



FONDAZIONE
EDMUND
MACH 



IOBC-WPRS

IOBC Working Group
“Integrated Protection of Fruit Crops”
Subgroup “Soft Fruits”

VIII Workshop

on Integrated Soft Fruit Production

 **Book of abstracts** 

Fondazione Edmund Mach
Vigalzano di Pergine Valsugana (TN)
26-28 May 2014

BRIDGING PEST AND DISEASE MANAGEMENT AND SELECTION IN BERRY GERMPLASM AND BREEDING PROGRAMS AT FEM

Giongo L., Poncetta P., Martinatti P., Grisenti M., Fontanari M., Ajelli M., Loretto P., Zoratti L., Grassi A., Mazzoni V., Costa F., Velasco R., Sargent DJ.

Fondazione Edmund Mach, Via Mach 1 San Michele all'Adige, Italy

Managing pests and diseases in berry breeding programs is of primary importance and as such is a continuous ongoing process at several levels. An a priori condition is to maintain constant field monitoring: not only where several crops are present at the same time but also at different developmental stages of the plants from seed to postharvest. For correct management during fruit production, evaluations of pest and disease resistance on single genotypes or varieties are essential. Whilst a wide germplasm base contributes beneficially to the enrichment of the ecosystem, the balance has to be carefully maintained in order to make plants fruiting for the selection process. Although the FEM programs are run at a single site, different environments are present and tunnels, glasshouses or open fields affect pest and diseases pressure on the plants in different ways. Field based phenomics, together with genomic tools are valuable analytical methods in berry breeding. At FEM, fruit quality is one of the main objectives of the blueberry, raspberry, and strawberry breeding and germplasm evaluation programs. During the selection or evaluation process, destructive and non-destructive specific phenotyping techniques and instruments are applied, to model analyses that ensure an efficient and robust dissection of agronomic and fruit quality related traits. One of the traits that was identified as primarily important for quality characterization for most of the berry classes is texture. Texture analyses were modelled first on known cultivars and other quality parameters correlated to it and then applied and used as a tool to assist breeding and focus the selection of those phenotypes that better fit for specific identified and derived fruit categories (eg: storage or processing attitude). However, this method is destructive, so, based on the identified textural properties, a coupled laser Doppler vibrometry non-destructive technique was also modelled and applied to berry phenotyping and this allowed also to work toward a clustering of *D. suzukii* infested fruits and berries that were not infested. Amongst others, also compounds of the secondary metabolism of the plants appear to differently correlate with fruit quality traits in the different species with tolerance to different pests and diseases. While genotyping is a potent tool for the programs to ensure trueness to type and pedigree tracking, applied genomics, used in different ways for the different berry crops and for the different traits, including pest and disease resistance, helps us to deliver more accurate predictions on performance relating to traits that are usually complex and affected by many genes. However, several symptoms that might have a causal pest or disease effect still remain obscure, and a stronger collaborative effort among experts will be necessary. Results of these synergic analyses, selection and management applied to germplasm and breeding are here reported.