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HORTICULTURE TECHNOLOGY NEWSLETTER

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MID-ATLANTIC FRUIT AND VEGETABLE CONVENTION

Dr. Joseph Fiola, Specialist in Viticulture and Small Fruit, University of Maryland Extension

The 2016 Mid-Atlantic Fruit and Vegetable Convention is held each year to provide the latest updates and important information to fruit and vegetable growers from Maryland, New Jersey, Pennsylvania, Virginia and surrounding states. The conference will be held at the Hershey Lodge and Convention Center in Hershey, PA on February 2-4, 2016.

The program will consist of six or more concurrent educational sessions offered during the three days. Sessions on tree fruits, small fruits, wine grapes, organic and general vegetables, pesticide safety, and too many others to mention.

This year, Elaine Froese a professional speaker, writer and farm family coach who specializes in succession planning will provide the keynote presentation. The full program is provided at the end of this newsletter.

As usual, there will be an extensive trade show, including displays of horticultural equipment, marketing merchandise, packaging, seed companies, fruit nurseries, as well as pesticides and other supplies and services for commercial growers. Pesticide applicator credits will be available for Maryland, Pennsylvania, and New Jersey growers that attend the sessions.

The program is jointly sponsored by Maryland State Horticultural Society, University of Maryland Extension, State Horticultural Association of Pennsylvania, Pennsylvania Vegetable Growers Association, Pennsylvania State University Cooperative Extension, New Jersey State Horticultural Society, Rutgers Cooperative Extension, Virginia Horticultural Society, and Virginia Cooperative Extension.

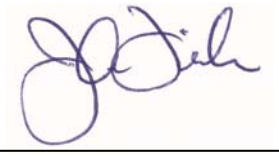
Maryland growers are reminded to pre-register (form on page 23) through the Maryland State Horticultural Society. Pesticide credits will be available at the meeting.

And just a reminder, updates on the latest research and extension for the commercial fruit and vegetable industry are presented in monthly issues of the Vegetable and Fruit Headline News from UME. If you would like to view archives or the latest edition, please go to:

Vegetable & Fruit Headline News
https://extension.umd.edu/anne-arundel-county/agriculture/vegetable-fruit-headline-news

Special Research Edition—Oct. 23, 2015
https://extension.umd.edu/sites/default/files/_docs/VegetableFruitHeadlines6-7.pdf

I look forward to seeing you in Hershey !



MSHS WEBSITE REVAMPED

The Maryland State Horticultural Society is proud to announce a new and improved website.

The URL has remained the same and we hope you will visit the site (http://www.mdhortsociety.org/) and navigate the various pages to obtain the latest news, upcoming events, membership information, awards, and MSHS history.

UNIVERSITY OF MARYLAND EXTENSION
Solutions in your community

Inside this issue:

FRUIT ROTS AND SPOTTED WING DROSOPHILA IN FALL RED RASPBERRIES: THE PERFECT STORM?

Kelly Hamby, Assistant Professor and Extension Specialist, University of Maryland Department of Entomology
Cassandra Swett, Assistant Professor and Extension Specialist, University of Maryland Department of Plant Science and Landscape Architecture, Berry Pathology Program

The Problems: Raspberry production in the Mid-Atlantic is challenged by pre-and post-harvest fruit rot diseases as well as insect pests, most notably the pre-harvest disease, *Botrytis* fruit rot, and the vinegar fly insect pest, spotted wing drosophila (*Drosophila suzukii*). While it is most important to manage *Botrytis* fruit rot during bloom, the pathogen, *Botrytis cinerea*, can also infect ripe fruit later in the season. Infection periods for *Botrytis* occur during periods of warm temperature that are combined with wetness (rains or heavy dews). Additionally, *Botrytis* more easily infects wounded fruit. Recent surveys suggest that a second fruit rot pathogen, *Cladosporium*, may also be causing pre and post-harvest losses. The grey-green color of early *Cladosporium* infections is the main trait that distinguishes it from *Botrytis* fruit rot which is lighter grey; however, later symptoms can be very similar. Wounding also appears to play an important role in facilitating *Cladosporium* fruit rot development, and it can initiate disease development even on un-ripe fruit. One potential source of wounds in Mid-Atlantic berry fields is spotted wing drosophila (SWD). SWD females create wounds as they lay their eggs in fruit, and in addition to the direct damage of larvae feeding in fruit, this may also facilitate secondary damage by fruit rot development in these fruit. Additionally, this secondary fruit rot may provide an inoculum source for fruit rot outbreaks. Compounding this issue, insecticides targeting SWD often wash off and do not effectively control spotted wing drosophila populations during pathogen infection periods triggered by persistent leaf wetness. SWD populations build during the season, with the heaviest insect pressure occurring in the late summer and early fall, so this is particularly relevant for late season management.

The North American Raspberry and Blackberry Association (NARBA) supported our project to gather preliminary data examining the possible role SWD plays in fruit rot development in raspberries in 2015. We present one portion of this project here, and a full report will be provided to NARBA later in the year.

Methods: Two Maryland fall (primocane fruiting) raspberry fields were used for this project. At site one three rows of 'Caroline' were used and at site two three rows of 'Jaclyn' were used. In early August, at least five raspberry clusters composed of hard green raspberries (at least 5 fruit per cluster) were bagged per row at each site using nylon mesh 1 gallon paint strainer bags securely closed with wire to exclude spotted wing drosophila. Un-infested (confirmed un-infested with SWD and not exhibiting any visible fruit rot symptoms) ripe raspberries were collected from both field sites and used within one day of collection for laboratory experiments. Raspberry clusters were placed in floral water picks inside test tube racks and kept cool until use. Treatments included a control where no flies and no spores were introduced to the fruit, SWD only where laboratory reared SWD (20 males, 20 females per enclosure) were introduced, and SWD with *Botrytis* spores. See Figure 1 for an example of the treatment enclosure. After a 24 hour treatment period where the clusters and flies were left at room temperature (~73°F (23°C)) on the bench top, the fruit clusters were sterilely removed from the cages and inspected to ensure no flies remained. They were then transferred to incubation bags and held at a 63°F (17°C) for 3-5 days before incidence of *Botrytis* and *Cladosporium,* as well as other post-harvest fruit rots were evaluated. Treatments were replicated two times for each site.

Figure 1. *Treatment enclosure.*

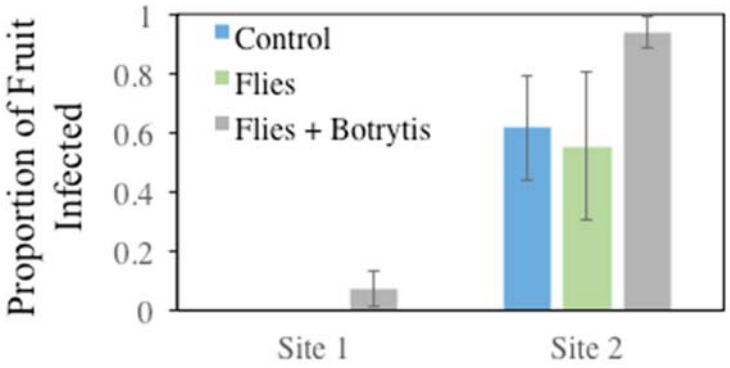


Figure 2. *Mean ± SE (N = 2) proportion of fruit infected with Botrytis fruit rot for each laboratory treatment for each site.*

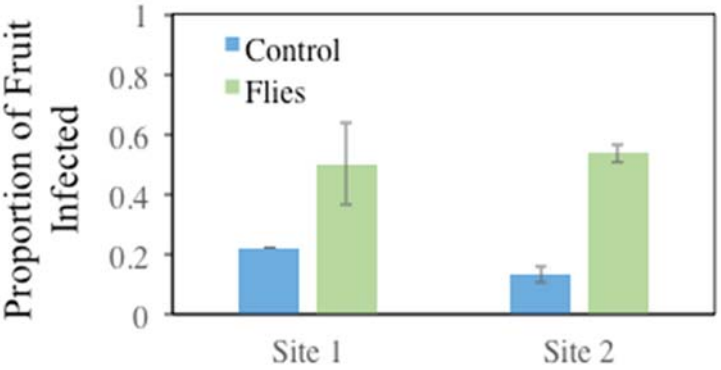


Figure 3. *Mean ± SE (N =2) proportion of fruit infected with Cladosporium fruit rot for each laboratory treatment for each site.*

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FRUIT ROTS AND SPOTTED WING DROSOPHILA IN FALL RED RASPBERRIES: THE PERFECT STORM? continued from page 12

Figure 4. SWD larva (arrow) from within a fruit rot infected raspberry.

Results: Flies exposed to *Botrytis* spores increased the number of *Botrytis* infected fruit in our laboratory studies relative to fruit that were not exposed to flies carrying spores (Figure 2). However, we do not know if the number of spores the laboratory flies were carrying would be similar to the spore exposure of flies in the field, nor do we know if flies in the field would visit un-infected fruit within 24 hours of spore exposure. Therefore, this laboratory experiment is a worst-case scenario. Site 2 had a much higher background level of *Botrytis*, probably due to infections that occurred during flowering. Interestingly, the introduction of laboratory flies and subsequent wounding of the field collected fruit by flies increased the number of fruit that were infected with *Cladosporium* fruit rot at both sites (Figure 3). Therefore, it is likely these fruit carried latent *Cladosporium* infections that better developed into rot after the flies wounded the fruit.

Discussion: SWD and fruit rot pathogens occur together in Mid-Atlantic fall red raspberry fields, and are likely impacting one another. However, we are just scratching the surface of these potential impacts with the preliminary laboratory and field studies that were conducted in 2015. We have confirmed that SWD wounds can increase incidence of fruit rot pathogens such as *Cladosporium* under controlled laboratory conditions. We also observed that if flies are exposed to *Botrytis* spores they may be able to transport them to healthy fruit and initiate *Botrytis* infections. In the field, we have observed early stages of fruit rot development occuring with SWD larvae (Figure 4). Do these larvae later die when the fruit rot infection advances (the fungus covers the fruit entirely), or do they finish development before the infection progresses and emerge successfully? If these flies successfully emerge, will they then carry spores to other fruit that are not exhibiting disease symptoms? If SWD is important to the development of fruit rot, this may mean that (1) the disease is less severe in early season raspberries that are less affected by the flies and (2) controlling SWD could help to minimize pre and post-harvest losses from fruit rots. We plan to continue investigating this issue, so stay tuned for further information.

Thanks to all the members of the Berry Pathology lab and Hamby lab who helped with sample collection, experiment set up, and processing. We would like to particularly thank cooperating growers for allowing us to use their sites and fruit and to NARBA for providing funding for the work.

UNIVERSITY OF MARYLAND EXTENSION OFFERS PRIVATE PESTICIDE CERTIFICATION AND RECERTIFICATION & NUTRIENT MANAGEMENT VOUCHER TRAINING

University of Maryland Extension is offering private pesticide applicator and Nutrient Management certifications and recertification classes for farmers during the fall, winter, and spring season. To find a listing for classes/workshops near you go to:

UNIVERSITY OF MARYLAND EXTENSION EVENTS:
http://extension.umd.edu/events

PRIVATE PESTICIDE CERTIFICATION COURSES
http://mda.maryland.gov/plants-pests/Documents/2015%20Private%20Testing%20and%20Training.pdf

PRIVATE PESTICIDE RECERTIFICATION MEETINGS:
http://mda.maryland.gov/plants-pests/Documents/Private%20Recert%20Meetings%202015%20-2016.pdf

NUTRIENT APPLICATOR VOUCHER COURSES:
http://mda.maryland.gov/resource_conservation/counties/VoucherTraining.pdf