, James M. Pflug, John Sproul and David Maddison, Oregon State Univ., Corvallis, OR

3:50 Concluding Remarks

Ten-Minute Papers, MUVE Section: Mosquitoes

A106 (Oregon Convention Center)

Moderators: Roxanne Connelly[1] and Donald Yee[2], [1]Univ. of Florida, Vero Beach, FL, [2]Univ. of Southern Mississippi, Hattiesburg, MS

1:30 Introductory Remarks

1:35 1656 Cloning and overexpression of transferrin gene from cypermethrin-resistant *Culex quinquefasciatus*. **Wenbin Tan**, 1392144@163.com, Jining Medical Univ., Jining, China

1:47 1657 G-protein for developing mosquito molecular pesticide. **Liming Zhao**, lmzhao@ufl.edu, Univ. of Florida, Vero Beach, FL

1:59 1658 The role of wing size variation in the fitness of *Aedes aegypti* field-populations. **Eileen Jeffrey Gutierrez**, ejeffrey@email.arizona.edu, Teresa Joy, Kacey Ernst, Kathleen R. Walker and Michael A. Riehle, Univ. of Arizona, Tucson, AZ

2:11 1659 Effect of larval competition on the extrinsic incubation period and vectorial capacity of *Aedes albopictus* for Dengue virus. **Jeffrey Bara**, jjbara@illinois.edu[1], Zoi Rapti[2], Carla Caceres[2] and Ephantus J. Muturi[1], [1]Univ. of Illinois, Champaign, IL, [2]Univ. of Illinois, Urbana, IL

2:23 1660 Impact of invasive honeysuckle and native trees on ecology of native and invasive mosquitoes. **Ephantus J. Muturi**, emuturi2@illinois.edu[1], Allison Gardner[2] and Jeffrey Bara[1], [1]Univ. of Illinois, Champaign, IL, [2]Univ. of Illinois, Urbana, IL

2:35 1661 Use of microdam reservoirs as larval habitat by malaria vectors. **Robert S. McCann**, robert.mccann@wur.nl and Edward D. Walker, Michigan State Univ., East Lansing, MI

2:47 1662 Suppression of the invasive disease vector, Asian tiger mosquito (*Aedes albopictus*), using inundative releases of cytoplasmically incompatible males. James Mains, Corey L. Brelsfoard and **Stephen Dobson**, sdobson@uky.edu, Univ. of Kentucky, Lexington, KY

2:59 Break

3:09 1663 The dilution effect in a field survey of eastern mosquitoes. **John Soghigian**, jsoghigian@clarku.edu and Todd P. Livdahl, Clark Univ., Worcester, MA

3:21 1664 The true meaning of bacteria in the guts of larval mosquitoes. **Michael G. Kaufman**, kaufma15@msu.edu and Edward D. Walker, Michigan State Univ., East Lansing, MI

3:33 1665 Sindbis virus suppresses dengue-4 virus in cell culture and reduces vector competence for dengue-4 virus. Ephantus J. Muturi, **Chang-Hyun Kim**, maraychk@illinois.edu and Jeffrey Bara, Univ. of Illinois, Champaign, IL

3:45 1666 Development of the Smart Mosquito Counter Device and its newly updated capability for mosquito identification. **Yi Hoonbok**, yih@swu.ac.kr[1], Yu Jae-seung[2], Kim Sangae[3], Kim Hyunjung[1], Park Hyun-chul[1], Lee Wookgyo[4], Ju Young Ran[4], Park Mi-Yeoun[4] and Shin E-hyun[4], [1]Seoul Women's Univ., Seoul, South Korea, [2]E-TND, Kwangju City, Kyunggi-do, South Korea, [3]Yeoungdeungpo-gu, Health Center, Seoul, South Korea, [4]Korea Centers for Diseases Control & Prevention, Chungwon-gun, Chungchungbuk-do, South Korea

3:57 1667 Prevalence of malaria vector mosquitoes *Anopheles culicifacies* and *Anopheles stephensi* (Diptera: Culicidae) of Sindh. **Nosheen Jehajo**, nosheenjehajo@gmail.com, Univ. of Sindh, Jamshoro, Pakistan

4:09 1668 Mosquitocidal activity of different plant extracts and essential oils against *Aedes aegypti* (Diptera: Culicidae). **Tahira Riasat**, tahirariasat@yahoo.com, Sehrish Rasheed and Naureen Qureshi, G.C. Univ., Faisalabad, Pakistan

4:21 1669 Larvicidal potentential of four plants extacts against *Culex quinquefasciatus*. **Naveeda Qureshi**, naveedaqrsh@gmail.com, Islamabad, Pakistan

4:33 1670 Measure post-blood meal dispersal of mosquitoes and duration of radioactivity by using the isotope 32P. **Chongxing Zhang**, chongxingzhang@aliyun.com, Shandong Academy of Medical Sciences, Jining, China

4:45 1671 Elevated levels of enzymes activity to Deltamethrin in a laboratory selected strain of *Anopheles stephensi* (Liston, 1901), urban malaria vector. **Palani Aarumugam**, aarumugamhint@gmail.com and K Gunasekaran, Pondicherry, India

Ten-Minute Papers, MUVE Section: Bed Bugs and Other True Bugs

B117-119 (Oregon Convention Center)

Moderators: Dini Miller[1] and Kenneth S. Brown[2], [1]Virginia Tech, Blacksburg, VA, [2]BASF Specialty Products, St Louis, MO

1:30 Introductory Remarks

1:42 1672 Residual activity of Phantom PI II for control of bed bugs (*Cimex lectularius* L.) on different surface types. **Znar Barwary**, flavipes@vt.edu, Virginia Tech, Blacksburg, VA

1:54 1673 Bed bug (*Cimex lectularius*) response to desiccant dust applications. **Molly L. Stedfast**, msted14@vt.edu and Dini M. Miller, Virginia Tech, Blacksburg, VA

2:06 1674 Pyrethroid susceptible and resistant bed bug egg transcript expression levels quantified by RNA-sequencing. **Brittany Elise Delong**, edbritt@vt.edu, Dini M. Miller and Zach N. Adelman, Virginia Tech, Blacksburg, VA

2:18 1675 Fumigation of bed bugs, *Cimex lectularius* L. (Hemiptera: Cimicidae): Effective application rates for sulfuryl fluoride. **Thomas Phillips**, twp1@ksu.edu[1], Michael J. Aikins[1], Ellen Thoms[2], J.J. DeMark[3] and Changlu Wang[4], [1]Kansas State Univ., Manhattan, KS, [2]Dow AgroSciences, Gainesville, FL, [3]Dow AgroSciences, Indianapolis, IN, [4]Rutgers, The State Univ. of New Jersey, New Brunswick, NJ

2:30 1676 Fumigant activity and AChE inhibition of myrtle and peppermint oils constituents toward adult bed bug, *Cimex lectularius* L. **Jun-Ran Kim**, jr2004@snu.ac.kr, Rural Development Administration, Suwon-si, South Korea

2:42 1677 Mortality of *Cimex lectularius* L., the common bed bug, by horizontal insecticide transfer. **Kevin Hinson**, krhinso@clemson.edu, Eric P. Benson, William C. Bridges and Patricia A. Zungoli, Clemson Univ., Clemson, SC

2:54 Break

3:06 1678 Effect of feeding status on mortality response of adult bed bugs (Hemiptera: Cimicidae) to some insecticide products. **Dong-Hwan Choe**, donghwan.choe@ucr.edu and Kathleen Campbell, Univ. of California, Riverside, CA

3:18 1679 Mechanisms that are contributing to the reduced cuticular penetration in the common bed bug, *Cimex lectularius* L. **Reina Koganemaru**, reinak7@vt.edu, Dini Miller, Zach Adelman, Richard Helm and W. Ray, Virginia Tech, Blacksburg, VA

3:30 1680 Finally some good news: Fitness costs to insecticide resistance in the bed bug. **Jennifer Gordon**, jgord13@gmail.com, Michael F. Potter and Kenneth F. Haynes, Univ. of Kentucky, Lexington, KY

3:42 1681 Promoting IPM for bed bug control in homeless shelters. **Michael Merchant**, m-merchant@tamu.edu[1], Paul Nester[1], Elizabeth Brown[2], Molly E. Keck[3] and Charles Helpert[1], [1]Texas A&M Univ., Dallas, TX, [2]Texas A&M Univ., Austin, TX, [3]Texas A&M Univ., San Antonio, TX

3:54 1682 A review of phylogenetic relationship among *Trypanosoma cruzi* I and *Triatoma sanguisuga*: First TcIa report in New Orleans. **Claudia Herrera**, cherrera@tulane.edu, Meredith Licon, Samuel Jameson, Pierre Buekens and Dawn M. Wesson, Tulane Univ., New Orleans, LA

Ten-Minute Papers, P-IE Section: Biology and Ecology

D135 (Oregon Convention Center)

Moderators: Rizana M. Mahroof[1] and Catharine M. Mannion[2], [1]South Carolina State Univ., Orangeburg, SC, [2]Univ. of Florida, Homestead, FL

1:30 1683 When life-history doesn't matter. **Miriama Malcicka**, miriama.malcicka@gmail.com, Free Univ., Amsterdam, Netherlands

1:42 1684 Summiting behavior of sugarbeet root aphid (*Pemphigus betae* Doane). **Nathan Russart**, russ0228@umn.edu[1], Ian MacRae[1], Mark A. Boetel[2], and Robert Foottit[3], [1]Univ. of Minnesota, Crookston, MN, [2]North Dakota State Univ., Fargo, ND, [3]Agriculture & Agri-Food Canada, Ottawa, ON, Canada

1:54 1685 Behavioral response of *Anthonomus eugenii* to volatiles from pepper reproductive structures. **Juan Cibrián-Tovar**, jcibrian@colpos.mx and Manolo Muñiz-Merino, Colegio de Postgraduados, Texcoco, Mexico

2:06 1686 Discovering new insecticidal attributes for the spinosyns and methoxyfenozide. **Jesse M. Richardson**, jmrichardson@dow.com, Dow AgroSciences, Hesperia, CA, John C. Palumbo[1], James Dripps[2], and Melissa Siebert[3], [1]Univ. of Arizona, Yuma, AZ, [2]Dow AgroSciences, Indianapolis, IN, [3]Dow AgroSciences, Greenville, MS

2:18 1687 Effect of temperature and humidity on the off-host survival of the wheat curl mite, *Aceria tosichella*. **Everlyne Wosula**, ewosula2@unl.edu, Anthony J. McMechan and Gary Hein, Univ. of Nebraska, Lincoln, NE

2:30 1688 Grasshopper community responses to bison grazing and fire frequency. **Angela N. Laws**, alaws@nd.edu, Univ. of Notre Dame, Notre Dame, IN and Anthony Joern, Kansas State Univ., Manhattan, KS

2:42 1689 Assessing risks to non-target arthropods via molecular analysis of trophic webs. **Kelton Welch**, kelton.welch@uky.edu and Jonathan G. Lundgren, USDA - ARS, Brookings, SD

2:54 1690 The population ecology and conservation of montane endemic butterflies in Southern Mexico. **Jorge León-Cortés**, jleon@ecosur.mx[1], Marisol Almaraz-Almaraz[1] and Helen Regan[2], [1]El Colegio de la Frontera Sur, San Cristóbal de las Casas, Mexico, [2]Univ. of California, Riverside, CA

3:06 1691 Distribution of psocids in different moisture gradients in wheat. **John Diaz-Montano**, john.diaz-montano@ars.usda.gov[1], James E. Throne[2], Paul W. Flinn[1] and James F. Campbell[1], [1]USDA - ARS, Manhattan, KS, [2]USDA - ARS, Parlier, CA

3:18 1692 Evolutionary ecology of host use in the silver-spotted skipper (*Epargyreus clarus*). **John T. Lill**, lillj@gwu.edu[1], Martha R Weiss[2], and Eric Lind[3], [1]George Washington Univ., Washington, DC, [2]Georgetown Univ., Washington, DC, [3]Univ. of Minnesota, Saint Paul, MN

3:30 Break

3:42 1693 How landscapes and dispersal interact to shape outbreak patterns of the western spruce budworm (*Choristoneura freemani*). **Brian Van Hezewijk**, bvanheze@NRCan.gc.ca, Natural Resources Canada - Canadian Forest Service, Victoria, BC, Canada

3:54 1694 Shifts in reproductive strategy by *Hemileuca eglanterina* (Lepidoptera: Saturniidae) in response to prescribed burning. **Paul**

Severns, severnsp@science.oregonstate.edu, Oregon State Univ., Corvallis, OR

4:06 1695 Effect of wild hosts on management of *Drosophila suzukii* (Diptera: Drosophilidae). **Teresia Nyoike**, Nyoiket@ufl.edu and Oscar Liburd, Univ. of Florida, Gainesville, FL

4:18 1696 Ecological study of *Tutta absoluta* (Lepidoptera, Gelechiidae) at Mzeraa, Biskra oasis, Algeria. **Tarai Nacer**, tarainacer@yahoo.fr, Univ. of Biskra, Biskra, Algeria

4:30 1697 Host selection by western corn rootworm larvae. **Elisa Bernklau**, bernklau@lamar.colostate.edu[1], Louis Bjostad[1] and Bruce Hibbard[2], [1]Colorado State Univ., Fort Collins, CO, [2]USDA - ARS, Columbia, MO

4:42 1698 Visual responses of corn silk flies (Diptera: Ulidiidae). **Sandra A. Allan**, sandy.allan@ars.usda.gov, USDA-ARS-CMAVE, Gainesville, FL

4:54 1699 Presentation withdrawn

5:06 1700 Many heads are better than one: Head capsule stacking alters feeding behaviour in gum-leaf skeletonizers. **Dieter Hochuli**, dieter.hochuli@sydney.edu.au, Univ. of Sydney, Sydney, Australia

Ten-Minute Papers, P-IE Section: Environmental Entomology B

E146 (Oregon Convention Center)

Moderators: Jeff Gore[1] and Carlos E. Bográn[2], [1]Mississippi State Univ., Stoneville, MS, [2]Texas A&M Univ., Bryan, TX

1:30 1701 Effects of landscape features on foraging by honey bees (*Apis melifera*) and bumble bees (*Bombus impatiens*) in pumpkin fields. **Jessica D. Petersen**, jessdpetersen@gmail.com[1], and Brian Nault[2], [1]Cornell Univ., Salem, VA [2]Cornell Univ., Geneva, NY

1:42 1702 Polyandry restores fertility and diminished paternal effects in sib-mated *Hippodamia convergens* females. **J. P. Michaud**, jpmi@ksu.edu[1], and Mohamed Bayoumy[2], [1]Kansas State Univ., Hays, KS, [2]Mansoura Univ., Mansoura, Egypt

1:54 1703 Solutions to the sugarcane aphid pandemonium in south Texas: 2014. **Raul Villanueva**, rtvillanueva@ag.tamu.edu, Danielle Sekula and Gabriela Esparza-Diaz, Texas A&M Univ., Weslaco, TX

2:06 1704 Assessing eco-evolutionary feedbacks among pea aphids, defensive symbionts, and natural enemies. **Jacob Russell**, jar337@drexel.edu[1], Andrew H. Smith[1] and Kerry M. Oliver[2], [1]Drexel Univ., Philadelphia, PA, [2]Univ. of Georgia, Athens, GA

2:18 1705 The mechanism for preventing migratory locust's swarm behavior by microsporidian parasites. **Wangpeng Shi**, wpshi@cau.edu.cn, China Agricultural Univ., Beijing, China

2:30 1706 Overwintering potential of the potato psyllid (*Bactericera cockerelli* Sulc) and the bacterium *Candidatus* Liberibacter solanacearum in eastern Oregon. **Darrin Walenta**, darrin.walenta@oregonstate.edu[1], Erik Echegaray[2] and Silvia Rondon[2], [1]Oregon State Univ., La Grande, OR, [2]Oregon State Univ., Hermiston, OR

2:42 1707 Application of spinetoram can stimulate populations of pear rust mite: A case of hormoligosis or disruption of biological control? **Richard Hilton**, richard.hilton@oregonstate.edu[1], and Robert A. Van Steenwyk[2], [1]Oregon State Univ., Central Point, OR, [2]Univ. of California, Berkeley, CA

2:54 1708 An offseason reservoir of Virginia creeper leafhopper (*Erythroneura ziczac*) is an alternate host of grapevine red-blotch-associated virus in California vineyards. **Brian Bahder**, bwbahder@ucdavis.edu[1], Frank Zalom[1], Mysore Sudarshana[2] and Saul Gonzalez[2], [1]Univ. of California, Davis, CA, [2]USDA - Forest Service, Davis, CA

3:06 1709 Interacting environmental stressors lead to altered transgenerational disease resistance in a lepidopteran. Grant Olson[1], Judith H. Myers[2] and **Jenny Cory**, jsc21@sfu.ca[1], [1]Simon Fraser Univ., Burnaby, BC, Canada, [2]Univ. of British Columbia, Vancouver, BC, Canada

3:18 1710 Effect of temperature and physiological state of the Indianmeal moth larvae (*Plodia interpunctella*) on the development and progeny production by the wasp *Habrabracon hebetor*. **George Mbata**, mbatag@fvsu.edu, Fort Valley State Univ., Fort Valley, GA

3:30 1711 Indirect negative effects of predation outweigh benefits of habitat restoration for immature stages of a wetland butterfly. **Frances S. Sivakoff**, Sivakoff.3@osu.edu[1], Erik T. Aschehoug[1], Heather L. Cayton[1], William F. Morris[2] and Nick M. Haddad[1], [1]North Carolina State Univ., Raleigh, NC, [2]Duke Univ., Durham, NC

3:42 Break

3:54 1712 Population level variation in chemical defense in the specialist butterfly, *Euphydryas phaeton* (Nymphalidae). **Peri A. Mason**, pmason@wesleyan.edu and M. Deane Bowers, Univ. of Colorado, Boulder, CO

4:06 1713 Beneficial insect communities in semi-natural grasslands and monocultures managed for conservation benefits. **Joshua W. Campbell**, jcampbel@highpoint.edu, High Point Univ., High Point, NC

4:18 1714 New insights into the relationship between phloem occlusion mechanisms and phloem sap-feeders. **Karla Medina-Ortega**, karlamedina11@gmail.com and Greg Walker, Univ. of California, Riverside, CA

4:30 1715 Double deception: Ant-mimicking spiders elude both visually- and chemically-oriented predators. Divya Uma, Azim Premji Univ., Bangalore, India and **Martha Weiss**, weissm@georgetown.edu, Georgetown Univ., Washington, DC

4:42 1716 Color morph and infection with *Candidatus* Liberibacter asiaticus influence flight capability and dispersal of the Asian citrus psyllid. **Xavier Martini**, xmartini@ufl.edu, Mark Hoffmann, Kirsten S Pelz-Stelinski and Lukasz L. Stelinski, Univ. of Florida, Lake Alfred, FL

4:54 1717 Eat or be eaten: Fungus and nematodes switch off as predator and prey. **E. Erin Morris**, eem62@cornell.edu[1], and Ann E. Hajek[2], [1]Univ. of Copenhagen, Copenhagen, Denmark, [2]Cornell Univ., Ithaca, NY

5:06 1718 Genetic analysis of defense related genes in switchgrass during greenbug aphid (*Schizaphis graminum* (Rondani)) infestation. **Teresa Donze-Reiner**, tdonze@unl.edu[1], Travis J. Prochaska[1], Nathan Palmer[1], Gautam Sarath[2] and Tiffany Heng-Moss[1], [1]Univ. of Nebraska, Lincoln, NE, [2]USDA - ARS, Lincoln, NE

5:18 1719 Urban outbreaks of herbivores: Determining the effects of nutrients and drought on herbivore abundance in urban forests. **Warren B. Sconiers**, vnugos2386@gmail.com, Emily K. Meineke, Adam Dale and Steven D. Frank, North Carolina State Univ., Raleigh, NC

TUESDAY, NOVEMBER 18, 2014, EVENING

Social Hour with Poster Presenters

Exhibit Hall C (Oregon Convention Center)

5:30 - 6:30

ESA Student Awards Ceremony

Oregon Ballroom (Oregon Convention Center)

Organizer: Cindy Myers, Entomological Society of America, Annapolis, MD

6:45 - 8:30

Organized Meeting: Annual Meeting of the Nearctic Regional Section, International Organization for Biocontrol

D139-140 (Oregon Convention Center)

Moderator and Organizer: Stefan T. Jaronski, USDA - ARS, Sidney, MT

5:30 Annual IOBC/NRS business meeting

6:00 Awards

6:15 2014 Distinguished scientist awardee presentation

6:45 Distinguished PhD student awardee presentation

7:15 Concluding Remarks, Q&A

Organized Meeting: Society of Overseas Nepalese Entomologists' Symposium: Linking the World through Entomological Works

Portland Ballroom 252 (Oregon Convention Center)

Moderators and Organizers: Jhalendra Rijal[1], Sudan Gyawaly[2] and Roshan Manandhar[3], [1]Univ. of California, Davis, CA, [2]Virginia Tech, Blacksburg, VA, [3]Lincoln Univ., Jefferson City, MO

6:00 Welcoming Remarks

6:10 1720 Potentiality of collaborative entomological research between developed and developing countries including Nepal. **Megha N. Parajulee**, m-parajulee@tamu.edu, Texas A&M Univ., Lubbock, TX

6:30 1721 Medical entomology research in Nepal. **William K. Reisen**, arbo123@pacbell.net, Univ. of California, Davis, CA

6:50 1722 Developing IPM packages for small holder vegetable farmers in South Asia. **Edwin Rajotte**, egrajotte@psu.edu, Pennsylvania State Univ., Univ. Park, PA

7:10 1723 ESA- policy in promoting entomological research in developing and under-developed countries. **Douglas G. Pfeiffer**, dgpfeiff@vt.edu, Virginia Tech, Blacksburg, VA

7:30 1724 Area-wide fruit fly management in the Pacific islands and technology transfer to Africa. **Luc Leblanc**, leblancl@ctahr.hawaii.edu[1], and Roger Vargas[2], [1]Univ. of Hawai'i, Honolulu, HI, [2]USDA - ARS, Hilo, HI

7:50 1725 Occurrence of entomopathogenic nematodes and their use against insect pests of agricultural crops in Nepal: Experiences and prospects. **Hari KC**, kchari2002@gmail.com, Ministry of Agricultural Development, Lalitpur, Nepal

8:10 Concluding Remarks

8:20 Student award ceremony

8:40 Business Meeting

Organized Meeting: Overseas Chinese Entomologists Association (OCEA): Global Challenges Bring Global Collaborations in Entomology

B110-112 (Oregon Convention Center)

Moderators and Organizers: Nannan Liu[1], Xiao-Qiang Yu[2] and Fangneng Huang[3], [1]Auburn Univ., Auburn, AL, [2]Univ. of Missouri, Kansas City, MO, [3]Louisiana State Univ., Baton Rouge, LA

6:00 1726 OCEA Welcoming Remarks. **Nannan Liu**, liunann@auburn.edu, Auburn Univ., Auburn, AL

6:20 1727 Plant chemical defense versus insect counter-defense. **Rensen Zeng**, rszeng@scau.edu.cn, South China Agricultural Univ., Guangzhou, China

6:40 1728 Molecular basis of behavioral regulation by 'push-pull' strategy in insects. **Guirong Wang**, grwang@ippcaas.cn, Chinese Academy of Agricultural Sciences, Beijing, China

7:00 1729 Presentation Withdrawn

7:20 1730 OCEA highlights of the year 2014. **Xiaoqiang Yu**, yux@umkc.edu, Univ. of Missouri, Kansas City, MO

7:40 1731 How to pursue the win-win strategies among the scientists with common interests? **T. X. Liu**, tongxianliu@yahoo.com, Northwest Agriculture & Forestry Univ., Yangling, China

8:00 1732 OCEA financial report of the year 2014. **Fangneng Huang**, fhunag@agcenter.lsu.edu, Louisiana State Univ., Baton Rouge, LA

Organized Meeting: Korean Young Entomologists (KYE)

B115-116 (Oregon Convention Center)

Moderators and Organizers: Donghun Kim[1] and Ikju Park[2], [1]Kansas State Univ., Manhattan, KS, [2]Univ. of Idaho, Moscow, ID

6:00 Welcoming Remarks

6:10 Introductory remarks for sub-organismal research

6:15 1733 Epigenetic regulation of diapause in the mosquito *Culex pipiens*: Is histone acetyl-modification inducing a molecular signal to program diapause? **Cheolho Sim**, Cheolho_Sim@baylor.edu, Baylor Univ., Waco, TX

6:27 1734 Occurrence of *Bemisia tabaci* and TYLCV in Korea: The role of vectors for plant virus transmission. **Kyeong-Yeoll Lee**, leeky@knu.ac.kr, Kyungpook National Univ., Daegu, South Korea

6:39 1735 Rapid cold hardeness of the Tobacco Budworm, *Helicoverpa assulta*. **Dae-weon Lee**, daeweonlee@ks.ac.kr and Wook Hyun Cha, Kyungsung Univ., Busan, South Korea

6:51 1736 Does isometric muscular training and/or silkworm pupae ingestion has synergistic effect on skeletal muscle synthesis? Sungpil Ryu, **Hyobin Seo**, dietnjoy@gmail.com and Yiseul Kim, Kyungpook National Univ., Sangju, South Korea

7:03 Introductory remarks for supra-organismal research

7:08 1737 Radar technology for entomological research. **Doo-Hyung Lee**, doohyung.lee@ars.usda.gov, Gachon Univ., Seongnam-si, South Korea

7:20 1738 A revision of Australian species of the supertribe Faronitae Reitter (Coleoptera: Staphylinidae: Pselaphinae). **Jong-Seok Park**, jpark16@tigers.lsu.edu, Louisiana State Univ., Baton Rouge, LA

7:32 1739 Genetic diversity of the *Halyomorpha halys* and *Riptortus pedestris* in the republic of Korea. **Chang-Gyu Park**, cgpark@hanmail.net[1], Sujung Min[1], Wonhoon Lee[2], Sang-Ku Lee[1], JeongJoon Ahn[3] and Bo Yoon Seo[1], [1]National Academy of Agricultural Science, Suwon, South Korea, [2]Yeongnam Regional Office, Busan, South Korea, [3]West Virginia Univ., Morgantown, WV

7:44 1740 Damage of Zoysiagrass by Zoysiagrass Mite, *Aceria zoysiae* depending on Zoysiagrass isolates in Korea. Chae Min Lee[1], Jong ju Kim[2], Young Hack Chung[2], Ho Yul Choo[2], Chang Joon Lee[3], Changhoon Shin[4], Kwang soo Lee[5] and **Dong Woon Lee**, whitegrub@knu.ac.kr[6], [1]Korea Forest Research Institute, Seoul, South Korea, [2]Gyeongsang National Univ., Jinju, South Korea, [3]Gyeongsangbukdo Forest and Environment Research Institute, Gyeongju, South Korea, [4]Jeju special Self-Governing Province Research Institute of Hallasan, Jeju, South Korea, [5]Southern Forest Research Center, Jinju, South Korea, [6]Kyungpook National Univ., Sangju, South Korea

7:56 Break

8:10 Introductory remarks for student competition

8:15 1741 The potential roles of conspecific body odors and plant volatiles in unmated *Mogulones borraginis* (Coleoptera: Curculionidae). **Ikju Park**, park0563@vandals.uidaho.edu, Mark Schwarzländer and Sanford Eigenbrode, Univ. of Idaho, Moscow, ID

8:27 1742 The identification of insecticidal active constituents of thyme essential oil via different application methods. **Jun-hyung Tak**, saturnpg7@yahoo.com, Univ. of British Columbia, Vancouver, BC, Canada

8:39 1743 Rice grasshopper (*Oxya japonica japonica)* ingestion and exercise training will affect the energy metabolism in mice? Sungpil Ryu, Hyobin Seo and **Yiseul Kim**, ratsnjoy@gmail.com, Kyungpook National Univ., Sangju, South Korea

8:51 1744 Genetic structure of *Laodelphax striatellus* Fallén (Hemiptera: Delphacidae) populations in South Korea. **Byungin Sohn**, qnodl@naver.com, Seoul National Univ., Seoul, South Korea

9:03 1745 Transcriptomics of tick salivary glands. **Donghun Kim**, kp5091@k-state.edu and Yoonseong Park, Kansas State Univ., Manhattan, KS

9:15 Concluding Remarks

Organized Meeting: The Coleopterist's Society Annual Meeting

A107-109 (Oregon Convention Center)

Moderators and Organizers: Robert S. Anderson[1] and Victoria Bayless[2], [1]Canadian Museum of Nature, Ottawa, ON, Canada, [2]Louisiana State Univ., Baton Rouge, LA

7:30 Welcoming Remarks

7:35 Introductory Remarks

7:40 1746 More than what you eat: what drives leaf-beetle diversity? **Caroline S. Chaboo**, cschaboo@ku.edu, Univ. of Kansas, Lawrence, KS

8:30 Break

8:45 Business Meeting

9:45 Concluding Remarks

TUESDAY, NOVEMBER 18, 2014, POSTERS

Section Poster Session 1: MUVE

Exhibit Hall C (Oregon Convention Center)

D3212 Disruption of multiple *Ixodes scapularis* midgut serine protease inhibitors by using chimeric double standed RNA. **Mariam Bakshi**, mariambakshi@tamu.edu and Albert Mulenga, Texas A&M Univ., College Station, TX

D3213 Ecology affecting blacklegged ticks in northern WI including deer activity, small mammal communities, vegetation and climate. **Scott Larson**, srlarson3@wisc.edu, Univ. of Wisconsin, Madison, WI

D3214 24h fed *Ixodes scapularis* tick saliva immunoproteome. **Lauren Lewis**, lspike99@neo.tamu.edu, Albert Mulenga, Lindsay Porter, Tae Kim and Zeljko Radulovic, Texas A&M Univ., College Station, TX

D3215 Integrated control of the blacklegged tick (*Ixodes scapularis*) in a Lyme disease endemic community. Laura Estep, **Kirby C. Stafford III**, Kirby.Stafford@ct.gov, Scott Williams and Goudarz Molaei, Connecticut Agricultural Experiment Station, New Haven, CT

D3216 Cysteine peptidase-like and cystatin-like proteins in *Amblyomma americanum* and *Ixodes scapularis* saliva. Tae Kim, Lucas Tirloni, Zeljko Radulovic and **Albert Mulenga**, amulenga@ag.tamu.edu, Texas A&M Univ., College Station, TX

D3217 Predicting the Lyme disease vector range expansion: A modeling approach for New York State. **Camilo Khatchikian**, camilok@sas.upenn.edu[1], Melissa Prusinski[2], Melissa Stone[3], Lisa Meehan[2], P. Bryon Backenson[2], Ing-Nang Wang[3], Michael Z. Levy[4] and Dustin Brisson[1], [1]Univ. of Pennsylvania, Philadelphia, PA, [2]New York State Dept. of Health, Albany, NY, [3]Univ. at Albany, Albany, NY, [4]Perelman School of Medicine, Philadelphia, PA

D3218 *Amblyomma americanum* tick saliva contains functional insulin-like growth factor binding protein-related protein 1. **Zeljko Radulovic**, amulenga@tamu.edu, Lindsay Porter, Tae Kim, Mariam Bakshi and Albert Mulenga, Texas A&M Univ., College Station, TX

D3219 Characterization of immunogenic inter-species conserved *Amblyomma americanum* saliva protein, Aa05. Albert Mulenga, **Lindsay Porter**, lindsayporter84@gmail.com and Taelor Pastine, Texas A&M Univ., College Station, TX

D3220 CO_2 attractant allows collection of hundreds of ticks from 60 locations within 2 hours. **David Gordon**, dgordon@pittstate.edu[1], Ali Hroobi[1] and Ram Raghavan[2], [1]Pittsburg State Univ., Pittsburg, KS, [2]Kansas State Univ., Manhattan, KS

D3221 Indian *Euphlebotomus* phlebotominae (Diptera: Psychodidae) with a description of two new species under genus *Phlebotomus* and subgenus *Euphlebotomus* (Indiana and Donje). **Prakash R. Salunkhe**, salunkhepr.niv@gmail.com, National Institute of Virology, Pune, India

D3222 Interactive key for males of *Fannia* (Diptera: Muscomorpha: Fanniidae) from southeastern Brazil. Cauê T. Mira[1], **Aricio Xavier Linhares**, aricio@unicamp.br[1] and Patrícia J. Thyssen[2], [1]State Univ. of Campinas, Campinas, Brazil, [2]Universidade Federal de Pelotas, Capao do Leao, RS, Brazil

D3223 Is aggregated oviposition by the blow flies *Lucilia sericata* and *Phormia regina* (Diptera: Calliphoridae) really pheromone-mediated? **Bekka Brodie**, bekka.brodie@umit.maine.edu[1], Warren Wong[1], Sherah L. VanLaerhoven[2] and Gerhard Gries[1], [1]Simon Fraser Univ., Burnaby, BC, Canada, [2]Univ. of Windsor, Windsor, ON, Canada

D3224 Interspecific competition among *Pseudacteon spp.* (Diptera: Phoridae), biological control agents of red imported fire ant, *Solenopsis invicta* (Hymenoptera: Formicidae). **Sim Barrow**, smbarrow@uark.edu, Kelly M. Loftin and Ricky F. Corder, Univ. of Arkansas, Fayetteville, AR

D3225 Assessing transstadial transmission of *Salmonella* Montevideo in the horn fly (Diptera: Muscidae). **K. H. Lohmeyer**, kim.lohmeyer@ars.usda.gov[1], P.U. Olafson[1], T. S. Edrington[2] and G.H. Loneragan[3], [1]USDA - ARS, Kerrville, TX, [2]USDA - ARS, College Station, TX, [3]Texas Tech Univ., Lubbock, TX

D3226 Azalea lace bug, *Stephanitis pyrioides* (Scott) (Hemiptera: Tingidae), a new pest for the Pacific Northwest. **James R. LaBonte**, jlabonte@oda.state.or.us and Thomas Valente, Oregon Dept. of Agriculture, Salem, OR

D3227 Nitric oxide as a new fumigant for post-harvest pest control. **Yong-Biao Liu**, YongBiao.Liu@ars.usda.gov, USDA - ARS, Salinas, CA

D3228 OFF with their heads! In the competition for fire ant hosts, is *Pseudacteon curvatus* delivering a knock-out punch? **Kelly Palmer**, ridleka@auburn.edu, Kathy Flanders and L. C. Graham, Auburn Univ., Auburn, AL

D3229 Food choice among different species of house dust mites. **Larry Arlian**, larry.arlian@wright.edu and Marjorie Morgan, Wright State Univ., Dayton, OH

D3230 Differential access to hosts sleeping in hammock or bed by Chagas disease vector *Triatoma dimidiata*. Etienne Waleckx[1], Rafael Pasos-Alquicira[1], Maria Jesus Ramirez-Sierra[1], **Claudia Herrera**, cherrera@tulane.edu[2] and Eric Dumonteil[1], [1]Universidad Autónoma de Yucatan, Merida, Mexico, [2]Tulane Univ., New Orleans, LA

D3231 Perception, health threat and control of the German cockroach remains a challenge in rural communities of North Carolina. **Beatrice N. Dingha**, bndingha@ncat.edu and Louis EN. Jackai, North Carolina A&T State Univ., Greensboro, NC

D3232 Mechanisms of inbreeding avoidance in the Chilean termite *Neotermes chilensis* (Isoptera: Kalotermitidae). **Daniel Aguilera-Olivares**, daguilera@abulafia.ciencias.uchile.cl[1], Luis Flores-Prado[2], David Veliz[1] and Hermann Niemeyer[1], [1]Universidad de Chile, Santiago, Chile, [2]Universidad Metropolitana de Ciencias de la Educacion, Santiago, Chile

D3233 Behavioral polymorphism of worker and soldier *Coptotermes formosanus* during panic escape. **Cai Wang**, howangcai@gmail.com, Gregg Henderson, Bal K. Gautam, Jie Chen and Dependra Bhatta, Louisiana State Univ., Baton Rouge, LA

D3234 Point of no return from water loss in *Coptotermes formosanus*. **Bal K. Gautam**, bgauta3@tigers.lsu.edu and Gregg Henderson, Louisiana State Univ., Baton Rouge, LA

D3235 Managed honey bees (*Apis mellifera*) in north Florida, New World Carniolan vs. Italian, colony health and *Varroa* load. **Robert Horsburgh**, rob.horsburgh@freshfromflorida.com, Florida Dept. of Agriculture and Consumer Services, Jacksonville, FL

D3236 Managing odorous house ants with a perimeter liquid baiting system. **Karen M. Vail**, kvail@utk.edu and Jennifer Chandler, Univ. of Tennessee, Knoxville, TN

D3237 Basic biology of an invasive ant pests: Intraspecific aggression and longevity in the dark rover ant (*Brachymyrmex patagonicus*). Paul B. Baker and **Javier G. Miguelena**, javierm@email.arizona.edu, Univ. of Arizona, Tucson, AZ

D3238 Efficacy of Termidor® SC and Alpine® WSG on tawny crazy ant, *Nylanderia fulva* (Mayr) Hymenoptera: Formicidae, in Calcasieu Parish, Louisiana. **Dennis R. Ring**, dring@agctr.lsu.edu[1], and Robert Davis[2], [1]Louisiana State Univ., Baton Rouge, LA [2]BASF Corporation, Pflugerville, TX

D3239 Evaluation of trapping for use in managing western yellowjacket and other pest vespids in Northern Colorado. **Whitney Cranshaw**, Whitney.Cranshaw@ColoState.edu, Kellie Due and Rachael Sitz, Colorado State Univ., Fort Collins, CO

D3240 Sublethal effects of *Active*Guard® exposure on feeding success and fecundity of the bed bug (*Cimex lectularius*). **Frances S. Sivakoff**, Sivakoff.3@osu.edu, Susan C. Jones, Kara S. Baker and Joshua L. Bryant, The Ohio State Univ., Columbus, OH

D3241 Effects of larval competition on vectorial capacity parameters of *Aedes aegypti* and *Aedes albopictus*. **Barry W. Alto**, bwalto@ufl.edu, Univ. of Florida, Vero Beach, FL

Section Poster Session 1: PBT

Exhibit Hall C (Oregon Convention Center)

D3242 Synergistic effects of heat and diatomaceous earth treatment for the control of *Plodia interpunctella* (Lepidoptera: Pyralidae). **Kyeong-Yeoll Lee**, leeky@knu.ac.kr[1], Hanna Kim[1] and Yeon Yu[2], [1]Kyungpook National Univ., Daegu, South Korea, [2]Catchers Co. Ltd., Gimae, South Korea

D3243 Influence of fungus volatile components on attraction of the fungus gnat (*Neoempheria sp.*) unique sex pheromones. **Masahiko Tokoro**, tokoro@affrc.go.jp, Hiroshi Kitajima and Atsushi Kato, Forestry and Forest Products Research Institute, Tsukuba, Japan

D3244 Antennal transcriptome analysis of the Red Palm Weevil, *Rhynchophorus ferrugineus*, to characterize the pheromone receptors. Binu Antony, Alan Soffan, **Saleh A. Aldosari**, aldosari95@hotmail.com and Abdulrahman Saad Aldawood, King Saud Univ., Riyadh, Saudi Arabia

D3245 Novel simple method to collect alarm pheromone from brown citrus aphid, *Toxoptera citricida* (subfamily Aphididae). **Serine Alfares**, serine@ufl.edu and Nabil Killiny, Univ. of Florida, Lake Alfred, FL

D3246 Antennal sensilla of the Mexican soybean weevil, *Rhyssomatus nigerrimus* (Coleoptera: Curculionidae). **Elsy Delgado-García**, elsydelgado@gmail.com[1], Juan Cibrián-Tovar[1], Jorge Valdez-Carrasco[1], Antonio Terán-Vargas[2] and Ricardo Castro-Torres[1], [1]Colegio de Postgraduados, Montecillo, Mexico, [2]INIFAP, Cuauhtemoc, Mexico

D3247 Molecular mechanisms of *Tetranychus urticae* chemical adaptation in hops field. **Fang Zhu**, fang.zhu@wsu.edu[1], Jon Bull[1], Tara Piraneo[2], Douglas B Walsh[2] and Laura C Lavine[1], [1]Washington State Univ., Pullman, WA, [2]Washington State Univ., Prosser, WA

D3248 Potential roles for D9-desaturase and MAPK- ATF-2 signaling transduction pathways in the desiccation-enhanced RCH response in *Sarcophaga bullata*. **Shu-Xia Yi**, yis@miamioh.edu and Richard E. Lee, Miami Univ., Oxford, OH

D3249 Rapid, mild desiccation enhances RCH response in the flesh fly, *Sarcophaga bullata*. Shu-Xia Yi, J.D. Gantz and **Richard E. Lee**, leere@miamioh.edu, Miami Univ., Oxford, OH

D3250 Development of a feeding assay to deliver bioactive molecules to varroa mites, *Varroa destructor* (Anderson & Trueman). **Ana Cabrera**, ana.cabrera@bayer.com[1], Paul D. Shirk[2] and Peter E. A. Teal[2], [1]Univ. of Florida, Gainesville, FL, [2]USDA - ARS, Gainesville, FL

D3251 Breeding honey bees: From evolutionary and functional genomics to sociology. **Elina L. Niño**, elnino@psu.edu[1], Mariana Wolfner[2], and Chloe Silverman[3],[1]Pennsylvania State Univ., Univ. Park, PA, [2]Cornell Univ., Ithaca, NY, [3]Drexel Univ., Philadelphia, PA

D3252 Alternative spliced orcokinins and their potential functions in *Tribolium castaneum*. **Hongbo Jiang**, jianghb@k-state.edu, Hong Geun Kim and Yoonseong Park, Kansas State Univ., Manhattan, KS

D3253 Determination of *n*-methyl-2-pyrrolidone and metabolites in honey bees using LC-ESI-MS. **Julia Fine**, jdf250@psu.edu[1], Chris Mullin[2] and Jing Chen[2], [1]Pennsylvania State Univ., Univ. Park, PA, [2]Pennsylvania State Univ., State College, PA

D3254 Population dynamics and growth rates of endosymbionts during *Diaphorina citri* (Hemiptera, Liviidae) ontogeny. **Fabio Dossi**, fdossi@usp.br and Fernando L Cônsoli, Univ. of Sao Paulo, Piracicaba, Brazil

D3255 Cuticular and Dufour's gland chemistry of two solitary cavity-nesting bees. **Theresa L. Pitts-Singer**, Theresa.Pitts-Singer@ars.usda.gov[1], Marcia Hagen[2], Bryan Helm[3], Steven Highland[4] and William P. Kemp[2], [1]USDA - ARS, Logan, UT, [2]USDA - ARS, Fargo, ND, [3]North Dakota State Univ., Fargo, ND, [4]Utah State Univ., Logan, UT

D3256 Detection of Deformed Wing Virus (DWV) in honeybee (*Apis mellifera L.*) and Varroa mites (*Varroa destructor*) and Kakugo Virus (KV) in aggressive honeybees using RT-PCR in Egypt. **Emtithal Abd-El-Samie**, emtithal_a@yahoo.com[1], Fatma Adham[1], Sawsan El-Mohandes[2] and Heba Seyam[2], [1]Cairo Univ., Cairo, Egypt, [2]Plant Protection Research Institute, Cairo, Egypt

D3257 Gene expression of aposymbiotic nymphs of the invasive kudzu bug, *Megacopta cribraria*. **Margaret L. Allen**, meg.allen@ars.usda.gov, USDA - ARS, Stoneville, MS

D3258 RNAseq and a fused neo-Z chromosome yields insight into dosage compensation and sex chromosome evolution in Lepidoptera. **Liuqi Gu**, lg356@cornell.edu and Douglas Knipple, Cornell Univ., Geneva, NY

D3259 Thermoregulation on nest in *Polistes dominula*. **Susan Weiner**, sweiner02@roosevelt.edu and Briana DeMasters, Roosevelt Univ., Chicago, IL

D3260 Germline transformation of the western corn rootworm (*Diabrotica virgifera virgifera*). **Marcé Lorenzen**, Marce_Lorenzen@ncsu.edu, Fu-Chyun Chu, Stephanie L. Gorski and Yasmin Cardoza, North Carolina State Univ., Raleigh, NC

D3261 Seasonal and geographical variation in diapause and cold hardiness of the Asian corn borer, *Ostrinia furnacalis*. Hai-Cui Xie[1], Dun-Song Li[2], Hong-Gang Zhang[1], **Charles E. Mason**, mason@udel.edu[3], Zhen-Ying Wang[1], Xin Lu[4], Wan-Zhi Cai[5] and Kang-Lai He[1], [1]Chinese Academy of Agricultural Sciences, Beijing, China, [2]Guangdong Academy of Agricultural Sciences, Guangzhou, China, [3]Univ. of Delaware, Newark, DE, [4]Jilin Academy of Agricultural Sciences, Jilin, China, [5]China Agricultural Univ., Beijing, China

D3262 The effect of diapause on stress tolerance in migratory milkweed bugs, *Oncopeltus fasciatus*. **Charles-Antoine Dean**, cedean2@illinois.edu[1], Nicholas M. Teets[2], and David Denlinger[3], [1]Univ. of Illinois, Urbana, IL, [2]Univ. of Florida, Gainesville, FL, [3]The Ohio State Univ., Columbus, OH

D3263 Characterization of gut microbiota associated with nondiapausing and diapausing northern house mosquitoes, *Culex pipiens*. **Elise Szuter**, szuterem@mail.uc.edu[1], Zakee Sabree[2] and Joshua B. Benoit[1], [1]Univ. of Cincinnati, Cincinnati, OH, [2]The Ohio State Univ., Columbus, OH

D3264 Molecular characterization and expression analysis of prothoracicotropic hormone in the flesh flies, *Sarcophaga bullata* and *S. crassipalpis*. **Qirui Zhang**, zhang.571@osu.edu and David Denlinger, The Ohio State Univ., Columbus, OH

D3265 Juvenile hormone biosynthesis in mosquitoes: An update. **Crisalejandra Rivera-Perez**, cririver@fiu.edu, Marcela Nouzova and Fernando Noriega, Florida International Univ., Miami, FL

D3266 Collecting live crepuscular and nocturnal Strepsiptera. **Marisano James**, mjajames@ucdavis.edu, Univ. of California, Davis, CA

D3267 Ecological characteristics and environment-friendly control strategies of the 28-spotted larger potato ladybird, *Henosepilachna vigintioctomaculata* (Coleoptera: Coccinellidae) in the Chinese boxthorn field. **Tae-Hee Ryu**, fbxogml89@naver.com, Na-Yeon Ko, Yu-Bin Jung, Chan-yeong Kang, Hye-Ri Kwon, Mi-Ja Seo, Yong-Man Yu and Young-Nam Youn, Chungnam National Univ., Daejeon, South Korea

Section Poster Session 1: SysEB

Exhibit Hall C (Oregon Convention Center)

D3268 Phenological attributes and phylogenetic relationships of *Rhagoletis juniperina* Marcovitch (Diptera: Tephritidae). Megan Frayer[1], Daniel Hulbert[1], Serdar Satar[2] and **James J. Smith**, jimsmith@msu.edu[1], [1]Michigan State Univ., East Lansing, MI, [2]Cukurova Univ., Adana, Balcali, Turkey

D3269 Genetic characterization of hard and soft ticks (Order Ixodida) from the Kurdistan region of Iraq. **Shamal Al-Muffti**, shamalmuffti100@yahoo.com[1], Daniel Hulbert[2] and James J. Smith[2], [1]Univ. of Duhok, Duhok, Iraq, [2]Michigan State Univ., East Lansing, MI

D3270 Invasion dynamics of *Wolbachia* bacteria in populations of the wasp, *Trichomalopsis sarcophagae* (Pteromalidae). **Kevin Floate**, Kevin.Floate@agr.gc.ca and Paul Coghlin, Agriculture & Agri-Food Canada, Lethbridge, AB, Canada

D3271 Microbiome of blow flies (Diptera; Calliphoridae) associated with human cadavers. **Raymond Berry**, rxb012@shsu.edu[1], Keli King[1], Daniel Haarmann[1], Joseph Petrosino[2], Aaron Lynne[1] and Sibyl Bucheli[1], [1]Sam Houston State Univ., Huntsville, TX, [2]Baylor Univ., Houston, TX

D3272 Microbiome of flesh flies (Diptera; Sarcophagidae) associated with human cadavers. **Keli King**, klk020@shsu.edu[1], Raymond Berry[1], Daniel Haarmann[1], Joseph Petrosino[2], Sibyl Bucheli[1] and Aaron Lynne[1], [1]Sam Houston State Univ., Huntsville, TX, [2]Baylor Univ., Houston, TX

D3273 The scarab beetles of San Diego County, California: A poster illustrating all currently known species. **Guy Hanley**, guy.hanley@minotstateu.edu[1] and Ron McPeak[2], [1]Minot State Univ., Minot, ND, [2]Battle Ground, WA

D3274 A state-wide survey of the Coleoptera emergent from dead twigs in Louisiana. **Michael Ferro**, spongymesophyll@gmail.com and Christopher E. Carlton, Louisiana State Univ., Baton Rouge, LA

D3275 Elateroid beetles of the Bahamas: Present and future diversity. **Paul J. Johnson**, Paul.johnson@sdstate.edu, South Dakota State Univ., Brookings, SD

D3276 Indicator taxa of disturbance and diversity in seral stage clear-cut forest stands. **Collin Peterson**, petecoll@onid.orst.edu, Northwest Entomolgical Research Center, Corvallis, OR

D3277 A Survey of the spider diversity on the Sam D. Hamilton Noxubee National Wildlife Refuge. **Breanna Lyle**, bl334@msstate.edu and John Guyton, Mississippi State Univ., Mississippi State, MS

D3278 Survey of insect diversity for South East Farallon Island. **Bret Robinson**, bretwr3@gmail.com, San Jose State Univ., Cupertino, CA

D3279 Invasive coccinellids force native species out of agricultural habitats. **John Losey**, jel27@cornell.edu, Evan Hoki, Rebecca Smyth, Rakim Turnipseed, Todd Ugine and Leslie Allee, Cornell Univ., Ithaca, NY

D3280 New species of *Pseudanophthalmus* from western Kentucky caves. **Olivia Boyd**, olivia.boyd081@topper.wku.edu[1], and T. Keith Philips[2], [1]Univ. of Georgia, Athens, GA, [2]Western Kentucky Univ., Bowling Green, KY

D3281 Biodiversity of ground beetles (Coleoptera: Carabidae) along a gradient of land use in Zambia. **Donald Chungu**, donald.chungu@gmail.com[1], Amos Sakala[2], Maxwell Daka[2], Nchimunya Hachilala[2] and Roland Brandl[1], [1]Univ. of Marburg, Marburg, Germany, [2]Copperbelt Univ., Kitwe, Zambia

D3282 Pacific Northwest sawflies: New discoveries, historical patterns of sampling effort, and the development of web-based biodiversity informatics. **Chris Looney**, clooney@agr.wa.gov[1], WA, David R. Smith[2], Rachel Olsson[3], Merrill A. Peterson[4], and Sharon Collman[5], [1]Washington State Dept. of Agriculture, Olympia, [2]Smithsonian Institution National Museum of Natural History, Washington, DC, [3]The Evergreen State College, Olympia, WA, [4]Western Washington Univ., Bellingham, WA, [5]Washington State Univ., Everett, WA

D3283 A preliminary insect biodiversity survey of the Christmas Mountains, Brewster Co. Tx. **Brent C. Rahlwes**, stdbcr16@snsu.edu, Sibyl Bucheli and Melissa S. Sisson, Sam Houston State Univ., Huntsville, TX

D3284 New digital identification tool of microlepidoptera on Solanaceae. James E. Hayden[1], **Sangmi Lee**, microlepi@hotmail.com[2], James Young[3], Jean-François Landry[4], Vazrick Nazari[4], Richard Mally[5], Louis Somma[1] and Kurt Ahlmark[1], [1]Florida Dept. of Agriculture and Consumer Services, Gainesville, FL, [2]Arizona State Univ., Tempe, AZ, [3]USDA - APHIS - PPQ, Baltimore, MD, [4]Agriculture & Agri-Food Canada, Ottawa, ON, Canada, [5]Senckenberg Naturhistorische Sammlungen, Dresden, Germany

D3285 Recent range expansion of the maize weevil S*itophilus zeamais*. **Alberto Correa**, ascorrea@usp.br[1], Raul Narciso C. Guedes[2], Lucas Braga[2], Gislaine Carvalho[2] and Luiz Orlando Oliveira[2], [1]Universidade de São Paulo, Piracicaba, Brazil, [2]Universidade Federal de Viçosa, Vicosa, Brazil

D3286 Exotic species dominate the woodboring insect community in a hardwood biomass plantation. **David R. Coyle**, dcoyle@warnell.uga.edu, Courtney Brissey and Kamal Gandhi, Univ. of Georgia, Athens, GA

D3287 Prey diversity of *Cerceris fumipennis* in Connecticut. **Claire E. Rutledge**, Claire.Rutledge@ct.gov, Connecticut Agricultural Experiment Station, New Haven, CT

D3288 A detailed morphological study of head stridulatory structure and related pronotal structures in ischyrosonychine tortoise beetles (Coleoptera: Chrysomelidae: Cassidinae). **Chulwoo Shin**, shinio@ku.edu, Univ. of Kansas, Lawrence, KS

D3289 Results of the 2013-2014 Wood Boring Beetle Surveys from the Regional Identification Center of the USDA-APHIS (Eastern Region) at Mississippi State University. **Jennifer Seltzer**, jls30@entomology.msstate.edu, Richard Brown and Terence Schiefer, Mississippi State Univ., Mississippi State, MS

D3290 Biology of *Compsobata univitta* (Walker, 1849) (Diptera: Micropezidae). **Jeffrey K. Barnes**, jbarnes@uark.edu, Univ. of Arkansas, Fayetteville, AR

D3291 The benefit of being a social butterfly: Communal roosting deters predation. **Susan D. Finkbeiner**, sfinkbei@uci.edu[1], Adriana D. Briscoe[1] and Robert Reed[2], [1]Univ. of California, Irvine, CA, [2]Cornell Univ., Ithaca, NY

D3292 The 2014 emergence of a previously unrecognized 13-year brood of periodical cicadas in southwestern Ohio and northern Kentucky. **Gene Kritsky**, cdarwin@aol.com[1], and Roy Troutman[2], [1]Mount St. Joseph Univ., Cincinnati, OH,[2]Batavia, OH

D3293 Pasture matrix promotes the increase of generalist ant species in forest fragments. Diego Santana Assis[1], **Evaldo Ferreira Vilela**, evaldovilela@gmail.com[1], Flavio Ramos[2] and Iracenir A. Dos Santos[1], [1]Federal Univ. of Viçosa, Viçosa, Brazil, [2]Universidade Federal de Alfenas, Alfenas, Brazil

D3294 Diversity and evolution of army ant syndrome and breeding system in the oriental *Leptogenys* ants. **Koichi Arimoto**, kou.arimoto@gmail.com and Munetoshi Maruyama, Kyushu Univ., Fukuoka-shi, Japan

D3295 Factors underlying the investment in alates vs. apterous morphs in the gall-dwelling aphid *Tamalia inquilinus*. **Clara Buchholtz**, cbuchholtz@mail.csuchico.edu, California State Univ., Chico, CA

D3296 Ecological viability of land between the Lakes National Recreation Area, Kentucky, as a potential reintroduction site for the federally endangered American burying beetle *(Nicrophorus americanus)*. **Carmen Greenwood**, cgreenwood1@murraystate.edu, James Hardin, Paul Gagnon, Terry Derting, Heather Passmore, Jane Benson, Nicholas Cash and David Kesler, Murray State Univ., Murray, KY

D3297 Emergence of periodical cicadas (*Magicicada* spp.) of Brood II in Connecticut in 2013. **Chris Maier**, Chris.Maier@ct.gov, Connecticut Agricultural Experiment Station, New Haven, CT

D3298 Sexual vs. asexual reproduction in a stick insect (*Megaphasma dentricus*). **Tara Maginnis**, maginnis@up.edu, Univ. of Portland, Portland, OR

D3299 Resource use on native and introduced host species: A view from the common buckeye butterfly. **Alyssa Roddy**, Alyssa.Roddy@selu.edu and Janice L. Bossart, Southeastern Louisiana Univ., Hammond, LA

D3300 Impacts of a controlled burn on foraging behavior of ants in a sandplain forest of Vermont. **Hillary A. Miller**, hmiller@mail.smcvt.edu and Valerie S. Banschbach, Saint Michael's College, Colchester, VT

D3302 Intrinsic vs extrinsic factors influencing susceptibility to a fungal pathogen in the tropical termite, *Nasutitermes acajutlae*. **Claire A. Fuller**, cfuller@murraystate.edu[1], Savannah Bell[1] and Rebeca Rosengaus[2], [1]Murray State Univ., Murray, KY, [2]Northeastern Univ., Boston, MA

D3303 Extreme weather events and native bees: Effects of the 2013 Colorado Flood. **Virginia L. Scott**, Virginia.Scott@colorado.edu, Adrian L. Carper and M. Deane Bowers, Univ. of Colorado, Boulder, CO

D3304 Cytological mechanism of *Cardinium*-induced cytoplasmic incompatibility in *Encarsia pergandiella* (Hymenoptera: Aphelinidae). **Marco Gebiola**, marco.gebiola@gmail.com[1], Suzanne E. Kelly[1], Massimo Giorgini[2] and Martha S. Hunter[1], [1]Univ. of Arizona, Tucson, AZ, [2]National Research Council of Italy, Portici, Italy

D3305 Evolution of nesting behavior and diversification of Ageniellini spider wasps (Hymenoptera: Pompilidae). **Cecilia Waichert**, cwaichert@gmail.com, James P. Pitts and Carol D. von Dohlen, Utah State Univ., Logan, UT

D3306 The effects of initial conditions on blowfly (Diptera: Calliphoridae) oviposition. **Christine Melvin**, cmmelvin@ucdavis.edu, Univ. of California, Goleta, CA

D3307 The impact of prescribed burning on native bee communities in longleaf pine (*Pinus palustris*) savannas in the North Carolina Sandhills. **Heather M.C. Moylett**, hmcampbe@ncsu.edu[1], Clyde E. Sorenson[1], Andrew R Deans[2] and Nick M. Haddad[1], [1]North Carolina State Univ., Raleigh, NC, [2]Pennsylvania State Univ., Univ. Park, PA

D3308 Global variation in microbiomes of *Diaphorina citri*, a vector of *Candidatus* Liberibacter asiaticus. **W Braswell**, Evan.Braswell@aphis.usda.gov[1], Erin Schuenzel[2] and Mark Scally[2], [1]USDA, Edinburg, TX, [2]Univ. of Texas, Edinburg, TX

Section Poster Session 1: P-IE

Exhibit Hall C (Oregon Convention Center)

D3309 A next-generation sequencing approach for detecting field-evolved resistance to Bt crops. **Megan Fritz**, mlfritz@ncsu.edu and Fred Gould, North Carolina State Univ., Raleigh, NC

D3310 Global transcriptome profiling of two pest ambrosia beetles (Coleoptera: Scolytinae). **David Held**, dwh0004@auburn.edu, Lee Zhang and Charles H. Ray, Auburn Univ., Auburn, AL

D3311 Post-cephalic sensory organs of third instar *Lasioptera donacis* in relation to feeding behavior. **Donald B. Thomas**, donald.thomas@ars.usda.gov and John A. Goolsby, USDA - ARS, Edinburg, TX

D3312 Multitrophic relationships of *Chilophaga virgati* Gagné (Diptera: Cecidomyiidae) and biomass switchgrass (*Panicum virgatum* L.). **Manuel Perilla Lopez**, juan.perilla@sdstate.edu, South Dakota State Univ., Brookings, SD

D3313 Glutathione is involved in plant defense against the gall midge *Mayetiola destructor*. **Xuming Liu**, xmliu@ksu.edu[1], Shize Zhang[2], R. Jeff Whitworth[1], Jeffrey J. Stuart[3] and Ming-Shun Chen[4], [1]Kansas State Univ., Manhattan, KS, [2]Northwest Agriculture & Forestry Univ., Yangling, China, [3]Purdue Univ., West Lafayette, IN, [4]USDA - ARS, Manhattan, KS

D3314 Effect of host plant resistance and a grass intercrop on potato leafhopper (*Empoasca fabae*) and its natural enemies in alfalfa. **Phoenixia Rene**, phrene@ursinus.edu, Jamie Faselt, Michael Melchiorre, Kimberly Realbuto, Damian Schell, Matthew Scott and Cory Straub, Ursinus College, Collegeville, PA

D3315 Western grape leafhopper populations are suppressed by the application of buprofezin or cyclaniliprole but stimulated by flonicamid. **Richard Hilton**, richard.hilton@oregonstate.edu and Shannon Davis, Oregon State Univ., Central Point, OR

D3316 Phytoplasma biodiversity in grapevines and leafhoppers sampled in vineyards of Quebec. Chrystel Olivier[1], **Charles Vincent**, charles.vincent@agr.gc.ca[2], Julien Saguez[2], Jacques Lasnier[3] and Tim Dumonceaux[1], [1]Agriculture & Agri-Food Canada, Saskatoon, SK, Canada, [2]Agriculture & Agri-Food Canada, Saint-Jean-sur-Richelieu, QC, Canada, [3]Ag-Cord, Inc., Granby, QC, Canada

D3317 Multiple, stochastic factors can determine acquisition success of the foregut-borne bacterium, *Xylella fastidiosa*, by a sharpshooter vector. **Elaine Backus**, Elaine.Backus@ars.usda.gov[1], Elizabeth Rogers[1] and Fabien Labroussaa[2], [1]USDA - ARS, Parlier, CA, [2]Univ. of California, Berkeley, CA

D3318 Vector activity and incidence of Pierce's disease in Arizona vineyards. **Steven J. Castle**, steven.castle@ars.usda.gov, Paul Merten and Charles Cowden, USDA - ARS, Maricopa, AZ

D3319 Belowground population dynamics of grape phylloxera (*Daktulosphaira vitifoliae* Fitch, Phylloxeridae) in cool climate viticulture. **Mark Hoffmann**, mark.hoffmann@ufl.edu[1], Lars Huber[2], Ernst Ruehl[3], and Gerhard Eisenbeis[4], [1]Univ. of Florida, Lake Alfred, FL, [2]SCC GmbH, Bad Kreuznach, Germany, [3]Univ. of Geisenheim, Geisenheim, Germany, [4]Univ. of Mainz, Mainz, Germany

D3320 Areawide mating disruption for control of vine mealybug (*Planococcus ficus*) in Napa vineyards. **Brian N. Hogg**, hoggbrian@yahoo.com[1], Monica Cooper[2] and Kent M. Daane[1], [1]Univ. of California, Berkeley, CA, [2]Univ. of California, Napa, CA

D3321 Monitoring aphid vectors of potato virus Y in Minnesota and North Dakota. **Nathan Russart**, russ0228@umn.edu, Univ. of Minnesota, Crookston, MN and Ian MacRae, Univ. of Minnesota, Saint Paul, MN

D3322 Barley Yellow Dwarf Virus complex: Comparing vector-plant-pathogen interaction in winter wheat varieties. **Mahnaz Rashidi**, mrashidi@uidaho.edu[1], Juliet Marshall[1], Nilsa Bosque-Pérez[2] and Arash Rashed[1], [1]Univ. of Idaho, Aberdeen, ID, [2]Univ. of Idaho, Moscow, ID

D3323 Aphid population fluctuations and patterns of species dominance in Puerto Rico. **David A. Jenkins**, David.Jenkins@ars.usda.gov and Ricardo Goenaga, USDA - ARS, Mayaguez, PR

D3324 Grape rust mite (*Calepitrimerus vitis*) densities and the development of short shoot syndrome in the Willamette Valley, Oregon. **George D. Hoffman**, george.hoffman@oregonstate.edu, Oregon State Univ., Corvallis, OR

D3325 Role of insects in the dispersal of *Claviceps purpurea*, a fungal pathogen causing ergot disease of grass seed crops. **Navneet Kaur**, Navneet.Kaur@oregonstate.edu[1], Jeremiah Dung[2], Robert Cating[1], Silvia Rondon[1], Stephen Alderman[3], Darrin Walenta[4] and Philip Hamm[1], [1]Oregon State Univ., Hermiston, OR, [2]Oregon State Univ., Madras, OR, [3]USDA - ARS, Corvallis, OR, [4]Oregon State Univ., La Grande, OR

D3326 Soybean aphid (*Aphis glycines*) alarm pheromone production and response. Jamin Dreyer, Jaclyn Eichele, Ray Heinz, Stephen P. Foster, Deirdre Prischmann-Voldseth and **Jason P. Harmon**, jason.harmon@ndsu.edu, North Dakota State Univ., Fargo, ND

D3327 *Rag* virulence at a low frequency among soybean aphids (*Aphis glycines)* occurring in Wisconsin. **Michael S. Crossley**, mcrossley3@gmail.com and David B. Hogg, Univ. of Wisconsin, Madison, WI

D3328 Comparison of insect communities in fungicide and insecticide seed-treated soybeans. **Kelley Tilmon**, kelley.tilmon@sdstate.edu, Adrianna Szczepaniec and Karly Henry, South Dakota State Univ., Brookings, SD

D3329 Environmental interaction data for use in environmental risk assessment of insect-protected soybean. **Sarah Donelson**, sarah.l.donelson@monsanto.com, Duska Stojsin, Aqeel Ahmad, Ignacio Negri-Aranguren and Bernard Sammons, Monsanto Company, St. Louis, MO

D3330 Behavioral plasticity in *Diaphorina citri* feeding on different citrus tissues. **Timothy Ebert**, tebert@ufl.edu[1], Elaine Backus[2] and Michael Rogers[1], [1]Univ. of Florida, Lake Alfred, FL, [2]USDA - ARS, Parlier, CA

D3331 Responses of D*iaphorina citri* Kuw. (Hemiptera: Liviidae) to mixtures of β-ocimene, d-limonene and methyl salicylate, under controlled conditions. **Ricardo Castro-Torres**, prometheida@gmail.com, Juan Cibrián-Tovar, Marcos Soto-Hernández and Enrique Arjona-Suárez, Colegio de Postgraduados, Montecillo, Mexico

D3332 Physical barriers to *Diaphorina citri* feeding and transmission of *Candidatus* Liberibacter asiaticus in citrus leaves. **Holly Shugart**, hshugart@ufl.edu and Michael Rogers, Univ. of Florida, Lake Alfred, FL

D3333 Nealta for management of mites in citrus and pears. **Sanjeev Bangarwa**, sanjeev.k.bangarwa@basf.com, Sam Willingham, Curtis Rainbolt, Dawn Brunmeier and Katherine Walker, BASF Corporation, Research Triangle Park, NC

D3334 Semiochemicals assessment in monitoring sugarcane weevil in Morelos, Mexico. **Obdulia Segura-León**, sleon@colpos.mx[1], Marianguadalupe Hernandez-Arenas[2] and Sergio Ramirez-Rojas[2], [1]Colegio de Postgraduados, Texcoco, Mexico, [2]INIFAP, Morelos, Mexico

D3335 Comparative flight responses of the walnut twig beetle, *Pityophthorus juglandis*, to varying release rates of ethanol in combination with aggregation pheromone in California and Tennessee. **Lori J. Nelson**, lnelson@fs.fed.us[1], Alicia Bray[2], Paul L. Dallara[3], William Klingeman[4], Jason Oliver[5] and Steven Seybold[1], [1]USDA - Forest Service, Davis, CA, [2]Central Connecticut State Univ., New Britain, CT, [3]Univ. of California, Davis, CA, [4]Univ. of Tennessee, Knoxville, TN, [5]Tennessee State Univ., McMinnville, TN

D3336 Thousand cankers disease and black walnut: Can outreach crack this tough nut? **Jerome F. Grant**, jgrant@utk.edu[1], Frank Hale[2], Alan Windham[2], Gregory J. Wiggins[1], Mark T. Windham[1], Renee Follum[1], Katheryne Nix[1] and Paris L. Lambdin[1], [1]Univ. of Tennessee, Knoxville, TN, [2]Univ. of Tennessee, Nashville, TN

D3337 Pest resistance in the USDA-ARS sweetpotato germplasm collection. **D. Michael Jackson**, mike.jackson@ars.usda.gov and Howard F. Harrison, USDA - ARS, Charleston, SC

D3338 SEM imaging combined with SEM-EDS analysis enables prediction of resistance of sorghum to storage insects. Michael Pendleton[1], Ann Ellis[2], **Bonnie Pendleton**, bpendleton@wtamu.edu[3], and Niamoye Diarisso[4], [1]Texas A&M Univ., College Station, TX, E. [2]Microscopy Consulting Technologists, Thomasville, GA, [3]West Texas A&M Univ., Canyon, TX, [4]Institut D'Economie Rural, Bamako, Mali

D3339 Chemical variability and leaf damage among lychee varieties, host of the Sri Lanka weevil *Myllocerus undecimpustulatus undatus* Marshall. **Jerome Niogret**, Niogret.Ecology.Consulting@gmail.com[1], Nancy D. Epsky[2], Paul E. Kendra[2] and Peter E. A. Teal[3], [1]Niogret Ecology Consulting LLC, Miami, FL, [2]USDA - ARS, Miami, FL, [3]USDA - ARS, Gainesville, FL

D3340 Eradication of the sweetpotato weevil, *Cylas formicarius elegantulus* (Coleoptera: Curculionidae), from Kume Island, Okinawa, Japan by using a combination of the sterile insect technique and the male annihilation technique. **Dai Haraguchi**, hrguchid@pref.okinawa.lg.jp[1], Takashi Matsuyama[2], Tsuguo Kohama[1], Yasutsune Sadoyama[2], Norikuni Kumano[2], Keiko Ohno-Shiromoto[3] and Takashi Kuriwada[4], [1]Okinawa Prefectural Agricultural Research Center, Itoman, Okinawa, Japan, [2]Okinawa Prefectural Plant Protection Center, Naha, Okinawa, Japan, [3]Ryukyu-Sankei Co. Ltd, Naha, Okinawa, Japan, [4]Kagoshima Univ., Kagoshima, Japan

D3341 Potential use of post-harvest insecticide applications for managment of cowpea curculio (*Chalcodermus aeneus*) in southern peas. **Alton Sparks**, asparks@UGA.EDU, David Riley and Jenna Kicklighter, Univ. of Georgia, Tifton, GA

D3342 Brief biology of pepper weevil, *Anthonomus eugenii* Cano, (Coleoptera: Curculionidae) and its management using new insecticides. **Dakshina Seal**, dseal@lfas.ufl.edu and Catherine Sabines, Univ. of Florida, Homestead, FL

D3343 Potential pests of an endangered composite, Ruth's golden aster (*Pityopsis ruthii*). **Ernest C. Bernard**, ebernard@utk.edu[1], Phillip Wadl[1], Robert Trigiano[1] and Adam Dattilo[2], [1]Univ. of Tennessee, Knoxville, TN, [2]Tennessee Valley Authority, Knoxville, TN

D3344 Effects of orchard floor management on disease and biocontrol. **Jason Schmidt**, jschmidt@msu.edu and Matthew Grieshop, Michigan State Univ., East Lansing, MI

D3345 Selection of *Bacillus thuringiensis* strains active against *Hypothenemus hampei* (Ferrari) (Coleoptera: Curculionidae: Scolytinae). **Janaina Zorzetti**, jzorzetti@hotmail.com[1], Pedro Neves[1], Gislayne Villas Boas[1], Laurival Villas Boas[1], Ana Maria Meneguim[2] and Edlene Barros[2], [1]State Univ. of Londrina, Londrina, Brazil, [2]Agronomic Institute of Paraná, Londrina, Brazil

D3346 Effects of insecticide seed treatments on the sugarcane aphid (*Melanaphis sacchari*) on grain sorghum. **Danielle Sekula**, Danielle.Sekula@ag.tamu.edu, Raul Villanueva and Gabriela Esparza-Díaz, Texas A&M Univ., Weslaco, TX

D3347 Identifying miRNA in green bug (*Schizaphis graminum*) and yellow sugarcane aphid (*Sipha flava*) via high-throughput sequencing. **John Wang**, hwang4@unl.edu[1], Guoqing Lu[2], Michael Wachholtz[2], Chi Zhang[1], Yongchao Dou[1], Tiffany M. Heng-Moss[1] and Gautam Sarath[3], [1]Univ. of Nebraska, Lincoln, NE, [2]Univ. of Nebraska, Omaha, NE, [3]USDA - ARS, Lincoln, NE

D3348 Preliminary results: Development of a sampling plan for black margined aphid (*Monellia caryella*) in pecans. **Mark Muegge**, mmuegge@ag.tamu.edu[1], Allen Knutson[2], and Salvador Vitanza[3], [1]Texas A&M Univ., Fort Stockton, TX, [2]Texas A&M Univ., Dallas, TX, [3]Texas A&M Univ., El Paso, TX

D3349 Canopy spectral reflectance: A potential monitoring tool for sugarbeet root maggot, *Tetanops myopaeformis*. **Ian MacRae**, imacrae@umn.edu[1], and Mark A. Boetel[2], [1]Univ. of Minnesota, Saint Paul, MN, [2]North Dakota State Univ., Fargo, ND

D3350 Refining sugarcane beetle management for the Louisiana sweetpotato industry. **Julien M. Beuzelin**, jbeuzelin@agcenter.lsu.edu[1], Tara P. Smith[2], Theresa F. Arnold[2] and David L. Kerns[3], [1]Louisiana State Univ., Alexandria, LA, [2]Louisiana State Univ., Chase, LA, [3]Louisiana State Univ., Winnsboro, LA

D3351 Efficacy of different insect traps in sweetpotatoes. **Tahir Rashid**, trashid@alcorn.edu[1], Paul J. McLeod[2], and Randall Luttrell[3],[1]Alcorn State Univ., Alcorn State, MS, [2]Univ. of Arkansas, Fayetteville, AR, [3]USDA - ARS, Stoneville, MS

D3352 Digital naturalism: Collaboratively designing technology for holistic ethological interaction. **Andrew Quitmeyer**, andy@quitmeyer.org, Georgia Tech, Atlanta, GA

D3353 Managing imported fire ants with the essential oil of Alaskan yellow cedar (*Cupressus nootkatensis*). **Karla Addesso**, kaddesso@blomand.net, Jason B. Oliver, Paul A. O'Neal and Nadeer N. Youssef, Tennessee State Univ., McMinnville, TN

D3354 Spatio-temporal dynamics of three-way mutualistic interactions. **Matthew O'Neill**, monei003@ucr.edu, Center for Conservation Biology, Riverside, CA

D3355 Bioassays of several insect growth regulators on the little fire ant *Wasmannia auropunctata* (Roger). Arnold Hara, **Susan Cabral**, susancab@hawaii.edu and Ruth Niino-DuPonte, Univ. of Hawai'i, Hilo, HI

D3356 High dynamics and invaders in an ant-plant interaction. **Tina Schroyer**, Tina2@pdx.edu[1], Corrie Moreau[2], Daniel J. Ballhorn[1], Arista Tischner[2], Cristina Sauceda[1] and Stefanie Kautz[1], [1]Portland State Univ., Portland, OR, [2]Field Museum of Natural History, Chicago, IL

D3357 Reproductive performance of *Plutella xylostella* for different cruciferous vegetables across 18 generations. **Caroline Placidi De Bortoli**, carubortoli@yahoo.com.br, Dagmara Gomes Ramalho, Alessandra Marieli Vacari, Rafael Ferreira Santos, Valéria Lucas de Laurentis and Sergio Antonio De Bortoli, Sao Paulo State Univ., Jaboticabal, Brazil

D3358 Preference of *Plutella xylostella* to different cruciferous vegetables across 18 generations. **Sergio Antonio De Bortoli**, bortoli@fcav.unesp.br, Dagmara Gomes Ramalho, Caroline Placidi De Bortoli, Rafael Ferreira Santos, Ana Carolina Pires Veiga and Alessandra Marieli Vacari, Sao Paulo State Univ., Jaboticabal, Brazil

D3359 Regional evaluation of thrips management strategies in runner and Virginia-type peanut. **Mark R. Abney**, mark_abney@ncsu.edu[1], Rick Brandenburg[2], Albert K. Culbreath[1], Ames Herbert[3], Scott Monfort[4] and Rajagopalbabu Srinivasan[1], [1]Univ. of Georgia, Tifton, GA, [2]North Carolina State Univ., Raleigh, NC, [3]Virginia Polytechnic Institute and State Univ., Blacksburg, VA, [4]Clemson Univ., Blackville, SC

D3360 Seasonal occurrence and development of degree-day models for predicting activity of *Acrolepiopsis assectella* (Lepidoptera: Acrolepiidae) in NY onions. **Masanori Seto**, ms545@cornell.edu and Anthony M. Shelton, Cornell Univ., Geneva, NY

D3361 Evaluation of synthetic formulations and formulations of entomopathogenic fungi for control of *Blapstinus* spp. darkling beetle on cantaloupe melon. **Eric T. Natwick**, etnatwick@ucdavis.edu[1], Robert W. Behle[2] and Mark A. Jackson[2], [1]Univ. of California, Holtville, CA, [2]USDA - ARS, Peoria, IL

D3362 Demonstrating companion planting to control insect pests of vegetables. **Jesusa C. Legaspi**, Jesusa.Legaspi@ars.usda.gov and Neil Miller, USDA - ARS, Tallahassee, FL

D3363 Potential of grafted tomatoes to limit damage of aphids, whiteflies and nematodes in Uzbekistan: With special reference to plant volatiles. **Bahodir Eshchanov**, baho83@mail.ru[1], Zsofia Szendrei[1], Jared Ali[1], Frank Zalom[2] and George W. Bird[1], [1]Michigan State Univ., East Lansing, MI, [2]Univ. of California, Davis, CA

D3364 A meta-analytical evaluation of ecological factors driving induced expression of plant volatiles. **Elizabeth Rowen**, erowen@purdue.edu and Ian Kaplan, Purdue Univ., West Lafayette, IN

D3365 Modes of exposure of neonicotinoid insecticides to non-herbivorous insects. **Nilima Prabhaker**, nilima.castle@ucr.edu[1], and Steven J. Castle[2], [1]Univ. of California, Riverside, CA, [2]USDA - ARS, Maricopa, AZ

D3366 Control of water lettuce (*Pistia stratiotes* L.) (Araceae) with water lettuce weevil (*Neohydronomus affinis* Hustache) (Coleoptera: Curculionidae) in Louisiana. **S.J. Johnson**, sjohnson@agcenter.lsu.edu[1], Michael Ferro[1], Michael J. Grodowitz[2], Katherine Parys[3] and Wendell Lorio[4], [1]Louisiana State Univ., Baton Rouge, LA, [2]US Army, Vicksburg, MS, [3]USDA - ARS, Stoneville, MS, [4]Louisiana State Univ., Luling, LA

D3367 Performance of biotypes of the biological control agent, A*phalara itadori* on North American knotweed species and genotypes. **Rob Bourchier**, robert.bourchier@agr.gc.ca[1], Brian Van Hezewijk[2], Fritzi Grevstad[3], and John Gaskin[4], [1]Agriculture & Agri-Food Canada, Lethbridge, AB, Canada, [2]Natural Resources Canada - Canadian Forest Service, Victoria, BC, Canada, [3]Oregon State Univ., Corvallis, OR, [4]USDA - ARS, Sidney, MT

D3368 Biological control for invasive knotweeds in North America using the psyllid *Aphalara itadori*. **Fritzi Grevstad**, fritzi.grevstad@science.oregonstate.edu[1], and Rob Bourchier[2], [1]Oregon State Univ., Corvallis, OR, [2]Agriculture & Agri-Food Canada, Lethbridge, AB, Canada

D3369 Expansion of knapweed seed head fly (*Urophora quadrifasciata*) and other selected herbivorous insects on spotted knapweed in Middle Tennessee. **Donald Sudbrink**, sudbrinkd@apsu.edu, Austin Peay State Univ., Clarksville, TN

D3370 Is kudzu bug (Hemiptera: Plataspidae) on its way to Canada from the U.S.? **Abdullahi Ameen**, abdullahi.ameen@inspection.gc.ca, Canadian Food Inspection Agency, Ottawa, ON, Canada

D3371 Weevil-plant associations revealed by multi-locus plant DNA barcoding. **Guanyang Zhang**, guanyang.zhang@asu.edu, Juyan Pourturk and Nico M. Franz, Arizona State Univ., Tempe, AZ

D3372 Barcoding exotic whitefly in Florida. **Cindy L. McKenzie**, Cindy.McKenzie@ars.usda.gov[1], Aaron Dickey[2], Ian Stocks[3] and Lance Osborne[2], [1]USDA - ARS, Ft. Pierce, FL, [2]Univ. of Florida, Apopka, FL, [3]Florida Dept. of Agriculture and Consumer Services, Gainesville, FL

D3373 Spotted wing drosophila (*Drosophila suzukii)* on diversified farms. **Jamie Christenson**, chrijami@onid.oregonstate.edu[1], Amy J. Dreves[1], Amanda Ohrn[1] and Thomas Peerbolt[2], [1]Oregon State Univ., Corvallis, OR, [2]Peerbolt Crop Management, Inc, Portland, OR

D3374 Biological control of spotted wing Drosophila (*Drosophila suzukii)*. **J. Megan Woltz**, woltzj@onid.orst.edu[1], and Jana C. Lee[2], [1]Oregon State Univ., Corvallis, OR, [2]USDA - ARS, Corvallis, OR

D3375 The spotted wing drosophila (*Drosophila suzukii*) monitoring network in Ohio. **Jim Jasinski**, jasinski.4@osu.edu[1], and Celeste Welty[2], [1]The Ohio State Univ., Urbana, OH, [2]The Ohio State Univ., Columbus, OH

D3376 Seasonal phenology of spotted wing drosophila in Wisconsin. **Christelle Guédot**, guedot@wisc.edu, Univ. of Wisconsin, Madison, WI

D3377 An innovative management approach for spotted wing drosophila (*Drosophila suzukii*) using an environmentally friendly attract and kill formulation. Michael Reinke[1], Richard Cowles[2], Jessica Self[1], Carmem Bernardi[1], Rodrigo Oliveira da Silva[1], **Brittany Poirson**, brittany.poirson@iscatech.com[1], and Agenor Mafra-Neto[1], [1]ISCA Technologies, Inc., Riverside, CA, [2]Connecticut Agricultural Experiment Station, Windsor, CT

D3378 Field decline, MRLs, and efficacy of spinosyns in controlling spotted wing drosophila (*Drosophila suzukii*) in highbush blueberry. **Heather Andrews**, heather.andrews@oregonstate.edu[1], Wei Q. Yang[1], Lynell K. Tanigoshi[2] and Beverly S. Gerdeman[3], [1]Oregon State Univ., Aurora, OR, [2]Washington State Univ., Mt. Vernon, WA, [3]Washington State Univ., Vancouver, WA

D3379 Factors influencing phototactic flight behavior in spotted-wing *drosophila* (*Drosophila suzukii*). **Mark K. Asplen**, asple001@umn.edu and Yusuf Adam, Metropolitan State Univ., Saint Paul, MN

D3380 Trapping systems for *Zaprionus indianus* (Diptera: Drosophilidae). **Nancy D. Epsky**, nancy.epsky@ars.usda.gov[1], Micah A. Gill[1], C. Teri Allen[1], Dong H. Cha[2] and Peter J. Landolt[2], [1]USDA - ARS, Miami, FL, [2]USDA - ARS, Wapato, WA

D3381 Abundance and seasonal occurrence of pest fruit flies (Diptera: Tephritidae) in residential and rural areas of Oahu (Hawaiian Islands). **Luc Leblanc**, leblancl@ctahr.hawaii.edu[1], Brian Fujita[2], Steven Graham[2], Steve McNeil[2] and Kurt Pohlman[2], [1]Univ. of Hawai'i, Honolulu, HI, [2]USDA - APHIS, Waimanalo, HI

D3382 Dynamic interactions by fruit/seed-infesting insects on *Schoepfia schreberi* (Olacaceae). **Maurilio Lopez**, maulopez@uv.mx, Universidad Veracruzana, Xalapa, Mexico

D3383 Effect of fertilization and drought on reproduction and emergence time of the arundo wasp, a biological control agent of arundo. **Patrick J. Moran**, patrick.moran@ars.usda.gov[1], and John A. Goolsby[2], [1]USDA - ARS, Albany, CA, [2]USDA - ARS, Edinburg, TX

D3384 Relative abundance of pests and natural enemies in Oklahoma winter crops. **Casi N. Jessie**, casi.jessie@okstate.edu[1], William Jessie[1], Kris Giles[1], Timothy J. Kring[2], Brian McCornack[3], James R. Hagler[4] and Jessica Magana[1], [1]Oklahoma State Univ., Stillwater, OK, [2]Univ. of Arkansas, Fayetteville, AR, [3]Kansas State Univ., Manhattan, KS, [4]USDA - ARS, Maricopa, AZ

D3385 Feasibility of rearing pinyon sawflies, *Neodiprion edulicolus* Ross (Hymenoptera: Diprionidae), for augmentative biological control of expanding singleleaf pinyon in the Great Basin. **Kirk C. Tonkel**, kirk.tonkel@ars.usda.gov and Brian G. Rector, USDA - ARS, Reno, NV

D3386 Thermal requirements of differents strains of *Telenemus podisi* (Hymenoptera: Platygastridae), in *Oebalus insularis* (Heteroptera: Pentatomidae) eggs. **Bruno Zachrisson**, bazsalam@gmail.com, Onesio Martinez and Guadalupe Gutierrez, IDIAP, Panama, Panama

D3387 Parasitism of *Halyomorpha halys* by indigenous natural enemies in landscape hosts in the Mid-Atlantic states. **Kim A. Hoelmer**, kim.hoelmer@ars.usda.gov[1], Christine Dieckhoff[2], Kathleen Tatman[1] and Ashley Colavecchio[2], [1]USDA - ARS, Newark, DE, [2]Univ. of Delaware, Newark, DE

D3388 Research on field releases of *Podisus maculiventris* (Hemiptera: Pentatomidae) to manage the yellowmargined leaf beetle, *Microtheca ochroloma* (Coleoptera: Chrysomelidae). **Ronald D. Cave**, rdcave@ufl.edu, Pasco B. Avery and Angie A. Niño, Univ. of Florida, Ft. Pierce, FL

D3389 Growth, development, and reproduction of *Podisus maculiventris* (Heteroptera: Pentatomidae) feeding on larvae versus pupae of the factitious prey *Tenebrio molitor* (Coleoptera: Tenebrionidae). **Juan Morales-Ramos**, juan.moralesramos@ars.usda.gov[1], M. Guadalupe Rojas[1], Thomas A. Coudron[2] and Kent S. Shelby[2], [1]USDA - ARS, Stoneville, MS, [2]USDA - ARS, Columbia, MO

D3390 Biological control of *Drosophila suzukii* in the U.S.: Current status and perspectives. **Kent M. Daane**, kdaane@ucanr.edu[1], Xin-geng Wang[1], Gülay Kaçar[1,6], Antonio Biondi[1], Kim A. Hoelmer[2], Betsey Miller[3], Jeffrey C. Miller[3], Peter W. Shearer[4], Massimo Giorgini[5], Emilio Guerrieri[5] and Vaughn Walton[3], [1]Univ. of California, Berkeley, CA, [2]USDA - ARS, Montferrier, France, [3]Oregon State Univ., Corvallis, OR, [4]Oregon State Univ., Hood River, OR, [5]National Research Council of Italy, Portici, Italy, [6]Abant Izzet Baysal University, Bolu, Turkey

D3391 Functional and ovipositional responses of two pupal parasitoids of *Drosophila suzukii*. Gülay Kaçar[1,3], **Antonio Biondi**, antonio.biondi@unict.it[1], Xin-geng Wang[1], David R. Haviland[2] and Kent Daane[1], [1]Univ. of California, Berkeley, CA, [2]Univ. of California, Bakersfield, CA, [3]Abant Izzet Baysal University, Bolu, Turkey

D3392 Monitoring for phorid fly establishment at release sites in middle Tennessee. Karla Addesso[1], **Shannen Leahy**, sleahy91@gmail.com[2] and Jason B. Oliver[1], [1]Tennessee State Univ., McMinnville, TN, [2]Tennessee Tech Univ., Cookeville, TN

D3393 Flight activity of two populations of *Cotesia flavipes* parasitoids reared in the laboratory for 10 generations. **Alessandra Marieli Vacari**, amarieli@ig.com.br, Maíra Trevisan, Valéria Lucas de Laurentis, Ana Carolina Pires Veiga, Rafael Ferreira Santos and Sergio Antonio De Bortoli, Sao Paulo State Univ., Jaboticabal, Brazil

D3394 Survival of the parasitoid *Cotesia flavipes* in a new biodegradable package developed for its commercialization, transport, and release into the field. **Rafael Ferreira Santos**, rsdosantos.rs@gmail.com[1], Caroline Placidi De Bortoli[1], Maíra Trevisan[1], Sergio Leandro De Bortoli[2], Alessandra Marieli Vacari[1]

and Sergio Antonio De Bortoli[1], [1]Sao Paulo State Univ., Jaboticabal, Brazil, [2]Universidade Estadual Paulista, Jaboticabal, Brazil

D3395 Using mark-capture to document natural enemy movement in Oklahoma winter crops. **Kris Giles**, kgiles@okstate.edu[1], Casi N. Jessie[1], James R. Hagler[2], Scott A. Machtley[2], Brian McCornack[3], Timothy J. Kring[4] and William Jessie[1], [1]Oklahoma State Univ., Stillwater, OK, [2]USDA - ARS, Maricopa, AZ, [3]Kansas State Univ., Manhattan, KS, [4]Univ. of Arkansas, Fayetteville, AR

D3396 *Leucopis* spp. (Diptera: Chamaemyiidae) predators of hemlock woolly adelgid in the Pacific Northwest: Potential biological control agents in the eastern U.S. **Darrell W. Ross**, darrell.ross@oregonstate.edu[1], Glenn R. Kohler[2], Sarah M. Grubin[3], Stephen D. Gaimari[4], Nathan Havill[5], and Kimberly F. Wallin[6], [1]Oregon State Univ., Corvallis, OR, [2]Washington Dept. of Natural Resources, Olympia, WA, [3]Massachusetts Dept. of Agricultural Resources, Boston, MA, [4]Plant Pest Diagnostics Branch, Sacramento, CA, [5]USDA - Forest Service, Hamden, CT, [6]USDA - Forest Service, South Burlington, VT

D3397 A biological control demonstration site: An educational resource to enhance management of hemlock woolly adelgid. **Gregory J. Wiggins**, wiggybug@utk.edu[1], Jerome F. Grant[1], Robert Webster[2], Rusty Rhea[3], Elizabeth P. Benton[1] and J. Patrick Parkman[1], [1]Univ. of Tennessee, Knoxville, TN, [2]National Parks Service, Gatlinburg, TN, [3]USDA - Forest Service, Asheville, NC

D3398 Effect of different insecticide programs on *Phytoseiulus persimilis* populations in tomatoes. **Jessica Ditillo**, jlditillo@gmail.com[1], James F. Walgenbach[2] and George G. Kennedy[1], [1]North Carolina State Univ., Raleigh, NC, [2]North Carolina State Univ., Fletcher, NC

D3399 Does deer browsing affect *Tamalia* galling aphid populations on manzanita (*Arctostaphylos* spp.) host plants? **Badri Ghimire**, bghimire@mail.csuchico.edu, California State Univ., Chico, CA

D3400 Distribution and GIS modelling of the potential habitat of nine endemic insects at the Monahans sandhills in western Texas. **Samuel Discua Duarte**, samuel.discua@ttu.edu[1], Scott Longing[1] and James Cokendolpher[2], [1]Texas Tech Univ., Lubbock, TX, [2]Museum of Texas Tech Univ., Lubbock, TX

D3401 A survey of Gomphid dragonflies in two blackwater streams in the Sandhills of North Carolina. **Clyde E. Sorenson**, clyde_sorenson@ncsu.edu, North Carolina State Univ., Raleigh, NC

D3402 Prey selection by the buprestid hunting wasp *Cerceris fumipennis*. **Christine A. Nalepa**, christine_nalepa@ncsu.edu and Whitney Swink, North Carolina Dept. of Agriculture, Raleigh, NC

D3403 Current research at the European Biological Control Laboratory. **Lincoln Smith**, link.smith@ars.usda.gov, USDA - ARS, Montferrier-sur-Lez, France

D3404 Harvesting and landscape effects on natural enemy abundance & biocontrol in perennial grasslands. **Tania Kim**, tkim@glbrc.wisc.edu[1], Heidi Liere[2], Timothy D. Meehan[1], Aaron F. Fox[3], Douglas A. Landis[4] and Claudio Gratton[1], [1]Univ. of Wisconsin, Madison, WI, [2]Univ. of the South, Sewanee, TN, [3]North Carolina State Univ., Raleigh, NC, [4]Michigan State Univ., East Lansing, MI

D3405 Biodiversity beyond parks: Do urban vacant lots hold promise for conservation and restoration? **Nicole Hoekstra**, hoekstra.10@osu.edu, Catherine P. Herms, John Cardina and Mary M. Gardiner, The Ohio State Univ., Wooster, OH

D3406 Butterflies (Lepidoptera) track vegetation response to sagebrush steppe restoration treatments. **James McIver**, james.mciver@oregonstate.edu, Eastern Oregon Agricultural Research Center - Oregon State Univ., Union, OR

D3407 Conservation grasslands support diverse native bee assemblages in agroecosystems. **Adrian L. Carper**, adrian.carper@gmail.com[1], Virginia L. Scott[1], Collin Schwantes[1], Stacy Endriss[2], Andrew P. Norton[2], M. Deane Bowers[1] and Mary A. Jamieson[3], [1]Univ. of Colorado, Boulder, CO, [2]Colorado State Univ., Fort Collins, CO, [3]Univ. of Wisconsin, Madison, WI

D3408 Long-term impacts of urbanization on desert arthropod communities. **Richard A. Redak**, richard.redak@ucr.edu, Thomas Prentice and Kathleen Campbell, Univ. of California, Riverside, CA

D3409 Impact of floral resource provisioning on beneficial insects in agricultural crops. **Thelma Heidel-Baker**, thelma@iastate.edu, Matthew E. O'Neal, Mark Gleason and Jean Batzer, Iowa State Univ., Ames, IA

D3411 Artificial diets for *Coleomegilla maculata* (Coleoptera: Coccinellidae) using extracts of *Tenebrio molitor* (Coleoptera: Tenebrionidae) and comparison to a meridic formulation. **M. Guadalupe Rojas**, guadalupe.rojas@ars.usda.gov and Juan Morales-Ramos, USDA - ARS, Stoneville, MS

D3412 Compatibility of *Delphastus catalinae*(Coleoptera:Coccinellidae) with selected insecticides for control of whitefly, *Bemicia tabaci* biotype B. **Amr Badawy**, badawy.5@osu.edu[1], Luis A. Cañas[2], Nuris Acosta[2], Mohamed Aly[1] and Khaled Osman[1], [1]South Valley Univ., Qena, Egypt, [2]The Ohio State Univ., Wooster, OH

D3413 Laboratory investigation of inhabitants of temporary waters: will crustaceans consume mosquito larvae? **W. Wyatt Hoback**, hobackww@unk.edu[1], and Gary J. Torrisi[2], [1]Oklahoma State Univ., Stillwater, OK, [2]Univ. of Nebraska, Lincoln, NE

D3414 Insect identification using laser and wing beat frequency. **Margot Mafra-Neto**, margotmafra@gmail.com[1], Yanping Chen[2], Gustavo Batista[3] and Eamonn Keogh[2], [1]John W North High School, Riverside, CA, [2]Univ. of California, Riverside, CA, [3]Univ. of Sao Paulo, Sao Paulo, Brazil

D3415 Estimation of qualitative losses caused by *Trogoderma granarium* Everts (Coleoptera: Dermestidae) in stored wheat grains. **Muhammad Afzal**, chafzal64@yahoo.com[1], Muhammad Haq[1], Muhammad Ullah[1] and Fatima Mustafa[2], [1]Univ. of Sargodha, Sargodha, Pakistan, [2]Univ. of Agriculture, Faisalabad, Pakistan

D3416 Efficacy of Seeker™ insecticide against insect pests of wheat and alfalfa. **Patricia Prasifka**, plprasifka@dow.com[1], Fikru Haile[2], Harvey Yoshida[3], Claudia Kuniyoshi[4], and Melissa Siebert[5], [1]Dow AgroSciences, West Fargo, ND, [2]Dow AgroSciences, Carmel, IN, [3]Dow AgroSciences, Richland, WA, [4]Dow AgroSciences, Fresno, CA, [5]Dow AgroSciences, Greenville, MS

D3417 Distribution of wheat stem sawfly in Eastern Colorado winter wheat. **Terri L. Randolph**, Terri.Randolph@ColoState.edu, Claire Tovrea, Christine Ward, Frank B. Peairs, Jack Mangels and Darren Cockrell, Colorado State Univ., Fort Collins, CO

D3418 2014 field evaluation of candidate *Metarhizium* fungi for grasshopper control on the U.S. Northern Plains. **Stefan T. Jaronski**, stefan.jaronski@ars.usda.gov[1], Larry E. Jech[2], K. Chris Reuter[3], Lonnie R. Black[3], Rob Schlothauer[4] and Donald W. Roberts[5], [1]USDA - ARS, Sidney, MT, [2]USDA - APHIS, Phoenix, AZ, [3]USDA - ARS, Phoenix, AZ, [4]USDA, Sidney, MT, [5]Utah State Univ., Logan, UT

D3419 Behavioral responses of *Cydia pomonella* and *Spodoptera littoralis* larvae to yeast volatiles. **Stefanos Andreadis**, ssa18@psu.edu[1], Peter Witzgall[1] and Alan L. Knight[2], [1]Swedish Univ. of Agricultural Sciences, Alnarp, Sweden, [2]USDA - ARS, Wapato, WA

D3420 Spatial synchrony between geographical distributions of insect and host populations, under climate change scenario in Korea. **Jung-Joon Park**, jungpark@gnu.ac.kr[1], and Kijong Cho[2], [1]Gyeongsang National Univ., Jinju, South Korea, [2]Korea Univ., Seoul, South Korea

D3421 Effectiveness of fruit bags for control of insect pests of apple in the mid-Atlantic United States. **Daniel L. Frank**, dlfrank@mail.wvu.edu, West Virginia Univ., Morgantown, WV

D3422 Current and future pest management potenital of solid set canopy delivery systems (SSCDS) in high density apples. **Matthew Grieshop**, grieshop@msu.edu, Jason Schmidt, Larry Gut, John C. Wise, George Sundin and Ron Perry, Michigan State Univ., East Lansing, MI

D3423 RNA-interference of four embryonically expressed genes in the codling moth *Cydia pomonella*. **Stephen Ireland**, scirelan@umich.edu, Univ. of Michigan, Ann Arbor, MI

D3424 Extension outreach tools for invasive pests and diseases. **Mary Kay Malinoski**, mkmal@umd.edu[1], David Clement[1] and CT. Bargeron[2], [1]Univ. of Maryland, Ellicott City, MD, [2]Univ. of Georgia, Tifton, GA

D3425 Cyflumetofen (Sultan) efficacy against spider mite (*Tetranychus urticae*) eggs and mobile stages. **Ronald Oetting**, roetting@uga.edu, Univ. of Georgia, Griffin, GA

WEDNESDAY, NOVEMBER 19, 2014, MORNING

Program Symposium: Reaching Beyond Our Horizon: Social Media & Connecting with the World

Portland Ballroom 252 (Oregon Convention Center)

Moderators and Organizers: Derek Hennen[1] and Morgan D. Jackson[2], [1]Univ. of Arkansas, Fayetteville, AR, [2]Univ. of Guelph, Guelph, ON, Canada

8:00 Welcoming Remarks

8:05 1747 The benefits of the selfie: Grad students and the imagined distraction of social media. **Derek Hennen**, derhennen@gmail.com, Univ. of Arkansas, Fayetteville, AR

8:25 1748 Graduate students teaching and learning about insects using social media. **Marianne Alleyne**, vanlaarh@life.illinois.edu, Univ. of Illinois, Urbana, IL

8:45 1749 Someone is WRONG on the Internet! What the science of science communication can teach us. **Gwen Pearson**, membracid@gmail.com, Get Your Nature Geek On, Toledo, OH

9:05 SP1750 How can social media extend the reach of public health messages? **Cameron Webb**, cameron.webb@swahs.health.nsw.gov.au, Univ. of Sydney, Westmead, Australia

9:17 1751 From spider sex to ants in drag: Using art and design to bridge the gap between scientific inquiry and public understanding. **Sarah Blackmon Lips**, redbike@gmail.com, BuzzHootRoar, Raleigh, NC

9:37 Break

9:47 SP1752 Targeted social media as a tool for recruiting citizen scientists to detect undocumented invasive species. **Leslie Allee**, lla1@cornell.edu[1], Rebecca R Smyth[1], Louis S. Hesler[2] and John Losey[1], [1]Cornell Univ., Ithaca, NY, [2]USDA - ARS, Brookings, SD

9:59 1753 And suddenly it's a job: From Amazon bug tweets to Al Jazeera news beats. **Phil Torres**, phillip.juan.torres@gmail.com, Al Jazeera America, Los Angeles, CA

10:19 1754 Changing the landscape: Videos, an ugly couch, and the future of entomology. **Jessica Honaker**, contactus@thebugchicks.com and Kristie Reddick, The Bug Chicks, Portland, OR

10:39 1755 A treasure hidden in plain sight! Discovery of the pink-spot sulphur butterfly (*Aphrissa neleis*) in Florida. **Andy Warren**, andy@butterfliesofamerica.com, Univ. of Florida, Gainesville, FL

10:59 1756 The new natural historians: Taxonomy and the social media revolution. **Morgan Jackson**, morgandjackson@gmail.com, Univ. of Guelph, Guelph, ON, Canada

11:19 Discussion

11:49 Concluding Remarks

Program Symposium: Ecoinformatics (Big Data) for Entomology: Pitfalls, Progress, And Promise

Portland Ballroom 251 (Oregon Convention Center)

Moderators and Organizers: Jay Rosenheim[1] and Claudio Gratton[2], [1]Univ. of California, Davis, CA, [2]Univ. of Wisconsin, Madison, WI

8:00 Introductory Remarks

8:05 1757 Quantifying secondary pest outbreaks in cotton: A case study in causal inference from observational data. **Kevin Gross**, kevin_gross@ncsu.edu[1], and Jay Rosenheim[2], [1]North Carolina State Univ., Raleigh, NC, [2]Univ. of California, Davis, CA

8:30 1758 Machine learning tools for data-driven crop management: Increasing yield and reducing pesticide use. **Matthew Meisner**, mhmeisner@ucdavis.edu and Jay Rosenheim, Univ. of California, Davis, CA

8:55 1759 Using large-scale herbivore monitoring records to understand regional patterns in population dynamics. **Perry de Valpine**, pdevalpine@berkeley.edu[1], and Clifford Ohmart[2], [1]Univ. of California, Berkeley, CA, [2]SureHarvest, Davis, CA

9:20 1760 Distinguishing between signal and noise in the California tephritid fruit fly invasion. **James R. Carey**, jrcarey@ucdavis.edu[1], Nikos Papadopoulos[2], Richard E. Plant[1] and Caroline Larsen[1], [1]Univ. of California, Davis, CA, [2]Univ. of Thessaly, N. Ionia, Greece

9:45 Break

10:05 1761 A honey bee health database: Challenges and opportunities. **Dennis vanEngelsdorp**, dennis.vanengelsdorp@gmail.com[1], James Wilkes[2], Kathy Bailys[3], Marla Spivak[4], David Tarpy[5], Eugene Lengerich[6], Michael Wilson[7] and Karen Rennich[1], [1]Univ. of Maryland, College Park, MD, [2]Appalachian State Univ., Boone, NC, [3]Univ. of Illinois, Urbana, IL, [4]Univ. of Minnesota, Saint Paul, MN, [5]North Carolina State Univ., Raleigh, NC, [6]Pennsylvania State Univ., Hershey, PA, [7]Univ. of Tennessee, Knoxville, TN

10:30 1762 Large scale observational data sets on *Helicoverpa* spp. and its egg parasitoid in Australian agricultural landscape: Implications of inferring casual relationships. **Nancy Schellhorn**, Nancy.Schellhorn@csiro.au[1], Cate Paull[1], Melissa Dobbie[1], Hazel R. Parry[2], Anne Bourne[1] and Myron Zalucki[3], [1]CSIRO, Brisbane, Australia, [2]CSIRO, Dutton Park, Australia, [3]Univ. of Queensland, Brisbane, Australia

10:55 1763 What can broad-scale, publicly-available data tell us about insect community responses to agricultural land use? **Timothy D. Meehan**, tmeehan@wisc.edu, Kaitlin Stack Whitney and Claudio Gratton, Univ. of Wisconsin, Madison, WI

11:20 1764 A citizen-army for science: Quantifying the contributions of citizen scientists to our understanding of monarch biology. **Leslie Ries**, lries@sesync.org[1], and Karen Oberhauser[2],[1]National Socio-Environmental Synthesis Center, Annapolis, MD, [2]Univ. of Minnesota, Saint Paul, MN

11:45 Concluding Remarks

Member Symposium: Insects as Sustainable and Innovative Sources of Food and Feed Production

Portland Ballroom 253 (Oregon Convention Center)

Moderator and Organizer: Marianne Shockley, Univ. of Georgia, Athens, GA

8:00 Welcoming Remarks

8:05 1765 Latitude and attitude: The effects of biodiversity and evolution on entomophagy across the world. **Julie Lesnik**, julie.lesnik@gmail.com, Wayne State Univ., Detroit, MI

8:25 1766 Entovita. **Daniel Thrasyvoulou**, info@entovita.com, Entovita, Seattle, WA

8:45 1767 Setting the table for a hotter, flatter, more crowded earth: Insects on the menu? **Marianne Shockley**, entomolo@uga.edu[1], and Sonny Ramaswamy[2], [1]Univ. of Georgia, Athens, GA, [2]USDA - NIFA, Washington, DC

9:05 1768 Cricket parantha: Creative restauranteurs incorporate insects into contemporary Indian cuisine. **David Gordon**, dggordon@olympus.net[1], and Meeru Dhalwala[2], [1]The Bug Chef, Seattle, WA, [2]Shanik, Seattle, WA

9:25 Break

9:40 1769 Live insects as feed (or food): Feeding captive insectivores. **Mark Finke**, mdfinke1116@desertinet.com, Mark Finke LLC, Rio Verde, AZ

10:00 1770 An analysis of the current and emergent ento industry: Edible insects in the national marketplace. **Harman Johar**, harmansj1@gmail.com, World Ento, Austin, TX

10:20 1771 Mealworms as Solomon's shamir: The table as a temple of peace in a densely populated world. **Amy Wright**, wrighta@apsu.edu, Austin Peay State Univ., Clarksville, TN

10:40 1772 Small bugs, big gains: Improving food security in rural southern African communities through microlivestock farming. **Valerie Stull**, vjstull16@gmail.com and Rachel Bergmans, Mighty Mealworms, WI

11:00 1773 Open bug farm: Making insect farming accessible to everyone through an open source farm kit. **Daniel Imrie-Situnayake**, dan@tiny-farms.com, Tiny Farms, CA

11:20 SP1774 Teaching with insects as food and feed: Incorporating entomophagy into sustainable agriculture education at the university and community level. **Donald Sudbrink**, sudbrinkd@apsu.edu, Austin Peay State Univ., Clarksville, TN

11:32 Panel Discussion

11:52 Concluding Remarks

Member Symposium: Cotton IPM: Texas Style

Portland Ballroom 254 (Oregon Convention Center)

Moderators and Organizers: Abdul Hakeem and Megha N. Parajulee, Texas A&M Univ., Lubbock, TX

10:00 Welcoming Remarks

10:02 Introductory Remarks

10:05 1775 History of cotton IPM in Texas. **Megha N. Parajulee**, m-parajulee@tamu.edu, Texas A&M Univ., Lubbock, TX

10:25 SP1776 Current status of and paths to improved IPM decision-making for an insect complex (Hemiptera: Pentatomidae and Miridae) damaging to cotton bolls. **Michael J. Brewer**, mjbrewer@ag.tamu.edu, Texas A&M Univ., Corpus Christi, TX

10:37 1777 Managing Midsouth cotton for earliness: Texas style IPM but with an Arkansas Twist! **N. Ray Benson**, rbenson@uaex.edu[1], Tina Teague[2] and Fred M. Bourland[3], [1]Univ. of Arkansas, Blytheville, AR, [2]Arkansas State Univ., Jonesboro, AR, [3]Univ. of Arkansas, Keiser, AR

10:57 Break

11:10 1778 Cotton fleahopper IPM. **Abdul Hakeem**, abdul.hakeem@ag.tamu.edu and Megha N. Parajulee, Texas A&M Univ., Lubbock, TX

11:25 SP1779 Characterization of direct-damaging feeding behavior of *Lygus lineolaris* on cotton squares using histology and EPG. **Felix Cervantes**, felix.cervantes@ars.usda.gov[1], and Elaine Backus[2], [1]Univ. of California, Parlier, CA, [2]USDA - ARS, Parlier, CA

11:37 Concluding Remarks

P-IE Section Symposium: Functional Characterization of Insect Chemoreceptors: On Receptivity Range and Expression

Portland Ballroom 255 (Oregon Convention Center)

Moderators and Organizers: William B. Walker and Mattias Larsson, Swedish Univ. of Agricultural Sciences, Alnarp, Sweden

8:00 1780 Receptors as interfaces to the chemosensory world of insects. **Mattias Larsson**, mattias.larsson@slu.se, Swedish Univ. of Agricultural Sciences, Alnarp, Sweden

8:15 1781 Evolutionary dynamics and functional properties of chemoreceptors in ants. **Jesse Slone**, jesse.d.slone@vanderbilt.edu[1], Xiaofan Zhou[1], Nathan Day[1], Greg Pask[2], Anandasankar Ray[2] and Laurence J. Zwiebel[1], [1]Vanderbilt Univ., Nashville, TN, [2]Univ. of California, Riverside, CA

8:40 1782 Beyond the mosquito antennae: expanding the view of chemoreceptor function in Anopheles gambiae. **R. Jason Pitts**, J.Pitts@Vanderbilt.edu, Stephen Derryberry, David Rinker, Chao Liu, Xiaofan Zhou and Laurence J. Zwiebel, Vanderbilt Univ., Nashville, TN

9:05 1783 Functional characterization of transcripts encoding codling and other moth chemoreceptors. **Stephen F. Garczynski**, steve.garczynski@ars.usda.gov, USDA - ARS, Wapato, WA

9:30 1784 Integration of functional characterization and expression profiles of S. littoralis odorant receptors. **William B. Walker**, william.b.walker.iii@slu.se[1], Arthur de Fouchier[2], Nicolas Montagné[2], Muhammad Binyameen[3], Claudia Steiner[2], Peter Anderson[1], Fredrik Schlyter[1], Bill Hansson[4], Emmanuelle Jacquin-Joly[5] and Mattias Larsson[1], [1]Swedish Univ. of Agricultural Sciences, Alnarp, Sweden, [2]Univ. Pierre et Marie Curie, Paris, France, [3]Bahauddin Zakariya Univ., Multan, Multan, Pakistan, [4]Max Planck Institute for Chemical Ecology, Jena, Germany, [5]Institut National de la Recherche Agronomique (INRA), Versailles, France

9:55 Break

10:05 1785 The narrowing olfactory receptor space. **Jonathan Bohbot**, jonathanbohbot@yahoo.com, Hebrew Univ., Rehovot, Israel

10:30 1786 Functional characterization of sex pheromone receptors in beet armyworm Spodoptera exigua (Hübner). Chengcheng Liu Lu[1], Yang Liu[1], William B. Walker[2], Shuang-Lin Dong[3] and **Guirong Wang**, grwang@ippcaas.cn[1], [1]Chinese Academy of Agricultural Sciences, Beijing, China, [2]Swedish Univ. of Agricultural Sciences, Alnarp, Sweden, [3]Nanjing Agricultural Univ., Nanjing, China

10:55 1787 A predicted sex pheromone receptor of codling moth Cydia pomonella detects the plant volatile pear ester. Jonas Bengtsson[1], **Francisco Gonzales**, gonzalez.francisco@slu.se[2], Alberto Cattaneo[3], Nicolas Montagné[4], William B. Walker[2], Marie Bengtsson[2], Gianfranco Anfora[3], Rickard Ignell[2], Emmanuelle Jacquin-Joly[5] and Peter Witzgall[2], [1]Stockholm Univ., Stockholm, Sweden, [2]Swedish Univ. of Agricultural Sciences, Alnarp, Sweden, [3]Fondazione Edmund Mach, San Michele all'Adige (TN), Italy, [4]Univ. Pierre et Marie Curie, Paris, France, [5]Institut National de la Recherche Agronomique (INRA), Versailles, France

11:09 1788 The detection of bitter and sweet compounds by individual taste receptors in Insects. **Erica Freeman**, erica.freeman@email.ucr.edu and Anupama Dahanukar, Univ. of California, Riverside, CA

11:23 SP1789 A model on the role of odorant binding proteins in social immunity. **M. Marta Guarna**, Marta.Guarna@outlook.com[1], Immacolata Iovinella[2], Kyung-Mee Moon[1], Elizabeth Huxter[3], Sarah Michaud[1], Robert Parker[1], Andony Melathopoulos[4], Paolo Pelosi[2], Stephen Pernal[5] and Leonard J. Foster[1], [1]Univ. of British Columbia, Vancouver, BC, Canada, [2]Univ. of Pisa, Pisa, Italy, [3]Kettle Valley Queens, Grand Forks, BC, Canada, [4]Dalhousie Univ., Halifax, NS, Canada, [5]Agriculture & Agri-Food Canada, Beaverlodge, AB, Canada

11:35 1790 Reception of repellents in Culex. **Walter Leal**, wsleal@ucdavis.edu, Univ. of California, Davis, CA

PBT Section Symposium: RNAi: Emerging Technology to Overcome Grand Challenges in Entomology

Portland Ballroom 256 (Oregon Convention Center)

Moderators and Organizers: William Moar[1] and Subba R. Palli[2], [1]Monsanto Company, St. Louis, MO, [2]Univ. of Kentucky, Lexington, KY

8:00 Introductory Remarks

8:05 1791 Using RNA interference technologies to control pest insects. **Steve Whyard**, Steve.Whyard@umanitoba.ca, Aditi Singh, Alison Partridge and Cassidy Erdelyan, Univ. of Manitoba, Winnipeg, MB, Canada

8:25 1792 The role of microRNAs in mosquitoes. **Alexander Raikhel**, araikhel@ucr.edu, Keira Lucas, Bo Zhao and Shiping Liu, Univ. of California, Riverside, CA

8:45 1793 RNAi in insects is dependent on breakdown and uptake of dsRNA. **Guy Smagghe**, guy.smagghe@ugent.be, Ghent Univ., Ghent, Belgium

9:05 1794 Cellular uptake of double-stranded RNA in *Tribolium castaneum*. **Kun-Yan Zhu**, kzhu@ksu.edu and Da Xiao, Kansas State Univ., Manhattan, KS

9:25 1795 *Tribolium castaneum* as a model for high-throughput RNAi-Screening. **Andreas Vilcinskas**, Andreas.Vilcinskas@agrar.uni-giessen.de, Justus-Liebig-Univ Giessen, Giessen, Germany

9:45 1796 New insights into RNAi strategies in insect pest control. **Xuexia Miao**, xxm@sibs.ac.cn and Haichao Li, Chinese Academy of Sciences, Shanghai, China

10:05 Break

10:15 1797 Factors impacting RNAi efficacy in the pest termite, *R. flavipes*. **Michael E. Scharf**, mscharf@purdue.edu, Kapil Raje and Andres Sandoval-Mojica, Purdue Univ., West Lafayette, IN

10:35 1798 RNAi-based strategies to reduce hemipteran pests and pathogen transmission. **Wayne Hunter**, Wayne.hunter@ars.usda.gov[1], and Eduardo Andrade[2], [1]USDA - ARS, Ft. Pierce, FL, [2]EMBRAPA, Brazil, Fort Pierce, FL

10:55 1799 Development and evaluation of dsRNA nanoparticles for control of mosquito larvae. **Subba Reddy Palli**, rpalli@email.uky.edu and Sumistha Das, Univ. of Kentucky, Lexington, KY

11:15 1800 Red Imported Fire Ant Control through RNAi Gene Silencing. **Robert Vander Meer**, bob.vandermeer@ars.usda.gov[1], and Man-Yeon Choi[1], [1]USDA - ARS, Gainesville, FL, [1]USDA - ARS, Corvallis, OR

11:35 1801 Pyramiding RNAi with Bt to control western corn rootworm, *Diabrotica virgifera virgifera*. **William Moar**, william.moar@monsanto.com, Pamela M. Bachman and Graham Head, Monsanto Company, St. Louis, MO

11:55 Concluding Remarks

P-IE Section Symposium: Novel Plant-Insect Associations: Implications of the Lack of Coevolution

D136 (Oregon Convention Center)

Moderators and Organizers: William O. Lamp[1] and Alina Avanesyan[2], [1]Univ. of Maryland, College Park, MD, [2]Univ. of Cincinnati, Cincinnati, OH

8:00 Welcoming Remarks

8:05 1802 Consequences of non-native host plants for caterpillars and their natural enemies. **M. Deane Bowers**, Deane.Bowers@colorado.edu, Univ. of Colorado, Boulder, CO

8:25 1803 Variation in ash resistance to emerald ash borer: lack of coevolutionary history facilitates a mega-invasion in defense free space. **Daniel A. Herms**, herms.2@osu.edu[1], Justin G. A. Whitehill[2], Chad M. Rigsby[3], Don Cipollini[3] and Pierluigi Bonello[4], [1]The Ohio State Univ., Wooster, OH, [2]Univ. of British Columbia, Vancouver, BC, Canada, [3]Wright State Univ., Dayton, OH, [4]The Ohio State Univ., Columbus, OH

8:45 1804 Interaction of generalist grasshoppers with native and exotic grasses: behavioral and molecular approaches. **Alina Avanesyan**, alina.avanesyan@gmail.com and Theresa Culley, Univ. of Cincinnati, Cincinnati, OH

9:05 1805 Prediction in novel thistle-insect interactions: challenges of phenological and spatial variation. **Leland Russell**, leland.russell@wichita.edu[1], Tatyana Rand[2], and Svata Louda[3], [1]Wichita State Univ., Wichita, KS, [2]USDA - ARS, Sidney, MT, [3]George Holmes Univ., Lincoln, NE

9:25 1806 Symbiont-insect interaction in a novel association: decreased wound response to an hopperburning leafhopper. **Bridget D. DeLay**, delay@bcm.edu[1], and William O. Lamp[2], [1]Baylor Univ., Waco, TX, [2]Univ. of Maryland, College Park, MD

9:45 Break

10:00 1807 Life history and fitness of herbivores colonizing novel host plants. **Carlos Garcia-Robledo**, carlos.garcia-robledo@inecol mx, Institute of Ecology (INECOL), Xalapa, Mexico, National Museum of Natural History, Smithsonian Institution, Washington, DC

10:20 1808 Predicting novel herbivore-plant food webs with limited information. **Ian S. Pearse**, ianspearse@gmail.com, Illinois Natural History Survey, Champaign, IL

10:40 1809 Alternative outcomes of the interaction of specialist herbivores with novel invasive host plants. **Don Cipollini**, don.cipollini@wright.edu, Samantha Davis and Deah Lieurance, Wright State Univ., Dayton, OH

11:00 1810 Reduced antagonism by a galling parasite through a novel induced phenotype. **Paul Nabity**, nabity@email.arizona.edu, Univ. of Arizona, Tucson, AZ

11:20 Concluding Remarks

P-IE Section Symposium: Non-Lethal Effects of Predators in Arthropod Food Webs: Ecological Patterns, Behavioral Mechanisms, and Agricultural Applications

D137-138 (Oregon Convention Center)

Moderators and Organizers: Carmen K. Blubaugh, Ian Kaplan and Carmen K. Blubaugh, Purdue Univ., West Lafayette, IN

8:30 Introductory Remarks

8:35 1811 Predation stress and mortality in dragonfly larvae: causes and consequences. **Shannon McCauley**, shannon.mccauley@utoronto.ca, Univ. of Toronto, Mississauga, ON, Canada

8:55 1812 Nonconsumptive mortality by dragonfly predators causes natural selection on damselfly prey. **Adam Siepielski**, adamsiepielski@sandiego.edu, Univ. of San Diego, San Diego, CA

9:15 1813 Transgenerational costs and benefits of predation risk. **Jennifer S. Thaler**, jst37@cornell.edu and Natasha Tigreros, Cornell Univ., Ithaca, NY

9:35 1814 Scary signals: spider cues affect herbivory and soil properties. **Michael Sitvarin**, sitvarmi@miamioh.edu[1], Ann L. Rypstra[1] and Jason M. Schmidt[2], [1]Miami Univ., Oxford, OH, [2]Univ. of Kentucky, Lexington, KY

9:55 Break

10:10 1815 Prey perception of predation risk: volatile chemical cues mediate non-consumptive effects. **Sara Hermann**, slh275@cornell.edu and Jennifer S. Thaler, Cornell Univ., Ithaca, NY

10:30 1816 Does fear beget fear? Examining antipredator cascades over four trophic levels. **Carmen K. Blubaugh**, blubaugh@purdue.edu and Ian Kaplan, Purdue Univ., West Lafayette, IN

10:50 1817 Complementary fear effects imposed by diverse predator communities. **William E. Snyder**, wesnyder@wsu.edu, Washington State Univ., Pullman, WA

11:10 1818 Implications of risk avoidance behaviors of prey in biological control systems. **Kathryn Ingerslew**, ksiggc@mail.missouri.edu and Deborah L. Finke, Univ. of Missouri, Columbia, MO

11:30 Concluding Remarks

Member Symposium: The Role of Diversity in Pollinator Conservation

E143-144 (Oregon Convention Center)

Moderators and Organizers: Christina Mogren and Kristine Nemec, USDA - ARS, Brookings, SD

8:00 1819 Conversion of urban vacant land into gardens influences bee community structure without altering pollination services. **Scott Prajzner**, prajzner.1@osu.edu and Mary M. Gardiner, The Ohio State Univ., Wooster, OH

8:20 1820 Diverse gardening strategies to conserve pollinators in urban landscapes. **Gail A. Langellotto**, gail.langellotto@oregonstate.edu[1], Kevin Matteson[2], and Evelyn Fetridge[3], [1]Oregon State Univ., Corvallis, OR, [2]Miami Univ., Oxford, OH, [3]Fordham Univ., Bronx, NY

8:40 1821 Habitat restoration promotes pollinator persistence in intensively-managed agriculture. **Leithen M'Gonigle**, leithen@berkeley.edu, Lauren Ponisio, Kerry Cutler and Claire Kremen, Univ. of California, Berkeley, CA

9:00 1822 Selection and testing of plant species for pollinator habitat, from decision analysis to validation. **Neal Williams**, nmwilliams@ucdavis.edu[1], Eric Lonsdorf[2] and Kimiora Ward[1], [1]Univ. of California, Davis, CA, [2]Chicago Botanic Garden, Glencoe, IL

9:20 1823 Floral resource production in oilseeds: Food for pollinators in an agriculture dominated landscape. **Matthew Thom**, matt.thom@ars.usda.gov[1], Carrie Eberle[1], Frank Forcella[1], Kristine Nemec[2], Jonathan Lundgren[2] and Russ Gesch[1], [1]USDA - ARS, Morris, MN, [2]USDA - ARS, Brookings, SD

9:40 Intermission

9:55 1824 Flowering oilseed biofuel crops and pollinator conservation. **Kristine Nemec**, kristine.nemec@ars.usda.gov[1], Carrie Eberle[2], Jonathan Lundgren[1] and Frank Forcella[2], [1]USDA - ARS, Brookings, SD, [2]USDA - ARS, Morris, MN

10:15 1825 Engaging farmers and land managers to conserve important native pollinators. **Sarina Jepsen**, sarina@xerces.org, Mace Vaughan, Eric Mader and Scott Black, Xerces Society, Portland, OR

10:35 1826 Agricultural landscape diversity shapes pollinator communities. **Christina Mogren**, christina.mogren@ars.usda.gov[1], Tatyana Rand[2] and Jonathan Lundgren[1], [1]USDA - ARS, Brookings, SD, [2]USDA - ARS, Sidney, MT

10:55 1827 Meta-community dynamics of pollinators in a fragmented landscape. **Alexandra Harmon-Threatt**, aht@illinois.edu[1], and Tiffany Knight[2], [1]Univ. of Illinois, Urbana, IL, [2]Washington Univ., St. Louis, MO

11:15 SP1828 Functional connectivity of a fragmented tallgrass prairie landscape for wild bees in Nebraska. **Bethany Teeters**, bteeters2@unl.edu, Univ. of Nebraska, Lincoln, NE

11:27 1829 Biotic homogenization of bee communities across spatial scales. **Tina Harrison**, tinaharrison09@gmail.com and Rachael Winfree, Rutgers, The State Univ. of New Jersey, New Brunswick, NJ

11:47 SP1830 Molecular techniques for identifying pollen from bees and the reliability of label data. **Karen W. Wright**, karen@sevilleta.unm.edu, Univ. of New Mexico, Albuquerque, NM

Member Symposium: Expanding Spotted Wing Drosophila (*Drosophila suzukii*) Research to New Horizons

E145 (Oregon Convention Center)

Moderators and Organizers: Kelly Hamby and Hannah J. Burrack, Univ. of California, Davis, CA

8:00 Welcoming Remarks

8:05 1831 *Drosophila suzukii* research efforts in the European Union. **Neil Audsley**, Neil.Audsley@fera.gsi.gov.uk, The Food and Environment Research Agency, York, United Kingdom

8:27 1832 Strategies for risk assessment and population management of *Drosophila suzukii* in Trentino, Italy. **Gianfranco Anfora**, gianfranco.anfora@fmach.it[1], Marco Valerio Rossi Stacconi[2], Vaughn Walton[3], and Claudio Ioriatti[4], [1]Fondazione Edmund Mach, San Michele all'Adige (TN), Italy, [2]Faculty of Agriculture, Perugia, Italy, [3]Oregon State Univ., Corvallis, OR, [4]Centre for Technology Transfer, S. Michele all'Adige (TN), Italy

8:49 1833 Food-based chemical lure for detection of spotted wing drosophila. **Peter J. Landolt**, peter.landolt@ars.usda.gov[1], Dong H. Cha[1], Todd B. Adams[2] and Helmuth W. Rogg[2], [1]USDA - ARS, Wapato, WA, [2]Oregon Dept. of Agriculture, Salem, OR

9:11 1834 Host-specific spotted wing drosophila biology and behavior in a postharvest context. **David Bellamy**, dave.bellamy@ars.usda.gov and Spencer Walse, USDA - ARS, Parlier, CA

9:33 Break

9:48 1835 Molecular and neural correlates for odor recognition in a pestiferous fruit fly, *Drosophila suzukii*. **Nicole Schiedler**, nscheidl@nd.edu[1], Madhura Siddappaji[1], Kelly Hamby[2], Joanna Chiu[2], Frank Zalom[2] and Zainulabeuddin Syed[1], [1]Univ. of Notre Dame, Notre Dame, IN, [2]Univ. of California, Davis, CA

10:10 1836 Ecological implications of the interactions between yeast and *Drosophila*. **Peter Witzgall**, peter.witzgall@ice3.se and Paul Becher, Swedish Univ. of Agricultural Sciences, Alnarp, Sweden

10:32 1837 *Drosophila* defense mechanisms against parasitoids. **Todd A. Schlenke**, tschlen@emory.edu, Reed College, Portland, OR

10:54 1838 Comparative biology of *w*Ri-like *Wolbachia* infections in *Drosophila suzukii*, *D. subpulchrella* and *D. simulans*. **Michael Turelli**, mturelli@ucdavis.edu, Univ. of California, Davis, CA

11:16 1839 Using the *Drosophila suzukii* genome to develop novel management approaches. **Katherine Murphy**, kamurphy@ucdavis.edu and Joanna Chiu, Univ. of California, Davis, CA

11:38 1840 Eco-friendly biocontrol of *Drosophila suzukii* using transgenic technologies. Jonas Schwirz[1], Alfred Handler[2] and **Marc Schetelig**, Marc.Schetelig@agrar.uni-giessen.de[1], [1]Fraunhofer Institute for Molecular Biology and Applied Ecology, Gießen, Germany, [2]USDA - ARS, Gainesville, FL

P-IE Section Symposium: Basic Approaches to Grand Challenges: Applying Insect Ecology to Improve Agricultural Sustainability and Food Security

B117-119 (Oregon Convention Center)

Moderators and Organizers: Randa Jabbour[1] and Adrianna Szczepaniec[2], [1]Univ. of Wyoming, Laramie, WY, [2]South Dakota State Univ., Brookings, SD

8:00 Introductory Remarks

8:05 1841 Landscape ecology applications for sustainable agriculture. **Megan E. O'Rourke**, megorust@vt.edu, Virginia Tech, Blacksburg, VA

8:25 1842 A natural approach to human pathogen uppression: Can biodiversity fill in the GAPs? **Matthew Jones**, matthew.s.jones@wsu.edu, Washington State Univ., Pullman, WA

8:45 1843 The planted field and beyond: tracking perilous particles to identify risks in the landscape for foraging honey bees. **Elizabeth Y. Long**, eylong@purdue.edu[1], Jeffrey D. Holland[1], Brian D. Eitzer[2] and Christian Krupke[1], [1]Purdue Univ., West Lafayette, IN, [2]Connecticut Agricultural Experiment Station, New Haven, CT

9:05 1844 Non-target effects of neonicotinoid insecticides: Implications for arthropod communities. **Adrianna Szczepaniec**, adrianna.szczepaniec@sdstate.edu[1], Karly Henry[1], Michael J. Raupp[2] and Micky D. Eubanks[3], [1]South Dakota State Univ., Brookings, SD, [2]Univ. of Maryland, College Park, MD, [3]Texas A&M Univ., College Station, TX

9:25 1845 Plant-mediated effects of drought stress on soybean aphids and virus infection. **Punya Nachappa**, nachappa@ipfw.edu, Christopher Culkin and Vamsi Nalam, Indiana Univ.-Purdue Univ., Fort Wayne, IN

9:45 Break

10:00 1846 Arabidopsis *LOX5* activity in roots promotes green peach aphid performance on foliage. **Vamsi Nalam**, nalamvj@ipfw.edu, Indiana Univ.-Purdue Univ., Fort Wayne, IN

10:20 1847 Application of genomic tools in invasive pest survey and exclusion. **Scott Geib**, Scott.Geib@ARS.USDA.GOV[1], Sheina Sim[2], Nicholas Manoukis[1], Norman Barr[3] and Daniel Z. Rubinoff[2], [1]USDA - ARS, Hilo, HI, [2]Univ. of Hawai'i, Honolulu, HI, [3]USDA - APHIS, Edinburg, TX

10:40 1848 Steps towards a systems-level approach to invasive species management for brown marmorated stink bug. **Anne L. Nielsen**, nielsen@aesop.rutgers.edu[1], Brett R. Blaauw[1] and Dean Polk[2], [1]Rutgers, The State Univ. of New Jersey, Bridgeton, NJ, [2]Rutgers, The State Univ. of New Jersey, Chatsworth, NJ

11:00 1849 The grand challenge of grain security - what do studies of insect dispersal tell us about the spread and frequency of phosphine resistance? **Michelle Rafter**, m.rafter@uq.edu.au, Univ. of Queensland, Brisbane, Australia

11:20 1850 Trophic interactions and plant breeding: Lessons for resistance breeding and sustainable agronomic practices. **Rupesh Ram Kariyat**, ruk157@psu.edu, ETH Zürich, Zürich, Switzerland

11:40 Concluding Remarks

SysEB Section Symposium: How the Fossil Record Can Contribute to Our Understanding of Insect Ecology and Evolution

B110-112 (Oregon Convention Center)

Moderators and Organizers: Dena Smith[1] and Sam Heads[2], [1]Univ. of Colorado, Boulder, CO, [2]Univ. of Illinois, Champaign, IL

8:00 Welcoming Remarks

8:05 1851 Eocene Insects - Innovative Morphologies and Novel Evolutionary Insights. **Sonja Wedmann**, Sonja.Wedmann@senckenberg.de, Senckenberg Forschungsinstitut und Naturmseum, Messel, Germany

8:25 1852 Macroevolutionary history of the Coleoptera: A quantitative analysis of fossil occurrences. **Dena Smith**, Dena.Smith@colorado.edu[1], and Jonathan Marcot[2],[1]Univ. of Colorado, Boulder, CO, [2]Univ. of Illinois, Urbana, IL

8:45 SP1853 Critiques and new hope on divergence time estimation of Lepidoptera. **Jae-Cheon Sohn**, SohnJ@si.edu[1], Charles Mitter[2], Michael P. Cummings[2], Donald R. Davis[1] and Conrad Labandeira[1], [1]National Museum of Natural History, Smithsonian Institution, Washington, DC, [2]Univ. of Maryland, College Park, MD,

8:57 1854 Fossil insects from the Lower Cretaceous Crato Formation of Brazil. **Sam Heads**, swheads@illinois.edu and M. Jared Thomas, Univ. of Illinois, Champaign, IL

9:17 SP1855 The Fossil amber fauna of the Simojovel formation and the Red Queen hypothesis. **Donald B. Thomas**, donald.thomas@ars.usda.gov, USDA - ARS, Edinburg, TX

9:29 1856 Rediscovery of the Milton Sanderson Dominican amber collection. **M. Jared Thomas**, thomasmj@illinois.edu and Sam Heads, Univ. of Illinois, Champaign, IL

9:49 Break

9:58 1857 Cretaceous context: understanding fossil ant diversity. **Phillip M. Barden**, pbarden@amnh.org, American Museum of Natural History, New York, NY

10:10 1858 Plant-Insect relationships from circa-110-million-year-old amber of Spain. **Ricardo Pérez-de la Fuente**, perezdelafuente@fas.harvard.edu[1], Enrique Peñalver[2], Antonio Arillo[3], Eduardo Barrón[2] and Xavier Delclòs[4], [1]Harvard Univ., Cambridge, MA, [2]Instituto Geológico y Minero de España, Madrid, Spain, [3]Facultad de Biología, Madrid, Spain, [4]Universitat de Barcelona, Barcelona, Spain

10:30 1859 Deep-Time perspective on climate change and Leaf Herbivory in Western North American Oaks. **Erin Leckey**, Erin.Leckey@colorado.edu and Dena Smith, Univ. of Colorado, Boulder, CO

10:50 1860 A preliminary report about the Eocene Plant-Insect associations from South China. **Qingqing Xu**, zhutianqiuxin@163.com[1], Conrad Labandeira[1] and Jin Jianhua[2], [1]National Museum of Natural History, Washington, DC, [2]Sun Yat-Sen Univ., Guangzhou, China

11:10 1861 Plant-Insect associations of late Cretaceous North America. **Augusta Maccracken**, gussie@umd.edu[1], Conrad Labandeira[2] and Charles Mitter[1], [1]Univ. of Maryland, College Park, MD, [2]National Museum of Natural History, Smithsonian Institution, Washington, DC

11:30 1862 What fossil insects can do for you? **Vladimir Blagoderov**, vlab@nhm.ac.uk, The Natural History Museum, Cromwell Rd., United Kingdom

11:50 SP1863 Gypsy moth (*Lymantia dispar*) refugia in Croatia? - evidence from molecular data. **Nikola Lackovic**, nikolal@sumins.hr[1], Dimitrios Avtzis[2], Milan Pernek[1] and Christian Stauffer[3], [1]Croatian Forest Research Institute, Jastrebarsko, Croatia, [2]Forest Research Institute, Thessaloniki, Greece, [3]Univ. of Natural Resources and Life Sciences, Vienna, Austria

12:02 Concluding Remarks

SysEB Section Symposium: A Hitchhiker's Guide to the Microcosmos: The Challenges of Dispersal

B113-114 (Oregon Convention Center)

Moderators and Organizers: Jessica Ware[1], Dominic Evangelista[2] and Merlijn Jocque[2], [1]American Museum of Natural History, New York, NY, [2]Rutgers, The State Univ. of New Jersey, Newark, NJ

8:00 Introductory Remarks

8:05 1864 Dispersal by giant damselflies. **Ola Fincke**, fincke@ou.edu, Univ. of Oklahoma, Norman, OK

8:25 1865 Dispersal, gene flow and population structure in a colorful polymorphic Neotropical damselfly system. **Melissa Sanchez-Herrera**, melsanc@gmail.com, Rutgers, The State Univ. of New Jersey, Newark, NJ

8:45 1866 Scrub-lovin' hoppers: a speciation tale of ancient islands, an absence of flight, and rapidly evolving phalli. **Derek A. Woller**, asilid@gmail.com, Univ. of Central Florida, Orlando, FL

9:05 1867 Dragonflies: understanding phylogenetic and functional diversity. **Jessica Ware**, jware@amnh.org, Rutgers, The State Univ. of New Jersey, Newark, NJ

9:25 Break

9:55 1868 Species sorting and cryptic dispersal: a landscape-scale experiment. **Karl Cottenie**, karl.cottenie@gmail.com, Univ. of Guelph, Guelph, ON, Canada

10:15 1869 The relationships between body size, distribution range and species richness in American odonates. **William R. Kuhn**, willkuhn@vt.edu, Rutgers, The State Univ. of New Jersey, Newark, NJ

10:35 Geographic ranges and dispersal: large scale problems and potential small scale solutions. **Dominic Evangelista**, dominicev@gmail.com, Rutgers, The State Univ. of New Jersey, Newark, NJ

10:55 1870 Understanding fig wasp dispersal across fig wasp microcosms. **Vignesh Venkateswaran**, vignesh@ces.iisc.ernet.in, Indian Institute of Science, Bangalore, India

11:15 Concluding Remarks

Member Symposium: Youthful Perspectives in Forensic Entomology, Part Deux: The Road Less Traveled

B115-116 (Oregon Convention Center)

Moderators and Organizers: Charity Owings[1] and Meaghan Pimsler[2], [1]Indiana Univ. Purdue Univ., Indianapolis, IN, [2]Texas A&M Univ., College Station, TX

8:00 Welcoming Remarks

8:00 1871 The grounds crew stole my liver, and other "adventures" in undergraduate entomological research. **Rachel M. Mohr**, rmmohr@mail.wvu.edu, West Virginia Univ., Morgantown, WV

8:20 1872 Bug-proofing the case: Forensic entomology from a criminal defense perspective. **Andrew Moll**, OLL@pd.sbcounty.gov, Office of the Public Defender, San Bernardino County, San Bernardino, CA

8:40 1873 Population genetic structure of an invasive forensically important blow fly. **Fanchen Bao**, fbao002@fiu.edu, Florida International Univ., Miami, FL

9:00 1874 CSI (Crime Scene Insects): UK. **Amoret Whitaker**, a.whitaker@nhm.ac.uk, Natural History Museum, London, United Kingdom

9:20 1875 Dealing with uncertainty in forensic entomology casework. **Michelle Sanford**, Michelle.Sanford@ifs.hctx.net, Harris County Institute of Forensic Sciences, Houston, TX

9:40 1876 60 years and 60,000 maggots: The current state of blow fly development. **Amanda Roe**, amanda.roe@hotmail.com, Univ. of Nebraska, Lincoln, NE

10:00 Break

10:20 1877 *De novo* genome assembly of *Phormia regina* (Diptera: Calliphoridae). **Anne Andere**, aaandere@iupui.edu, Indiana Univ. Purdue Univ., Indianapolis, IN

10:40 1878 Overlap, experiences and future opportunities between veterinary entomology with forensic entomology. **Justin Talley**, justin.talley@okstate.edu, Oklahoma State Univ., Stillwater, OK

11:00 1879 Me? A Federal Agent? Alternate career paths for forensic entomologists. **Elizabeth Richards**, elizabeth.richards@us.af.mil, Defense Forensic Science Center, Forest Park, GA

11:20 1880 Experiences with developing and teaching a college level forensic entomology course. **Lauren Weidner**, laurenmweidner@gmail.com, Rutgers, The State Univ. of New Jersey, New Brunswick, NJ

11:40 1881 Crime scene investigation: Utilizing all the forensic pieces of the puzzle. **Celestina Rossi**, celestina.rossi@mctx.org, Montgomery County Sheriff's Dept., Conroe, TX

12:00 Concluding Remarks

Member Symposium: Underlying Aspects of Insect Reproduction: What We Know and What Needs to be Done

C123 (Oregon Convention Center)

Moderators and Organizers: Geoffrey M. Attardo[1], Immo A. Hansen[2] and Joshua B. Benoit[3], [1]Yale Univ., New Haven, CT, [2]New Mexico State Univ., Las Cruces, NM, [3]Univ. of Cincinnati, Cincinnati, OH

8:00 Welcoming Remarks

8:05 1882 Juvenile hormone biosynthesis and reproductive physiology in mosquitoes. **Crisalejandra Rivera-Perez**, cririver@fiu.edu and Fernando Noriega, Florida International Univ., Miami, FL

8:35 1883 The composition and regulation of milk proteins associated with tsetse fly lactation. **Geoffrey M. Attardo**, Geoffrey.attardo@yale.edu, Yale Univ., New Haven, CT

9:05 1884 Genomic analysis of adult reproductive diapause in the mosquito *Culex pipiens*. **Cheolho Sim**, Cheolho_Sim@baylor.edu, Baylor Univ., Waco, TX

9:35 1885 Resource allocation across life history stages in Drosophila. **Allen Gibbs**, allen.gibbs@unlv.edu, Univ. of Nevada, Las Vegas, NV

10:05 SP1886 Identification of the ovary ecdysteroidogenic hormone receptor in the yellow fever mosquito *Aedes aegypti*. **Mark R. Brown**, mrbrown@uga.edu, Kevin J. Vogel and Michael R. Strand, Univ. of Georgia, Athens, GA

10:17 Break

10:30 1887 Egg maturation cycles are regulated by autophagic degradation of the fat body in *Aedes aegypti*. **Bart Bryant**, wbb@ksu.edu, Kansas State Univ., Manhattan, KS

11:00 1888 Antioxidant-mediated hormesis improves male and female reproductive output. **Giancarlo Lopez-Martinez**, gclopez@nmsu.edu, New Mexico State Univ., Las Cruces, NM

11:30 1889 Regulation of vitellogenins by alternative splicing in mosquitoes. **Jason Rasgon**, jlr54@psu.edu, Pennsylvania State Univ., Univ. Park, PA

MUVE Section Symposium: One Health: Linking Entomologists to Aid in the Pursuit of Improved Health for Humans, Animals, and Our Ecosystems

A107-109 (Oregon Convention Center)

Moderators and Organizers: Jenny S. Carlson[1] and Rebecca Trout Fryxell[2], [1]Univ. of California, Davis, CA, [2]Univ. of Tennessee, Knoxville, TN

8:00 Welcoming Remarks

8:05 1890 Global surveillance for emerging wildlife zoonoses: Integrating entomology. **Kirsten Gilardi**, kvgilardi@ucdavis.edu, Univ. of California, Davis, CA

8:20 1891 Ecology of antibiotic resistance traits: Crossroads of microbiology, entomology, public and animal health. **Ludek Zurek**, lzurek@ksu.edu, Kansas State Univ., Manhattan, KS

8:35 1892 Is there a role for a Food Safety Entomologist in the One Health concept? **Astri Wayadande**, a.wayadande@okstate.edu, Oklahoma State Univ., Stillwater, OK

8:50 1893 Presentation Withdrawn

9:05 SP1894 Evaluation of ultra low volume deposition of public health insecticides in a hot desert environment. **Michael L Fisher**, ento4life@gmail.com[1], CDR David F. Hoel[2], and Muhammad Farooq[3], [1]North Carolina State Univ., Raleigh, NC, [2]US Navy, Gainesville, FL, [3]Navy Entomology Center of Excellence, Jacksonville, FL

9:17 1895 One Health & vector-borne disease control with endectocidal drugs. **Brian D. Foy**, brian.foy@colostate.edu, Colorado State Univ., Fort Collins, CO

9:32 Break

9:42 1896 Using genetics to control arthropod disease vectors. **Bradley White**, bradley.white@ucr.edu, Univ. of California, Riverside, CA

9:57 SP1897 Targeted trapping of malaria vectors: *Anopheles darlingi* in the Peruvian Amazon. **George Peck**, gwpeck5@gmail.com, Walter Reed Army Institute of Research, Silver Spring, MD

10:09 1898 Techniques to add value to sand fly collections point the way to area-wide control to reduce sand fly populations as well as transmission of *Leishmania* parasites. **Lane Foil**, lfoil@agcenter.lsu.edu, Louisiana State Univ., Baton Rouge, LA

10:24 1899 Integrating field ecology and medicine to improve our understanding of tick-borne diseases. **Andrea Swei**, aswei@sfsu.edu, San Francisco State Univ., San Francisco, CA

10:39 1900 Understanding ecological and environmental drivers for risk prediction of *Culicoides t*ransmitted orbiviral diseases. **Christie Mayo**, cemayo@ucdavis.edu, Univ. of California, Davis, CA

10:54 1901 Ticks and their "friends": a medical and veterinary problem with a one-health solution. **Rebecca Trout Fryxell**, RFryxell@utk.edu, Univ. of Tennessee, Knoxville, TN

11:09 1902 Importance of understanding *Plasmodium* transmission for animals and humans. **Jenny S. Carlson**, jencarlson@ucdavis.edu, Univ. of California, Davis, CA

11:24 Discussion

11:54 Concluding Remarks

Ten-Minute Papers, MUVE Section: Social Media and Digital Information

A103-104 (Oregon Convention Center)

Moderators: Scott Hutchins, Dow AgroSciences, Indianapolis, IN

8:00 1903 Can social media extend the reach of public health messages? **Cameron Webb**, cameron.webb@swahs.health.nsw.gov.au, Univ. of Sydney, Westmead, Australia

8:12 1904 The role of electronic media in entomological surveillance on Chagas vectors disease (Hemiptera: Reduviidae). **Margarita Peñaloza**, margap2001@hotmail.com, Estudiante Maestria, Bogotá, Colombia

8:24 1905 The population biology browser (PopBio) from Vectorbase. **Gloria I. Giraldo-Calderón**, ggiraldo@nd.edu[1], Robert M. MacCallum[2], Daniel Lawson[3], Scott J. Emrich[1] and Frank H. Collins[1], [1]Univ. of Notre Dame, Notre Dame, IN, [2]Imperial College London, London, England, [3]European Bioinformatics Institute (EMBL-EBI), Hinxton, England

8:36 1906 Take a journey with me: Personalizing social media to attract more followers. **Wizzie Brown**, ebrown@agnet.tamu.edu, Texas A&M Univ., Austin, TX

8:48 1907 A gameplan for connecting to new audiences: Getting help from a team of MBA allstars. **Wendy A. Johnson**, wendyann@ksu.edu and Brian McCornack, Kansas State Univ., Manhattan, KS

Ten-Minute Papers, MUVE Section: Forensic and Veterinary Entomology

A103-104 (Oregon Convention Center)

Moderators: D. Wes Watson, North Carolina State Univ., Raleigh, NC

9:00 Introductory Remarks

9:05 1908 Seasonal evaluation of stable fly populations on Central and West Texas dairies. **Sonja L. Swiger**, slswiger@ag.tamu.edu, Texas A&M Univ., Stephenville, TX

9:17 1909 Evaluation of Cimi-Shield™ Knock-Out Bed Bug Eliminator against house fly (*Musca domestica*) adults. **Jerome Hogsette**, jerry.hogsette@ars.usda.gov, USDA - ARS, Gainesville, FL

9:29 1910 Laboratory colonization and life history characteristics of the canyon fly (*Fannia conspicua*). **Alec Gerry**, alec.gerry@ucr.edu, Univ. of California, Riverside, CA

9:41 1912 The living dead of Alaskan salmon marine derived nutrients: Insights from the Calliphoridae microbiome. **M. Eric Benbow**, benbow@msu.edu and Jennifer L. Pechal, Michigan State Univ., East Lansing, MI

9:53 1913 An evaluation of sampling methods used to produce forensic entomology insect growth models. **Jeffrey Wells**, jedwell@fiu.edu[1], Melise Lecheta[2], Mauricio Moura[2] and Lynn LaMotte[3], [1]Florida International Univ., Miami, FL, [2]Universidade Federal do Paraná, Curitiba, Brazil, [3]Louisiana State Univ., New Orleans, LA

10:05 1914 Microbial community function associated with ephemeral resources as mediated by nutrient content and dipteran larval activity. **Jonathan A. Cammack**, jonathan.cammack@ag.tamu.edu, Stephanie N. Thornton and Jeffery K. Tomberlin, Texas A&M Univ., College Station, TX

Ten-Minute Papers, SysEB Section: Coleoptera Systematics

A105 (Oregon Convention Center)

Moderators: Nathan P. Lord[1] and James A. Robertson[2], [1]Brigham Young Univ., Provo, UT, [2]Univ. of Arizona, Tucson, AZ

8:00 Introductory Remarks

8:02 1915 The 1000 curculionidae phylogeny and evolution project (1K Weevils): Phylogenomic and morphological data converge to reveal the evolutionary history of a superradiation. **Duane D. McKenna**, dmckenna@memphis.edu, Univ. of Memphis, Memphis, TN

8:14 1916 Transformations of head and thorax structures during the metamorphosis of *Chrysomela populi* (Coleoptera, Chrysomelidae). **Si-Qin Ge**, gesq@ioz.ac.cn and Xing-Ke Yang, Chinese Academy of Sciences, Beijing, China

8:26 1917 Phylogeny of the aquatic beetle family Noteridae (Coleoptera: Adephaga) inferred from molecular sequence data and morphology. **Stephen Baca**, s953b810@ku.edu and Andrew Short, Univ. of Kansas, Lawrence, KS

8:38 1918 Trends and impact of host utilization in beetles. **James A. Robertson**, erotylid@gmail.com[1], Michael F. Whiting[2], Adam Slipinski[3], Joseph V. McHugh[4], and Meredith Blackwell[5], [1]Univ. of Arizona, Tucson, AZ, [2]Brigham Young Univ., Provo, UT, [3]CSIRO, Canberra, Australia, [4]Univ. of Georgia, Athens, GA, [5]Louisiana State Univ., Baton Rouge, LA

8:50 1919 Comparative diversification of mesquite-feeding seed beetles (Coleoptera: Chrysomelidae: Bruchinae). **Geoffrey Morse**, gmorse@sandiego.edu and Veronica Moffitt, Univ. of San Diego, San Diego, CA

9:02 Break

9:17 1920 The first visual transcriptomes of the jewel beetles (Coleoptera: Buprestidae), including the emerald ash borer (EAB: *Agrilus planipennis* Fairmaire), with evidence of multiple opsin copies and sexual dimorphisms. **Nathan P. Lord**, bothriderid@gmail.com[1],

Gavin J. Martin[1], Jonathan Lelito[2] and Seth M. Bybee[1], [1]Brigham Young Univ., Provo, UT, [2]USDA - APHIS - PPQ, Brighton, MI

9:29 1921 Into the ant nest: Molecular evolution of chemoreception and host specialization in predatory paussine beetles. **Tanya Renner**, tanyarenner@email.arizona.edu, Wendy Moore and Amanda Romaine, Univ. of Arizona, Tucson, AZ

9:41 1922 Evolution of myrmecophily in xanthopygine rove beetles (Coleoptera: Staphylinidae). **Stylianos Chatzimanolis**, stylianos-chatzimanolis@utc.edu[1], and A.J. Brunke[2], [1]Univ. of Tennessee, Chattanooga, TN, [2]Natural History Museum of Denmark, Copenhagen, Denmark

9:53 1923 Investigating the systematics and genomics of ground beetles (Carabidae) with next-generation molecular techniques. **James M. Pflug**, pflugja@onid.oregonstate.edu, Kojun Kanda, John Sproul and David Maddison, Oregon State Univ., Corvallis, OR

10:05 1924 Amphidorini morphology (Coleoptera: Tenebrionidae): Where systematics, evolutionary ecology, and biogeography meet. **Aaron D. Smith**, pimeliinae@gmail.com, Northern Arizona Univ., Flagstaff, AZ

10:17 Concluding Remarks

Ten-Minute Papers, SysEB Section: Ant Systematics

A106 (Oregon Convention Center)

Moderators: Max E. Winston[1] and Courtney Rockenbach[2], [1]Univ. of Chicago, Chicago, IL, [2]Rutgers, The State Univ. of New Jersey, Newark, NJ

8:00 Welcoming Remarks

8:02 1925 Evolution of the trap-jaw ants in the genera *Odontomachus* and *Anochetus*. **Fredrick Larabee**, larabee@life.illinois.edu and Andrew V. Suarez, Univ. of Illinois, Urbana, IL

8:14 1926 Mechanisms of collective decision-making in the slave-making ant, *Protomognathus americanus*. **Julie Miller**, julie.serena@gmail.com, Cornell Univ., Ithaca, NY

8:26 1927 Antkey: Designing an interactive identification guide to invasive ants using next-generation web tools. **Eli Sarnat**, e.sarnat@gmail.com and Andrew V. Suarez, Univ. of Illinois, Urbana, IL

8:38 1928 Chemical warfare in invasive ants: A detoxification interaction facilitates an invasion. **Edward G. LeBrun**, elebrun@mail.utexas.edu, Univ. of Texas, Austin, TX

8:50 Break

9:05 1929 Argentine ant (*Linepithema humile*) invasion along riparian corridors in southern California. **Lauren Fah**, lfah66@yahoo.com and Dessie Underwood, California State Univ., Long Beach, CA

9:17 1930 Presentation Withdrawn

9:29 1931 A life table approach to modeling annual worker production within colonies of the Florida harvester ant (*Pogonomyrmex badius*). **Christina Kwapich**, ckwapich@bio.fsu.edu[1], and Walter R. Tschinkel[2], [1]Arizona State Univ., Tempe, AZ, [2]Florida State Univ., Tallahassee, FL

9:41 1932 Aggressive interactions between *Solenopsis geminata* and *Paratrechina longicornis* (Hymenoptera: Formicidae). Yi-Hsiu Tsai[1], Wen-Jer Wu[2] and **Li-Chuan Lai**, lclai@pu.edu.tw[1], [1]Providence Univ., Taichung, Taiwan, [2]National Taiwan Univ., Taipei, Taiwan

9:53 1933 Utilizing genotyping-by-sequencing to elucidate Neotropical army ant evolution. **Max E. Winston**, mewinsto@gmail.com[1], Daniel Kronauer[2], and Corrie Moreau[3], [1]Univ. of Chicago, Chicago, IL, [2]Harvard Univ., Cambridge, MA, [3]Field Museum of Natural History, Chicago, IL

10:05 Concluding Remarks

Ten-Minute Papers, P-IE Section: Biological Control A

F151 (Oregon Convention Center)

Moderators: Thomas R. Unruh[1] and Alejandro Del Pozo[2], [1]USDA - ARS, Wapato, WA, [2]North Carolina State Univ., Raleigh, NC

8:00 1934 Biological control: Key factor for IPM of the sugarcane borers in the Cauca River Valley of Colombia. **German Vargas**, gavargas@cenicana.org and Luis Gomez, Colombian Sugarcane Research Center, Cali, Colombia

8:12 1935 Introducing the new novel biological insecticide Venerate from Marrone Bio Innovations. **Reid Ipser**, ripser@marronebio.com[1], Pamela Marrone[1] and Timothy Johnson[2], [1]Marrone Bio Innovations, Inc, Davis, CA, [2]Marrone Bio Innovations, Inc, Danville, PA

8:24 1936 Reproductive biology of *Ooencyrtus nezarae*, an egg parasitoid of the kudzu bug *Megacopta cribraria* in Japan. **Keiji Takasu**, takasu@brs.kyushu-u.ac.jp, Kyushu Univ., Fukuoka, Japan

8:36 1937 The European earwig (*Forficula auricularia*) is a beneficial insect in most tree fruits. **Thomas R. Unruh**, thomas.unruh@ars.usda.gov[1], and Richard Hilton[2], [1]USDA - ARS, Wapato, WA, [2]Oregon State Univ., Central Point, OR

8:48 1938 Effect of entomopathogenic fungi and entomogenous nematodes, and low risk insecticides against wheat stem sawfly (*Cephus cinctus*). **Gadi VP Reddy**, reddy@montana.edu[1], Brian Thompson[1], Khanobporn Tangtrakulwanich[1], Shaohui Wu[2], John Miller[1], Victoria Ophus[1] and Julie Prewett[1], [1]Montana State Univ., Conrad, MT, [2]Rutgers, The State Univ. of New Jersey, New Brunswick, NJ

9:00 1939 Evaluation of the effectiveness of entomopathogens for the management of wireworms (Coleoptera: Elateridae) on spring wheat. **Brian Thompson**, brian.thompson@montana.edu[1], Gadi VP Reddy[1], Khanobporn Tangtrakulwanich[1], Shaohui Wu[2], John Miller[1], Victoria Ophus[1] and Stefan T. Jaronski[3], [1]Montana State Univ., Conrad, MT, [2]Rutgers, The State Univ. of New Jersey, New Brunswick, NJ, [3]USDA - ARS, Sidney, MT

9:12 1940 Dispersal of ambush and cruise foraging entomopathogenic nematodes in a complex heterogeneous environment. **Harit K. Bal**, bal.9@osu.edu[1], and Parwinder Grewal[2], [1]The Ohio State Univ., Wooster, OH, [2]Univ. of Tennessee, Knoxville, TN

9:24 1941 Year-to-year variation of prey utilization by *Cerceris fumipennis* (Hymenoptera: Crabronidae) at two sites in North Carolina. **Whitney Swink**, whitney.swink@ncagr.gov[1], Christine A. Nalepa[1] and Joshua P. Basham[2], [1]North Carolina Dept. of Agriculture, Raleigh, NC, [2]Tennessee State Univ., McMinnville, TN

9:36 1942 The implications of rapid evolution for safety and effectiveness of biological weed control. **Linda Buergi**, buergil@onid.oregonstate.edu[1], Evrim Karacetin[2] and Peter McEvoy[1], [1]Oregon State Univ., Corvallis, OR, [2]Erciyes Univ., Kayseri, Turkey

9:48 1943 Relative abundance and movement of adult green lacewings between Oklahoma winter canola and winter wheat fields. **Casi N. Jessie**, casi.jessie@okstate.edu[1], Kris Giles[1], James R. Hagler[2], Scott A. Machtley[2], Brian McCornack[3], Timothy J. Kring[4] and William Jessie[1], [1]Oklahoma State Univ., Stillwater, OK, [2]USDA - ARS, Maricopa, AZ, [3]Kansas State Univ., Manhattan, KS, [4]Univ. of Arkansas, Fayetteville, AR

10:00 Break

10:12 1944 Are we getting better at this? An examination of biocontrol establishment and success rates through time. **Aaron Anderson**, Aaron.G.Anderson@colostate.edu, Paul J. Ode and Andrew P. Norton, Colorado State Univ., Fort Collins, CO

10:24 1945 Pre-introduction assessment of an Asian larval parasitoid for classical biological control of *Drosophila suzukii* in the US. **Antonio Biondi**, antonio.biondi@unict.it[1], Xin-geng Wang[1], Kent Daane[1], Jeffrey C. Miller[2], Betsey Miller[2], Peter W. Shearer[3] and Vaughn Walton[2], [1]Univ. of California, Berkeley, CA, [2]Oregon State Univ., Corvallis, OR, [3]Oregon State Univ., Hood River, OR

10:36 1946 Thermal threshold and thermal requirement of *Chrysoperla carnea* (Stephens) (Neuroptera: Chrysopidae) under constant temperatures. **Muhammad Noor-UL-Ane**, mnoor493@hotmail.com, Univ. of Agriculture, Faisalabad, Pakistan

Ten-Minute Papers, P-IE Section: Population Monitoring and Modeling A

F149 (Oregon Convention Center)

Moderators: Gregg Nuessly[1] and Elena Rhodes[2], [1]Univ. of Florida, Belle Glade, FL, [2]Univ. of Florida, Gainesville, FL

8:00 1947 Development of the Genuity® rootworm manager application for iPad users. **Douglas Jones**, douglas.b.jones@monsanto.com and Matthew W. Carroll, Monsanto Company, St. Louis, MO

8:12 1948 Current distribution and status of Mexican rice borer (Eoreuma loftini) in Florida. **Gregg Nuessly**, gnuessly@ufl.edu[1], James Hayden[2], Les Baucum[3], Wayne Dixon[2], Leroy Whilby[2] and Nicholas Larsen[1], [1]Univ. of Florida, Belle Glade, FL, [2]Florida Dept. of Agriculture and Consumer Services, Gainesville, FL, [3]Univ. of Florida, Sebring, FL

8:24 1949 Clear sticky sheets for monitoring blueberry gall midge, *Dasineura oxycoccana* (Johnson), and parasitoid rearing from flower and leaf buds. **Elena Rhodes**, erhodes@ufl.edu and Oscar Liburd, Univ. of Florida, Gainesville, FL

8:36 1950 Automating soybean aphid counts on leaflets using image processing algorithms and a smartphone. **Brian McCornack**, mccornac@ksu.edu and Dylan Kraus, Kansas State Univ., Manhattan, KS

8:48 1951 Explanation for why % catch suppression does not correlate well with % damage for behavioral control tactics. James R. Miller[1], and **Paul A. Weston**, pweston@csu.edu.au[2], [1]Michigan State Univ., East Lansing, MI, [2]Charles Sturt Univ., Wagga Wagga, Australia

9:00 1952 Effects of density-dependent mortality and temporal variation in temperature on the population dynamics of the western corn rootworm (*Diabrotica virgifera virgifera* LeConte): A stochastic model. **Haridas Chirakkal**, hchirakkal2@unl.edu[1], Lance Meinke[1], Bruce E. Hibbard[2], Blair Siegfried[1] and Brigitte Tenhumberg[1], [1]Univ. of Nebraska, Lincoln, NE, [2]USDA - ARS, Columbia, MO

9:12 1953 Predicting emergence in a Midwestern population of the green June beetle. Cory Creed[1], Brian Cowell[2], Donn T. Johnson[2] and **Maciej A. Pszczolkowski**, MPszczolkowski@missouristate.edu[1], [1]Missouri State Univ., Mountain Grove, MO, [2]Univ. of Arkansas, Fayetteville, AR

9:24 1954 Plume reach and trapping radius of codling moth (*Cydia pomonella*). **Christopher Adams**, adamsch@msu.edu, Peter S. McGhee, Larry Gut and James R. Miller, Michigan State Univ., East Lansing, MI

9:36 1955 Mapping the distribution of a potentially new tiny terror in southern white pine forests. **Ashley Schulz**, anschulz@uga.edu[1], Christopher Asaro[2], David R. Coyle[1], Michelle Cram[3], Rima Lucardi[3], Angela M. Mech[1] and Kamal J.K. Gandhi[1], [1]Univ. of Georgia, Athens, GA, [2]Virginia Dept. of Forestry, Charlottesville, VA, [3]USDA - Forest Service, Athens, GA

9:48 Break

10:00 1956 Light effects on relative attractiveness of yellow traps to western cherry fruit fly (*Rhagoletis indifferens*). **Wee Yee**, wee.yee@ars.usda.gov, USDA - ARS, Wapato, WA

10:12 1957 Improved traps for the coconut rhinoceros beetle (*Oryctes rhinoceros*). **Aubrey Moore**, amoore@uguam.uog.edu[1], Roland Quitugua[1], Matthew Siderhurst[2] and Eric B. Jang[2], [1]Univ. of Guam, Mangilao, Guam, [2]USDA - ARS, Hilo, HI

10:24 1958 Factors affecting trap capture of lady beetles (Coleoptera: Coccinellidae). **Ted Cottrell**, ted.cottrell@ars.usda.gov and Emily Kemp, USDA - ARS, Byron, GA

10:36 1959 Assessing and improving the accuracy of annual forest health aerial detection surveys in the US. **Robbie W. Flowers**, rflowers@odf.state.or.us[1], Andrew D. Graves[2], Tom W. Coleman[3], Ryan Hanavan[4], Zachary Heath[5], Danny Cluck[6], and Glenn R. Kohler[7], [1]Oregon Dept. of Forestry, Salem, OR, [2]USDA - Forest Service, Albuquerque, NM, [3]USDA - Forest Service, San Bernardino, CA, [4]USDA - Forest Service, Durham, NH, [5]USDA - Forest Service, Davis, CA, [6]USDA - Forest Service, Redding, CA, [7]Washington Dept. of Natural Resources, Olympia, WA

10:48 1960 Development and evaluation of various trapping systems for monitoring pollinator abundance and diversity in apple orchard ecosystem. **Neelendra K. Joshi**, nkj105@psu.edu[1], David J. Biddinger[1], Edwin Rajotte[2], Mark Otieno[2], Timothy W. Leslie[3] and Melanie A. Kammerer[2], [1]Pennsylvania State Univ., Biglerville, PA, [2]Pennsylvania State Univ., Univ. Park, PA, [3]Long Island Univ., Brooklyn, NY

11:00 1961 DefoliationPro: A new training tool for improving the accuracy and precision of defoliation ratings. **Forrest Nutter**, fwn@iastate.edu, Michael T. McCarville and Adam J. Varenhorst, Iowa State Univ., Ames, IA

11:12 1962 Phenology model for the omnivorous leaftier, *Cnephasia longana*: Reviving intensive research from a bygone era. **Leonard Coop**, coopl@science.oregonstate.edu, Oregon State Univ., Corvallis, OR

11:24 1963 Learning to love leftovers: Expanding our knowledge of insect distribution and diversity using insect by-catch. **Lori R. Spears**, lori.spears@usu.edu and Ricardo A. Ramirez, Utah State Univ., Logan, UT

WEDNESDAY, NOVEMBER 19, 2014, AFTERNOON

Insect Illustration Workshop

E146 (Oregon Convention Center)

Moderator and Organizer: Stacey Thalden, Intersectus Design

1:30–3:30

Lunch and Learn: Outreach in Unusual Places: Making Push-Pull Marketing Work for You

Portland Ballroom 252 (Oregon Convention Center)

Moderator and Organizer: Gwen Pearson, Get Your Nature Geek On, Toledo, OH

12:15–1:15

Program Symposium: Novel Ecological Approaches to Vector Control

Portland Ballroom 251 (Oregon Convention Center)

Moderators and Organizers: Allison Gardner and Carla Caceres, Univ. of Illinois, Urbana, IL

1:30 Welcoming Remarks

1:35 1964 Eco-evolutionary feedbacks in aquatic systems: Implications for mosquito control. **Carla Caceres**, caceres@life.illinois.edu[1], Brian F. Allan[1] and Ephantus Muturi[2], [1]Univ. of Illinois, Urbana, IL, [2]Univ. of Illinois, Champaign, IL

1:55 1965 Can non-vector herbivores suppress the spread of a plant virus? **Paul Chisholm**, paul.chisholm@email.wsu.edu[1], Sanford Eigenbrode[2] and David Crowder[1], [1]Washington State Univ., Pullman, WA, [2]Univ. of Idaho, Moscow, ID

2:15 1966 Ecological and biorational strategies for tick control and the prevention of tick-borne disease. **Kirby C. Stafford**, Kirby.Stafford@ct.gov and Laura Estep, Connecticut Agricultural Experiment Station, New Haven, CT

2:35 Break

2:50 1967 Efficacy, non-target effects and other considerations for microbial and other non-traditional mosquito larvicides. **Sharon Lawler**, splawler@ucdavis.edu and Deborah Dritz, Univ. of California, Davis, CA

3:10 1968 Ecological factors affecting success of barrier trapping methods for mosquito control. **Cynthia Lord**, clord@ufl.edu, Joseph J. Pohedra and C. Roxanne Connelly, Univ. of Florida, Vero Beach, FL

3:30 1969 Precision mosquito control concepts. **Randy Gaugler**, gaugler@rci.rutgers.edu[1], Greg Williams[2], Yi Wang[3], Scott Crans[4], Ary Farajollahi[4] and Devi Suman[1], [1]Center for Vector Biology, New Brunswick, NJ, [2]Hudson County Mosquito Control, Jersey City, NJ, [3]Chinese Academy of Sciences, Wuhan, Hubei, China, [4]Rutgers, The State Univ. of New Jersey, New Brunswick, NJ

3:50 1970 Mosquito mating biology and behavior as a target for vector control. **Laura Harrington**, lch27@cornell.edu, Cornell Univ., Ithaca, NY

4:10 1971 Integrated mosquito management for constructed wetlands: Addressing top-down effects that bottom out. **William E. Walton**, william.walton@ucr.edu, David Popko, Dagne Duguma and Margaret Wirth, Univ. of California, Riverside, CA

4:30 1972 Exploitation of ecological traps for mosquito control. **Allison Gardner**, amgardn2@illinois.edu[1], Brian F. Allan[1] and Ephantus J. Muturi[2], [1]Univ. of Illinois, Urbana, IL, [2]Univ. of Illinois, Champaign, IL

4:50 Concluding Remarks

MUVE Section Symposium: Beyond Drinking the Worm: Linking Concept with Action to Save the World with Entomophagy

Portland Ballroom 253 (Oregon Convention Center)

Moderators and Organizers: James Ricci, Kim Hung and Adena Why, Univ. of California, Riverside, CA

1:30 Introductory Remarks

1:35 1973 Eating bugs 101: Why, how, and the role of education in moving past mental taboos. **Robert Allen**, rna0014@gmail.com, Little Herds, Austin, TX

1:55 1974 Bringing insectxy back: Hopping cricket bars into the mainstream. **Patrick Crowley**, pat@chapul.com, Chapul, Salt Lake City, UT

2:15 1975 Sustainable critters or delicious fritters? Consumer perceptions of edible insects in The Netherlands and Thailand. **Catriona Lakemond**, catriona.lakemond@wur.nl, Wageningen Univ., Wageningen, Netherlands

2:35 1976 Toward maximizing efficiency of black soldier fly production for food and feed. **John C. Schneider**, jcs1@msstate.edu, Mississippi State Univ., Mississippi State, MS

2:55 1977 Insects as food: An overview of U.S. regulatory requirements. **Ricardo Carvajal**, rcarvajal@hpm.com, Hyman, Phelps & McNamara, P.C., Washington, DC

3:15 1978 Way forward to bring insects in the human food chain. **Paul Vantomme**, paul.vantomme@fao.org, Food and Agriculture Organization of the United Nations, Rome, Italy

3:35 Break and Poster Viewing

SD1979 Ento: The art of eating insects. **Aran Dasan**, aran.dasan@network.rca.ac.uk, Ento, London, United Kingdom

SD1980 What are we actually eating when we consume witchetty grubs? **Alan Yen**, Alan.Yen@dpi.vic.gov.au[1], Conrad Bilney[2] and Susan Lawler[2], [1]Dept. of Environment and Primary Industries, Bundoora, Australia, [2]La Trobe Univ., Wodonga, Australia

SD1981 Entomophagy at The New York Entomological Society 100th Anniversary Celebration, May 20, 1992, The Explorer's Club, Manhattan, New York. **Louis N. Sorkin**, sorkin@amnh.org, American Museum of Natural History, New York, NY

SD1982 A market analysis of entomophagy in the United States. Stephen Bayes and **Virginia Emery**, vj.emery@berkeley.edu, Univ. of California, Berkeley, CA

3:50 1983 Palm weevils: easy to farm and good to eat!. **Mark S. Hoddle**, mark.hoddle@ucr.edu, Univ. of California, Riverside, CA

4:10 1984 Importance of entomophagy in Madagascar. **Maminirina Randrianandrasana**, mrandri2@uiuc.edu and May R. Berenbaum, Univ. of Illinois, Urbana, IL

4:30 1985 Act locally, reach globally: Marketing and promoting entomophagy begins at home. **Jerome F. Grant**, jgrant@utk.edu and Renee Follum, Univ. of Tennessee, Knoxville, TN

4:50 1986 Potential of insects as food and feed in assuring food security. **Arnold van Huis**, arnold.vanhuis@wur.nl, Wageningen Univ., Wageningen, Netherlands

5:10 1987 What entomophagy really means, and why it's so challenging. **David Gracer**, david_gracer@hotmail.com, Community College of Rhode Island, Warwick, RI

5:30 Concluding Remarks

Member Symposium: Predatory Lady Beetles: Global Opportunities for Biological Control and Challenges As Invasive Species

Portland Ballroom 254 (Oregon Convention Center)

Moderators and Organizers: Yukie Kajita[1] and John Obrycki[2], [1]Univ. of Tennessee, Chattanooga, TN, [2]Univ. of Kentucky, Lexington, KY

1:30 Introductory Remarks

1:35 1988 Minds of their own: Encouraging ladybird beetles as biological control agents. **Edward W. Evans**, ted.evans@usu.edu, Utah State Univ., Logan, UT

1:52 1989 Bacteria and microsporidia symbionts of the introduced lady beetle *Coccinella septempunctata*. **Eric M. O'Neill**, eric-oneill@utc.edu, Yukie Kajita, Josh Evers and Evan McKenzie, Univ. of Tennessee, Chattanooga, TN

2:09 1990 Refuge for native lady beetles (Coleoptera: Coccinellidae) in perennial grassland habitats. **Lauren M. Diepenbrock**, Lmhd74@mizzou.edu[1], and Deborah L. Finke[2], [1]North Carolina State Univ., Raleigh, NC, [2]Univ. of Missouri, Columbia, MO

2:26 1991 Asymmetric reproductive interference between specialist and generalist *Harmonia ladybirds* in their native range. **Noriyuki Suzuki**, fvgnoriyuki@gmail.com[1], Naoya Osawa[2] and Takayoshi Nishida[2], [1]Tohoku Univ., Sendai, Japan, [2]Kyoto Univ., Kyoto, Japan

2:43 1992 Lady beetles in diverse communities: Which niche fits? **Jacob Aspund**, jake.asplund@wsu.edu and William Snyder, Washington State Univ., Pullman, WA

3:00 1993 An Achilles heel for *Harmonia axyridis*: Anti-predator defenses in *Aphis craccivora*. **Jennifer White**, jenawhite@uky.edu and Joshua McCord, Univ. of Kentucky, Lexington, KY

3:17 Break

3:27 1994 Invasive population genetics of the predatory lady beetle *Hippodamia convergens* in the Americas. **Arun Sethuraman**, arun@temple.edu[1], Fredric Janzen[2], Andrew P. Michel[3], and John Obrycki[4], [1]Temple Univ., Philadelphia, PA, [2]Iowa State Univ., Ames, IA, [3]The Ohio State Univ., Wooster, OH, [4]Univ. of Kentucky, Lexington, KY

3:44 1995 Odor-mediated aggregations of *Hippodamia convergens*, a native coccinellid of North America. **Christopher A. Wheeler**, christopher.wheeler@versailles.inra.fr[1], and Ring T. Cardé[2], [1]Pasteur Institute, Versailles, France, [2]Univ. of California, Riverside, CA

4:01 1996 Debate regarding the role of intraguild predation in restructuring lady beetle communities. **Mary M. Gardiner**, gardiner.29@osu.edu, Chelsea A. Smith, Alice M. Vossbrinck and Andrew Michel, The Ohio State Univ., Wooster, OH

4:18 1997 Do defensive chemicals facilitate intraguild predation and influence invasion success in ladybird beetles? **Yukie Kajita**, yukie-kajita@utc.edu[1], John Obrycki[2], John J. Sloggett[3], Edward W. Evans[4] and Kenneth F. Haynes[2], [1]Univ. of Tennessee, Chattanooga, TN, [2]Univ. of Kentucky, Lexington, KY, [3]Maastricht Univ., Maastricht, Netherlands, [4]Utah State Univ., Logan, UT

4:35 Concluding Remarks

Member Symposium: Transgenic Insect Resistant Soybeans

Portland Ballroom 252 (Oregon Convention Center)

Moderators and Organizers: Nandi Nagaraj[1], Aqeel Ahmad[2] and Murugesan Rangasamy[1], [1]Dow AgroSciences, Indianapolis, IN, [2]Monsanto Company, St. Louis, MO

1:30 Welcoming Remarks

1:35 1998 Management strategies for important insects in soybeans in the Southeast. **Jeremy K. Greene**, greene4@clemson.edu[1], Ames Herbert[2], Dominic Reisig[3], Jack S. Bacheler[4], Francis Reay-Jones[5], Phillip Roberts[6], Michael Toews[6], David Buntin[7], Ronald Smith[8] and Tim Reed[9], [1]Clemson Univ., Blackville, SC, [2]Virginia Polytechnic Institute and State Univ., Blacksburg, VA, [3]North Carolina State Univ., Plymouth, NC, [4]North Carolina State Univ., Raleigh, NC, [5]Clemson Univ., Florence, SC, [6]Univ. of Georgia, Tifton, GA, [7]Univ. of Georgia, Griffin, GA, [8]Auburn Univ., Auburn, AL, [9]Alabama CES, Madison, AL

1:55 1999 Potential value and fit of Bt soybeans in midsouth soybean systems. Angus Catchot[1], **Jeff Gore**, jgore@drec.msstate.edu[2], Don Cook[2], Scott Stewart[3] and Gus Lorenz[4], [1]Mississippi State Univ., Mississippi State, MS, [2]Mississippi State Univ., Stoneville, MS, [3]Univ. of Tennessee, Knoxville, TN, [4]Univ. of Arkansas, Lonoke, AR

2:15 2000 Efficacy of Dow AgroSciences' dual-gene Bt soybeans against key lepidopteran pests in Brazil and Argentina. **Antonio C. Santos**, acsantos1@dow.com[1], Maria Cometti[2], Boris Castro[3], Amanda Jacobson[4] and Luiz Henrique Marques[3], [1]Dow AgroSciences, Indianapolis, IN, [2]Dow AgroSciences, Colon, Argentina, [3]Dow AgroSciences, Mogi Mirim, Brazil, [4]Dow AgroSciences, Greenville, MS

2:35 2001 Intacta: Product attributes & IRM strategies. **Samuel Martinelli**, samuel.martinelli@monsanto.com[1], Graham P. Head[1], Renato A. de Carvalho[2] and Patrick Dourado[2], [1]Monsanto Company, St. Louis, MO, [2]Monsanto do Brasil Ltda., São Paulo, Brazil

2:55 2002 Next generation transgenic IR products in soybeans. **Ted C. MacRae**, ted.c.macrae@monsanto.com[1], Kim Beazley[2], Lisa Ruschke[1], Radomir Stojsin[2], Kiarong Tian[2] and Maria Sanchez-Peña[2], [1]Monsanto Company, Chesterfield, MO, [2]Monsanto Company, St. Louis, MO

3:15 Break

3:25 2003 Genes for chewing insect resistance in soybean. **Maria Ortega Ortega**, ortega77@uga.edu, Roger Boerma, John All and Wayne Parrott, Univ. of Georgia, Athens, GA

3:45 2004 IRM considerations for Dow AgroSciences' dual-gene Bt soybeans in South America. **Nicholas Storer**, nstorer@dow.com and Antonio C. Santos, Dow AgroSciences, Indianapolis, IN

4:05 2005 IRM for insecticidal soybean: From a maizing knowledge to not knowing beans about the insects. **David Onstad**, david.onstad@pioneer.com[1], Z. Pan[2], P Crain[1] and J. Lindsey Flexner[1], [1]DuPont, Wilmington, DE, [2]DuPont Crop Protection, Newark, DE

4:25 2006 Environmental risk assessment of insect protected soybeans. **Aqeel Ahmad**, aqeel.ahmad@monsanto.com, Bernard Sammons, Michael Horak, Steven L. Levine and David Carson, Monsanto Company, St. Louis, MO

4:45 2007 Trait discovery and characterization for soy lepidopteran control. **Kimberly Sampson**, kimberly.sampson@bayer.com, Bayer CropScience, Morrisville, NC

5:05 Concluding Remarks

P-IE Section Symposium: Recovering Monarch Butterfly Populations in North America: A Looming Challenge for Science, the Public, Industry and Legislators

Portland Ballroom 256 (Oregon Convention Center)

Moderators and Organizers: Myron Zalucki, Univ. of Queensland, Brisbane, Australia

1:30 Introductory Remarks

1:30 2008 Host plants and migration success: A holistic approach. **Stephen B. Malcolm**, Steve.malcolm@wmich.edu, Western Michigan Univ., Kalamazoo, MI

1:50 2009 Trends in mortality of the monarch butterflies overwintering in Mexico from 2004 to 2014: Implications for restoration and forest management. **Eduardo Rendón Salinas**, erendon@wwfmex.org, World Wildlife Fund, Zitácuaro, Mexico

2:10 2010 Overwintering sites and monarch population decline. **Lincoln Brower**, brower@sbc.edu[1], and Ernest Williams[2], [1]Sweet Briar College, Sweet Briar, VA, [2]Hamilton College, Clinton, NY

2:30 2011 The contribution of roundup ready crops to the monarch decline. **John Pleasants**, jpleasan@iastate.edu, Iowa State Univ., Ames, IA

2:50 2012 Migration and parasitism: Is disease contributing to monarch population declines? **Sonia Altizer**, saltizer@uga.edu, Univ. of Georgia, Athens, GA

3:10 Break

3:20 2013 Monarch conservation: US government agencies respond. **Michael Rizo**, mrizo@fs.fed.us[1], and Mia Monroe[2], [1]USDA - Forest Service, Washington, DC, [2]National Parks Service, Mill Valley, CA

3:40 2014 A monarch butterfly recovery plan. **Chip Taylor**, chip@ku.edu, Univ. of Kansas, Lawrence, KS

4:00 2015 Landscape-level conservation for the monarch butterfly: How farmers and other large land managers can help save this iconic species. **Scott Black**, sblack@xerces.org, Sarina Jepsen and Brianna Borders, Xerces Society, Portland, OR

4:20 2016 Food chain restoration for monarch recovery in the southwest. **Gary Nabhan**, gpnabhan@email.arizona.edu, Univ. of Arizona, Tucson, AZ

4:40 2017 Supporting monarch habitat restoration on a productive agricultural landscape. **Eric Sachs**, eric.s.sachs@monsanto.com, Monsanto Company, St. Louis, MO

5:00 2018 Conservation and collaboration: The monarch joint venture and monarch citizen science. Karen Oberhauser[1], **Leslie Ries**, lries@umd.edu[2], and Wendy Caldwell[3], [1]Univ. of Minnesota, Saint Paul, MN, [2]Univ. of Maryland, College Park, MD, [3]Monarch Watch Joint Venture, St. Paul, MN

Member Symposium: Grand Challenge: Effective Science Education with Communication

Portland Ballroom 255 (Oregon Convention Center)

Moderators and Organizers: Tamra Reall Lincoln[1], Rebecca Schmidt[2], Kayla I. Perry[3], Michael Forthman[4], and Kyndall Dye[5], [1]Univ. of Missouri, Columbia, MO, [2]Washington State Univ., Wenatchee, WA, [3]The Ohio State Univ., Wooster, OH, [4]Univ. of California, Riverside, CA, [5]Univ. of Kentucky, Lexington, KY

1:30 Introductory Remarks

1:35 2019 Edutainment with insects. **Tom Turpin**, turpin@purdue.edu, Purdue Univ., West Lafayette, IN

1:54 2020 It can be done!!! Inspiring insect interest in the non-bug-loving student. **Sujaya Rao**, sujaya@oregonstate.edu, Oregon State Univ., Corvallis, OR

2:13 2021 Influencing the public and policy: The importance of science as storytelling. **Robert K. D. Peterson**, bpeterson@montana.edu, Montana State Univ., Bozeman, MT

2:32 2022 Backyard bark beetles: Using citizen science to educate the public and monitor invasive species. **Sedonia Steininger**, m.sedonia@ufl.edu and Jiri Hulcr, Univ. of Florida, Gainesville, FL

2:51 2023 Engaging the reluctant learner: Art, science & bugs. **Daniel Babbitt**, babbittd@si.edu, Smithsonian Insect Zoo and Butterfly Pavilion, Washington, DC

12:00 2024 Meeting the challenge: Entomological education and outreach on the palouse. **Alix Whitener**, alix.crilly@email.wsu.edu[1], Rebecca Schmidt[2] and Robert A. Zinna[1], [1]Washington State Univ., Pullman, WA, [2]Washington State Univ., Wenatchee, WA

3:03 Poster Session

SD2025 Adventures in education: Using entomology to engage children in science. **Tamra Reall Lincoln**, TRFY9F@mail.mizzou.edu[1], Kathryn Ingerslew[1], Brittani Alexander[1], Lauren M. Diepenbrock[1], John Krauska[1], Mervat A. B. Mahmoud[1], Daniel Reynoso-Velasco[2] and Hongwei Zhang[1], [1]Univ. of Missouri, Columbia, MO, [2]Universidad Nacional Autónoma de México, Mexico City, Mexico

SD2026 Pollination investigators: Measuring pollination services in backyard gardens. **Scott Prajzner**, prajzner.1@osu.edu, Nicole Hoekstra, Andrea Kautz and Alice M. Vossbrinck, The Ohio State Univ., Wooster, OH

SD2027 Social media: Giving science communication a facelift. **M. T. Bentley**, Volcum1@ufl.edu, Aaron Pomerantz, Lary Reeves and Geoff Gallice, Univ. of Florida, Gainesville, FL

SD2028 From the lab and beyond: Entomology in action. **Kyndall Dye**, kyndall.dye@uky.edu, Jennifer Gordon, Sydney Crawley, Katelyn A. Kowles, Caitlin Stamper and Abiya Saeed, Univ. of Kentucky, Lexington, KY

SD2029 Bringing the hop yards back: A feasibility study and outreach program for Ohio. **Chelsea A. Smith**, smith.7231@osu.edu[1], Mary M. Gardiner[1], Brad Bergefurd[2] and Thom Harker[2], [1]The Ohio State Univ., Wooster, OH, [2]The Ohio State Univ., Piketon, OH

SD2030 Outreach at UCR: Dynamic approaches to community science education. **Deborah De La Riva**, ddela005@ucr.edu, Amelia Lindsey, Parry Kietzman, Emily McDermott and Christopher Shogren, Univ. of California, Riverside, CA

SD2031 Response to the recent detection of *Syricoris lacunana* Denis & Schiffermueller (Tortricidae) in Forest Park, Portland, Oregon. **Mark E. Hitchcox**, Mark.E.Hitchcox@aphis.usda.gov, USDA - APHIS - PPQ, Portland, OR

4:03 2032 Engaging the non-science student in science – through insects. **Richard S. Zack**, zack@wsu.edu, Washington State Univ., Pullman, WA

4:22 2033 Pedagogy toward advancing scientific literacy and communication among college students. **Carol Anelli**, anelli.7@osu.edu, The Ohio State Univ., Columbus, OH

4:41 2034 Pesticide education search tool (PEST): A new IPM application from the national pesticide information center. **David Stone**, Dave.Stone@oregonstate.edu, Kaci Buhl and Sean Ross, Oregon State Univ., Corvallis, OR

4:53 2035 Making the case: Forensic entomology case studies. **Nancy Miorelli**, Univ. of Georgia, Athens, GA

5:05 2036 Bring in your bugs! How citizen science can foster entomological literacy. **Andrea Lucky**, alucky@ufl.edu, Univ. of Florida, Gainesville, FL

5:24 Concluding Remarks

Member Symposium: Biogeography and Evolution of Mesoamerican Arthropods

B110-112 (Oregon Convention Center)

Moderators and Organizers: Michael Branstetter[1] and John T. Longino[2], National Museum of Natural History, Smithsonian Institution, Washington, DC, [2]Univ. of Utah, Salt Lake City, UT

1:30 Introductory Remarks

1:35 2037 Project ADMAC: Ant diversity of the Mesoamerican corridor. **John Longino**, jacklongino@gmail.com, Univ. of Utah, Salt Lake City, UT

1:50 2038 Phylogenomics and comparative biogeography of two Mesoamerican ant genera. **Michael Branstetter**, mgbranstetter@gmail.com, National Museum of Natural History, Smithsonian Institution, Washington, DC

2:05 2039 The phylogeny and evolution of acacia ants (*Pseudomyrmex ferrugineus* group). **Philip S. Ward**, psward@ucdavis.edu, Univ. of California, Davis, CA

2:20 2040 Barriers to gene flow in lowland Mesoamerican ants and bruchid beetles specializing on a continuously distributed host tree. **Elizabeth G. Pringle**, epringle@umich.edu, Univ. of Michigan, Ann Arbor, MI

2:35 2041 Patterns of cryptic speciation, endemism, and host plant specialization in Mesoamerican 'hispine' beetles (Chrysomelidae: Cassidinae). **Duane D. McKenna**, dmckenna@memphis.edu, Univ. of Memphis, Memphis, TN

2:50 Break

3:00 2042 Endemism in MesoAmerican weevils. **Robert S. Anderson**, randerson@mus-nature.ca, Canadian Museum of Nature, Ottawa, ON, Canada

3:15 2043 Phylogenetics and biogeography of the tribe Proculini (Coleoptera: Passalidae) in the Mesoamerican highlands. **Cristian Beza-Beza**, cfbeza@memphis.edu, Univ. of Memphis, Memphis, TN

3:30 2044 Human crop domestication facilitated by the rapid range expansion of a specialist pollinator. **Margarita López-Uribe**, mml82@cornell.edu, Cornell Univ., Ithaca, NY

3:45 SP2045 Ancient reverse colonization of Central America from the Caribbean in weevils of the *Exophthalmus* genus complex (Curculionidae: Entiminae). **Guanyang Zhang**, gzhan001@ucr.edu, Usmaan Basharat and Nico M. Franz, Arizona State Univ., Tempe, AZ

3:57 SP2046 Phylogeography and population genetics of the Mesoamerican bumble bee species complex, *Bombus ephippiatus*. **Michelle A. Duennes**, mduennes@life.illinois.edu[1], Jorge Merida[2], Esteban Pineda[2], Philippe Sagot[2], Remy Vandame[2] and Sydney A. Cameron[1], [1]Univ. of Illinois, Urbana, IL, [2]El Colegio de la Frontera Sur, San Cristóbal de las Casas, Mexico

4:09 Concluding Remarks

Member Symposium: Cockroaches, Asthma and Children's Environmental Health

B115-116 (Oregon Convention Center)

Moderator and Organizer: Sherry Glick, U.S. Environmental Protection Agency, Dallas, TX

1:30 2047 EPA's role in implementing IPM programs to reduce pests and asthma incidences in schools. **Sherry Glick**, Glick.sherry@epa.gov, U.S. Environmental Protection Agency, Dallas, TX

1:50 2048 PMP perspectives on cockroach control and asthma. **Marcia Duke**, mduke@pestworld.org, National Pest Management Association, Fairfax, VA

2:10 2049 Simple solutions: Big results. **Dawn Gouge**, dhgouge@cals.arizona.edu, Univ. of Arizona, Maricopa, AZ

2:30 2050 IPM interventions to mitigate public health impacts of cockroach allergens. **Richard G. Santangelo**, rick_santangelo@ncsu.edu, North Carolina State Univ., Raleigh, NC

2:50 2051 IPM in homes and schools: Kids with asthma. **John C. Carlson**, jcarlso@tulane.edu, Tulane Univ., New Orleans, LA

3:10 2052 Cockroaches, asthma and children's environmental health: Joining EPA's efforts to reduce exposure to cockroach allergens in homes and schools. **Brenda Doroski**, doroski.brenda@epa.gov, U.S. Environmental Protection Agency, Washington, DC

P-IE Section Symposium: Entomology's Role in Sustaining Ecosystem Services in Agroecosystems

B113-114 (Oregon Convention Center)

Moderators and Organizers: David Crowder and Elinor Lichtenberg, Washington State Univ., Pullman, WA

1:30 2053 Practical strategies for conserving pollinators and other beneficial insects in agricultural landscapes: a case study of the Xerces Society's successful pollinator conservation program. **Mace Vaughan**, mace@xerces.org and Eric Mader, Xerces Society, Portland, OR

1:50 2054 Effects of agricultural management and landscapes on the abundance and diversity of arthropods: a global analysis. **Elinor Lichtenberg**, e.lichtenberg@wsu.edu[1], Christina Kennedy[2] and David Crowder[1], [1]Washington State Univ., Pullman, WA, [2]The Nature Conservancy, Fort Collins, CO

2:10 2055 Using ecoinformatics ('big data') to detect biocontrol services in a citrus agroecosystem. **Jay Rosenheim**, jarosenheim@ucdavis.edu, Matthew Meisner and Lindsey Hack, Univ. of California, Davis, CA

2:30 2056 The surrogate species approach to protecting biological diversity and ecosystem services: when can we extrapolate from a few species to many? **John Banks**, banksj@u.washington.edu[1], and John Stark[2], [1]Univ. of Washington, Tacoma, WA, [2]Washington State Univ., Puyallup, WA

2:50 2057 Assessment and valuation of ecosystem services: An interdisciplinary effort in the Nicoya Peninsula of Costa Rica. **Nilsa A. Bosque-Pérez**, nbosque@uidaho.edu[1], Sara M. Galbraith[2], Hector Tavárez-Vargas[2] and Oscar Abelleira-Martínez[1], [1]Univ. of Idaho, Moscow, ID, [2]Tropical Agricultural Research and Higher Education Center (CATIE), Turrialba, Costa Rica

3:10 2058 Quantifying the social dimension of agriculture: Integrating farmer perspectives into entomology research and education. **Randa Jabbour**, randa.jabbour@maine.edu[1], Shiri Noy[1] and Eric Gallandt[2], [1]Univ. of Wyoming, Laramie, WY, [2]Univ. of Maine, Orono, ME

3:30 Break

3:50 2059 Natural enemies promote biological control and enhance plant health. **Deborah L. Finke**, FinkeD@Missouri.edu[1], and Elizabeth Y. Long[2], [1]Univ. of Missouri, Columbia, MO, [2]Purdue Univ., West Lafayette, IN

4:10 2060 Biodiversity and ecosystem services: does the biodiversity of semi natural habitat influence the abundance and diversity of beneficial invertebrates in crops? **Rosalind F. Shaw**, R.Shaw@exeter.ac.uk[1], Judy K. Pell[2], James M. Bullock[3], Richard F. Pywell[3], Ben A. Woodcock[3] and Juliet L. Osborne[1], [1]Univ. of Exeter, Penryn, United Kingdom, [2]J.K. Pell Consulting, Luton, United Kingdom, [3]Centre for Ecology & Hydrology, Wallingford, United Kingdom

4:30 2061 Ecosystem service delivery in diverse tropical and temperate agricultural systems: the role of landscape context and farm management. **Mark Otieno**, mxo22@psu.edu, Shelby Fleischer and Kristal Watrous, Pennsylvania State Univ., Univ. Park, PA

4:50 2062 Enhancing floral resources for beneficial insects, ecosystem services, and farm revenue. **Brett R. Blaauw**, blaauw@aesop.rutgers.edu[1], and Rufus Isaacs[2], [1]Rutgers, The State Univ. of New Jersey, Bridgeton, NJ, [2]Michigan State Univ., East Lansing, MI

5:10 2063 Economic challenges for arthropod-based ecosystem services: Habitat cost and efficacy risk. **Scott Swinton**, swintons@msu.edu, Michigan State Univ., East Lansing, MI

P-IE Section Symposium: New Perspectives on Changing Landscapes Offered by Big Data Approaches

B117-119 (Oregon Convention Center)

Moderators and Organizers: Steven Highland[1] and Rosalind James[2], [1]Utah State Univ., Logan, UT, [2]USDA - ARS, Logan, UT

1:30 Introductory Remarks

1:40 2064 The phylogenetics and population genetics of disease vector mosquitoes on a continental scale. **Phillip Schumm**, Phillip.Schumm@ars.usda.gov[1], Lee Cohnstaedt[1], Paul Hohenlohe[2], Elin Maki[1] and Jason Boone[3], [1]USDA - ARS, Manhattan, KS, [2]Univ. of Idaho, Moscow, ID, [3]Floragenex, Inc, Eugene, OR

2:00 2065 The promise and peril of retroactive data capture from museum specimens. **James Strange**, James.Strange@ars.usda.gov[1], Jonathan Koch[2], Harold Ikerd[1] and Terry L. Griswold[1], [1]USDA - ARS, Logan, UT, [2]Utah State Univ., Logan, UT

2:20 2066 Factors affecting honey-bee mortality: a spatial approach. **Miriam Bixby**, miriambixby@gmail.com, Univ. of British Columbia, Vancouver, BC, Canada and Kathy Baylis, Univ. of Illinois, Urbana, IL

2:40 2067 An overview of glassy-winged sharpshooter and Pierce's disease in California. **Mark Sisterson**, mark.sisterson@ars.usda.gov[1], and Rodrigo Krugner[2], [1]USDA - ARS, Parlier, CA, [2]Univ. of California, Riverside, CA

3:00 2068 Temporal changes in crop diversity and its potential impact on honey bees. **Jonathan Aguilar**, jaguilar@ksu.edu[1], Steven Highland[2], Rosalind James[3], John Hendrickson[4] and Dennis Welker[2], [1]Kansas State Univ., Garden City, KS, [2]Utah State Univ., Logan, UT, [3]USDA - ARS, Logan, UT, [4]USDA - ARS, Mandan, ND

3:20 Break

3:40 2069 How changes to grassland landscapes impact insect communities: results from a collaborative distributed experiment. **Eric Lind**, elind@umn.edu[1], Elizabeth Borer[2], Adam Kay[3], Kim La Pierre[4] and Nutrient Network[2], [1]Univ. of Maryland, College Park, MD, [2]Univ. of Minnesota, Saint Paul, MN, [3]Univ. of St. Thomas, Saint Paul, MN, [4]Univ. of California, Berkeley, CA

4:00 2070 Long-term mosquito population surveillance records and satellite environmental data leveraged to investigate arbovirus transmission risk in the US. **Seth Britch**[1], Kenneth J. Linthicum[1], Assaf Anyamba[2], Edwin Pak[2], Jennifer Small[2] and Compton J. Tucker[2], [1]USDA - ARS, Gainesville, FL, [2]National Aeronautics and Space Administration, Greenbelt, MD

4:20 2071 Pathogens, parasites, and crashing gypsy moth populations. **Ann E. Hajek**, aeh4@cornell.edu[1], Patrick Tobin[2], and Kyle J. Haynes[3], [1]Cornell Univ., Ithaca, NY, [2]USDA - Forest Service, Morgantown, WV, [3]Univ. of Virginia, Blandy, VA

4:40 2072 IPM trends and data: two decades of pesticide use and risk. **Michael Guzy**, guzym@engr.orst.edu[1], Peter C. Ellsworth[2], Al Fournier[3], Wayne Dixon[2], Paul Jepson[1], John C. Palumbo[4] and Wade D. Pronschinske[5], [1]Oregon State Univ., Corvallis, OR, [2]Univ. of Arizona, Maricopa, AZ, [3]Univ. of Arizona, Tucson, AZ, [4]Univ. of Arizona, Yuma, AZ, [5]Madison, WI

5:00 2073 Spatial and temporal patterns of honey-bee colony change. **Steven Highland**, Steven.Highland@ars.usda.gov [1], Rosalind James[2] and Dennis Welker[1], [1]Utah State Univ., Logan, UT, [2]USDA - ARS, Logan, UT

5:20 Concluding Remarks

Member Symposium: How Cool is Entomology?

D139-140 (Oregon Convention Center)

Moderators and Organizers: Theresa L. Pitts-Singer[1] and Brian G. Rector[2], [1]USDA - ARS, Logan, UT, [2]USDA - ARS, Reno, NV

1:30 Welcoming Remarks

1:35 2074 Living buildings, marauding hordes, and other army ant greatest hits. **Sean O'Donnell**, so356@drexel.edu, Drexel Univ., Philadelphia, PA

2:00 2075 Searching for the holy grail of stinging insects: Journeys into scientific unknowns. **Justin Schmidt**, ponerine@dakotacom.net, Southwestern Biological Institute, Tucson, AZ

2:25 Break

2:35 2076 Everything we need to know about immunology – and then some – we learned from insects. **Shirley Luckhart**, sluckhart@ucdavis.edu, Univ. of California, Davis, CA

2:55 2077 Sterile insect technique: The real-world benefits of zapping bugs with radiation. **James E. Carpenter**, jim.carpenter@ars.usda.gov, USDA - ARS, Tifton, GA

3:20 2078 Genetic pest management: Engineering pests to be nicer. **Fred Gould**, fred_gould@ncsu.edu, North Carolina State Univ., Raleigh, NC

3:45 Break

3:55 2079 Eight-legged educators: Exploiting the enigmatic nature of arachnids for public engagement. **Eileen Hebets**, ehebets2@unl.edu, Univ. of Nebraska, Lincoln, NE

4:20 2080 The bees' perspective. **Marla Spivak**, spiva001@umn.edu, Univ. of Minnesota, Saint Paul, MN

4:45 Panel Discussion

P-IE Section Symposium: Effects of Cropping System Landscapes on the Ecology and Management of Insect Vectors and Transmitted Pathogens

E141-142 (Oregon Convention Center)

Moderators and Organizers: Diane G. Alston[1] and Brian A. Nault[2], [1]Utah State Univ., Logan, UT, [2]Cornell Univ., Geneva, NY

1:30 Introductory Remarks

1:40 2081 Interactions between thrips and *Panotea* spp. and their influence on onion center rot epidemics in Georgia's farmscapes. **Rajagopalbabu Srinivasan**, babusri@uga.edu[1], Bhabesh Dutta[1], Apurba Barman[2], F. Avci[3], Diane Ullman[4], David Langston[1] and Ron Gitaitis[1], [1]Univ. of Georgia, Tifton, GA, [2]Texas A&M Univ., Lubbock, TX, [3]Univ. of Georgia, Athens, GA, [4]Univ. of California, Davis, CA

2:05 2082 Field and farmscape crop management effects on *Thrips tabaci* and Iris yellow spot virus transmission in onion. **Diane G. Alston**, diane.alston@usu.edu, Claudia Nischwitz, Daniel Drost, Bonnie Bunn, Kristie Buckland, Jennifer R. Reeve and Corey V. Ransom, Utah State Univ., Logan, UT

2:30 2083 Effects of distance, reproductive mode, and host plant associations on the genetic structure of *Thrips tabaci* in New York onion agro-ecosystems: implications for thrips and tospovirus management. **Alana L. Jacobson**, aljacob2@ncsu.edu[1], and Brian A. Nault[2], [1]North Carolina State Univ., Raleigh, NC, [2]Cornell Univ., Geneva, NY

2:55 2084 Landscape-scale spatial relationships between sharpshooters and Pierce's disease. **Yong-Lak Park**, Yong-Lak.Park@mail.wvu.edu[1], and Thomas M. Perring[2], [1]West Virginia Univ., Morgantown, WV, [2]Univ. of California, Riverside, CA

3:20 Break

3:35 2085 Considering landscape composition for managing *Bemisia* whitefly and Cucurbit yellow stunting disorder virus in melons in Arizona. **John C. Palumbo**, jpalumbo@ag.arizona.edu[1], and Yves Carriere[2], [1]Univ. of Arizona, Yuma, AZ, [2]Univ. of Arizona, Tucson, AZ

4:00 2086 Landscape-scale dynamics of tobacco thrips (*Frankliniella fusca*) populations: Implications for the spread of Tomato spotted wilt virus and insecticide resistance. **George G. Kennedy**, gkennedy@ncsu.edu and Thomas M. Chappell, North Carolina State Univ., Raleigh, NC

4:25 2087 Influence of regional landscapes on Potato virus Y incidence in seed potato. **Russell L. Groves**, groves@entomology.wisc.edu[1], Emily Duerr[1], Amy Charkowski[1], Alex Crockford[2] and Anders Huseth[3], [1]Univ. of Wisconsin, Madison, WI, [2]Univ. of Wisconsin, Antigo, WI, [3]Cornell Univ., Geneva, NY

4:50 Concluding Remarks

Member Symposium: New Horizons in Ornamental IPM

E143-144 (Oregon Convention Center)

Moderators and Organizers: Danica Maxwell and Danny Klittich, Univ. of California, Davis, CA

1:30 Introductory Remarks

1:35 2088 IPM in horticultural cropping systems: Is there still "such-a-thing" as IPM? **Raymond Cloyd**, rcloyd@ksu.edu, Kansas State Univ., Manhattan, KS

1:53 2089 You want me to do what? Helping growers implement biocontrol programs. **Betsy Lamb**, eml38@cornell.edu, Cornell Univ., Ithaca, NY

2:11 2090 Biological control in outdoor nursery production using semiochemicals, flowers, releases, etc. **Jana C. Lee**, jana.lee@ars.usda.gov, USDA - ARS, Corvallis, OR

2:29 2091 Biological control: Working towards sustainable management of the exotic brown marmorated stink bug, *Halymorpha halys*. **Paula M. Shrewsbury**, pshrewsb@umd.edu, Ashley L. Jones, Michael J. Raupp and Cerruti RR Hooks, Univ. of Maryland, College Park, MD

2:47 2092 Silicon in floriculture, a review. **Danny Klittich**, dsklittich@ucdavis.edu, Univ. of California, Davis, CA

3:05 2093 Can silicate fertilizers influence citrus leafminer performance? **Danica Maxwell**, dfmaxwell@ucdavis.edu, Univ. of California, Davis, CA

3:23 Break

3:43 2094 IPM approach to a challenging invasive: Diaprepes root weevil in Southern California. **James A. Bethke**, jabethke@ucanr.edu, Univ. of California, San Marcos, CA

4:01 2095 Residue in flowering plants from soil applied imidacloprid. **Vera Krischik**, Univ. of Minnesota, Saint Paul, MN

4:19 2096 Rethinking how to do turf IPM in the South. **Eileen A. Buss**, eabuss@ufl.edu, Univ. of Florida, Gainesville, FL

4:55 2098 Designing the dreaded brown marmorated stink bugs out of residential landscapes. **Michael J. Raupp**, mraupp@umd.edu, Erik J. Bergmann and Holly M. Martinson, Univ. of Maryland, College Park, MD

5:15 Concluding Remarks

Member Symposium: Meeting the Challenge of Fruit Fly Pests from Beyond the Horizon: Advances in Detection, Eradication, and Management of Invasive Fruit Fly Species

E145 (Oregon Convention Center)

Moderators and Organizers: James Dripps[1], Roger Vargas[2], James Dripps[1] and Roger Vargas[2], [1]Dow AgroSciences, Indianapolis, IN, [2]USDA - ARS, Hilo, HI

1:30 Welcoming Remarks

1:35 2099 Recent incursions of exotic fruit flies (Diptera:Tephritidae) into California. **Jason Leathers**, jason.leathers@cdfa.ca.gov, California Dept. of Food & Agriculture, Sacramento, CA

2:05 2100 Fruit fly methods development in Florida. **Trevor Smith**, trevor.smith@freshfromflorida.com, Florida Dept. of Agriculture and Consumer Services, Gainesville, FL

2:35 2101 An unexpected invader, *Drosophila suzukii*. **Kelly Hamby**, kahamby@ucdavis.edu[1], Mark Bolda[2], Hannah Burrack[3] and Frank Zalom[1], [1]Univ. of California, Davis, CA, [2]Univ. of California, Watsonville, CA, [3]North Carolina State Univ., Raleigh, NC

3:05 2102 Research and development of novel reduced risk area-wide treatments for fruit fly (Diptera:Tephritidae) eradication programs on the U.S. mainland. **Roger Vargas**, roger.vargas@ars.usda.gov[1], James Dripps[2], Trevor Smith[3], John Stark[4], and Jaime Pinero[5], [1]USDA - ARS, Hilo, HI, [2]Dow AgroSciences, Indianapolis, IN, [3]Florida Dept. of Agriculture and Consumer Services, Gainesville, FL, [4]Washington State Univ., Puyallup, WA, [5]Lincoln Univ., Jefferson City, MO

3:35 Break

3:50 2103 Area-wide management of fruit flies in the Pacific and beyond. **Ronald Mau** maur@ctahr.hawaii.edu[1], Roger Vargas[2] and Luc Leblanc[1], [1]Univ. of Hawai'i, Honolulu, HI, [2]USDA - ARS, Hilo, HI

4:20 2104 Determining the capability of insecticides and biological controls of tephritid fruit flies: Why toxicity data for one species can't predict effects on other species. **John Stark**, starkj@wsu.edu[1], Roger Vargas[2], and John Banks[3], [1]Washington State Univ., Puyallup, WA, [2]USDA - ARS, Hilo, HI, [3]Univ. of Washington, Tacoma, WA

4:50 2105 Integrated risk mitigation for fruit flies: Host plant suitability, area of low pest prevalence and the appropriate level of treatment. **Nicanor Liquido**, Nicanor.J.Liquido@aphis.usda.gov, USDA - APHIS - PPQ, Honolulu, HI

5:20 Concluding Remarks

Member Symposium: Landscape and Entomology: Geospatial Research in a Changing World

F150 (Oregon Convention Center)

Moderators and Organizers: Noel Hahn[1], Sunil Tewari[2] and Matthew Strom[1], [1]Rutgers, The State Univ. of New Jersey, New Brunswick, NJ, [2]Rutgers, The State Univ. of New Jersey, Chatsworth, NJ

1:30 Introductory Remarks

1:30 2106 Using GIS to map and manage stink bugs. **Michael Toews**, mtoews@uga.edu[1], and Ishakh Pulakkatu Thodi[2], [1]Univ. of Georgia, Tifton, GA, [2]Mississippi State Univ., Starkville, MS

1:50 2107 Integrating broad-scale landscape perspectives with bees, floral resources, and fruit crop yields. **Rachel Mallinger**, remallinger@wisc.edu, Hannah Gaines Day and Claudio Gratton, Univ. of Wisconsin, Madison, WI

2:10 2108 Landscape epidemiology of west nile virus: How mosquito host selection drives transmission. **William K. Reisen**, arbo123@pacbell.net, Univ. of California, Davis, CA

2:30 2109 Multiscale spatial analysis to identify landscape correlates of native stink bugs and the invasive stink bug *Halyomorpha halys*. **P. Dilip Venugopal**, dilip@umd.edu[1], Galen Dively[1], Ames Herbert[2], Joanne Whalen[3] and William O. Lamp[1], [1]Univ. of Maryland, College Park, MD, [2]Virginia Polytechnic Institute and State Univ., Blacksburg, VA, [3]Univ. of Delaware, Newark, DE

2:50 2110 Spatial optimization of invasive species surveillance effort across road networks. **Andrew M. Liebhold**, aliebhold@fs.fed.us[1], and Rebecca Epanchin-Niell[2], USDA - Forest Service, Morgantown, WV, [2]Resources for the Future, Washington, DC

3:10 2111 Crowdsourcing invasive species occurrences in North America. **Joseph LaForest**, laforest@uga.edu, Univ. of Georgia, Tifton, GA

3:30 Concluding Remarks

Ten-Minute Papers, P-IE Section: Population Monitoring and Modeling B

F149 (Oregon Convention Center)

Moderators: William Meikle[1] and C. Sheena Sidhu[2], [1]USDA - ARS, Tucson, AZ, [2]Univ. of California, Riverside, CA

1:30 2112 Analysis of range changes to detect decline of native and spread of invasive Coccinellids. **Rebecca R Smyth**, rrs7@cornell.edu[1], Matthew J. Petersen[2], Patrick Sullivan[1], Leslie L. Allee[1] and John E. Losey[1], [1]Cornell Univ., Ithaca, NY, [2]Cornell Univ., Geneva, NY

1:42 2113 Ants on the move: Nest relocation in the harvester ant, *Pogonomyrmex badius*. **Walter R. Tschinkel**, tschinkel@bio.fsu.edu, Florida State Univ., Tallahassee, FL

1:54 2114 Effect of annual weather variation *vs* short-term weather extremes on population change of the alpine butterfly (*Parnassius*

smintheus) in the Rocky Mountains. **Jens Roland**, jroland@ualberta.ca[1], and Stephen Matter[2], [1]Univ. of Alberta, Edmonton, AB, Canada, [2]Univ. of Cincinnati, Cincinnati, OH

2:06 2115 Is *Moringa oleifera* Lam. safe to export to US mainland? An evaluation of insects associated with moringa in Hawai'i. **Christine Lynch**, calynch@hawaii.edu[1], Helen Spafford[1] and Nicanor Liquido[2], [1]Univ. of Hawai'i, Honolulu, HI, [2]USDA - APHIS - PPQ, Honolulu, HI

2:18 2116 Elucidating identity of cassava witches' broom vectors in Vietnam: A step-wise approach. **Vi Le**, vinipp3880@gmail.com[1], Hoat Trinh[1], Quan Mai[1] and Kris Wyckhuys[2], [1]Plant Protection Research Institute, HaNoi, Vietnam, [2]International Center for Tropical Agriculture CIAT, Hanoi, Vietnam

2:30 2117 Monitoring and management of major insect pests of peppermint in northern California. **Jhalendra Rijal**, jrijal@ucdavis.edu and Larry D. Godfrey, Univ. of California, Davis, CA

2:42 2118 Occurrence of the cotton boll worm (*Helicoverpa armigera)* Lepidoptera: Noctuidae on cotton crop from Hyderabad, Pakistan. **Mansoor Shah**, lakiyary@hotmail.com, Univ. of Sindh, Jamshoro, Pakistan

2:54 2119 Using funtional trait analysis to explore cleptoparsite (*Meloe franciscanus*) host range across a large geographic mosaic: Chemical signals and temporal synchrony. **Leslie Saul-Gershenz**, lsaulgershenz@ucdavis.edu[1], Jocelyn G. Millar[2], J. Steven McElfresh[2] and Neal M. Williams[1], [1]Univ. of California, Davis, CA, [2]Univ. of California, Riverside, CA

3:06 2120 Assessing the potential for establishment of western cherry fruit fly (*Rhagoletis indifferens*) using MaxEnt and CLIMEX niche models. **Sunil Kumar**, sunil@nrel.colostate.edu[1], Lisa Neven[2] and Wee Yee[2], [1]Colorado State Univ., Fort Collins, CO, [2]USDA - ARS, Wapato, WA

3:18 2121 Ecological niche modeling for projecting North American distributions for Old World tamarisk beetles (*Diorhabda* spp.; Coleoptera: Chrysomelidae). **James Tracy**, JamesLTracy@tamu.edu[1], Robert Coulson[1] and Allen Knutson[2], [1]Texas A&M Univ., College Station, TX, [2]Texas A&M Univ., Dallas, TX

3:30 2122 Modeling population dynamics of *Ips typographus* in the Bohemian Forest (Czech Republic). **Ludek Berec**, berec@entu.cas.cz, South Bohemian Univ., Ceske Budejovice, Czech Republic

3:42 Break

3:54 2123 Distribution of olive fruit fly (*Bactrocera oleae*) in California after the 1998 invasion. **Victoria Y. Yokoyama**, victoria.yokoyama@ars.usda.gov, USDA - ARS, Parlier, CA

4:06 2124 Data fusion techniques in pest detection: Using NASA Goddard's LiDAR, Hyperspectral & Thermal Imager to detect the emerald ash borer, *Agrilus plannipenis*, in New England. **Ryan Hanavan**, rhanavan@fs.fed.us[1], Bruce Cook[2], Lawrence Corp[3], Rich Hallett[4], and Jen Pontius[5], [1]USDA - Forest Service, Durham, NH, [2]National Aeronautics and Space Administration, Greenbelt, MD, [3]Sigma Space Corporation, Greenbelt, MD, [4]USDA - Forest Service, Durham, NE, [5]Univ. of Vermont, Burlington, VT

4:18 2125 Origins of fairy circles and heuweltjies (earth mounds) in Southern Africa. **Mike Picker**, mike.picker@uct.ac.za and Kelly Vlieghe, Univ. of Cape Town, Cape Town, South Africa

4:42 2126 Presentation Withdrawn

Ten Minute Papers, P-IE Section: Biological Control B

F151 (Oregon Convention Center)

Moderators: Patrick J. Moran[1] and John A. Goolsby[2], [1]USDA - ARS, Albany, CA, [2]USDA - ARS, Edinburg, TX

1:30 2127 Managing a unique subterranean bark beetle pest with entomopathogens. **Anis Lestari**, anislestari1@gmail.com and Sujaya Rao, Oregon State Univ., Corvallis, OR

1:42 2128 Field release and establishment of introduced olive fruit fly parasitoids in California and predication of geographical range of the parasitoids. **Kent M. Daane**, kdaane@ucanr.edu[1], Xin-geng Wang[1], Diego J. Nieto[2], Charles H. Pickett[3], Kim A. Hoelmer[4] and Marshall W. Johnson[5], [1]Univ. of California, Berkeley, CA, [2]Univ. of California, Santa Cruz, CA, [3]California Dept. of Food & Agriculture, Sacramento, CA, [4]USDA - ARS, Montferrier, France, [5]Univ. of California, Parlier, CA

1:54 2129 Evaluating the potential of two resident parasitoids for the biocontrol of *Drosophila suzukii*. **Xin-geng Wang**, xggwang@ucanr.edu[1], Gülay Kaçar[1,3], Kent M Daane[1], Betsey Miller[2] and Vaughn Walton[2], [1]Univ. of California, Berkeley, CA, [2]Oregon State Univ., Corvallis, OR, [3]Abant Izzet Baysal University, Bolu, Turkey

2:06 2130 A phytocentric focus in weed biological control: Does plant morphology affect insect and plant responses during interaction? **Rosemarie De Clerke-Floate**, rosemarie.declerk-floate@agr.gc.ca[1], and Robert Laird[2], [1]Agriculture and Agri-Food Canada, Lethbridge, AB, Canada, [2]Univ. of Lethbridge, Lethbridge, AB, Canada

2:18 2131 Biological control of the Virginia creeper leafhopper (*Erythroneura ziczac* Walsh), a new invasive pest in Northern California vineyards. **Houston Wilson**, houston@berkeley.edu[1], Glenn McGourty[2], Lucia Varela[3], Serguei Triapitsyn[4] and Kent Daane[1], [1]Univ. of California, Berkeley, CA, [2]Univ. of California, Ukiah, CA, [3]Univ. of California, Santa Rosa, CA, [4]Univ. of California, Riverside, CA

2:30 2132 Predator-In-First: A novel biocontrol strategy for managing thrips and other key pests in pepper crops. **Vivek Kumar**, vivekiari@ufl.edu[1], Yingfang Xiao[1], Cindy L. McKenzie[2] and Lance Osborne[1], [1]Univ. of Florida, Apopka, FL, [2]USDA - ARS, Ft. Pierce, FL

2:42 2133 A novel system for dissemination of an entomopathogen, *Isaria fumosorosea*, for biological control of the Asian citrus psyllid, *Diaphorina citri*, in abandoned citrus groves. **Andrew Chow**, andrew.chow@tamuk.edu[1], Christopher Dunlap[2], Mark A. Jackson[2], Mamoudou Setamou[1] and Joseph Patt[3], [1]Texas A&M Univ., Weslaco, TX, [2]USDA - ARS, Peoria, IL, [3]USDA - ARS, Ft. Pierce, FL

2:54 2134 Assessing the role of environmental conditions on efficacy rates of entomopathogenic nematodes for controlling small hive beetles (*Aethina tumida)* in honey bee (*Apis mellifera)* hives: A citizen science approach. **Elizabeth Hill**, izzy@izzyhill.com[1], Deborah A. Delaney[2], Ashleigh Smythe[3], and Maryann Frazier[4], [1]Center for Urban Bee Research, Washington, DC, [2]Univ. of Delaware, Newark, DE, [3]Virginia Military Institute, Lexington, VA, [4] Pennsylvania State Univ., Univ. Park, PA

3:06 2135 Biological control of emerald ash borer in a southern climate: Can they take the heat? **Gregory J. Wiggins**, wiggybug@utk.edu[1], Nicholas Hooie[1], Jerome F. Grant[1], Paris L. Lambdin[1] and Jonathan Lelito[2], [1]Univ. of Tennessee, Knoxville, TN, [2]USDA - APHIS - PPQ, Brighton, MI

3:18 2136 Does mechanical control of Dalmatian toadflax impair its biological control? **Gary Chang**, chang@gonzaga.edu, Braeden Van Deynze, Rebecca Velasco, Alexander Dickman and Bryson Newell, Gonzaga Univ., Spokane, WA

3:30 Break

3:42 2137 Effects on the native plant community of *Persicaria perfoliata* biological control by the Asian weevil *Rhinoncomimus latipes*. **Ray S. Williams**, willmsrs@appstate.edu and Matthew Swain, Appalachian State Univ., Boone, NC

3:54 2138 Foliar application of *Steinernema feltiae* for biological control of the leaf-mining leek moth larvae (*Acrolepiopsis assectella*) in *Allium* vegetables: Remedy for NY onions? **Masanori Seto**, ms545@cornell.edu and Anthony M. Shelton, Cornell Univ., Geneva, NY

4:06 2139 Establishing *Diadromus pulchellus* for biological control of leek moth, *Acrolepiopsis assectella*: How many does it take? **Peter Mason**, peter.mason@agr.gc.ca, Andrea Brauner and Jacob Miall, Agriculture & Agri-Food Canada, Ottawa, ON, Canada

4:18 2140 Above-below ground intraguild interactions influence greenhouse augmentative biocontrol. Emily Pochubay, **Jason Schmidt**, jschmidt@msu.edu, David R. Smitley, Joseph Tourtois and Matthew Grieshop, Michigan State Univ., East Lansing, MI

4:30 2141 Biological control insects adapt to new climates: Geographic differentiation of the photoperiod response in the loosestrife leaf beetle, *Galerucella calmariensis*. **Fritzi Grevstad**, fritzi.grevstad@science.oregonstate.edu and Leonard Coop, Oregon State Univ., Corvallis, OR

4:42 2142 Laboratory and field evaluation of four phytoseiid mites in managing *Eotetranychus lewisi* and *Tetranychus urticae* in coastal California strawberry. **Anna Howell**, adhowell@ucanr.edu and Oleg Daugovish, Univ. of California, Ventura, CA

4:54 2143 Evaluation of the parasitoids, *Copidosoma koehleri* (Blanchard) and *Orgillus lepidus* Muesebeck for biological control of *Phthorimaea operculella* (Zeller) in Nepal. **Ram Mainali**, mainalism.rp@gmail.com, Himalayan College of Agricultural Science and Technology (HICAST), Kathmand, Saint Helena

Ten-Minute Papers, SysEB Section: Behavior and Life History

A106 (Oregon Convention Center)

Moderators: Amanda Whispell Purwar[1] and Patrick Abbot[2], [1]Rutgers, The State Univ. of New Jersey, New Brunswick, NJ, [2]Vanderbilt Univ., Nashville, TN

1:30 Introductory Remarks

1:32 2144 The impact of temperature and relative humidity on tropical termite (*Nasutitermes acajutlae*) life history. **Claire A. Fuller**, cfuller@murraystate.edu[1], and Marielle A. Postava-Davignon[2],[1]Murray State Univ., Murray, KY, [2]Husson Univ., Bangor, ME

1:44 2145 The Foundress' Dilemma: Group selection for cooperation among queens of *Pogonomyrmex californicus*. **Zachary Shaffer**, zshaffe@asu.edu, Stephen Pratt, Jennifer H Fewell and Brian Haney, Arizona State Univ., Tempe, AZ

1:56 2147 Copulation-associated colour change in *Argia apicalis* (Odonata: Coenagrionidae). **Amanda Whispell Purwar**, apurwar@rutgers.edu, Rutgers, The State Univ. of New Jersey, New Brunswick, NJ

2:08 2148 Influence of imidacloprid versus kaolin on honey bee foraging behavior and natural enemy assemblages. **Vonny Barlow**, vmbarlow@ucdavis.edu[1], and Joan Leong[2], [1]Univ. of California, Blythe, CA, [2]California State Polytechnic Univ., Pomona, CA

2:20 2149 Multi-modal signal interactions in the ladybeetle, *Hippodamia convergens*, aposematic system. **Christopher Wheeler**, cwhee002@ucr.edu[1], Ring T. Cardé[2] and Jocelyn G. Millar[2], [1]Pasteur Institute, Versailles, France, [2]Univ. of California, Riverside, CA

2:32 Break

2:47 2151 The role of kinship and parental manipulation in facultative eusociality in a tropical sweat bee (*Megalopta genalis*). **Karen Kapheim**, karen.kapheim@usu.edu[1], Peter Nonacs[2], Adam Smith[3], Robert K. Wayne[2] and William Wcislo[4], [1]Utah State Univ., Logan, UT, [2]Univ. of California, Los Angeles, CA, [3]George Washington Univ., Washington, DC, [4]Smithsonian Tropical Research Institute, Panama City, Panama

2:59 2152 Reactions of the the Collembolan, *Sinella curviseta,* to chemical stimuli. **Ann L. Rypstra**, rypstral@muohio.edu, Michael Sitvarin and Muhammad Khalid Mukhtar, Miami Univ., Oxford, OH

3:11 2153 Presentation Withdrawn

3:23 2154 Do aphid soldiers elicit an immune response in victims? **Patrick Abbot**, patrick.abbot@vanderbilt.edu, Sarah P. Lawson, Leah T. Sigle and Andrew W. Legan, Vanderbilt Univ., Nashville, TN

3:35 2155 Nurse bee behavior manipulates worker honey bee reproductive development. **Ying Wang**, ying.wang.6@asu.edu, Osman Kaftanoglu, M. Kim Fondrk and Robert Page, Jr, Arizona State Univ., Tempe, AZ

3:47 2156 The maintenance of caste proportions delays the growth of termite incipient colonies. **Thomas Chouvenc**, tomchouv@ufl.edu and Nan-Yao Su, Univ. of Florida, Davie, FL

3:59 Concluding Remarks

Ten-Minute Papers, SysEB Section: Biodiversity

A105 (Oregon Convention Center)

Moderators: Matthew Bertone[1] and William Haines[2], [1]North Carolina State Univ., Raleigh, NC, [2]Univ. of Hawai'i, Honolulu, HI

1:30 Introductory Remarks

1:32 2157 Exoskeletons in your closet: Results from the exhaustive inventory of arthropods in 50 homes. **Matthew Bertone**, matt_bertone@ncsu.edu[1], Michelle Trautwein[2] and Rob R. Dunn[1], [1]North Carolina State Univ., Raleigh, NC, [2]California Academy of Sciences, San Francisco, CA

1:44 2158 Leafhopper paradise: The Cicadellidae of farm and field in the Granite State (New Hampshire) (Hemiptera: Auchenorrhyncha). **Donald Chandler**, Donald.Chandler@unh.edu[1], and K.G. Andrew Hamilton[2], [1]Univ. of New Hampshire, Durham, NH, [2]Agriculture & Agri-Food Canada, Ottawa, ON, Canada

1:56 2159 Diversity of feral honey bees (*Apis mellifera*) across New Mexico. Juliana Rangel, Texas A&M Univ., College Station, TX and **Melanie Kirby**, rmsqbcoop@gmail.com, Rocky Mountain Survivor Queen Breeders Cooperative, Truchas, NM

2:08 2160 Insects assembled from banana plantation of Jahut the indegenous people in Kuala Kurau. **Fauziah Abdullah**, q5fauzi@yahoo.com, Univ. of Malaya, Kuala Lumpur, Malaysia

2:20 2161 Biodiversity of intertidal springtails across the Isthmus of Panama. **Aron Katz**, aronkatz@illinois.edu[1], and Felipe N. Soto-Adames[2], [1]Univ. of Illinois, Urbana, IL, [2]Univ. of Illinois, Champaign, IL

2:32 Break

2:47 2162 Distribution and re-description of *Belenois aurota* F. (Pieridae: Lepidoptera) from Pakistan. **Bhojoo Mal**, bhojumal@yahoo.com, Univ. of Sindh, Jamshoro, Pakistan

2:59 2163 A biodiversity survey of the arthropod community associated with decaying cactus tissue in Baja California Sur. **Maxi Richmond**, mrichmond@ucsd.edu, Ellen Reese, Dionne Mejia and Therese Markow, Univ. of California, La Jolla, CA

3:11 2164 The bumble bee fauna of Yosemite National Park: Patterns across a large altitudinal gradient. **Terry Griswold**, terry.griswold@ars.usda.gov[1], Jonathan Koch[2] and James Strange[1], [1]USDA - ARS, Logan, UT, [2]Utah State Univ., Logan, UT

3:23 2165 First comprehensive survey of nine endemic insects at the Monahans Sandhills in Western Texas. **Scott Longing**, scott.longing@ttu.edu[1], James Cokendolpher[2] and Samuel Discua Duarte[1], [1]Texas Tech Univ., Lubbock, TX, [2]Museum of Texas Tech Univ., Lubbock, TX

3:35 2166 The Pulelehua Project: Mapping distributions and assessing population connectivity of the Hawaiian Kamehameha butterfly (*Vanessa tameamea*). **William Haines**, whaines@hawaii.edu[1], Daniel Rubinoff[1] and Cynthia B. A. King[2], [1]Univ. of Hawai'i, Honolulu, HI, [2]State of Hawai'i, Honolulu, HI

3:47 2167 A survey of the primitive weevils of Wisconsin (Coleoptera: Nemonychidae, Anthribidae, Attelabidae, and Brentidae). **Julia Janicki**, jhjanicki@gmail.com and Daniel K. Young, Univ. of Wisconsin, Madison, WI

3:59 2168 Using insect biodiversity to build better cities. **Emily Hartop**, ehartop@nhm.org, Natural History Museum of Los Angeles County, Los Angeles, CA

4:11 Concluding Remarks

Ten-Minute Papers, PBT Section: Physiology in Pest Management

C124 (Oregon Convention Center)

Moderators: Keyan Zhu-Salzman[1] and Qisheng Song[2], [1]Texas A&M Univ., College Station, TX, [2]Univ. of Missouri, Columbia, MO

1:30 Welcoming Remarks

1:42 2169 Longest *in vitro* above-freezing storage of animal semen attributable to the honey bee. **Brandon Hopkins**, bhopkins@wsu.edu[1], Walter Sheppard[1], Susan Cobey[1] and Charles Herr[2], [1]Washington State Univ., Pullman, WA, [2]Center for Animals Near Biological Extinction, Colfax, WA

1:54 2170 Reproductive quality of honey bee (*Apis mellifera*) drones in Texas. **Adrian Fisher II**, solifuge9378@neo.tamu.edu and Juliana Rangel, Texas A&M Univ., College Station, TX

2:06 2171 Quercetin and some agrochemicals might be the causal factors of colony collape disorder. **Wenfu Mao**, mao@life.uiuc.edu, Univ. of Illinois, Urbana, IL

2:18 2172 Stock, age, and seasonal differences in insecticide sensitivity of the honey bee, *Apis mellifera*. **Frank Rinkevich**, fdr5@LSU.edu[1], Joseph Margotta[1], Jean Pittman[1], Matthew Tarver[2], James A. Ottea[1] and Kristen Healy[1], [1]Louisiana State Univ., Baton Rouge, LA, [2]USDA - ARS, Baton Rouge, LA

2:30 2173 Diapause induction and termination in the small brown planthopper, *Laodelphax striatellus* (Hemiptera: Delphacidae). **Fangsen Xue**, xue_fangsen@hotmail.com, Jiangxi Agricultural Univ., Nanchang, China

2:42 2174 A novel RNAi approach for managing western corn rootworm. **Ana Maria Vélez**, anamaria.velez@gmail.com[1], Chitvan Khajuria[2], Kenneth Narva[3] and Blair Siegfried[1], [1]Univ. of Nebraska, Lincoln, NE, [2]Monsanto Company, Chesterfield, MO, [3]Dow AgroSciences, Indianapolis, IN

2:54 Break

3:06 2175 Determination of metabolic effects of Bt toxin on *Pandemis* leafroller. **Aaimie Hale**, aaimiehale@gmail.com, Heritage Univ., Toppenish, WA

3:18 2176 Effects of temperature and moisture on Mormon cricket (*Anabrus simplex*) reproduction with implications for responses to climate change. **Robert B. Srygley**, robert.srygley@ars.usda.gov, USDA - ARS, Sidney, MT

3:30 2177 A computer model of attractant-based traps in a landscape. **Nicholas Manoukis**, nicholas.manoukis@ars.usda.gov[1], Scott Geib[1] and Brian Hall[2], [1]USDA - ARS, Hilo, HI, [2]Univ. of Hawai'i, Honolulu, HI

3:42 2178 Characterizing environmental RNAi mechanisms in western corn root worm, *Diabrotica virgifera virgifera*. **Partha Ramaseshadri**, parthasarathy.ramaseshadri@monsanto.com, Monsanto Company, Chesterfield, MO

3:54 2179 Influence of low oxygen conditions on the efficacy of irradiation as a phytosanitary treatment. **Catriona Condon**, chcondon@ufl.edu[1], Sabrina White[1], Woodward Bailey[2], Laura Jeffers[3], Robert L. Meagher[4] and Daniel Hahn[1], [1]Univ. of Florida, Gainesville, FL, [2]USDA - APHIS, Miami, FL, [3]USDA - APHIS, Raleigh, NC, [4]USDA - ARS, Gainesville, FL

4:06 2180 Critical photoperiod inducing diapause in the western tarnished plant bug (*Lygus hesperus*) from Arizona. **Dale W. Spurgeon**, dale.spurgeon@ars.usda.gov, USDA - ARS, Maricopa, AZ

4:18 2181 Climate change and upper lethal temperture effects: Consequences for the distribution of southern pine beetle. **Jeff Lombardo**, jeffrey.a.lombardo.gr@dartmouth.edu, Dartmouth College, Hanover, NH

4:30 Concluding Remarks

Social Hour with Poster Presenters

Exhibit Hall C (Oregon Convention Center)

12:15–1:15

WEDNESDAY, NOVEMBER 19, 2014, EVENING

Closing Plenary Session and Old Masters Linnaean Games

Oregon Ballroom (Oregon Convention Center)

Moderators and Organizers: C. David Gammel[1], Frank Zalom[2] and Phillip G. Mulder[3], [1]Entomological Society of America, Annapolis, MD, [2]Univ. of California, Davis, CA, [3]Oklahoma State Univ., Stillwater, OK

5:30–7:30

WEDNESDAY, NOVEMBER 19, 2014, POSTERS

Section Poster Session 2: P-IE

Exhibit Hall C (Oregon Convention Center)

D3426 The effect of pollen consumption on sperm transferred by solitary male bees. **Mary Welter**, welterml@whitman.edu, Whitman College, Walla Walla, WA

D3427 Potential of mass trapping and attract-and-kill strategies for minimizing *Drosophila suzukii*. **Marcus Chatfield**, chatfiem@onid.oregonstate.edu[1], Amy J. Dreves[1], Jana C. Lee[2] and Amanda Ohrn[1], [1]Oregon State Univ., Corvallis, OR, [2]USDA - ARS, Corvallis, OR

D3428 The overwintering adventure of *D. suzukii* in Willamette Valley, Oregon. **Alex Hughan**, hughana@onid.orst.edu[1], Amy J. Dreves[1], Amanda Ohrn[1], Jana C. Lee[2] and Adam Cave[2], [1]Oregon State Univ., Corvallis, OR, [2]USDA - ARS, Corvallis, OR

D3429 Oviposition cues of the blueberry gall midge, *Dasineura oxycoccana*. **Nicole B. Benda**, nbenda@ufl.edu[1], Hans T. Alborn[2], Peter E. A. Teal[2] and Oscar Liburd[1], [1]Univ. of Florida, Gainesville, FL, [2]USDA - ARS, Gainesville, FL

D3430 Effects of three novel resistant black raspberries on *Amphorophora agathonica* feeding behavior and performance. **Danielle Lightle**, danielle.lightle@ucanr.edu[1], Michael Dossett[2], Chad Finn[3] and Jana C. Lee[3], [1]Univ. of California, Orland, CA, [2]Agriculture & Agri-Food Canada, Agassiz, BC, Canada, [3]USDA - ARS, Corvallis, OR

D3431 Stable isotope composition and adaptation of Japanese beetles (*Popillia japonica* Newman) in Oregon. **Diana N. Kearns**, dkearns@oda.state.or.us[1], Bruce A. Hungate[2] and Helmuth W. Rogg[1], [1]Oregon Dept. of Agriculture, Salem, OR, [2]Northern Arizona Univ., Flagstaff, AZ

D3432 Evaluation of a novel attract-&-kill technology for control of oriental beetle in blueberries. **Robert Holdcraft**, rholdcra@rci.rutgers.edu[1], Cesar Rodriguez-Saona[1], Agenor Mafra-Neto[2], Lukasz Stelinski[3] and Dean Polk[1], [1]Rutgers, The State Univ. of New Jersey, Chatsworth, NJ, [2]ISCA Technologies, Inc., Riverside, CA, [3]Univ. of Florida, Lake Alfred, FL

D3433 Blackberry varietal suceptibility to rednecked caneborer, *Agrilus ruficollis* (F.). **Jackie Lee**, jackie.lee@okstate.edu, Oklahoma State Univ., Stillwater, OK

D3434 Azalea lace bug in Oregon. **Michael Flores**, tigerofjiang@mail.fresnostate.edu[1], Robin Rosetta[2], Jana C. Lee[3], [1]Oregon State Univ., Corvallis, OR, [2]Oregon State Univ., Aurora, OR, [3]USDA - ARS, Corvallis, OR

D3435 Differential induction of insect defenses in seven cranberry varieties. **Elvira de Lange**, elvira.delange@rutgers.edu[1], James Polashock[2], Nicholi Vorsa[1] and Cesar Rodriguez-Saona[1], [1]Rutgers, The State Univ. of New Jersey, Chatsworth, NJ, [2]USDA - ARS, Chatsworth, NJ

D3436 Arthropod abundance and diversity on Elderberry extra-floral nectaries is influenced by cultivars and prunning methods. **Roshan Manandhar**, manandharr@lincolnu.edu and Jaime Pinero, Lincoln Univ., Jefferson City, MO

D3437 Status of IPM programs for blueberry production in the San Joaquin Valley of California. David R. Haviland and **Stephanie M. Rill**, smrill@ucdavis.edu, Univ. of California, Bakersfield, CA

D3438 Testing the "trap-bush" concept to manage plum curculio adults in blueberries. **Cesar Rodriguez-Saona**, CRodriguez@rce.rutgers.edu[1], Tracy C. Leskey[2], and Anne L. Nielsen[3], [1]Rutgers, The State Univ. of New Jersey, Chatsworth, NJ, [2]USDA - ARS, Kearneysville, WV [3]Rutgers, The State Univ. of New Jersey, Bridgeton, NJ

D3439 *NEALTA* miticide. **Joe Stout**, joseph.stout@basf.com and Rebecca Willis, BASF Corporation, Research Triangle Park, NC

D3440 Effect of twospotted spider mite, *Tetranychus urticae* Koch (Acari: Tetranychidae), damage on peppermint essential oil yield and quality. **Kris Tollerup**, ketollerup@ucanr.edu[1], Larry Godfrey[2], and Rob Wilson[3], [1]Univ. of California, Parlier, CA, [2]Univ. of California, Davis, CA, [3]Univ. of California, Tulelake, CA

D3441 Changes in pesticide use patterns in U.S. mint: Two decades of grower surveys demonstrate significant shifts. **Holly Ferguson**, hferguson@wsu.edu, Sally O'Neal and Douglas Walsh, Washington State Univ., Prosser, WA

D3442 Spider mite (*Tetranychus spp.*) control in ornamental production using a novel mode of action. **Bryan Vander Mey**, bvandermey@ucdavis.edu and James A. Bethke, Univ. of California, San Marcos, CA

D3443 Efficacy of a lignin-encapsulated nootkatone formulation for control of two-spotted spider mites (*Tetranychus urticae*). Karla Addesso, Tennessee State Univ., McMinnville, TN, **Kevin Trostel**, kt2r@mtmail.mtsu.edu[1], and Robert W. Behle[2], [1]Middle Tennessee State Univ., Murfreesboro, TN, [2]USDA - ARS, Peoria, IL

D3444 Seasonal changes in arthropod densities and pest management in off-season, high tunnel strawberries. **Barbara Lewis**, balewis@uark.edu, Donn Johnson and M. Garcia, Univ. of Arkansas, Fayetteville, AR

D3445 Number of cumulative spider mite days that cause yield loss in strawberries. **Donn Johnson**, dtjohnso@uark.edu, Barbara Lewis and M. Garcia, Univ. of Arkansas, Fayetteville, AR

D3446 Efficacy of cyflumetofen against spider mites and its compatibility with predatory mites. **Juang Horng Chong**, juanghc@clemson.edu, Clemson Univ., Florence, SC

D3447 The IR-4 project: Helping specialty crop growers address pest problems by facilitating minor use pesticide registrations. **Michelle Samuel-Foo**, mfoo@ufl.edu[1], and Keith Dorschner[2], [1]Univ. of Florida, Gainesville, FL, [2]Rutgers, The State Univ. of New Jersey, Princeton, NJ

D3448 Pollinating and beneficial insects within four treatments of switchgrass and pine. Joshua W. Campbell and **Taylor Patzwahl**, patzwt10@highpoint.edu, High Point Univ., High Point, NC

D3449 *Varroa destructor* detected in an *Apis mellifera* colony (Hymenoptera: Apidae) in Southern Guam. **Ross Miller**, rmiller@uguam.uog.edu and Christopher Rosario, Univ. of Guam, Mangilao, Guam

D3450 Male behavior of *Bombus hortulanus* (Hymenoptera: Apidae) from the Andes. **Melissa Guerrero**, mel_yvette2292@hotmail.com and Jose Ricardo Cure, Universidad Militar Nueva Granada, Cajica, Colombia

D3451 Phenotypic variation in a carpenter bee which uses alternative nesting host-plants. **Luis Flores-Prado**, luis.flores@umce.cl[1], Daniel Aguilera-Olivares[2] and German Manriquez[2], [1]Universidad Metropolitana de Ciencias de la Educacion, Santiago, Chile, [2]Universidad de Chile, Santiago, Chile

D3452 Bees and gardens: research, teaching, and extension at the Häagen-Dazs Honey Bee Haven. **Christine Casey**, cacasey@ucdavis.edu, Univ. of California, Davis, CA

D3453 SPLATbloom for more effective pollination. **Jonathan Rico**, jonathan.r@iscatech.com[1], Agenor Mafra-Neto[1], Rafael Borges[2], Michael Reinke[1] and William Urrutia[1], [1]ISCA Technologies, Inc., Riverside, CA, [2]ISCA Tecnologias Ltda, Ijui, RS, Brazil

D3454 Use of lab and field toxicity and exposure studies to develop a comprehensive risk assessment of methoxyfenozide for honey bees. **Vincent J. Kramer**, vjkramer@dow.com[1], Giovanna Meregalli[2], Brian Bret[3] and Jennifer Hughes[1], [1]Dow AgroSciences, Indianapolis, IN, [2]Dow AgroSciences, Abingdon, United Kingdom, [3]Dow AgroSciences, Roseville, CA

D3455 Honey bees avoid ant harassment using scent cues. **C. Sheena Sidhu**, cssidhu@ucr.edu and Erin Wilson Rankin, Univ. of California, Riverside, CA

D3456 *Peponapis pruinosa* nesting and tillage with *Cucurbita* production. **Ric Bessin**, rbessin@uky.edu, Univ. of Kentucky, Lexington, KY

D3457 Oh the places bees go: RFID methods connect bumblebee foraging and resources in Wisconsin landscapes. **Jeremy Hemberger**, hemberger@wisc.edu and Claudio Gratton, Univ. of Wisconsin, Madison, WI

D3458 Inhibiting brain oxidative phosphorylation increases aggression in honey bees and fruit flies. **Hongmei Li-Byarlay**, hmliuiuc@gmail.com[1], Clare Rittschof[2], Jonathan Massey[2], Barry R. Pittendrigh[2] and Gene E. Robinson[2], [1]North Carolina State Univ., Raleigh, NC, [2]Univ. of Illinois, Urbana, IL

D3459 Population differentiation in blue orchard bees (*Osmia lignaria*) observed using multi-locus microsatellite genotypes. **James Strange**, James.Strange@ars.usda.gov[1], and Richard Roehrdanz[2], [1]USDA - ARS, Logan, UT, [2]USDA - ARS, Fargo, ND

D3460 Impact of landscape heterogeneity on pollinator communities surveyed in Kansas soybean. **Alysha Soper**, alyshaso@ksu.edu, Ryan Hackett and Brian McCornack, Kansas State Univ., Manhattan, KS

D3461 Pollinator conservation research and initiatives for golf courses and urban landscapes. **Abiya Saeed**, abiyasaeed@gmail.com, Bernadette Mach, Emily K. Dobbs, Carl T. Redmond and Daniel Potter, Univ. of Kentucky, Lexington, KY

D3462 Pollen use of wild bees and a method to assess the risk of exposure to pesticides in an agricultural landscape. **Chia-Hua Lin**, lin.724@buckeyemail.osu.edu[1], Brendan Zapp[2], Jessie Wallace[2], Reed Johnson[1] and Karen Goodell[3], [1]The Ohio State Univ., Wooster, OH, [2]The Ohio State Univ., Columbus, OH, [3]The Ohio State Univ., Newark, OH

D3463 Native buzz: How citizen scientists can help evaluate pollinator diversity. **Haleigh Ray**, hray12@ufl.edu, Jennifer Gillett-Kaufman and Jason R. Graham, Univ. of Florida, Gainesville, FL

D3464 Comparative studies of pollinator diversity among perennial irrigated crops and adjacent riparian habitats in Eastern Washington. **Courtney Grula**, courtneygrula@gmail.com, Washington State Univ., Prosser, WA

D3465 Pollinator response to harvesting and local resources in bioenergy grasslands. **Brian Spiesman**, bspiesman@wisc.edu and Claudio Gratton, Univ. of Wisconsin, Madison, WI

D3466 Insecticidal effects of essential oils against cabbage looper, *Trichoplusia ni* (Lepidoptera: Noctuidae). **Yasmin Akhtar**, yasmin.akhtar@ubc.ca[1], Gabriel Luiz Goncalves[1], Wagner Tavares[2], José Zanuncio[2] and Murray B. Isman[1], [1]Univ. of British Columbia, Vancouver, BC, Canada, [2]Federal Univ. of Viçosa, Viçosa, Brazil

D3467 Documenting the effect of natural enemies on *Brassica* aphids in Oklahoma winter canola. **William Jessie**, w.jessie@okstate.edu[1], Casi N. Jessie[1], Kris Giles[1] and Brian McCornack[2],[1]Oklahoma State Univ., Stillwater, OK, [2]Kansas State Univ., Manhattan, KS

D3468 Isolation and identification of the sex pheromone of *Hypsipyla grandella* Zeller. **José Pineda-Ríos**, pinedarmanuel@gmail.com[1], Juan Cibrián-Tovar[1], Enrique Arjona-Suárez[1], Rosa López-Romero[1], David Cibrián-Tovar[2] and Jorge Macías-Sámano[3], [1]Colegio de Postgraduados, Montecillo, Mexico, [2]Universidad Autónoma Chapingo, Chapingo, Mexico, [3]El Colegio de la Frontera Sur, Tapachula, Mexico

D3469 Dynamics of a koa moth (Geometridae: *Scotorythra paludicola*) outbreak at Hakalau Forest National Wildlife Refuge, Hawai'i. **Robert Peck**, bwpeck@usgs.gov[1], Paul Banko[2], David Foote[2], Laura Petteway[2] and Kelsie Ernsberger[2], [1]Univ. of Hawai'i, Hawai'i National Park, HI, [2]U.S. Geological Survey, Hawai'i National Park, HI

D3470 Impact of sex, age and mating status on flight behavior of the navel orangeworm (*Amyelois transitella*) (Lepidoptera: Pyralidae). **Charles S. Burks**, charles.burks@ars.usda.gov[1], Thomas Sappington[2], and Bradley Higbee[3], [1]USDA - ARS, Parlier, CA, [2]USDA - ARS, Ames, IA, [3]Paramount Farming Co, Shafter, CA

D3471 Developing alternative management strategies for cabbage maggot (*Delia radicum*). **Renee Prasad**, renee@escrop.com[1], Bob Vernon[2] and Wim van Herk[2], [1]E.S. Cropconsult Ltd., Surrey, BC, Canada, [2]Agriculture & Agri-Food Canada, Agassiz, BC, Canada

D3472 Effects of winter sanitation in pistachio orchards on navel orangeworm (Pyralidae) trap counts. **Bradley Higbee**, bradh@paramountfarming.com[1], and Charles S. Burks[2], [1]Paramount Farming Co, Shafter, CA, [2]USDA - ARS, Parlier, CA

D3473 Susceptibility to cabbage maggot infestation on brassicas when planted side-by-side with host and non-host crops in California's central coast. **Shimat V. Joseph**, svjoseph@ucdavis.edu[1], Larry D. Godfrey[2] and Christopher Bettiga[1], [1]Univ. of California, Salinas, CA, [2]Univ. of California, Davis, CA

D3474 Selection of *Bacillus thuringiensis* strains active against *Elasmopalmus lignosellus* (Zeller, 1848) (Lepidoptera: Pyralidae). **Pedro Neves**, pedroneves@uel.br[1], Janaina Zorzetti[1], Gislayne Boas[1], Ana Maria Meneguim[2], Edilene Barros[2], Ana Ricietto[1] and Fernanda Fazion[1], [1]State Univ. of Londrina, Londrina, Brazil, [2]Agronomic Institute of Paraná, Londrina, Brazil

D3475 Intraguild competition among noctuids in corn. **José P. G. F. Silva**, jpgfdsilva@gmail.com[1], Ivana F. da Silva[1], Edson L. L. Baldin[1], Silvana V. Paula-Moraes[2] and Thomas E. Hunt[3],[1]Universidade Estadual Paulista, Botucatu, Brazil, [2]Empresa Brasileira de Pesquisa Agropecuária (EMBRAPA) Cerrados, Planaltina, Brazil, [3]Univ. of Nebraska, Concord, NE

D3476 Potential impact of *Spodoptera exigua* and *Helicoverpa zea* on glandless cotton in New Mexico. **Jane Breen Pierce**, japierce@nmsu.edu[1], Patricia E Monk[1], Robert Flynn[1], John Idowu[2] and Andrew Garnett[1], [1]New Mexico State Univ., Artesia, NM, [2]New Mexico State Univ., Las Cruces, NM

D3477 Fecal contamination of food increases herbivore performance on plants. **Swayamjit Ray**, szr146@psu.edu[1], Iffa Gaffor[1], Wen-Po Chuang[2], Anjel Helms[1], John Tooker[1], Gary Felton[1] and Dawn Luthe[1], [1]Pennsylvania State Univ., Univ. Park, PA, [2]Kansas State Univ., Manhattan, KS

D3478 The effect of Tree of Heaven, *Ailanthus altissima*, water-soluble extract on the growth and development of fall armyworm, *Spodoptera frugiperda* (Lepidoptera: Noctuidae). **Ryan L. Wagner**, ryan.wagner@millersville.edu[1], Megan Leach[2] and John R. Wallace[1], [1]Millersville Univ., Millersville, PA, [2]Univ. of Maine, Orono, ME

D3479 Transcriptome response of rearing western bean cutworm on alternate hosts. Brad Coates and **Jean Dyer**, jean.dyer@pioneer.com, USDA - ARS, Ames, IA

D3480 Baseline susceptibility of soybean looper to flubendiamide. **M. J. Murray**, mmurray@agcenter.lsu.edu, A. R. Richter, Katherine Jackson and Jeffrey A. Davis, Louisiana State Univ., Baton Rouge, LA

D3481 First report of *Elaphria agrotina* and *E. deltoides* (Lepidoptera: Noctuidae: Elaphriini) feeding on maize and a possible misidentification of *Striacosta albicosta*. Alexandre Specht[1], Miguel Soria[2], Talita Maba[3], Luana Belufi[3], Barbara Godoi[4], MÔnica Pereira[4] and **Silvana V. Paula-Moraes**, Silvana@cpac.embrapa.br[1], [1]Empresa Brasileira de Pesquisa Agropecuária (EMBRAPA) Cerrados, Planaltina, Brazil,[2]Mato Grosso Cotton Institute - IMAmt, Primavera do Leste, Brazil, [3]Fundação de Pesquisa e Desenvolvimento Tecnológico Rio Verde, Lucas do Rio Verde, Brazil, [4]Universidade do Estado de Mato Grosso, Tangará da Serra, Brazil

D3482 Within-population variability in responses to insecticide bioassays. **K. Clint Allen**, clint.allen@ars.usda.gov, Randall Luttrell, Nathan Little and Katherine Parys, USDA - ARS, Stoneville, MS

D3483 Damages of cotton bollworm, *Helicoverpa armigera* (Lepidoptera: Noctuidae), on reproductive cotton. **Geraldo Papa**, gpapa@bio.feis.unesp.br, Sao Paulo State Univ., Ilha Solteira, Brazil

D3484 Effect of natural diets on life cycle, survival and fecundity of *Copitarsia decolora* (Guenné) (Noctuidae: Lepidoptera). **Ana Castro Marquez**, ecologia@unimilitar.edu.co, Diana Perez, Daniel Rodriguez and Fernando Cantor, Military Univ. Nueva Granada, Cajicá, Colombia

D3485 Maximizing *In Vivo* production of *Agrotis ipsilon* (Hufnagel) baculovirus. **Robert W. Behle**, robert.behle@ars.usda.gov, USDA - ARS, Peoria, IL

D3486 Selection and characterization of *Spodoptera frugiperda* (Lepidoptera: Noctuidae) resistance to pyramided Bt maize in Brazil. **Daniel Bernardi**, dbernardi2004@yahoo.com.br[1], Eloisa Salmeron[1], Renato Horikoshi[1], Oderlei Bernardi[1], Renato A. de Carvalho[2], Samuel Martinelli[3], Graham P. Head[3] and Celso Omoto[1], [1]Univ. of São Paulo, Piracicaba, Brazil, [2]Monsanto do Brasil Ltda., São Paulo, Brazil, [3]Monsanto Company, St. Louis, MO

D3487 Frequency of alleles for resistance to Vip3Aa20 toxin in field populations of *Spodoptera frugiperda* (Lepidoptera: Noctuidae) in Brazil. **Oderlei Bernardi**, oderleibernardi@yahoo.com.br[1], Daniel Bernardi[1], Douglas Amado[1], Rebeca da S. Ribeiro[1], Daniela M. Okuma[1], Eloisa Salmeron[1], Julio Fatoretto[2], Anthony D. Burd[3] and Celso Omoto[1], [1]Univ. of São Paulo, Piracicaba, Brazil, [2]Syngenta Proteção de Cultivos Ltda., São Paulo, Brazil, [3]Syngenta Plant Protection, Greensboro, NC

D3488 Baseline susceptibility of soybean looper to Cry1Ac protein. **Katherine Jackson**, kjackson@agcenter.lsu.edu, Arthur Richter and Jeffrey A. Davis, Louisiana State Univ., Baton Rouge, LA

D3489 Herbivore induction of cyanogenic glycosides in different plant structures of wild lima bean. **Maximilien Cuny**, maxcuny@hotmail.com[1], J. Gwen Shlichta[1], Quint Rusman[2], Johnattan Hernandez-Cumplido[1] and Betty Benrey[1], [1]Univ. of Neuchâtel, Neuchâtel, Switzerland, [2]Wageningen Univ., Wageningen, Netherlands

D3490 Dry bean grower survey in Minnesota and North Dakota: A review of insect pest problems and insecticide use. **Janet Knodel**, janet.knodel@ndsu.edu and Patrick Beauzay, North Dakota State Univ., Fargo, ND

D3491 Expression pattern of defense-related genes is not correlated with continuous herbivore damage in *Datura wrightii*. **Aaron Olcerst**, AOlce001@ucr.edu and J. Daniel Hare, Univ. of California, Riverside, CA

D3492 Effects of UVB radiation on induced resistance traits in *Datura wrightii*. **Sean McNamara**, smcna004@ucr.edu and J. Daniel Hare, Univ. of California, Riverside, CA

D3493 New insecticide in development for chewing insects. **Rebecca Willis**, rebecca.willis@basf.com, BASF Corporation, Research Triangle Park, NC

D3494 Re-initiating a corn rootworm survey in MN: Developments and insights from engaged ag professionals and growers. **Ken Ostlie**, ostli001@umn.edu, Trisha Leaf, Elizabeth Schacht and Megan E. Carter, Univ. of Minnesota, Saint Paul, MN

D3495 Current corn rootworm (*Diabrotica* spp.) management efficacy patterns in South Dakota. **Bradley McManus**, Bradley.McManus@sdstate.edu and Billy Fuller, South Dakota State Univ., Brookings, SD

D3496 Phosphite toxicity to the Colorado potato beetle: Direct vs. plant-mediated effects. Megan Patterson[1], and **Andrei Alyokhin**[2], [1]Maine Board of Pesticides Control, Augusta, ME, [2]andrei.alyokhin@umit.maine.edu, Univ. of Maine, Orono, ME

D3497 Diversity and population dynamics of insects in corn (*Zea mays*)- beans (*Phaseolus vulgaris*) intercrop systems. Martin Martin, **Franklin Quarcoo**, franklynquarcoo@gmail.com and Conrad Bonsi, Tuskegee Univ., Tuskegee, AL

D3498 Estimating western corn rootworm gene flow. **Thomas Sappington**, Tom.Sappington@ars.usda.gov, USDA - ARS, Ames, IA

D3499 The scale of evolution: Landscape-level analysis of Cry3Bb1 resistance in western corn rootworm. **John Doudna**, jdoudna@iastate.edu and Aaron Gassmann, Iowa State Univ., Ames, IA

D3500 Colorado potato beetle (*Leptinotarsa decemlineata)* effects on the epidemiology of *Potato virus Y* and *Potato leafroll virus*. **Everett Booth**, Everett.booth@umit.maine.edu and Andrei Alyokhin, Univ. of Maine, Orono, ME

D3501 Comparative feeding behavior of cereal aphids on switchgrass, *Panicum virgatum* L. **Kyle G. Koch**, kylegkoch@gmail.com[1], Tiffany Heng-Moss[1], Jeffrey Bradshaw[2] and Gautam Sarath[3],[1]Univ. of Nebraska, Lincoln, NE, [2]Univ. of Nebraska, Scottsbluff, NE, [3]USDA - ARS, Lincoln, NE

D3502 *Mir1* dependent maize defense against aphids. **Joe Louis**, joelouis@unl.edu, Univ. of Nebraska, Lincoln, NE

D3503 Evaluating the impact of winter cover crops on predator abundance & biocontrol services in continuous corn biofuel cropping systems. **Aaron Fox**, aaronfox@msu.edu[1], Tania Kim[2], J. Megan Woltz[3], Timothy D. Meehan[2], Claudio Gratton[2] and Douglas A. Landis[1], [1]Michigan State Univ., East Lansing, MI, [2]Univ. of Wisconsin, Madison, WI, [3]Oregon State Univ., Corvallis, OR

D3504 Changes in forest insect community structure following pre-commercial thinning for biofuel production. **Lucy Cooper**, coop8200@vandals.uidaho.edu, Stephen P. Cook and Mark Coleman, Univ. of Idaho, Moscow, ID

D3505 Identification and characteristics of insect pathogen *Serratia marcescens* isolated from *Protaetia brevitarsis seulensis* (Kolbe) in Korea. **Sunghee Nam**, creative716@korea.kr[1], Kyu-Won Kwak[1], Kwan-Ho Park[1], Myung-Sae Han[2], Ji-Young Choi[3], Seok-Hyun Lee[3] and Young-Cheol Choi[3], [1]Suwon city, South Korea, [2]Kyungpook National Univ., Daegu, South Korea, [3]Rural Development Administration, Suwon-si, South Korea

D3506 Survival of larval winter moths (Lepidoptera: Geometridae) in field and laboratory studies. **Adam Pepi**, apepi@umass.edu, Univ. of Massachusetts, Amherst, MA

D3507 Improved monitoring methods for invasive Lepidoptera. **D Lance**, david.r.lance@aphis.usda.gov, J. Francese and V. Mastro, USDA - APHIS - PPQ - CPHST, Buzzards Bay, MA

D3508 Lowering the effective field dose of chlorantraniliprole for control of rangeland grasshopper (Orthoptera: Acrididae) populations. **Larry E. Jech**, larry.e.jech@aphis.usda.gov[1], Chris Reuter[2], Lonnie R. Black[2] and R. Nelson Foster[2], [1]USDA - APHIS, Phoenix, AZ, [2]USDA - ARS, Phoenix, AZ

D3509 Characterization of an EPG waveform library for Lygus spp. on cotton squares. **Felix Cervantes**, felix.cervantes@ars.usda.gov, Univ. of California, Parlier, CA and Elaine Backus, USDA - ARS, Parlier, CA

D3510 Influence of pH and temperature on sulfoxaflor for control of aphids in laboratory trials. **Ed King**, jeking@dow.com, Mary Kubiszak and Luis Gomez, Dow AgroSciences, Indianapolis, IN

D3511 Efficacy of new DuPont™ Lumivia™ insecticide seed treatment against soil insect pests in corn. **Thomas P. Kuhar**, tkuhar@vt.edu[1], Hélène Doughty[2], Marco Toapanta[3], and Donald D. Ganske[4], [1]Virginia Polytechnic Institute and State Univ., Blacksburg, VA, [2]Virginia Polytechnic Institute and State Univ., Virginia Beach, VA, [3]DuPont Crop Protection, Johnston, IA, [4]DuPont Crop Protection, Winchester, VA

D3512 Pink bollworm (*Pectinophora gossypiella*) pupal sterilization at a mass-rearing facility: Benefits and risks. John Claus[1], Soon Flynn[2], Ernie D. Miller[3], Sarah Shirota[2], Guolei Tang[1] and **Michelle Walters**, michelle.l.walters@aphis.usda.gov[1], [1]USDA - APHIS - PPQ, Phoenix, AZ, [2]Arizona State Univ., Tempe, AZ, [3]USDA - APHIS, retired, Phoenix, AZ

D3513 Fine mapping of a QTL for Cry1F resistance in the European corn borer. **Brad Coates**, Brad.Coates@ars.usda.gov[1], and Blair Siegfried[2], [1]USDA - ARS, Ames, IA, [2]Univ. of Nebraska, Lincoln, NE

D3514 Managing tobacco hornworm and tobacco budworm with transplant water applications of chlorantraniliprole in flue-cured tobacco in South Carolina. **Francis Reay-Jones**, freayjo@clemson.edu and Bruce A. Fortnum, Clemson Univ., Florence, SC

D3515 Identification and monitoring of the red clover casebearer moth *(Coleophora deuratella)* in clover seed crops in western Oregon. **Nicole Anderson**, nicole.anderson@oregonstate.edu[1], R. MacPherran[1] and Gale Gingrich[2], [1]Oregon State Univ., Corvallis, OR, [2]Marion Ag Service, St. Paul, OR

D3516 Gypsy moth in Serbia: Status and prospects. **Slobodan Milanovic**, slobodan.milanovic@sfb.bg.ac.rs[1], Ljubodrag Mihajlovic[1] and Nenad Markovic[2], [1]Univ. of Belgrade, Belgrade, Serbia,[2]State Enterprise for Forest Management "Srbijašume" Belgrade, Belgrade, Serbia

D3517 Landscape effects on insecticide resistance in *Lygus lineolaris* (Palisot de Beauvois). **Katherine Parys**, katherine.parys@ars.usda.gov[1], Katherine Renken[2], Gordon Snodgrass[1], K. Clint Allen[1] and Nathan Little[1], [1]USDA - ARS, Stoneville, MS, [2]Louisiana State Univ., Baton Rouge, LA

D3518 Sequential sampling plan for *Tibraca limbativentris* Stal (Hemiptera: Pentatomidae) in irrigated rice fields. **Tavvs Alves**, alves011@umn.edu[1], and José Barrigossi[2], [1]Univ. of Minnesota, Saint Paul, MN, [2]Embrapa Rice and Beans, Santo Antonio de Goias, Brazil

D3519 Multivariate and ecological approach to assess non-target effects of Bt rootworm maize on ground beetles (Carabidae). **Royce Bitzer**, mariposa@iastate.edu[1], Richard Hellmich[1], Keri Carstens[2] and Nicholas Schmidt[2], [1]USDA - ARS, Ames, IA, [2]DuPont Pioneer, Johnston, IA

D3520 Field evaluations of maize expressing an RNAi-based insect protected trait on non-target organisms. **Aqeel Ahmad**, aqeel.ahmad@monsanto.com[1], Peter Asiimwe[1], Changjian Jiang[1], Ignacio Negri[2], Wladecir Oliveira[3], Bernard Sammons[1] and David Carson[1], [1]Monsanto Company, St. Louis, MO, [2]Monsanto Argentina SAIC, Buenos Aires, Argentina, [3]Monsanto do Brasil Ltda., São Paulo, Brazil

D3521 Predatory insect communities in edge habitats adjacent to corn and soybean agroecosystems. **Daniel M. Pavuk**, dmpavuk@bgnet.bgsu.edu, Bowling Green State Univ., Bowling Green, OH

D3522 The effect of row cover and pesticide application variable timing on pests in organic vegetable. **Jamin Dreyer**, jamin.dreyer@uky.edu[1], Jason Schmidt[2], Mark A. Williams[1] and James D. Harwood[1], [1]Univ. of Kentucky, Lexington, KY, [2]Michigan State Univ., East Lansing, MI

D3523 Leaffooted bugs (*Leptoglossus* spp) on almonds and alternate host plants. **Ashley Valle Arevalo**, avallearevalo@ucmerced.edu[1], Bradley Higbee[2], David R. Haviland[3], David Doll[1] and Andrea Joyce[1], [1]Univ. of California, Merced, CA, [2]Paramount Farming Co, Shafter, CA, [3]Univ. of California, Bakersfield, CA

D3524 The determination and validation of degree day requirements for *Bactericera cockerelli* (Sulc) (Hemiptera: Triozidae). **Milo Lewis**, mihigh07@gmail.com[1], Kevin Heinz[1], Elizabeth Pierson[1]and Jerry Michels[2], [1]Texas A&M Univ., College Station, TX, [2]Texas A&M Univ., Amarillo, TX

D3525 *Wolbachia* infection differs among *Bactericera cockerelli* haplotypes. **William Cooper**, rodney.cooper@ars.usda.gov[1], Kylie Swisher[1], Stephen F. Garczynski[1], Tariq Mustafa[2], Joseph Munyaneza[1] and David Horton[1], [1]USDA - ARS, Wapato, WA, [2]Washington State Univ., Pullman, WA

D3526 Incidence of zebra chip disease and control of the potato psyllid (*Bactericera cockerelli*) in organic systems. **Gabriela Esparza-Díaz**, gesparzadiaz@ag.tamu.edu and Raul Villanueva, Texas A&M Univ., Weslaco, TX

D3527 Liberibacter transmission efficiency among haplotypes of *Bactericera cockerelli*. **Joseph Munyaneza**, joseph.munyaneza@ars.usda.gov[1], Tariq Mustafa[2], Kylie Swisher[1], David Horton[1]and Richard Zack[2], [1]USDA - ARS, Wapato, WA, [2]Washington State Univ., Pullman, WA

D3528 On-site training on hydrilla IPM: How to reach new audiences. **Jennifer Gillett-Kaufman**, gillett@ufl.edu, Verena-Ulrike Lietze, Emma N. I. Weeks and James P. Cuda, Univ. of Florida, Gainesville, FL

D3529 The growing role of extension entomology in pest diagnostics and the detection of invasive pests. **Frank Hale**, fahale@utk.edu[1], Darrell Hensley[2], Jerome F. Grant[2], Scott D. Stewart[3], Heather Kelly[3], Alan Windham[1], Steve Bost[1] and Parwinder Grewal[2], [1]Univ. of Tennessee, Nashville, TN, [2]Univ. of Tennessee, Knoxville, TN, [3]Univ. of Tennessee, Jackson, TN

D3530 Where aloha stops: How invasive species are affecting the urban forest in Hawaii. **Andrew Kaufman**, kaufmana@hawaii.edu and Leyla V. Kaufman, Univ. of Hawai'i, Honolulu, HI

D3531 Discovery and spread of *Eriococcus lagerstroemiae* (Hemiptera: Eriococcidae), a new invasive pest of crape myrtle. **Michael Merchant**, m-merchant@tamu.edu[1], Mengmeng Gu[2], Jim Robbins[3], Erfan Vafaie[4], Norman Barr[5], Amber D. Tripodi[6], Allen L. Szalanski[6], John Hopkins[3] and Gregory Evans[7], [1]Texas A&M Univ., Dallas, TX, [2]Texas A&M Univ., College Station, TX, [3]Univ. of Arkansas, Little Rock, AR, [4]Texas A&M Univ., Overton, TX, [5]USDA - APHIS, Edinburg, TX, [6]Univ. of Arkansas, Fayetteville, AR, [7]USDA - APHIS, Beltsville, MD

D3532 Invasion of the Asian green stinkworms: Managing excessive casting by the megascolecid earthworm *Amynthas hupeiensis* on golf course putting greens. **Carl T. Redmond**, ctredm00@uky.edu, Abiya Saeed and Daniel Potter, Univ. of Kentucky, Lexington, KY

D3533 Trap cropping: A simple, effective, and inexpensive organic IPM approach to manage cucumber beetles and squash bugs in cucurbit crops. **Jaime Pinero**, PineroJ@lincolnu.edu and Jacob Wilson, Lincoln Univ., Jefferson City, MO

D3534 Comparing and enhancing ecosystem services provided by the soil food web in long-term organic and transitioning farming systems. **Harit K. Bal**, bal.9@osu.edu[1], Kuhuk Sharma[1], Khandakar Rafiq Islam[2], Edward McCoy[1], Subbu Kumarappan[3], Alan Sundermeier[4] and Parwinder Grewal[5], [1]The Ohio State Univ., Wooster, OH, [2]The Ohio State Univ., Piketon, OH, [3]Agricultural Technical Institute, Wooster, OH, [4]The Ohio State Univ., Bowling Green, OH, [5]Univ. of Tennessee, Knoxville, TN

D3535 Plant clinics helping farmers in Africa contend with arthropod pests. **Willis Ochilo**, wnochilo@gmail.com, MaryLucy Oronje and Washington Otieno, CABI, Nairobi, Kenya

D3536 Research experiences for teachers using soybean as a model system. **Brian McCornack**, mccornac@ksu.edu and Wendy Johnson, Kansas State Univ., Manhattan, KS

D3537 Developing IPM strategies in the subtropics of Texas: Attraction-repellance of pests in organic brassica production. **Carlo R. Moreno**, morenocr@utpa.edu and Alex E. Racelis, Univ. of Texas, Edinburg, TX

D3538 Stop school pests: A national IPM standard training program. Lynn Braband[1], Herb Bolton[2], Marcia Duke[3], Jim Farrar[4], Carrie Foss[5], Sherry Glick[6], Dawn Gouge[7], Fudd Graham[8], Thomas A. Green[9], Michael Herring[10], Katherine Howard[11], Janet A. Hurley[12], Jack Marlowe[13], Michael Page[14], Susan T. Ratcliffe[15], Clay Scherer[16], Gregg Smith[17], **Mariel Snyder**, msnyder@ipminstitute.org[18], Tim Stock[19], James VanKirk[20], Carol Westinghouse[21], and Deborah Young[22], [1]Cornell Univ., Rochester, NY, [2]USDA - CREES, Washington, DC, [3]National Pest Management Association, Fairfax, VA, [4]Western IPM Center, Davis, CA, [5]Washington State Univ., Puyallup, WA, [6]U.S. Environmental Protection Agency, Dallas, TX, [7]Univ. of Arizona, Maricopa, AZ, [8]Auburn Univ., Auburn, AL, [9]IPM Institute of North America, Madison, WI, [10]Centers for Disease Control and Prevention, Atlanta, GA, [11]U.S. Environmental Protection Agency, IA, [12]Texas A&M Univ., Dallas, TX, [13]Eden Advanced Pest Technologies, Olympia, WA, [14]Florida Dept. of Agriculture and Consumer Services, Tallahassee, FL, [15]North Central IPM Center, Urbana, IL, [16]Syngenta Plant Protection, Jensen Beach, FL, [17]Salt Lake City School Distrcit, Salt Lake City, UT, [18]Entomological Foundation, Madison, WI, [19]Oregon State Univ., Corvallis, OR, [20]Southern Region IPM Center, Raleigh, NC, [21] Informed Green Solutions, Inc., East Burke, VT, [22]CO Coalition, Fort Collins, CO

D3539 Impact of natural enemies on brown marmorated stink bug (*Halyomorpha halys*) in North Carolina agroecosystems. **Emily Ogburn**, Emily.Ogburn@gmail.com, North Carolina State Univ., Mills River, NC and James F. Walgenbach, North Carolina State Univ., Fletcher, NC

D3540 Distribution of brown marmorated stink bug in California, (*Halyomorpha halys*), and its extant natural enemies. **Charles Pickett**, cpickett@cdfa.ca.gov[1], Mark S. Hoddle[2], Jesus Lara Artiga[2]and Marypat Stadtherr[1], [1]California Dept. of Food & Agriculture, Sacramento, CA, [2]Univ. of California, Riverside, CA

D3541 Damage by the green-belly stink bug, *Dichelops furcatus* (F.) (Hemiptera: Heteroptera: Pentatomidae) to wheat plants on different phenological stages of development. **Alice Agostinetto**, aliceagostinetto@yahoo.com.br[1], Antônio Panizzi[2] [1]Univ. of Passo Fundo, Passo Fundo, Brazil and, [2]National Wheat Research Center, Passo Fundo, Brazil

D3542 Nymph biology of *Dichelops furcatus* (F.) and of *Dichelops melacanthus* (Dallas) (Heteroptera: Heteroptera: Pentatomidae) on different food sources. **Lisonéia Smaniotto**, liso_smaniotto@hotmail.com[1], and Antônio Panizzi[2], [1]UFPR, Curitiba, Brazil, [2]National Wheat Research Center, Passo Fundo, Brazil

D3543 Spatial distribution of brown marmorated stink bug (Hemiptera: Pentatomidae) in cornfield: Implications for sampling. **JeongJoon Ahn**, jeahn@mail.wvu.edu, Chang-Gyu Park and Yong-Lak Park, West Virginia Univ., Morgantown, WV

D3544 Stylet penetration estimates for selected hemipteran crop pests. **Jesus F. Esquivel**, jesus.esquivel@ars.usda.gov, USDA - ARS, College Station, TX

D3545 Changes in tree community composition within high elevation whitebark pine stands following mountain pine beetle (*Dendroctonus ponderosae*) outbreaks. **Kendra Schotzko**, kschotzko@vandals.uidaho.edu[1], Stephen P. Cook[1], Carl L. Jorgensen[2], Laura Lowrey[2] and Sandy Kegley[3], [1]Univ. of Idaho, Moscow, ID, [2]USDA - Forest Service, Boise, ID, [3]USDA - Forest Service, Coeur d'Alene, ID

D3546 Evaluating the role of rhizophagous insects and associated fungi in pine health issues in southeastern U.S. **Kamal J.K. Gandhi**, gandhi.42@osu.edu[1], David R. Coyle[1], Kier Klepzig[2], Frank Koch[3], Larry Morris[1], John T. Nowak[4], Bill Otrosina[5] and Bill Smith[6], [1]Univ. of Georgia, Athens, GA, [2]USDA - Forest Service, Pineville, LA, [3]USDA - Forest Service, Research Triangle Park, NC, [4]USDA - Forest Service, Asheville, NC, [5]USDA - Forest Service, Athens, GA, [6]USDA - Forest Service, Raleigh, GA

D3547 Pine shoot beetle, *Tomicus piniperda* (Linnaeus): analysis of regulatory options. **Glenn Fowler**, glenn.fowler@aphis.usda.gov[1], Yu Takeuchi[2], Trang Vo[3] and Lynn Garrett[1], [1]USDA - APHIS - PPQ - CPHST, Raleigh, NC, [2]North Carolina State Univ., Raleigh, NC, [3]USDA - APHIS - PPQ - CPHST, Riverdale Park, MD

D3548 Implications of thousand cankers disease for the nursery industry: Are young black walnut trees at risk of attack by the walnut twig beetle (*Pityophthorus juglandis*)? **Jackson Audley**, jaudley@utk.edu[1], William Klingeman[1], Albert Mayfield[2], Scott W. Myers[3] and Adam M. Taylor[1], [1]Univ. of Tennessee, Knoxville, TN, [2]USDA - Forest Service, Asheville, NC, [3]USDA - APHIS - PPQ - CPHST, Buzzards Bay, MA

D3549 *Ips paraconfusus* Lanier (Coleoptera: Curculionidae): new record and outbreak descriptions of the California fivespined Ips in the Pacific Northwest. **Todd Murray**, tmurray@wsu.edu[1], Glenn R. Kohler[2], Robbie W. Flowers[3], Elizabeth A. Willhite[4], and Glenn Ahrens[5], [1]Washington State Univ., Stevenson, WA, [2]Washington Dept. of Natural Resources, Olympia, WA, [3]Oregon Dept. of Forestry, Salem, OR, [4]USDA - Forest Service, Sandy, OR, [5]Oregon State Univ., Oregon City, OR

D3550 A novel semiochemical-based tool (SPLAT® Verb) for protecting pines from mortality attributed to bark beetles. **Jessica Self**, Jessica.self@iscatech.com[1], Christopher J. Fettig[2], Steve Munson[3] and Agenor Mafra-Neto[1], [1]ISCA Technologies, Inc., Riverside, CA, [2]USDA - Forest Service, Davis, CA, [3]USDA - Forest Service, Ogden, UT

D3551 Identification and behavior of a third male-produced pheromone component for the Asian longhorned beetle *Anoplophora glabripennis*. **Damon Crook**, damon.j.crook@aphis.usda.gov[1], Ann Ray[2], David Lance[1], Baode Wang[1], Joseph Francese[1] and Victor Mastro[1], [1]USDA - APHIS - PPQ - CPHST, Buzzards Bay, MA, [2]Xavier Univ., Cincinnati, OH

D3552 Longhorn beetle (Coleoptera: Cerambycidae) communities in hardwood and coniferous sites at high risk for exotic forest pest introductions. **Sara Tanis**, tanissar@msu.edu[1], Deborah G. McCullough[1], Kyle Redilla[1] and Therese Poland[2], [1]Michigan State Univ., East Lansing, MI, [2]USDA - Forest Service, Lansing, MI

D3553 Update on the host range of the Asian longhorned beetle (*Anoplophora glabripennis*). **Baode Wang**, Baode.Wang@aphis.usda.gov, USDA - APHIS - PPQ - CPHST, Buzzards Bay, MA

D3554 Ipsenol, monochamol and α-pinene: Trap lure blend for *Monochamus* species (Cerambycidae) in Canada and USA. **Daniel R. Miller**, dmiller03@fs.fed.us[1], Jeremy D. Allison[2], Christopher M. Crowe[1], Darci Dickinson[3], Andy Eglitis[4], Richard W. Hofstetter[5], A. Steven Munson[6], Therese M. Poland[7], Laurie S. Reid[8], Brytten E. Steed[9] and Jon Sweeney[10], [1]USDA - Forest Service, Athens, GA, [2]Natural Resources Canada, Great Lakes Forestry Centre, Sault Ste. Marie, ON, Canada, [3]USDA - Forest Service, Wenatchee, WA, [4]USDA - Forest Service, Bend, OR, [5]Northern Arizona Univ., Flagstaff, AZ, [6]USDA - Forest Service, Ogden, UT, [7]USDA - Forest Service, East Lansing, MI, [8]South Carolina Forestry Commission, Columbia, SC, [9]USDA - Forest Service, Missoula, MT, [10]Canadian Forest Service, Fredericton, NB, Canada

D3555 Using webinars to keep stakeholders up to date on emerald ash borer (*Agrilus planipennis*) and other invasive insects. **Adam Witte**, arwitte@purdue.edu and Clifford S Sadof, Purdue Univ., West Lafayette, IN

D3556 Increasing the number of eyes looking for invasive species: The creation of first detector workshops in Illinois. **Kelly Estes**, kcook8@illinois.edu[1], Stephanie Porter[2], Christopher Evans[3], and Scott Schirmer[4], [1]Univ. of Illinois, Champaign, IL, [2]Burrus Hybrids, Arenzville, IL, [3]Illinois Dept. of Natural Resources, Benton, IL, [4]Illinois Dept. of Agriculture, DeKalb, IL

D3557 The biology and prey of *Cerceris fumipennis* and its use for bio-surveillance of the emerald ash borer. **Morgan Dube**, morgan.dube@agr.nh.gov, Univ. of New Hampshire, Durham, NH

D3558 Distribution of oak pit scale and associated crown dieback of Oregon white oak in Washington. **Glenn R. Kohler**, glenn.kohler@dnr.wa.gov and Aleksandar Dozic, Washington Dept. of Natural Resources, Olympia, WA

D3559 Evaluating the efficacy of several insecticides on the neonicotinoid-resistant European elm scale (*Eriococcus spuria*) and the response of natural enemies. **Rachael Sitz**, rachael.fithian@colostate.edu, Peter Forrence and Whitney Cranshaw, Colorado State Univ., Fort Collins, CO

D3560 Assessing the aggressiveness of bark- and wood-boring beetles colonising girdled Scots pine trees. **Jiri Foit**, foit.jiri@gmail.com and Vaclav Cermak, Mendel Univ., Brno, Czech Republic

D3561 Calling all wood-boring beetles: Laboratory and in-field bioassays with potentially attractive compounds for beetle management. **Alicia Bray**, brayalic@gmail.com[1], Karla Addesso[2], Jason Oliver[2] and Paul A. O'Neal[2], [1]Central Connecticut State Univ., New Britain, CT, [2]Tennessee State Univ., McMinnville, TN

D3562 Comparison of tree bolt ethanol infusion treatments to commercial lures for the longevity of attraction of wood-boring insects. Alicia Bray[1], Jason B. Oliver[2], Nadeer Youssef[2], **Joshua P. Basham**, joshua_basham@yahoo.com[2], Karla Addesso[2], Christopher M. Ranger[3] and Victor Mastro[4], [1]Central Connecticut State Univ., New Britain, CT, [2]Tennessee State Univ., McMinnville, TN, [3]USDA - ARS, Wooster, OH, [4]USDA - APHIS - PPQ - CPHST, Buzzards Bay, MA

D3563 Buprestid beetle community composition and attraction to different lures in forested sites in Michigan. **Kyle Redilla**, redillak@msu.edu[1], Deborah G. McCullough[1], Sara Tanis[1] and Therese Poland[2], [1]Michigan State Univ., East Lansing, MI, [2]USDA - Forest Service, Lansing, MI

D3564 Importance of leaf volatiles in the host selection behavior of the redbay ambrosia beetle X*yleborus glabratus*. **Xavier Martini**, xmartini@ufl.edu[1], Marc Hughes[2], Jason. A. Smith[2] and Lukasz L. Stelinski[1], [1]Univ. of Florida, Lake Alfred, FL, [2]Univ. of Florida, Gainesville, FL

D3565 Seasonal movement of exotic ambrosia beetles (Coleoptera: Scolytinae) into ornamental nurseries. **Michael Reding**, mike.reding@ars.usda.gov[1], Christopher Ranger[1], Chris Werle[2], Jason Oliver[3], Peter B. Schultz[4] and Blair Sampson[5], [1]USDA - ARS, Wooster, OH, [2]Louisiana State Univ., Baton Rouge, LA, [3]Tennessee State Univ.,

McMinnville, TN, [4]Virginia Tech, Virginia Beach, VA, [5]USDA - ARS, Poplarville, MS

D3566 Tree proximity and ethanol dose as factors in trap tree strategy for exotic ambrosia beetles. **Jason B. Oliver**, joliver@tnstate.edu[1], Karla Addesso[1], Nadeer Youssef[1], Paul A. O'Neal[1], Christopher Ranger[2], Michael E. Reding[2], Peter B. Schultz[3], Blair Sampson[4], Joshua P. Basham[1], Joseph Lampley[1] and Debbie Eskandarnia[1], [1]Tennessee State Univ., McMinnville, TN, [2]USDA - ARS, Wooster, OH,[3]Virginia Tech, Virginia Beach, VA, [4]USDA - ARS, Poplarville, MS

D3567 Effect of extreme winter temperatures on ambrosia beetle outbreaks in Virginia nurseries. **Peter B. Schultz**, schultzp@vt.edu[1], Christopher Ranger[2], Michael E. Reding[2] and Jason Oliver[3],[1]Virginia Tech, Virginia Beach, VA, [2]USDA - ARS, Wooster, OH, [3]Tennessee State Univ., McMinnville, TN

D3568 Biotic parameter assessments of candidate entomopathogenic fungi evaluated for management of ambrosia beetles *Xylosandrus crassiusculus* and *Xyleborus volvulus* (Coleoptera: Curculionidae) in avocado production. **Pasco Avery**, pbavery@ufl.edu[1], Verónica Bojorque[2], and Daniel Carrillo[3], [1]Univ. of Florida, Ft. Pierce, FL, [2]Pan-American Agricultural School (Zamorano), Tegucigalpa, Honduras, [3]Univ. of Florida, Homestead, FL

D3569 Ambrosia beetles associated with laurel wilt-affected avocado orchards in south Florida. **Jorge Peña**, jepena@ufl.edu, Teresa Narvaez, Daniel Carrillo and Rita E. Duncan, Univ. of Florida, Homestead, FL

D3570 Aggregation pheromone of harlequin bug (Hemiptera: Pentatomidae): Field attractiveness of components to males, females, and nymphs. **Donald C. Weber**[1], Guillermo Cabrera Walsh[2], Michael M. Athanas[1], Anthony S. DiMeglio[1], Tracy C. Leskey[3], Kamlesh R. Chauhan[1] and Ashot Khrimian[1], [1]USDA - ARS, Beltsville, MD, [2]Fundación para el Estudio de Especies Invasivas, Hurlingham, Buenos Aires, Argentina, [3]USDA - ARS, Kearneysville, WV

Section Poster Session 2: SysEB

Exhibit Hall C (Oregon Convention Center)

D3571 Honeybees and their social cues in the context of porch fanning behavior. **Sharif Durzi**, sharif.durzi@gmail.com, Univ. of Colorado at Boulder, Boulder, CO

D3572 The effects of variable rates of temperature in the thermoregulation fanning behavior of *Apis mellifera l*. **Rachael Kaspar**, raka5016@colorado.edu, Univ. of Colorado at Boulder, Boulder, CO

D3573 Results of multilocus source estimation analyses of historical us captures of medfly (*Ceratitis capitata*). **Raul Ruiz-Arce**, Raul.A.Ruiz@aphis.usda.gov and Terrance Todd, USDA - APHIS, Edinburg, TX

D3574 Scale Insects, edition 2, a tool for the identification of potential pest scales at U.S.A. ports-of-entry (Hemiptera, Sternorrhyncha, Coccoidea). **Douglass Miller**, douglass.miller@ars.usda.gov[1], Alessandra Rung[2], and Grishma Parikh[3], [1]USDA-ARS, Beltsville, MD, [2]California Dept. of Food and Agriculture, Sacramento, CA, [3]Cooperative Agricultural Support Services, Sacramento, CA

D3575 When doing nothing is something. How task allocation mechanisms compromise between flexibility, efficiency, and inactive agents. **Daniel Charbonneau**, dcharbonneau@email.arizona.edu and Anna Dornhaus, Univ. of Arizona, Tucson, AZ

D3576 Audibility in the cricket, Acheta domesticus determined using evoked potentials. **Silas Smith**, silas.smith@umconnect.umt.edu, Rita Quigley, Al Yonovitz and Kara Joyce, The Univ. of Montana, Missoula, MT

D3577 Transcriptome phylogeny and evolution of host chemical sequestration within the lichen moth tribe (Insecta: Lepidoptera: Erebidae: Arctiinae: Lithosiini). Clare Scott and **Jennifer Zaspel**, jzaspel@purdue.edu, Purdue Univ., West Lafayette, IN

D3578 The cochineal insect genome: *Dactylopius coccus* Genome assembly. **Alex Van Dam**, vandama01@gmail.com[1], Simon Rasmussen[1], Bent Petersen[1], Rubini Kannangara[2], Paiman Khorsand-Jamal[2], Bjoern Madsen[2], Finn Okkels[2], Mads Bennedsen[2], Kim Binderup[2], Thomas Sicheritz Pontén[1], Ulf Thrane[1], Birger Lindberg Møller[3], Uffe Mortensen[1] and Rasmus Frandsen[1], [1]Denmark Technical Univ., Kgs. Lyngby, Denmark, [2]Chr. Hansen A/S, Hørsholm, Denmark, [3]Univ. of Copenhagen, Copenhagen, Denmark

D3579 Invasion genomics of the soybean aphid (*Aphis glycines*) in the United States. **Jacob A. Wenger**, wenger.93@osu.edu[1], Andrew P. Michel[1] and MA. Rouf Mian[2], [1]The Ohio State Univ., Wooster, OH, [2]USDA - ARS, Wooster, OH

D3580 Epigenetic regulation of temperature-induced eyespot plasticity in the painted lady butterfly, *Vanessa cardui*. **Heidi Connahs**, heidi.connahs@email.und.edu, Turk Rhen and Rebecca Simmons, Univ. of North Dakota, Grand Forks, ND

D3581 Male reproductive fitness and queen polyandry are linked to variation in the supergene *Gp-9* in the fire ant *Solenopsis invicta*. **DeWayne Shoemaker**, dewayne.shoemaker@ars.usda.gov, Lucinda Lawson and Robert Vander Meer, USDA - ARS, Gainesville, FL

D3582 Evolution of Ischnuran color vision. **Haley Cahill Wightman**, haleyw@gmail.com and Seth M. Bybee, Brigham Young Univ., Provo, UT

D3583 Integrating the resources of a living collection with advancements in genome biology at the Drosophila Species Stock Center. **Maxi Richmond**, mrichmond@ucsd.edu and Therese Markow, Univ. of California, La Jolla, CA

D3584 A novel mitochondrial chromosome structure in the Thysanoptera. **Aaron Dickey**, amdickey@ufl.edu[1], Vivek Kumar[1], Antonella Jara-Cavieres[2], J. Kent Morgan[3], Robert G. Shatters[3], Cindy McKenzie[3] and Lance Osborne[1], [1]Univ. of Florida, Apopka, FL, [2]Indian River Research and Education Center, Fort Pierce, FL, [3]USDA - ARS, Ft. Pierce, FL

D3585 Defining the species complex of the legume pod borer, *Maruca vitrata* (Lepidoptera: Crambidae), by comparative mitochondrial phylogenomics. **Tolulope A. Agunbiade**, agunbia1@illinois.edu, Univ. of Illinois, Urbana, IL

D3586 Presentation Withdrawn

D3587 28S ribosomal RNA sequences separate five prominent *Lygus* (Hemiptera: Miridae) pest species into three species clusters. **Richard Roehrdanz**, richard.roehrdanz@ars.usda.gov and Sheila Wichmann, USDA - ARS, Fargo, ND

D3588 Clarifying the species concepts of *Cyclocephala mafaffa* and *C. deceptor* (Coleoptera: Scarabaeidae: Dynastinae): Scarab

beetle pollinators of aroids and custard apples. **Matthew Moore**, mrmoore19@ufl.edu and Stefani Harrison, Univ. of Florida, Gainesville, FL

D3589 Species delimitation in the genus *Mocyta* Mulsant & Rey, 1873 (Coleoptera, Staphylinidae, Aleocharinae), using molecular markers. Eilen Josefsen, Maria Mavrikidi, Lutz Bachmann and **Vladimir Gusarov**, vladimir.gusarov@nhm.uio.no, Univ. of Oslo, Oslo, Norway

D3590 A preliminary phylogeny of *Hypoprepia* and other lichen feeding relatives based on morphological data (Lepidoptera: Erebidae: Arctiinae). **Timothy Anderson**, ander472@purdue.edu and Jennifer Zaspel, Purdue Univ., West Lafayette, IN

D3591 Beyond a bug in a box: Connecting collections with community via augmented reality and specimen-based learning applications. **Melody Basham**, access2discovery@gmail.com[1], Yasin Özarslan[2] and Nico Franz[1], [1]Arizona State Univ., Tempe, AZ, [2]Dept. of Science Culture, Izmir, Turkey

D3592 Morphology and distribution of sensilla on the antenna of the Argentine ant. **Gerald Baker**, GBaker@Entomology.msstate.edu, Richard Brown and Amanda Lawrence, Mississippi State Univ., Mississippi State, MS

D3593 A new remarkably-preserved fossil assassin bug (Heteroptera: Reduviidae) from the Green River formation of Colorado. **Daniel Swanson**, drswans2@illinois.edu[1], Sam Heads[2], Steven Taylor[2] and JE. McPherson[3], [1]Univ. of Illinois, Urbana, IL, [2]Univ. of Illinois, Champaign, IL, [3]Southern Illinois Univ., Carbondale, IL

D3594 Toward a digital teaching collection of aquatic macroinvertebrates using interactive, gigapixel technology (Ephemeroptera, Plecoptera, and Trichoptera). Marti Louw[1], and **John Wenzel**, WenzelJ@carnegiemnh.org[2], [1]Center for Learning in Out-of-School Environments, Pittsburgh, PA, [2]Carnegie Museum of Natural History, Rector, PA

D3595 Non-monophyly of the termite-guest subtribe Termitozyrina (Coleoptera: Staphylinidae: Lomechusini). **Taisuke Kanao**, kanatai1225@gmail.com and Munetoshi Maruyama, Kyushu Univ., Fukuoka-shi, Japan

D3596 Evaluation of morphological and genetic variation in 3 *Contarinia* gall midges (Diptera: Cecidomyiidae) infesting Douglas-fir needles. **Joshua J. Vlach**, jvlach@oda.state.or.us and Thomas Valente, Oregon Dept. of Agriculture, Salem, OR

D3597 A new genus of pselaphine staphylinid beetle from Australia (Coleoptera: Staphylinidae: Pselaphinae: Faronitae). **Jong-Seok Park**, jpark16@tigers.lsu.edu[1], and Donald S. Chandler[2], [1]Louisiana State Univ., Baton Rouge, LA, [2]Univ. of New Hampshire, Durham, NH

D3598 Molecular and morphological diagnostics of Dryophthorinae (Curculionidae): Phase I — *Scyphophorus* Schoenherr. Joshua Persson[1], and **Maria Lourdes Chamorro**, lourdes.chamorro@ars.usda.gov[2], [1]George Mason Univ. and National Museum of Natural History, Washington, DC, [2]USDA - ARS, Washington, DC

D3599 Revision of the neotropical genus *Augochloropsis* (Hymenoptera, Halictidae). Jose Ricardo Cure and **Cindy Julieth Celis**, cindy.celis1@gmail.com, Universidad Militar Nueva Granada, Cajica, Colombia

D3600 Phylogenetic concentration and provenance of host data for parasitic wasps of the superfamily Platygastroidea (Hymenoptera). **Norman F. Johnson**, johnson.2@osu.edu, Luciana Musetti, Victor Zeinner, Sara Hemly and Joseph Cora, The Ohio State Univ., Columbus, OH

D3601 A classification conundrum: Examining the diversity and phylogenetic relationships of ambush bugs. **Paul Masonick**, pmaso001@ucr.edu, Christiane Weirauch, Sarah Frankenberg and Amy Michael, Univ. of California, Riverside, CA

D3602 Using Fitch's elephanthopper to design a management plan for the Spirit Knoll State Preserve. **Kirk J. Larsen**, larsenkj@luther.edu, Luther College, Decorah, IA

D3603 Using citizen science to monitor pollinator activity in South Dakota backyards. **Amanda Bachmann**, Amanda.Bachmann@sdstate.edu, South Dakota State Univ., Pierre, SD

D3604 Buprestidae of Louisiana: From traditional faunisctics to early detection of the Emerald Ash Borer arrival. **Christopher E. Carlton**, ccarlt@lsu.edu[1], Wood Johnson[1], Jeremy D. Allison[1], Ted C. MacRae[2], Alexey Tishechkin[1], Warren Virgets[1], Michael Ferro[1] and Jong-Seok Park[1], [1]Louisiana State Univ., Baton Rouge, LA, [2]Monsanto Company, Chesterfield, MO

D3605 Testing of three panel traps for the collection of buprestid and cerambycid beetles. **Nadeer Youssef**, nyoussef@blomand.net, Jason B. Oliver, Joshua P. Basham, Joseph Lampley and Debbie Eskandarnia, Tennessee State Univ., McMinnville, TN

D3606 Strange little flies in a big city: Exotic Drosophilidae (Diptera) in urban Los Angeles. David Grimaldi[1], Lesley Thayer[1], Martin Hauser[2], Michael Turelli[3], **Paul Ginsberg**, psginsberg@ucdavis.edu[3] and Brian V. Brown[4], [1]American Museum of Natural History, New York, NY, [2]California Dept. of Food and Agriculture (CDFA), Sacramento, CA, [3]Univ. of California, Davis, Davis, CA, [4]Natural History Museum, Los Angeles County, Los Angeles, CA

D3607 Changes in thermoregulatory fanning behavior over honeybee lifespan. **Logan Manaker**, Logan.Manaker@colorado.edu, Univ. of Colorado at Boulder, Boulder, CO

Section Poster Session 2: PBT

Exhibit Hall C (Oregon Convention Center)

D3608 Respiration rate in sealed hermetic environments as a function of population size and biomass for two stored grain pests, Callosobruchus maculatus (F.) and Sitophilus oryzae (L.). **Scott Williams**, willi324@purdue.edu and Dieudonne Baributsa, Purdue Univ., West Lafayette, IN

D3609 Mountain pine beetle cold tolerance. **Katherine Bleiker**, kbleiker@nrcan.gc.ca and Gregory Smith, Canadian Forest Service, Natural Resources Canada, Victoria, BC, Canada

D3610 RNA Sequencing of western corn rootworm (*Diabrotica virgifera virgifera*) neonates exposed to the Cry3Bb1 toxin. **Leslie Rault**, leslie.rault@huskers.unl.edu, Univ. of Nebraska, Lincoln, NE

D3611 Association of Cry2Ab resistance with alkaline phosphatase in pink bollworm *Pectinophora gossypiella* (Saunders) (Lepidoptera: Gelechiidae). **Govind Gujar**, gtgujar@yahoo.com, New Delhi, India

D3612 Comparative analysis of the transcriptome of *Spodoptera frugiperda* (Lepidoptera: Noctuidae) strains resistant and susceptible to the insecticide lufenuron. **Antonio Rogério Bezerra do Nascimento**, nascimento_arb@yahoo.com.br, Pablo Fresia, Fernando L Cônsoli and Celso Omoto, Univ. of Sao Paulo, Piracicaba, Brazil

D3613 Efficacy of registered residual insecticides on mortality of the mold mite, *Tyrophagus putrescentiae* (Shranck). **Salehe Abbar**, abbar@ksu.edu and Thomas Phillips, Kansas State Univ., Manhattan, KS

D3614 Insecticide resistance and cross-resistance in field populations of annual bluegrass weevil, *Listronotus maculicollis* Dietz, from the Northeast. **Olga Kostromytska**, kolgaent@rci.rutgers.edu and Albrecht Koppenhöfer, Rutgers, The State Univ. of New Jersey, New Brunswick, NJ

D3615 Environmental assessment of MON 87411 maize expressing DvSnf7 RNA targeting western corn rootworm (*Diabrotica virgifera virgifera*) on beneficial soil arthropods and microorganisms. Mark S. Paradise, Pamela M. Bachman, Laura Barberis, Kristin Huizinga, **Peter Jensen**, peter.d.jensen@monsanto.com, David Carson and Steven L. Levine, Monsanto Company, St. Louis, MO

D3616 Efficacy of sulfoxaflor against Asian citrus psyllid *(Diaphorina citri*) under laboratory and field conditions. **Gurpreet. S. Brar**, gpsbrar@ufl.edu, Univ. of Florida, Belle Glade, FL and Lukasz L. Stelinski, Univ. of Florida, Lake Alfred, FL

D3617 Heat-induced mortality and expression of heat shock proteins in Colorado potato beetles treated with imidacloprid. **Jie Chen**, jchen31@tigers.lsu.edu[1], Andrei Alyokhin[2], Ai Kitazumi[2], Jasper Alpuerto[2] and Benildo de los Reyes[2], [1]Louisiana State Univ., Baton Rouge, LA, [2]Univ. of Maine, Orono, ME

D3618 Evaluating chronic effects of imidacloprid on honey bee (*Apis mellifera*) colonies in a colony feeding study. **Allen Olmstead**, allen.olmstead@bayer.com[1], Jessica Lawrence-Louque[2] and David Fischer[1], [1]Bayer CropScience, Research Triangle Park, NC, [2]Smithers Viscient, Snow Camp, NC

D3619 Comparative histopathology of two novel bacterial insecticidal proteins in *Tenebrio molitor* and *Diabrotica virgifera virgifera* larvae. **Heba Abdelgaffar**, habdelga@utk.edu[1], Cris Oppert[2], Jayme Williams[2], Deepa Balasubramanian[2] and Juan Luis Jurat-Fuentes[1], [1]Univ. of Tennessee, Knoxville, TN, [2]Bayer CropScience, Morrisville, NC

D3620 The Pesticide Risk Mitigation Engine (ipmPRiME.com): A user-friendly online tool for field-specific risk assessment and mitigation. **Thomas A. Green**, ipmworks@ipminstitute.org[1], Chuck Benbrook[2], Karen Benbrook[3], Pierre Mineau[4], Susan Kegley[5], Tomothy Brown[5] and Jonathan Kaplan[6], [1]IPM Institute of North America, Madison, WI, [2]Washington State Univ., Enterprise, OR, [3]BCS Ecologic, Inc., Enterprise, OR, [4]Pierre Mineau Consulting, Ottawa, ON, Canada, [5]Pesticide Research Institute, Berkeley, CA, [6]Natural Resources Defense Council, San Francisco, CA

D3621 Workshop summary: Bumble bee ecotoxicology and risk assessment. **David Fischer**, david.fischer@bayer.com, Ana Cabrera and Allen Olmstead, Bayer CropScience, Research Triangle Park, NC

D3622 The center for arthropod management technologies: An NSF industry/university cooperative research center. Janice Seibel, **Subba Reddy Palli**[2], rpalli@email.uky.edu and Bryony Bonning[1], [1]Iowa State Univ., Ames, IA, [2]Univ. of Kentucky, Lexington, KY

D3623 Gene silencing of arginine kinase in tissues of the squash bug, *Anasa tristis* (De Geer) (Heteroptera: Coreidae). **Kent S. Shelby**, Kent.Shelby@ars.usda.gov, USDA - ARS, Columbia, MO

D3624 Development and validation of a dual luciferase reporter system for *in vitro* evaluation of gene silencing efficacy in the Southern cattle tick: Comparison to *in vivo* gene silencing by microinjection. **Kevin B. Temeyer**, kevin.temeyer@ars.usda.gov[1], Alexander P. Tuckow[1], Aaron D. Gross[2], Jason P. Tidwell[3], Joel R. Coats[2] and Adalberto A. Pérez de León[1], [1]USDA - ARS, Kerrville, TX, [2]Iowa State Univ., Ames, IA, [3]USDA - ARS, Edinburg, TX

D3625 Induction of soluble AChE expression via alternative splicing by chemical stress in *Drosophila melanogaster*. **Young-Ho Kim**, bioman05@snu.ac.kr, Ju Hyeon Kim and Si Hyeock Lee, Seoul National Univ., Seoul, South Korea

D3626 Presentation Withdrawn

D3627 Role of RNA interference (RNAi) as molecular biopesticide for control of the invasive pest gypsy moth (*Lymantria dispar*). **Saikat Kumar Ghosh**, Saikat.Ghosh@ars.usda.gov and Dawn E. Gundersen-Rindal, USDA - ARS, Beltsville, MD

D3628 No observed effects in honey bee larvae and adults from DvSnf7 dsRNA exposure. **Jianguo Tan**, jianguo.tan@monsanto.com, Pamela Bachman, Peter Jensen, Geoffrey Mueller, Joshua Uffman and Steven Levine, Monsanto Company, St. Louis, MO

D3629 Direct evidence for systemic RNAi in western corn rootworm, *Diabrotica virgifera virgifera* LeConte (Coleoptera: Chrysomelidae). **Murugesan Rangasamy**, mrangasamy@dow.com, Kenneth Narva, Huarong Li, Premchand Gandra, Andrew Bowling and Heather Pence, Dow AgroSciences, Indianapolis, IN

D3630 Phospholipids and triacylglycerols fatty acid composition of major tissues of the RED PALM weevil, *Rhynchophorus ferrugineus* (Coleoptera: Curculionidae). **Gadelhak Gadelhak**, gadgaber@yahoo.com, Alexandria Univ., Faculty of Agriculture, Alexandria, Egypt

D3631 Gut symbionts in the southern chinch bug. **Yao Xu**, bigantbrl@hotmail.com, Eileen A. Buss and Drion G. Boucias, Univ. of Florida, Gainesville, FL

D3632 Multicopper oxidase-1 orthologs from diverse insect species have ascorbate oxidase activity. **Maureen Gorman**, mgorman@ksu.edu, Zeyu Peng, Neal Dittmer, Minglin Lang, Lisa Brummett, Caroline Braun, Lawrence Davis and Michael Kanost, Kansas State Univ., Manhattan, KS

D3633 Fecundity and longevity in the western tarnished plant bug (*Lygus hesperus*). **Colin S. Brent**, colin.brent@ars.usda.gov, USDA, Maricopa, AZ

D3634 Insulin and Target of Rapamycin pathway inhibition using novel reagents reduces fecundity of *Aedes aegypti* females *in vivo*. **Melissa Mattee**, mmattee@uga.edu, Michael R. Strand and Mark R. Brown, Univ. of Georgia, Athens, GA

D3635 Nitrogen economy during development of the wood feeding cockroach, *Cryptocercus punctulatus*. **Donald E. Mullins**, mullinsd@vt.edu[1], Christine A. Nalepa[2] and Sandra E. Gabbert[1], [1]Virginia Polytechnic Institute and State Univ., Blacksburg, VA, [2]North Carolina Dept. of Agriculture, Raleigh, NC

Section Poster Session 2: MUVE

Exhibit Hall C (Oregon Convention Center)

D3636 Identification of wild collected mosquito vectors of diseases using gas chromatography-mass spectrometry in Jazan Province, Saudi Arabia. **Azzam Alahmed**, azzam333@yahoo.com, King Saud Univ., Riyadh, Saudi Arabia

D3637 Methionine: A new biopesticide for use in mosquito management. **Julie Baniszewski**, jbaniszewski10@ufl.edu[1], Emma N. I. Weeks[1], Sandra A. Allan[2], Alissa Marie Berro[1], Jim Cuda[1] and Bruce R. Stevens[1], [1]Univ. of Florida, Gainesville, FL, [2]USDA-ARS-CMAVE, Gainesville, FL

D3638 Olfactory learning and memory in the disease vector mosquito, *Aedes aegypti*. **Clement Vinauger**, vinauger@uw.edu, Eleanor Lutz and Jeff Riffell, Univ. of Washington, Seattle, WA

D3639 Doing more with less. Does nutrient stoichiometry help explain the superior competitive ability of *Aedes albopictus* over other container mosquitoes? **Donald A. Yee**, donald.yee@usm.edu and John Lloyd Martin, Univ. of Southern Mississippi, Hattiesburg, MS

D3640 An analysis of environmental factors determining peak flight activity periods for the mosquitoes *Culex tarsalis*, *Cx. pipiens*, and *Anopheles freeborni*. **Mary A. Sorensen**, marys@placermosquito.org, Placer Mosquito & Vector Control District, Roseville, CA

D3641 Functional characterization of cationic amino acid transporter, AaCAT3 in the Dengue vector, *Aedes aegypti*. **Hitoshi Tsujimoto**, htsujimo@nmsu.edu[1], David P. Price[1], Dmitri Boudko[2] and Immo A. Hansen[1], [1]New Mexico State Univ., Las Cruces, NM, [2]Rosalind Franklin Univ., North Chicago, IL

D3642 Increased arbovirus transmission risk from interactions between competition and pesticide exposure in larval mosquitoes. **Cynthia C. Lord**, clord@ufl.edu, Joseph J. Pohedra and Barry W. Alto, Univ. of Florida, Vero Beach, FL

D3643 A survey of adult and larval mosquitoes (Diptera: Culicidae) from the Chequamegon Moraine Outwash Plain in Washburn County, Wisconsin. **Jamee Lee Hubbard**, Jamee.Hubbard@uwsp.edu, Univ. of Wisconsin, Stevens Point, WI

D3644 Mosquito and mosquito-borne disease surveillance in West Virginia. **Eric J. Dotseth**, Eric.J.Dotseth@wv.gov[1], Daniel Payne[2], Courtney Stamm[2], Wyatt Payne[3] and Anthony Alsobrook[4], [1]West Virginia Dept. of Health & Human Resources, Charleston, WV, [2]West Virginia State Univ., Institute, WV, [3]Bridgemont Community & Technical College, Montgomery, WV, [4]Marshall Univ., Huntington, WV

D3645 Japanese encephalitis virus detected in *Culex orientalis*, *Culex pipiens and Armigeres subalbatus* (Diptera: Culicidae) in Korea. **E-Hyun Shin**, ehshin@nih.go.kr, Hyunwoo Kim, Go-Woon Cha, Young Eui Jeong, Kyu Sik Chang, Jong Yul Roh, Sung Chan Yang, Mi Yeoun Park and Chan Park, Korea National Institute of Health, Chungbuk, South Korea

D3646 Ecological analyses of mosquito communities in Iowa. **Mike W. Dunbar**, dunbar@iastate.edu, Brendan Dunphy, Ignacio Alverez-Castro, Paul Airs and Lyric Bartholomay, Iowa State Univ., Ames, IA

D3647 Mosquito (Family: Culicidae) survey in Quicksilver and Sanborn Park. **Duy Tu**, kevincongtu@gmail.com, San Jose State Univ., San Jose, CA

D3648 Evaluation of mosquito dispersal from a known breeding habitat in Connecticut. **Julia Mondak**, aliciabray@ccsu.edu and Alicia Bray, Central Connecticut State Univ., New Britain, CT

D3649 Assessment of urban retention ponds for mosquito production in central Connecticut. **Jeremy DeSimone**, braykev@gmail.com and Alicia Bray, Central Connecticut State Univ., New Britain, CT

D3650 Changes in cuticular hydrocarbons associated with mating in female *Anopheles gambiae*. **Sanford D. Eigenbrode**, sanforde@uidaho.edu[1], Sumi Lee[2], Byung-Sik Shin[2] and Hongjian Ding[1], [1]Univ. of Idaho, Moscow, ID, [2]Changwon National Univ., Gyungnam, South Korea

D3651 Non-target organism acute toxicity testing of methionine, a novel mosquito larvicide. **Emma N. I. Weeks**, eniweeks@ufl.edu[1], Julie Baniszewski[1], James P. Cuda[1], Nancy Denslow[1], James D. Ellis[1], Kevin Kroll[1], Daniel Schmehl[1], Bruce R. Stevens[1] and Hudson Tomé[2], [1]Univ. of Florida, Gainesville, FL, [2]Universidade Federal de Viçosa, Viçosa, Brazil

D3652 A reduced-representation genomic sampling approach to detect artificial selection in *Aedes aegypti* L. **Michael Reiskind**, michael_reiskind@ncsu.edu[1], Martha Reiskind[1], Paul Labadie[1], Irka E. Bargielowski[2] and L. Philip Lounibos[2], [1]North Carolina State Univ., Raleigh, NC, [2]Univ. of Florida, Vero Beach, FL

D3653 Thermal conditions and *Aedes aegypti* larval behavior. Michael Reiskind and **Matthew Janairo**, msjanair@ncsu.edu, North Carolina State Univ., Raleigh, NC

D3654 Container type influences the relative abundance, body size, and vector competence of *Ochlerotatus triseriatus* for La Crosse virus. **Jeffrey Bara**, jjbara@illinois.edu and Ephantus J. Muturi, Univ. of Illinois, Champaign, IL

D3655 Mosquito repellent testing using a high throughput bioassay: Transfluthrin against dengue and malaria vectors. **George Peck**, gwpeck5@gmail.com, Walter Reed Army Institute of Research, Silver Spring, MD

D3656 Emergence of *Culicoides sonorensis* (Diptera: Ceratapogonidae) from potential breeding habitats in northeastern Kansas. **Robert Pfannenstiel**, Bob.Pfannenstiel@ars.usda.gov and Mark Ruder, USDA - ARS, Manhattan, KS

D3657 Characteristic analysis of antibodies against mosquito salivary proteins in dengue patients. **Tsai-Ying Yen**, farscape@ms38.hinet.net and Kun-Hsien Tsai, National Taiwan Univ., Taipei, Taiwan

D3658 Home trap for catch and kill dengue vector (*Aedes aegypti*). **Héctor Parra Moreno**, hparra@uis.edu.co, Universidad Industrial de Santander, Bucaramanga, Colombia

D3659 The use of Passive+ Monitors as an adjunct to treatments for bed bugs (*Cimex lectularius*). **David Cain**, dcain@bed-bugs.co.uk, Bed Bugs Limited, London, United Kingdom

D3660 Characterization of the Odorant Receptor Co-receptor (ORCO) in the bed bug, *Cimex lectularius* L. **Stacy D. Rodriguez**, stacyr@nmsu.edu, Lisa L. Drake, David P. Price, Hitoshi Tsujimoto, Chelsea Rodriguez, Brittny Blakely, Erika Monroy, William Maio, Alvaro Romero and Immo A. Hansen, New Mexico State Univ., Las Cruces, NM

TUESDAY, NOVEMBER 18, 2014
WEDNESDAY, NOVEMBER 19, 2014

Virtual Poster Session

Exhibit Hall C (Oregon Convention Center)

VP0007 Biology and Demography of *(Ephestia kuehniella)* (Pyralidae: Lepidoptera). Zeinab Moghadamfar[1], **Hajar Pakyari**[1], hajar.pakyari@gmail.com, and Masoud Amir-Mafi[2], [1]Islamic Azad

University, Takestan, Iran, [2]Iranian Research Institute of Plant Protection, Tehran, Iran

VP0008 Biotype identification of *Spodoptera frugiperda* individuals from the Northeast region of Tamaulipas, Mexico. **Ninfa M. Rosas-Garcia**, nrosas@ipn.mx, Maribel Mireles-Martinez, Gildardo Rivera-Sanchez, Jesus Villegas-Mendoza and Elsa Herrera-Mayorga, Centro de Biotecnología Genómica-IPN, Reynosa, Mexico

VP0009 Profile comparison of glycoprotein's present in the middle and posterior intestine of *Meccus pallidipennis* and *Triatoma barberi*. **Elizabeth Rivas**, elizarime@gmail.com, Paz-Maria Salazar-Schettino, Gloria Rojas Wastavino, Margarita Cabrera Bravo and Mauro Vences Blanco, Facultad de Medicina, Distrito Federal, Mexico

VP0010 Parasitoid complex associated to *Tuta absoluta* (Lepidoptera: Gelechiidae) and other leafminers in cultivated and non-cultivated Solanaceae, in Argentina. **Nadia Salas Gervassio**, nadu_2005@hotmail.com[1], Maria G. Luna[1], Sangmi Lee[2], Adriana Salvo[3] and Norma Sanchez[1], [1]CEPAVE (CONICET-UNLP), La Plata, Argentina, [2]Arizona State Univ., Tempe, AZ, [3]Centro de Investigaciones Entomológicas de Córdoba/Instituto Multidisciplinario de Biología Vegetal (IMBIV), Córdoba, Argentina

VP0011 Profiling gene expression and network analysis in human U937 cells in response to Solenopsin, a constituent of *fire ant* venom. **Priya Das**, priyadas001@gmail.com[1], Pawan Dhar[2], Achuthsankar S Nair[3] and Oommen V Oommen[3], [1]Dept. of Computational Biology & Bioinformatics,Univ. of Kerala, Thiruvananthapuram, India, [2]Centre for Systems & Synthetic Biology, Univ. of Kerala, Thiruvananthapuram, India, [3]Dept. of Computational Biology & Bioinformatics, Univ. of Kerala, Thiruvananthapuram, India

VP0012 *Brassica napus* flower visitors in the southern Pampas, Buenos Aires, Argentina. **Soledad Villamil**, soledad.villamil@uns.edu.ar[1], Liliana Gallez[1], Valdemar Delhey[1] and Liliana Iriarte[2], [1]Universidad Nacional del Sur, Bahía Blanca, Argentina, [2]Chacra Experimental Integrada Barrow, Tres Arroyos, Argentina

VP0013 DNA based markers to characterize insect pest damage: diagnostic trials on *Leptoglossus occidentalis* (Hemiptera: Coreidae). **Matteo Bracalini**, matteo.bracalini@unifi.it, Matteo Cerboneschi, Francesco Croci, Tiziana Panzavolta, Riziero Tiberi and Stefania Tegli, Univ. of Florence, Florence, Italy

VP0014 Origin and evolution of cellulose digestion in insects: insights from the transcriptomic analyses of the apterygotan insect *Thermobia domestica*. **Nancy Calderón-Cortés**, ncalderon@enesmorelia.unam.mx[1] and Hirofumi Watanabe[2], [1]Universidad Nacional Autónoma de México, Morelia, Mexico, [2]National Institute of Agrobiological Sciences, Tsukuba, Japan

VP0015 Artisanal Multiplication of Entomopathogenic Nematodes in Ecuador for the Control of *Phyllophaga* sp. **Francisco Báez**, francisco.baez@iniap.gob.ec, Patricio Gallegos, Cesar Asaquibay and Marcia Oña, Instituto Nacional Autónomo de Investigaciones Agropecuarias INIAP, Quito, Ecuador

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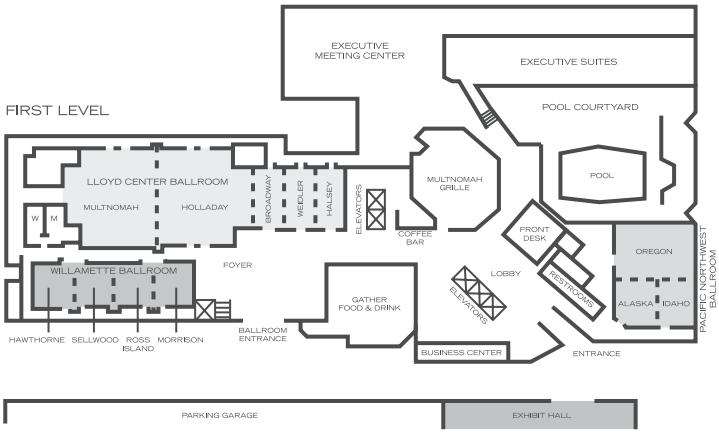

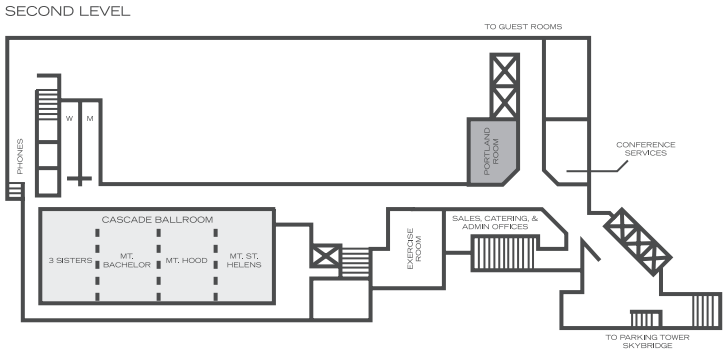

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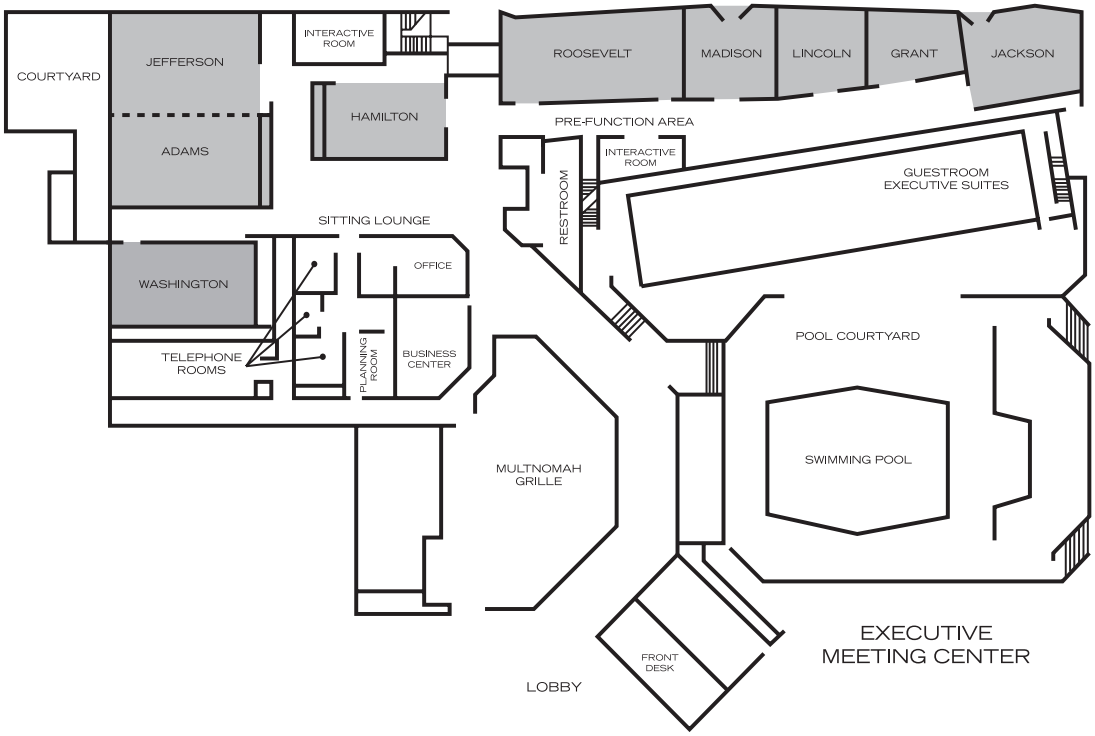

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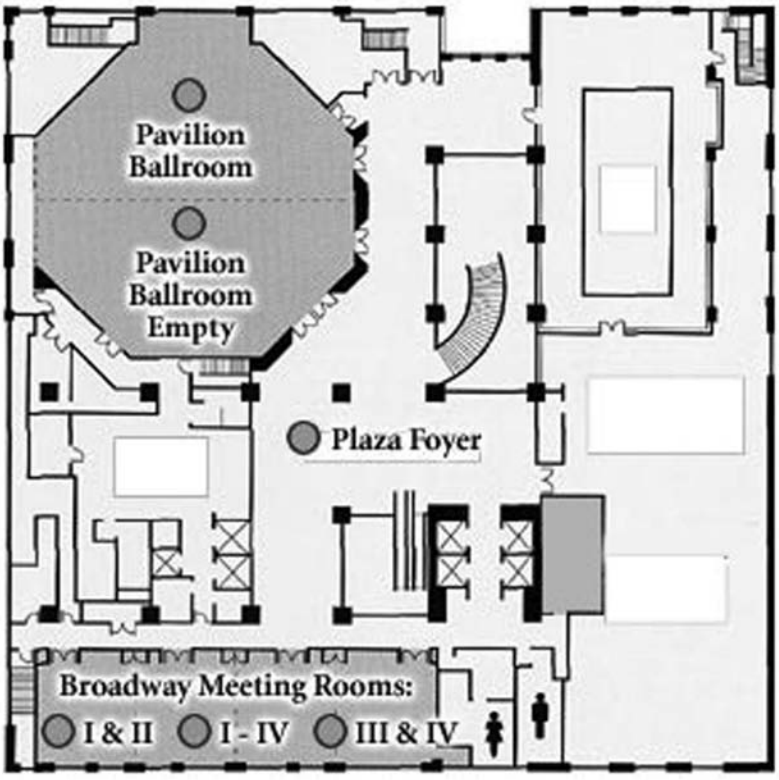
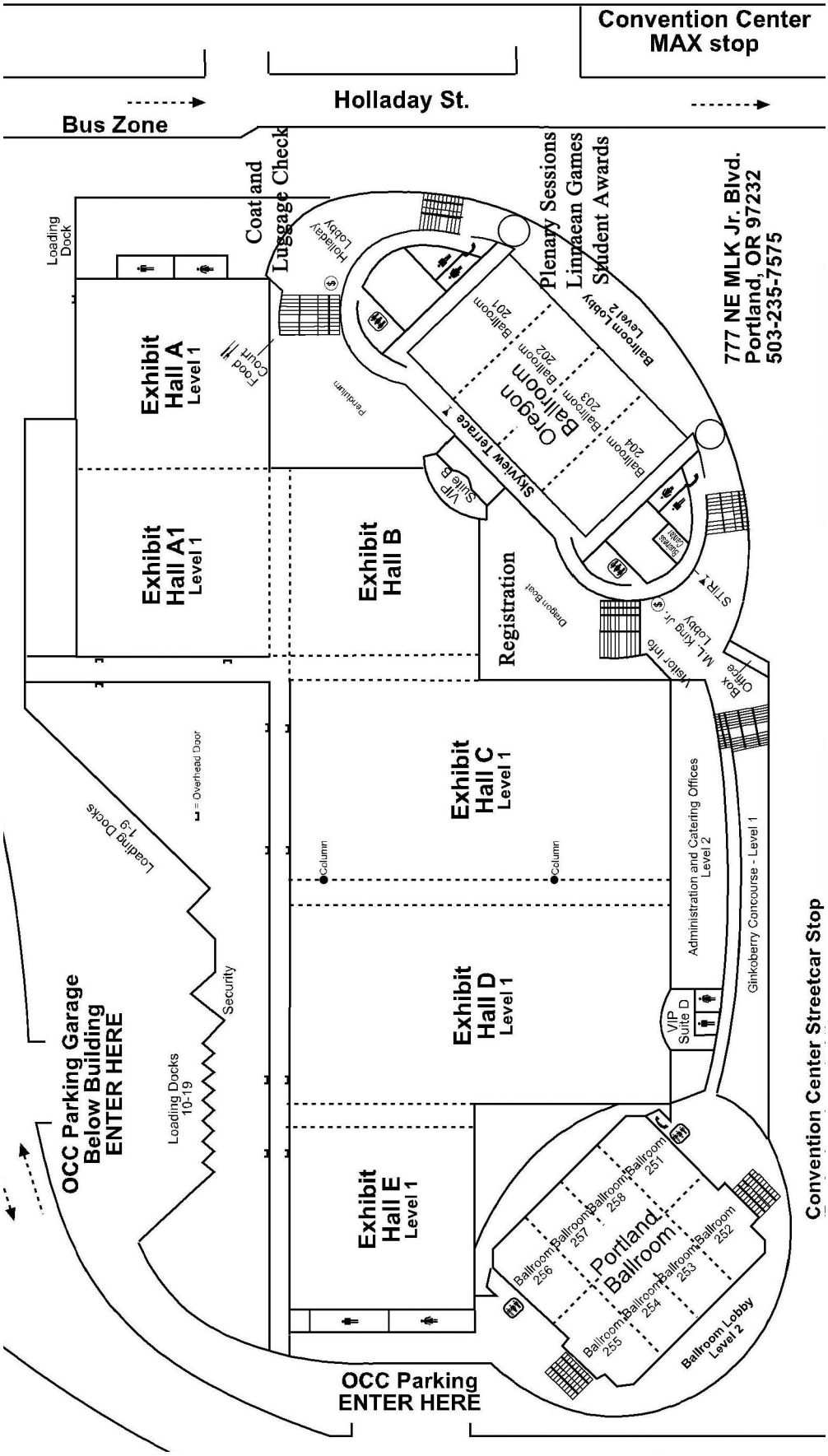
Plaza Level



Hilton Portland & Executive Tower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Bus Zone
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Portland, OR 97232
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Plenary Sessions
Linnaean Games
Student Awards
Coat and Luggage Check
Loading Dock
Exhibit Hall A Level 1
Food Court
Exhibit Hall A1 Level 1
Exhibit Hall B
Registration
Holladay Lobby
Pedestrium
Ballroom Lobby Level 2
Ballroom 201
Ballroom 202
Ballroom 203
Ballroom 204
Oregon Ballroom
Skyview Terrace
VIP Suite B
Oregon Boat
MLK Jr. Lobby
Visitor Info
Box Office
STIR
Exhibit Hall C Level 1
Column
Exhibit Hall D Level 1
Administration and Catering Offices Level 2
Glinkoberry Concourse - Level 1
VIP Suite D
= Overhead Door
Loading Docks 1-9
Security
Loading Docks 10-19
OCC Parking Garage Below Building ENTER HERE
Exhibit Hall E Level 1
Ballroom 251
Ballroom 252
Ballroom 253
Ballroom 254
Ballroom 255
Ballroom 256
Ballroom 257
Ballroom 258
Portland Ballroom
Ballroom Lobby Level 2
OCC Parking ENTER HERE
Convention Center Streetcar Stop

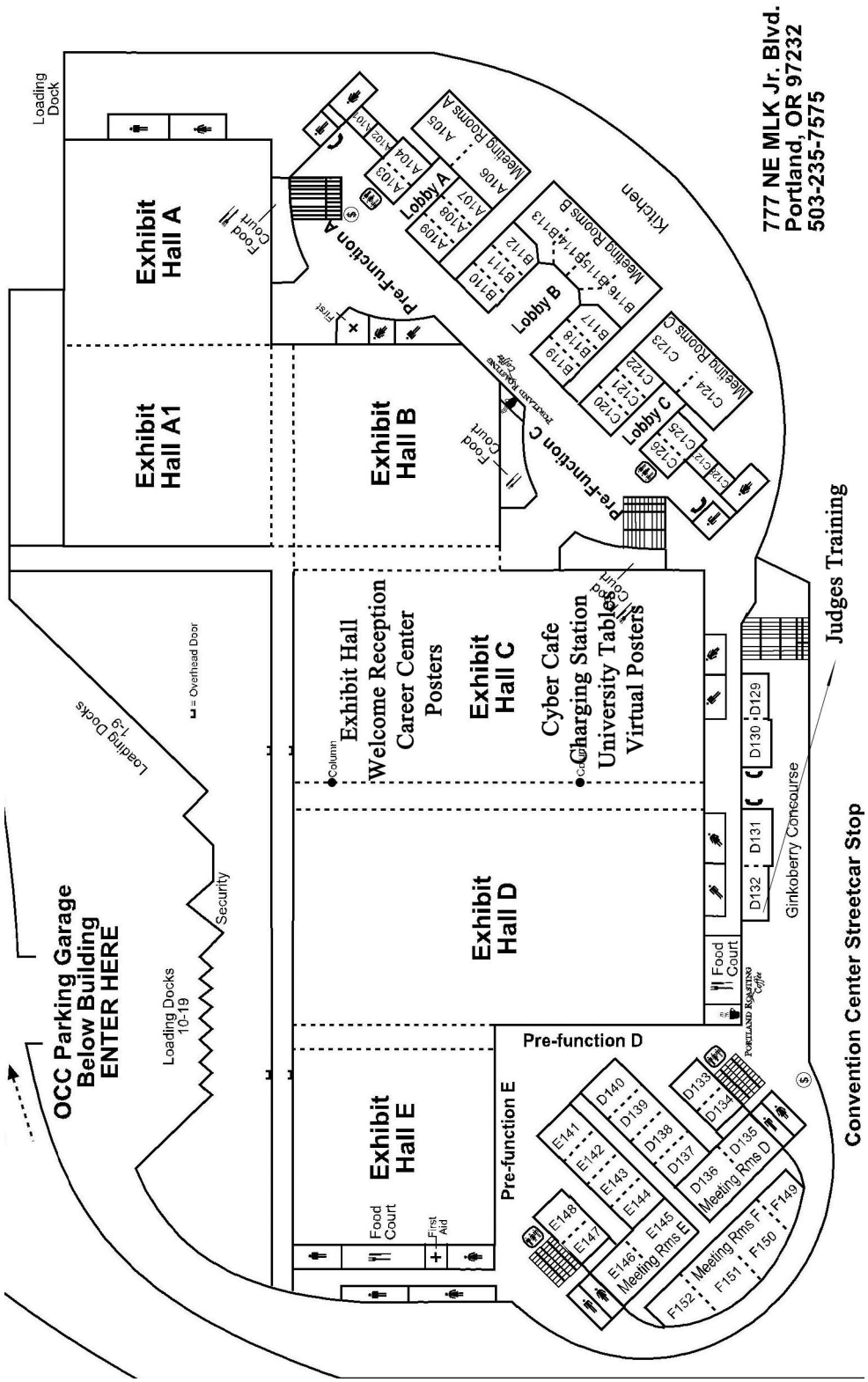
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Exhibit Hall A
Exhibit Hall A1
Exhibit Hall B
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Exhibit Hall D
Exhibit Hall E
Food Court
Pre-Function A
Pre-Function C
Lobby A
Lobby B
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Welcome Reception
Career Center
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Cyber Cafe
Charging Station
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= Overhead Door
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Annual Review of Entomology

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Editor: **May R. Berenbaum**, *University of Illinois, Urbana-Champaign*

The *Annual Review of Entomology*, in publication since 1956, reviews significant developments in the field of entomology, including biochemistry and physiology, morphology and development, behavior and neuroscience, ecology, agricultural entomology and pest management, biological control, forest entomology, acarines and other arthropods, medical and veterinary entomology, pathology, vectors of plant disease, genetics and genomics, and systematics, evolution, and biogeography.

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