

SUPPORTING FRUIT PRODUCTION

OHIO FRUIT NEWS

Research and Recommendations from experts at The Ohio State University

May 2018

Preparing for the season? We are too!

Melanie Lewis Ivey, Assistant Professor, Fruit Pathology and Fresh Produce Safety

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The 2018 season is here! Depending on the part of the state that you are in, you maybe just getting into the field or already experiencing bud break. Regardless, we hope to update you throughout the season with important and timely information to make your management decisions easier and better informed. This edition of OFN offers a hopeful update on stink bugs, a new apple disease to keep your eye out for in Ohio, an article on where hops and strawberries are currently this season, and an update on the spotted wing drosophila.

In the fruit pathology laboratory located in Wooster, we are preparing for a busy season! Along with continued work in diagnostics for all of our growers throughout the state, we will be planting a high density apple orchard this May. The orchard will be located on the OSU-Wooster Campus Snyder Farm. The apples will be grown using a trellis support system and will be planted with newer varieties including MAIA-1 Evercrisp, to compliment the current production practices of our Ohio apple growers. In the coming years, the orchard will be used to conduct a wide range of integrated pest management research and Extension activities. You can stay up to date on our progress on our facebook page: facebook.com/fruitpathology/.

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Grass seed being planted in newly renovated land, which will house our orchard.

Posts for the trellis have arrived!



Hopeful News about Biological Control of Stink Bugs!

Celeste Welty, Extension Entomologist

The news about the brown marmorated stink bug (BMSB) has generally been bad over the past few years, as this new invasive pest has continued to expand its range within the USA, causing increasing problems as a pest of fruit, vegetable, and grain crops. We know that our native natural enemies have not been able to provide much biological control of BMSB, but there has been hope about potential biocontrol of BMSB by a tiny wasp that parasitizes BMSB eggs in Asia. The wasp is *Trissolcus japonicus*, nicknamed the samurai wasp.

USDA entomologists at Newark, Delaware, have been conducting intensive studies of the samurai wasp over the past 10 years with the hope that it could be introduced into the USA for control of BMSB, but thus far its introduction has not been approved by USDA. However a significant event occurred in 2014, when the samurai wasp was detected outdoors in Maryland, where it apparently showed up on its own, probably via a parasitized BMSB egg mass present in cargo shipped from Asia. In 2015, the samurai wasp was also detected in Virginia, Delaware, and Washington State. In 2016, it was detected in New Jersey, New York, and Oregon. In 2017, it was detected in Pennsylvania. Once an exotic species like this has been detected, it can be studied and intentionally spread within any State, but it is not allowed to be transported across State lines.

In Ohio, as part of our involvement in a multi-State project on BMSB management, we surveyed for the possible presence of the samurai wasp within Ohio in 2017. To do this, we collected fresh egg masses from our lab colony of BMSB; we deployed the egg masses in the field by clipping them to the underside of leaves, mostly on plants in wooded edges adjacent to fruit and vegetable crops. The egg masses were left outside for 3 days, then brought back to the lab where we observed whether they eventually hatched into stink bugs or if they were parasitized. If they were parasitized, we collected and preserved the wasps that emerged. We deployed 544 egg masses between May and September at several Ohio locations. Over the winter, we have been working our way through these samples, and identifying wasps that emerged from parasitized eggs. In early March, we found that wasps that emerged from two egg masses were identified as the samurai wasp. The two egg masses were deployed in Columbus in early August 2017. This finding that the samurai wasp has spread to Ohio is quite exciting. We plan to do additional surveys in 2018 to determine whether it is present at additional locations within Ohio.

Shown here are some pictures of the samurai wasp, close-up (Figure 1); the samurai wasp laying an egg in a BMSB egg (Figure 2); and a samurai wasp emerging as a new adult from an egg of BMSB (Figure 3). Look at the color of the stink bug eggs to see the difference between healthy, unparasitized BMSB egg masses, which are pale green (Figure 4), and parasitized BMSB egg masses, which are black (Figure 5).

Figure 1: The samurai wasp

(photo by Elijah Talamas, Florida Dept. of Agriculture and Consumer Services)



Figure 3: A samurai wasp emerging as a new adult from an egg of a BMSB

((photo by Chris Hedstrom, Oregon Dept. of Agriculture)



Figure 2: The samurai wasp laying its egg in an egg of the brown marmorated stink bug

(photo by Chris Hedstrom, Oregon Dept. of Agriculture)





Figure 4: Healthy egg masses of BMSB; the eggs are pale green

(photo by Peter Shearer, Oregon State University)



Figure 5: Parasitized egg mass of the BMSB; the eggs are black

(photo from Oregon State University)

New Apple Disease Reported in New York

Melanie L. Lewis Ivey, Assistant Professor, Fruit Pathology and Fresh Produce Safety

Paecilomyces rot is a new disease of apples that has been reported in New York. The disease is caused by a food spoilage fungus called *Paecilomyces niveus*. In the past, the presence of this fungus in foods containing apples was attributed to soil contamination, however recent research by scientists at Cornell University indicates that diseased apple fruit may be the actual source. The fungus was commonly found in orchard soils in New York and caused disease on two popular varieties of apples-Gala and Golden Delicious. Other varieties may be susceptible but have not yet been evaluated.

Symptoms of fruit infections are similar to those of other summer fruit rot diseases such as bitter rot (*Colletotrichum* spp.) and black rot (*Botryosphaeria obtusa*). External symptoms include brown, circular lesions with concentric rings. A firm cone-shaped internal rot occurs and fungal growth within the fruit may be visible.

Although the disease has not been reported in Ohio it will be important to monitor for it because the fungus produces a toxin called patulin that is not eliminated by thermal processing. Patulin is a toxin for which consumers have almost no tolerance and thus this apple disease has the potential to be a major food safety concern for the apple industry. Patulin is also produced by other spoilage fungi including *Aspergillus* and *Penicillium*, which is why most commercial growers do not sell dropped or rotten apples or use them for cider production. Backyard apple growers should also avoid eating or making juice or cider with dropped apples or apples with fruit rot symptoms.

A Gala apple infected with newly described apple disease, *Paecilomyces* rot.

(Photos: Megan Biango-Daniels, Cornell University)



NEWA Apple Disease Tool Updates

Melanie L. Lewis Ivey, Assistant Professor, Fruit Pathology and Fresh Produce Safety

As we approach critical periods for fire blight and apple scab infections I was planning on writing a short article on what is new with the apple scab and fire blight models on NEWA. However, my colleagues at Cornell University beat me to it! I guess great minds do think alike! The article is geared toward apple growers who are using NEWA as a tool to predict fire blight and apple scab infection events. If you are not using NEWA and would like more information about this tool please contact Dr. Melanie Lewis Ivey at ivey.14@osu.edu or 330-263-3849.

The following article is reprinted with permission from Juliet Carroll (NYS IPM Program) and Kerik Cox (Plant Pathology and Plant Microbe Biology).

NEWA APPLE DISEASE TOOLS NOW SAVE BIOFIX DATE – AND MORE

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The apple scab and fire blight models on NEWA will now (1) save your apple biofix dates, (2) allow you to "click out" of biofix dates that are too early, and (3) provide the full model interface from the Station Pages.

(1) Biofix dates for apple scab and fire blight

Tired of entering green tip dates and first blossom open dates over and over again? That's now being saved! The NEWA apple diseases tools will now save the green tip date, first blossom open date, and the orchard blight history selection. The biofix date that you last entered is saved in local storage in the web browser's cache. You may need to clear your browser's cache to enable local storage and see these changes. The dates and orchard characteristics cached are specific to the weather station location and the year used. The information saved is what you last entered when using the tool for that weather station and year.

To get ready for spring disease management, here's what's saved after you enter it:

Apple Scab – green tip date (50% green tip on 'McIntosh' apple or closest equivalent.) For the ascospore maturity model, McIntosh apple phenology was used for the research the model is based upon. Always use this variety for your orchard of interest, unless you aren't growing it; then use the closest equivalent.

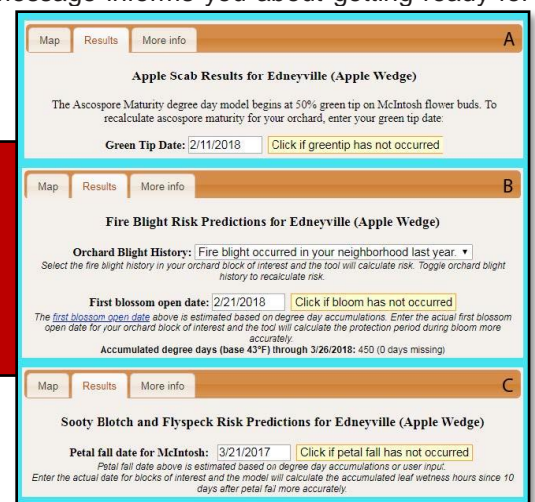
Fire Blight – first blossom open date on variety of interest and orchard blight history selection for block of interest. For the Cougar Blight and Epiphytic Infection Potential (EIP) models, use the first blossom open date for the variety of interest in the block of interest to get the results for that variety.

This information is saved locally in your browser's cache. Local storage from your browser is not backed up, so if it is cleared (deleted), it will need to be reentered. Always keep a record of your biofix dates and orchard characteristics. You may need to clear your browser's cache to enable local storage and see these changes. Remember, though, that clearing your browser's cache will delete your saved biofix dates and you may not want to do that if NEWA is already saving them.

(2) Biofix has not occurred yet

Is the NEWA-estimated biofix date too early and you want to eliminate it? Now you can! On the Apple Diseases tools for apple scab (green tip date), fire blight (first blossom open date) and sooty blotch / flyspeck (petal fall) a "Click if <biofix> has not occurred" button returns you to the pre-biofix IPM information for that apple disease tool (Figure 1A, B, C). This is especially important for fire blight, because the pre-biofix IPM message contains fundamental information about scouting for oozing, overwintering fire blight cankers. For apple scab, the pre-biofix message informs you about getting ready for

Figure 1: Screen shots of the new button that can be used if biofix has not yet occurred. (A) For apple scab green tip. (B) For fire blight. (C) For sooty blotch/flyspeck.



(3) Full interface access from Station Pages

Do you want to see what happened last year or change the biofix date on an apple disease or insect tool when accessing it from a Station Page? Now you can! Previously, the Station Page Pest Forecasts for apple diseases (apple scab, fire blight, sooty blotch/flyspeck) and insects (spotted tentiform leafminer, oriental fruit moth, codling moth, plum curculio, obliquebanded leafroller, apple maggot) provided current day results only.

Now, those links will take you to the current day results in the fully functional interface, including the map, results, and more info tabs (Figure 2). The left-hand part of that interface allows you to select dates in the past to look at what the tool predicted for last year or prior years. You also can select an alternate weather station location and see the map of weather stations. A link below the model results will return you to the Station Page for the weather station of interest. For more details on this, read more information in the Your NEWA blog, Apple tools made easier to use, <http://blogs.cornell.edu/yourenewa/2018/03/27/apple-tools-made-easier-to-use/>. While there, subscribe to the Your NEWA blog to get the new posts.

Disease Cycle	Disease Management
Oozing cankers put bloom at risk:	Learn how to identify fire blight cankers. Scout orchard blocks for active, oozing fire blight cankers. Determine and record each orchard block's fire blight history to use in the blossom blight tool, as shown: --No fire blight in your neighborhood last year. --Fire blight occurred in your neighborhood last year (default). --Fire blight is now active in your neighborhood. At silver tip apply a copper spray to clean up inoculum on tree surfaces. At bloom, apples and pears become susceptible to blossom blight infections. Frost blossoms open begins the critical period for protection during bloom, which is when blossom blight risk is calculated.

Figure 2: Screen shot of the NEWA fire blight tool accessed from the Geneva Station Page. The full interface has the Map, Results, and More Info tabs and the left-hand selection tools to access different dates and locations. Return to the Station Page using the link at the bottom of the webpage display.

What's Happening on Ohio Fruit and Hop Farms?

Brad Bergefurd, Extension Educator and Horticulture Specialist

February weather in March and March weather in February? May not be a bad thing for Ohio fruit and hop farmers?

As I write this article April 9, 2018, usually here in southern Ohio we are within 3 weeks of strawberry harvest, hops are usually being trained, peaches are at or past full bloom and apples are at all stages of development. As of today protective row covers remain on plasticulture strawberry, most matted row strawberry fields are still covered in straw mulch, the first hop shoots are just starting to emerge from the ground and full bloom is sporadic on most tree fruit. This is not a bad thing, for most of the economically damaging weather related issues we experience as hop and fruit growers are due to a rapid warm up followed by a period of below normal temperatures and freeze events. In my opinion, I will take a late spring year over an early spring year anytime, the longer our plants remain dormant the better chance we have of skirting freeze and frost events which mean more profits for farmers. Even with the delayed spring we are currently experiencing, this does not mean we are out of the woods yet. It is always important to be aware of the temperatures that fruit crops can withstand injury at different stages of development. Many of our fruit crops may be in harm's way with the recent very warm weather.

The forecasted warm temperatures and the lack of soil frost since early February may allow fruit and hop development to move forward at an extremely fast pace. Historically, cold temperatures are still likely to occur in the next four weeks that could put crops in jeopardy. Below is some information gathered from Horticultural Crisis Situations Bulletin 748 that may be helpful as we move through the next month.

Horticultural Crisis Situations, Bulletin 748, Ohio State University Extension

Causes of Frost

- Radiational frost most likely occurs on calm nights with clear skies in spring, fall or winter. At night, the earth's surface no longer receives solar radiation. It acts as a heat radiator, transferring heat by conduction and convection into the atmosphere. As heat loss from the earth's surface brings the temperature to 32°F or below, frost can occur.
- Air mass freezes can occur even under overcast skies and windy conditions. Frost results when a cold air mass with a temperature below 32°F enters and remains in an area for a period of time.
- Some other considerations: Local frosts can occur even though official temperatures are reported to be above 32°F. This is because official temperatures often are measured six feet above ground level. It's usually several degrees cooler at the soil surface.

Dry soils usually are colder than wet soils, and cultivated soil gives off more heat than soils with mulch or sod.

Flowers of fruit species vary by their hardiness and according to their stage of bud development. Strawberries are more susceptible than other small fruits to frost injury simply because they're closer to the ground. Occasionally, grape blossoms are frost-damaged. But in general, losses of grapes and brambles are due to winter-kill of vines or canes, rather than frost damage to the buds. Currants, gooseberries and blueberries seldom bloom early enough in Ohio to incur frost damage. Strawberry plants grow close to the ground where the coldest air settles on clear, calm, cold nights in early spring. Thus, blossoms are subject to injury by late-spring frosts. Early blooming varieties, unmulched plants and plants on a southern exposure are most susceptible. Mulched plants bloom later, which reduces the risk of frost damage. Loss of an entire crop is less common with strawberries than with most tree fruits for two reasons: blossoms don't all appear at once, and buds are in different stages of development. Strawberry flower buds are susceptible to frost anytime after bud break. Cultivars that develop flower buds early, such as Earliglow, are more susceptible to frost before first bloom. As flower buds develop from tight buds to open flowers, they become more sensitive to freezing temperatures between 14-28°F. Economically, the first flowers that open produce the largest berries. When 5-7% of the flowers are lost, 10-15 % of the total crop is lost. The duration of temperature required for damage can be 20 minutes to 2 hours, depending on wind, humidity and cultivar.

See these threshold charts for critical temperature for fruit development:

msue.anr.msu.edu/uploads/files/PictureTableofFruitFreezeDamageThresholds.pdf

msue.anr.msu.edu/uploads/files/TreeFruitCriticalTemperatures.pdf

plantpathology.ca.uky.edu/files/mw_strawberry_productn_b926.pdf

plantpathology.ca.uky.edu/files/mw_grape_productn_b919.pdf



Top Left: On March 3rd Contender and Red Haven peach buds (Photo by Paiges Produce)



Top Right: Hops are emerging about a month behind 2017

Bottom Left: Plasticulture strawberries remain covered 4/9/2018



Bottom Right: Protected strawberries



Prepare for Spotted Wing Drosophila in 2018

Jim Jasinski, Dept. of Extension, IPM Program Coordinator

The winter of 2017-18 was not particularly severe, so hopes of reduced insect populations and damage from pests such as spotted wing Drosophila (SWD) are not likely to materialize. In 2018, the Dept. of Entomology and IPM Program have secured funding to maintain a monitoring and reporting network for this invasive pest of small fruits, peaches, and grapes.

No major changes to the network or monitoring process will be instituted in 2018, and the trap and lure combination will remain the same as previous years, Scentry trap and commercial lure, which is available from many IPM vendors online. We are finalizing the 20-30 counties that will participate in the network. A focus of this year's monitoring network will be to look for SWD in counties where it is not known to exist, particularly in the northwest, east, southeast and southwest corners of the state.

Network traps will be deployed in the first week of June and may run through October for some sites. The map below shows the current known distribution of this pest from 2011-17 (Figure 1).

On a final note, last week we conducted a SWD identification, monitoring and management workshop in Marietta, OH for small fruit, grape, and peach growers. The hands-on identification exercises and management updates were definitely appreciated by those in attendance, giving them increased confidence to monitor and manage this pest in their crops.

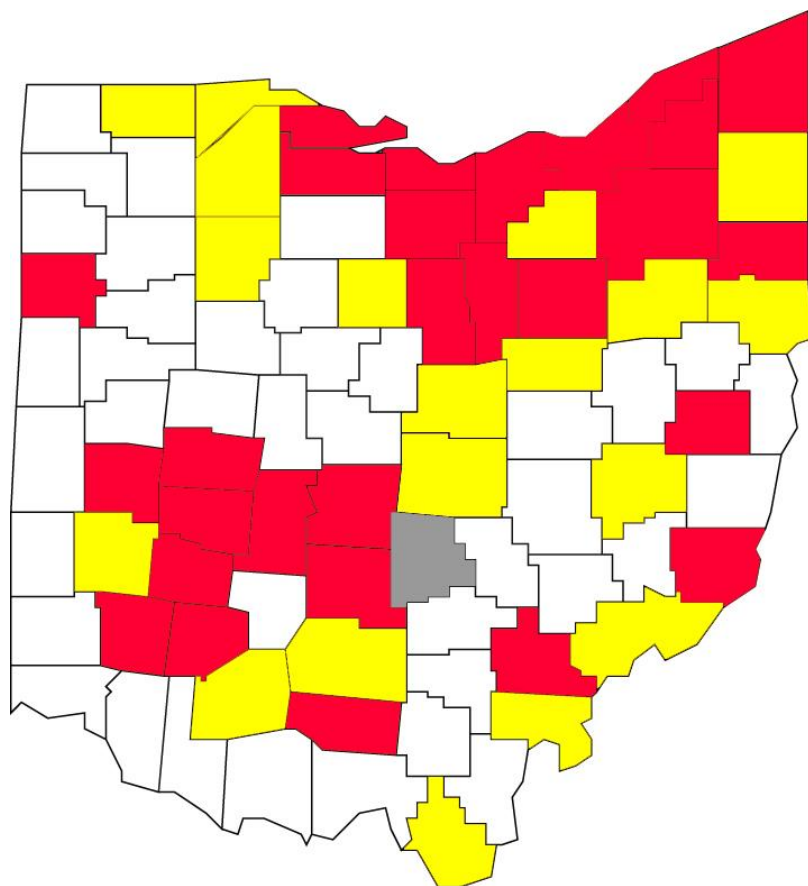


Figure 1. Status of SWD from 2011-2017 based on monitoring and anecdotal reports. Red counties are positive for SWD, yellow counties are suspected SWD positive, white counties have not been surveyed for SWD, and the gray county was monitored for SWD but not found.

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Grower Resources:

NEW: Midwest Fruit Pest Management Guide 2018
(Additionally: Kocide 3000-O is now registered in Ohio! [Click here for the label.](#))

[OSU Fruit Pathology Resources](#)

[OSU Fruit and Vegetable Pest Management](#)

[OSU Fruit and Vegetable Diagnostic Laboratory](#)

[OSU Bramble: Production Management and Marketing Guide \(Bulletin 782\)](#)

NEW: 2018 Grape Spray Guide



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