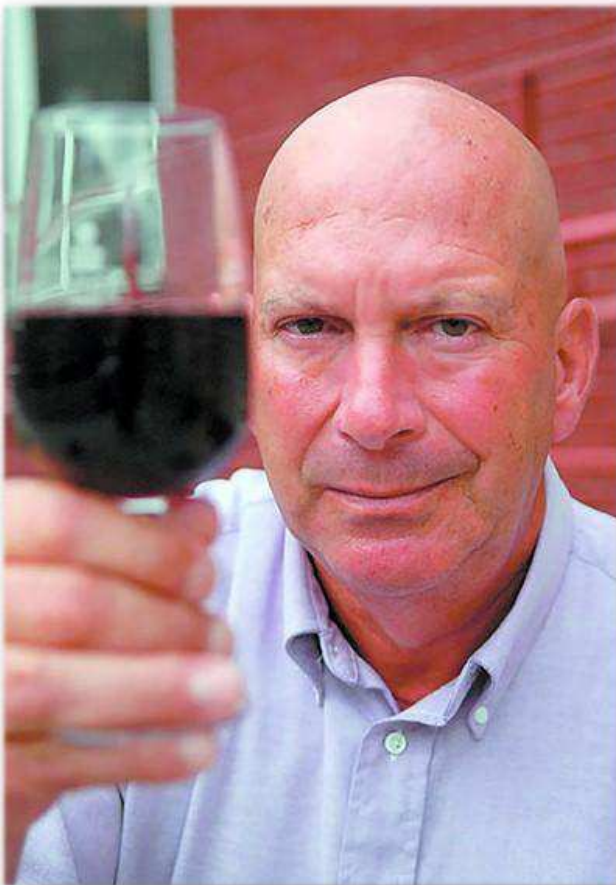


2018 Orchard Pest and Disease Management Conference

The 92nd Conference is pleased to announce
our keynote speaker:



Harvey Reissig

Professor Emeritus, Cornell University

Keynote Address:

**What I Learned About
Tree-fruit IPM Working 40
Years for Cornell, or:
Reflections from a retired
"Nozzlehead"**



Hilton Portland, Portland, Oregon
January 10-12

the pest in fruit production areas with baited traps, but the majority of sites still report low numbers. Some growers in 2016 started to find damaged fruit in orchard margins, and in 2017, damaged fruit has started to come across some packing lines. The 2017 season was the first time some Michigan apple and peach growers started to actively manage for the pest in orchard margins if they found damaged fruit the previous season. In June 2017 we organized a BMSB Clinic to help growers recognize stink bug damage, to talk about monitoring techniques, and management programs. This presentation will also include a brief overview of some of the work being done in Michigan on trapping efficacy.

Attract-and-Kill: Is There a Future for Spotted Wing *Drosophila* Management?

Juan Huang and Larry Gut
Michigan State University, East Lansing, MI

Keywords: attract-and-kill, spotted wing drosophila, *Drosophila suzukii*, deltamethrin, cherry

Abstract: The effects of three attract-and-kill (AK) prototypes: MSU attract and kill pouch, prototype A, and SinoGreen B, on trap captures of spotted wing drosophila were assessed in cherry orchards. All three prototypes consisted of a device treated with deltamethrin and a food based bait. The MSU AK pouch was deployed at 500/acre in 0.5 acre plots, along with two controls: one plot with no pouch and the other plot containing 500 control pouches with the bait only. Interestingly, the plot with control pouches caught at least 2 times more males and females SWD than the plot with no pouch and the plot with AK pouch, indicating that the baits might draw flies into the testing plot. The prototype A was deployed at 0, 20, or 40 per plot (approximately 0.7 acre each). Similar SWD capture was recorded between control and AK treated plots. SinoGreen B was deployed at 0, 70, and 210/acre in one-acre plots. Plots containing 210 SinoGreen B received the least amount of SWD among treatments. Therefore, MSU prototype and prototype A failed to provide SWD control, but SinoGreen B may have a potential to suppress SWD population.

A Food-Grade Gum as a Management Tool for *Drosophila suzukii*

Gabriella Tait¹, Clive Kaiser², Marco Valerio Rossi Stacconi¹, Daniel Dalton²,
Gianfranco Anfora¹, and Vaughn M. Walton²

¹Fondazione Edmund Mach, Trento, Italy;

²Oregon State University, Department of Horticulture, Corvallis, OR

Keywords: Gum, insecticide-free lure, behavior manipulation, Integrated Pest Management

Abstract: Spotted wing drosophila, *Drosophila suzukii*, is a worldwide pest of soft-skinned and small-fruit. This species is able to utilize different habitats and substrates for both nutrition and reproduction. This capacity can be attributed to multiple olfactory cues, a topic of multiple investigations. The current study first aimed to identify volatiles that facilitate altered orientation and oviposition behavior. The identified volatiles resulted in significant levels of both response and attraction of *D. suzukii* in controlled orientation and electrophysiology studies. We secondly aimed to incorporate these volatiles into a matrix in order to be in direct competition to susceptible fruits. Subsequent incorporation of these volatiles into a gum matrix resulted in mean reductions of 50% of egg laying in controlled in laboratory trials on blackberry, blueberry, cherry, raspberry and strawberry.

Small and large-scale field trials were hereafter conducted over periods of 2.5 to 4 days. Blueberry fruit on bushes were exposed to predetermined *D. suzukii* populations in commercial-standard blueberry field settings. Both small and large-scale field trials using the gum matrix resulted in 50% to 76% reduction in fruit infestation and eggs laid respectively. Up to 40% and less than 20% of untreated and treated fruit were respectively targeted by *D. suzukii*. These results indicate that the insecticide-free gum matrix significantly alters *D. suzukii* behavior to ultimately result in reduced damaged fruit. This reduction may be due to a combination of altered behavior and the division of reproductive resources. The reproductive resources lost on the gum ultimately results in less egg laying in susceptible fruit, as well as lowered fertility of adults. We believe that our work will help expand the toolbox for spotted wing drosophila control in commercial field settings.

Winter Morph Spotted Wing Drosophila: Biology, Phenology, and Response to Visual and Olfactory Cues

Danielle Kirkpatrick, Heather Leach, Ke Dong, Rufus Isaacs, and Larry Gut
Michigan State University, Department of Entomology, East Lansing, MI

Keywords: spotted wing drosophila, SWD, *Drosophila suzukii*, winter morph, biology, phenology, color, trap

Abstract: Spotted wing drosophila, *Drosophila suzukii* (Matsmura) (Diptera: Drosophilidae) has rapidly become a devastating global pest of soft-skinned and stone fruits. Much has been learned about the spotted wing drosophila summer morph, the morph trapped during spring and summer months, but little is known about the spotted wing drosophila winter morph, the morph trapped in fall and winter months as temperatures begin to decrease. Compared to summer morphs, winter morphs have longer wings, darker bodies, and upregulated genes that enable them to withstand colder temperatures and successfully overwinter. Here we report outcomes of choice and no-choice laboratory bioassays quantifying alightment on sticky disks of various colors, but no odors. Red, purple, and black disks captured the most spotted wing drosophila summer and winter morphs. The electroantennogram (EAG) method was used to compare and record the responses of antennal olfactory receptors to six volatile compounds for summer and winter morphs. Significant differences in antennal responses between spotted wing drosophila summer and winter morphs were observed for three of the volatiles tested. Behavioral laboratory bioassays comparing responses of summer and winter morphs were performed combining optimal visual and olfactory cues based on the results of the laboratory color bioassays and electroantennogram studies. The combined results of these behavioral bioassays will optimize traps for the different spotted wing drosophila morphs based on their behavioral responses to visual and olfactory cues, enabling growers to trap spotted wing drosophila earlier in spring months and delay or reduce the population buildup throughout summer.