Northern Michigan FruitNet 2014
Northwest Michigan Horticultural Research Center

Weekly Update
August 5, 2014

CALENDAR OF EVENTS

8/9	**Summer Vineyard Conference** Crooked Vine Vineyard & Winery Alanson, MI
8/14	**GT County Household Hazardous Waste & Pesticide Collection** recyclesmart.info
8/15	**Hops Field Day**
8/21	**SW Pre-harvest Grape Meeting** Berrien Springs, MI
9/4	**NWMHRC Open House – 35th Anniversary**
9/5	**Weathering the Climate: Cultivation & Technology in Grape Production** NMC Hagerty Center, Traverse City

NORTHWEST MICHIGAN REGIONAL REPORT
E. Pochubay, N. Rothwell, and D. Elsner, Extension Educators, MSU

Tart cherry harvest is underway and growers are harvesting through the night.

Weather Report. Temperatures were cool, in the mid- to upper 60s early last week and some areas reached daytime highs in the low 80s over the weekend. Weather conditions have been mostly dry throughout the region. The last significant rainfall we received was 26-27 July; the NWMHRC received just over half an inch that weekend. There is little to no chance of rain through Saturday 9 August. Currently, a slight chance of rain on Sunday 10 August evening is predicted.

Crop Report. Sweet and tart cherry harvest is ongoing and weather conditions in the coming week look favorable for harvest. Sweet and tart cherry quality are good this season and although we have observed cracking following the last rainfall at the station, there have been few reports of significant cracking on sweets in the region. As mentioned last week, we had windy conditions and wind whip is evident on tart cherry fruit. Apples are sizing well and are also looking good. Most growers have been very pleased with the quality and quantity of fruit so far this season.

Pest Report. We have received few reports of insect and disease problems since the beginning of harvest. Most of the comments that we have received have been on how to interpret low numbers of pests in traps this season. In cherries, the insects of primary concern pre- and post- harvest have been **cherry fruit fly** (CFF) and **spotted wing drosophila** (SWD). Compared with previous years, CFF and SWD catches are low this season throughout the region. A total of five **cherry fruit flies** were caught at the station this week and catches were >5 in previous weeks. Reports of CFF activity in the area suggest that CFF populations have been low in most areas in our region. We have, however, received isolated reports of traps with 18 or more CFF. On Friday, an update with last week's regional spotted wing *Drosophila* catches were sent to FruitNet subscribers. Here is a recap of SWD captures for the week of 28 July – 1 August: In **Benzie** County, a total of two female SWD were trapped: one SWD in tart cherry and one SWD in a neighboring vineyard. In **Leelanau** County, the NWMHRC was the only site where SWD were detected; we found a total of three female SWD in tart cherry. Most of the SWD were caught on **Old Mission Peninsula** with a total of seven female SWD: four of the seven were found in a tart cherry block that had been harvested and the remaining three were trapped in sweet cherry. SWD catches at the station this week were higher than last week; we caught a total of four females and three males. We will report this week's regional SWD catches again on Friday to FruitNet subscribers.

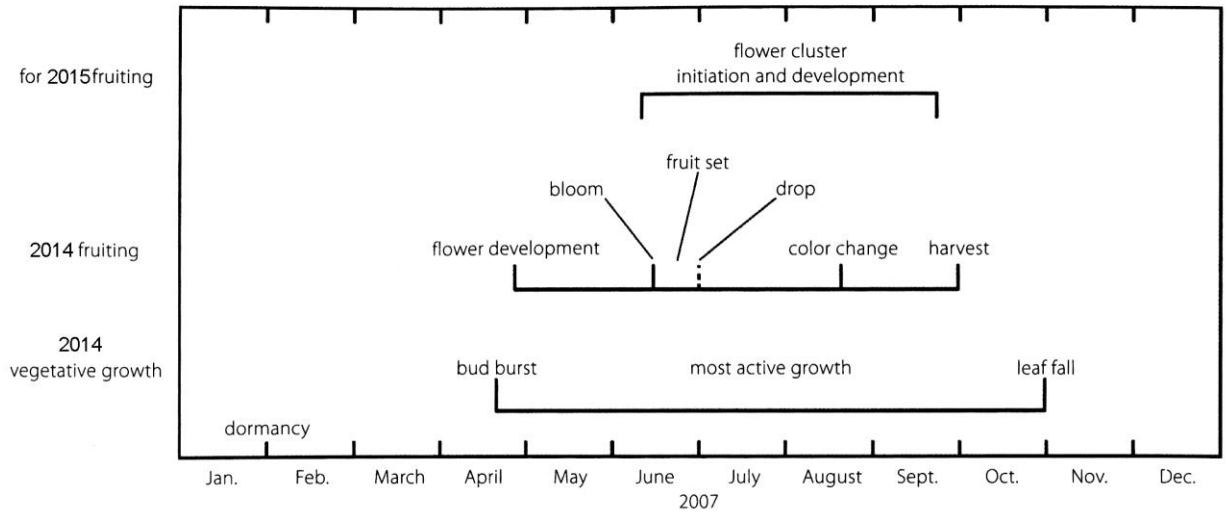
Growers who have monitored for and caught few or no CFF and SWD and have very little fruit remaining on trees are considering forgoing a postharvest insecticide application, particularly if they are not planning to make a postharvest **cherry leaf spot** application. Growers who are considering not making a postharvest CLS application have low or no visible CLS infection and made a pre-harvest application with an SDHI fungicide which can provide protection for several weeks after application. This late in the season, a postharvest CLS spray may not be necessary if orchards have low CLS infection and received an application of Luna Sensation or Merivon as the last fungicide prior to harvest. Growers have done an excellent job preventing disease infection and most orchards seem to have low cherry leaf spot infection.

Two-spotted spider mites and **European red mites** are present and populations are variable with some hot spots in orchards. Warm and dry conditions in the coming week could favor the development of **mites** and growers who have used insecticides known to flare mites (ex. synthetic pyrethroids) should be aware of possible mite outbreaks. **Peachtree borers** and **American plum borer** activity is ongoing at the station with an average of 14.33 **greater peachtree borers**, 21 **lesser peachtree borers**, and 18 **American plum borers** per trap.

In apples, second generation **spotted tentiform leafminer** moths at the station spiked this week with an average of 211 moths per trap. We found a total of two **codling moth** and two **obliquebanded leafroller** at the station this week. We did not find **apple maggot** this week and the first apple maggot fly captured at the station was on 21 July; some growers have started spraying for this pest at this time, particularly in orchards where there has been codling moth and obliquebanded leafroller activity.

Wine Grapes

Canopy management for vinifera varieties is going to be just as important in this disastrous year as in a normal year. It will be key to producing healthy buds and canes that can withstand the winter ahead and be highly productive in 2015. The buds being initiated and nurtured at the nodes of shoots at this time will be the ones we are relying on for productivity next year.



Generalized calendar of grapevine growth and development. *Adapted from Shaulis and Pratt (1965).*

Bud quality is negatively influenced by stresses such as drought, poor nutrition, and shading. Shoot positioning will help create thin canopies with well-exposed leaves, and it will also help combat **powdery mildew**. I would only recommend hedging on vines that have a full complement of shoots and foliage. Vines with very few shoots need all of the leaves they have, and they would not be likely to shade themselves to a significant degree anyway.

Even though there will be very little reward this fall for the effort and labor to do shoot positioning and hedging, these practices are needed to make sure 2015 will be a strong comeback year for the region's vinifera production.

This is the time of year when large **hornworm caterpillars** or **Japanese beetle** adults can cause heavy defoliation to shoots. This is typically only an issue for young vineyards with small vine canopies, but this year it may be important to watch out for defoliation in older vineyards as well. In places where there are only a few shoots and a limited canopy on cold-injured vines, the vines will suffer greatly if a significant amount of defoliation occurs.

Thanks very much to Annemiek Schilder, Craig Cunningham and the P45 board for running the show at last Friday's meeting. I had to be out-of-town on family business.

Straights Area Grape Growers Association
Summer Vineyard Conference
Location
Crooked Vine Vineyard & Winery
8370 Lakeview Road, Alanson, MI 49706

August 9, 2014

Schedule:

10:00 AM	**Opening Remarks – TBA**
10:15 AM	**Vineyard Pest & Disease Management – Rufus Isaacs, Department of Entomology, Michigan State University**
12:00 AM	**Lunch Break**
1:00 PM	**Viticulture Experiences Past & Present – Megan Budd, Vineyard manager Horticulturist, Mackinaw Trails Winery, Petoskey**
2:15 PM	**The Vineyard Experience – David Anthony, Northern Sun Winery, Bark Creek, Michigan**
3:45 PM	**Visit to area vineyard(s) – car pooling suggested**
5:00-7:00PM	**Wine tasting and Hor D Oeuvres**

For more information or to register for this meeting, please contact Geoff Frey at 231-881-6582. If you are looking into cold hardy varietals, you will benefit from attending.

NMC-MSU TO HOST CONFERENCE ON CLIMATE AND TECHNOLOGY IN GRAPE PRODUCTION

Northwestern Michigan College and Michigan State University are hosting a conference, Weathering the Climate: Cultivation and Technology in Grape Production," **Friday, September 5** at the Hagerty Center at NMC's Great Lakes Campus, 710 E. Front Street, Traverse City.

The conference features experts in agricultural technology, geography, horticulture, and other areas related to unmanned aerial systems technology and the science of grape production.

Sessions cover topics like Climate Change and Potential Agronomic Impacts in the Great Lakes Region, Impacts of the 2014 Polar Vortex on Grapes: Lessons Learned, How to Manage Grapes for Our Changing Climate, and Unmanned Systems and Technology Applications in Viticulture. There will be a vineyard demonstration of the application of unmanned systems at Chateau Chantal Vineyard and Winery, and a panel of grape growers who will discuss practical applications of unmanned systems technology in vineyard management.

Experts speaking at the Weathering the Climate conference include Brian Matchett, MSU Institute of Agricultural Technology; Jeff Andresen, MSU Department of Geography, Imed Dami, Ohio State University Department of Horticulture and Crop Science; Paolo Sabbatini, MSU Department of Horticulture; Duke Elsner, MSU Extension; Ed Bailey, NMC Technical Division; and Tony Sauerbrey, NMC Unmanned Aerial Systems.

The panel will include Ben Bramer, Agrivine; Stan Howell, MSU Department of Horticulture; Mark Johnson, Chateau Chantal; Larry Mawby, L. Mawby Vineyards; James Peters, Staits Area Grape Growers Association and Coenraad Stassen, Brys Estate Vineyard.

Registration for the event can be done online by visiting nmc.edu/viticulture and following the links. Cost for the conference is $60, conference and dinner is $85. Rooms have been made available for conference attendees to reserve at the Bayshore Resort.

FOR MORE INFORMATION
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WHAT TO DO WHEN YOU START SEEING DISEASE IN THE VINEYARD: POST-INFECTION TREATMENTS

When fungal diseases show up in vineyards, it is not too late for action. There are various things to consider when making post-infection fungicide applications, including weather conditions and product efficacy.

Posted on **July 29, 2014, MSUE News,** by **Annemiek Schilder**, Michigan State University Extension, Department of Plant, Soil and Microbial Sciences

Unusually humid weather this 2014 season has provided plenty of opportunity for diseases to become a problem in vineyards. Black rot, Phomopsis, anthracnose, powdery mildew, downy mildew and Botrytis have all been seen to varying degrees in Michigan vineyards this year. The general approach to disease management is to apply preventative fungicide sprays and careful and timely canopy management. Field scouting for diseases is an important component of an integrated disease management approach. However, sometimes diseases can take us by surprise and symptoms appear, either due to high disease pressure, poor fungicide timing, suboptimal spray coverage, fungicide wash-off due to rain, or a combination of factors. In addition, fungicide resistance may play a role in some cases, such as in grape powdery mildew.

Michigan State University Extension advises growers to prepare to apply post-infection treatments if necessary. Several fungicides have post-infection activity, like the sterol inhibitors such as Elite and Rally, which means that they'll stop disease development if applied after an infection period has occurred, but before disease symptoms appear. Their activity usually ranges from 24-72 hours after infection for black rot and powdery mildew. The strobilurins have less post-infection activity, but have fairly strong anti-sporulant properties, which can help reduce sporulation and disease spread. However, very few fungicides have the ability to eradicate active infections once symptoms have become apparent. At most you can expect to knock them down a bit and suppress sporulation while you keep infections from spreading to healthy clusters and leaves.

For visible powdery mildew, oils such as Tritek and JMS Stylet Oil are the best in our experience – two sprays (1-2 percent v/v) five to seven days apart are needed to observe a substantial reduction in disease. Apply as soon as you start to see the first powdery mildew colonies since the longer you wait, the harder it is to get the disease under control. Make sure to apply sufficient spray volume to get good coverage since these are contact materials. Also, be careful during periods of hot weather as oils tend to block the stomata, preventing evaporative cooling of leaves so they can get very hot and may burn. During hot weather, use the 1 percent v/v rate. Other eradicant products with moderate efficacy are Kaligreen, MilStop, and Armicarb

(potassium bicarbonate salts) and Oxidate (hydrogen peroxide). You can follow these with preventive fungicide applications to protect against new infections.

For visible downy mildew, the best options are Ridomil Gold MZ or Ridomil Gold Cu since these have excellent systemic and curative activity. However, keep in mind that the pre-harvest intervals (PHI) are long and may preclude their use at this time: 66 days for the MZ formulation and 42 days for the copper formulation. Phosphites such as Phostrol and ProPhyt are good alternatives – they have a zero-day PHI. Two sprays five days apart boost the curative and anti-sporulant potential. Be careful during hot weather or when plants are stressed as phosphites are salts and phytotoxicity is a possibility. Cut back on the concentration or wait until the temperature drops. Some other products like copper, Ziram, oils and salts can kill downy mildew sporangia on contact, but remember that sporangia are produced on the undersides of leaves and it may be more difficult to achieve effective coverage for that reason.

Things to remember

- Apply treatments as soon as possible after symptoms are seen; regular and careful scouting is a prerequisite. However, waiting a little longer to ensure good spray conditions is a better option than spraying immediately under poor spray conditions.

- If disease symptoms are showing up on leaves and shoots, you can assume that there is plenty of disease pressure to infect the fruit as well.

- Avoid spraying systemic fungicides on heavily sporulating lesions since this is not very effective anyway and can encourage fungicide resistance development. Rather, apply a contact fungicide to kill the spores first and then follow up with systemic fungicide applications.

- Remove infected clusters if possible and pull leaves around clusters to ensure good spray coverage of fruit zone and reduce humidity around clusters. This is especially important for Botrytis bunch rot and sour rot – be careful not too pull too many leaves which will leave the clusters vulnerable to sun-scalding.

- Ensure thorough coverage of leaves and bunches, particularly for contact fungicides, which means increase spray volume, reduce air flow, reduce tractor speed, spray every row and adjust nozzles accordingly.

- About four to five weeks after bloom, berries become mostly resistant to powdery mildew, downy mildew and black rot, although already-infected berries may show symptoms. There usually is no point in spraying clusters to protect them from new infections; however, some late infections may occur, especially on “straggler” clusters that are behind in their development. Also, some wine grape cultivars may remain susceptible to black rot up to eight weeks after bloom.

- As berries ripen, they become more susceptible to Botrytis bunch rot and sour rot. Choose effective fungicides for control of these diseases. These are best applied before bunch closing, at veraison and two weeks before harvest. Clusters remain susceptible to Phomopsis throughout their development, but usually spores taper off and infection risk is low to nil after bunch closure. As infected berries ripen, however, they can rot and produce spores, leading to increased secondary infection risk close to harvest.

- Apply fungicides at the highest labeled rate to ensure good post-infection activity.
- Ensure forward protection of healthy plant parts by tank-mixing or following up with materials that have good protective activity.
- Always read the label for the PHI, incompatibility with other products, and other restrictions.
- Scout again to see if your treatment was effective, keeping in mind that newly developing infections may continue to manifest themselves for a week or more after the spray.

Dr. Schilder's work is funded in part by MSU's AgBioResearch.

This article was published by **Michigan State University Extension**. For more information, visit http://www.msue.msu.edu. To contact an expert in your area, visit http://expert.msue.msu.edu, or call 888-MSUE4MI (888-678-3464).

MICHIGAN SPOTTED WING DROSOPHILA REPORT FOR July 29, 2014

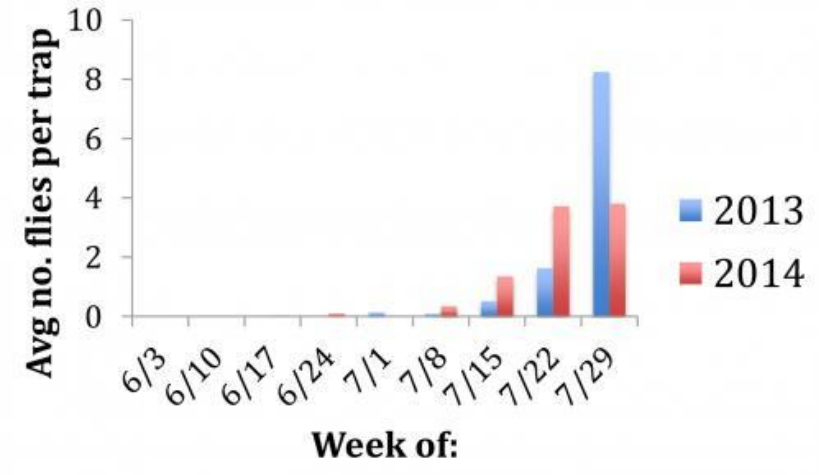
Spotted wing Drosophila numbers remain steady in southwest Michigan, still low in other areas; protect susceptible crops where they are detected.

Posted on **July 29, 2014, MSUE News,** by **Julianna Wilson**, Rufus Isaacs, Michigan State University Extension, Department of Entomology

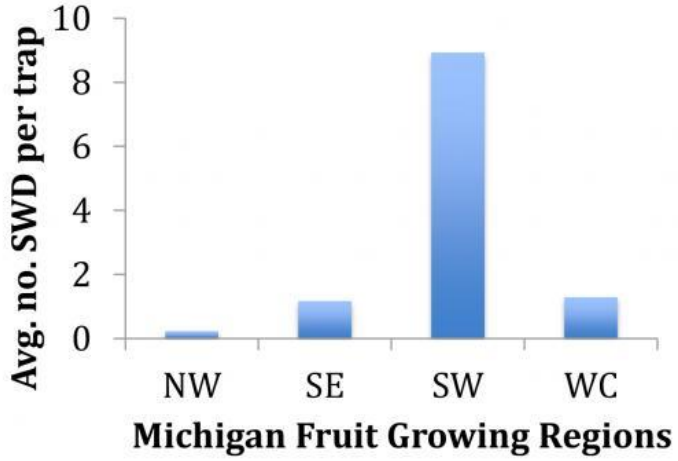
This is the sixth weekly report of the Michigan State University Extension spotted wing Drosophila (SWD) statewide monitoring program for 2014. Our network of traps across more than 100 sites was checked during the week of July 24 and shows continued moderate activity of this pest in southwest counties, low activity in west central and northwest counties, and new activity in southeast counties. There was a total of 218 male and 197 female SWD trapped from the following Michigan counties: Berrien, near blueberries, raspberries, tart cherries, peaches and strawberries; Van Buren, near plums, tart cherries, strawberries, blueberries and grapes; Allegan, near blueberries and tart cherries; Ottawa, near blueberries; Kalamazoo, near black raspberries; Kent, near raspberries; Montcalm, near apples; Oceana, near tart cherries; Leelanau, near tart and sweet cherries; Benzie, near tart cherries; Ingham, near grapes; Livingston, near raspberries; and Genesee, near grapes. The proximity to a particular crop indicates the location of the trap, so interpret this long list of nearby crops to mean that SWD is active across the fruit-growing regions of the state.

The traps in the network catching SWD increased from 30 to 40 percent this week, with new reports coming out of southeast Michigan. Similar to last week, the average number of SWD per trap this week was four across the entire network, but more than eight SWD per trap were found on average in southwest Michigan. Again, traps near fencerows or woodlots containing wild berry-producing shrubs caught higher numbers of SWD. Where SWD numbers are still low, growers should continue to be on alert for this pest as their susceptible fruit crops start or continue to ripen.

Comparison of average trap catches by week between 2013 and 2014.



Comparison of average SWD adults captured per trap by region. This week trapping is reported from 35 sites in the northwest (NW) counties of Antrim, Benzie, Grand Traverse, and Leelanau; 12 sites in the southeast (SE) counties of Genesee, Ingham, Lapeer, Livingston, Macomb, and Oakland; 41 sites in the southwest (SW) counties of Allegan, Berrien, Kalamazoo, Ottawa, and Van Buren; and 21 sites in the west central (WC) counties of Ionia, Kent, Montcalm, Muskegon, and Oceana.



Sampling of fruit over the past week revealed low levels of infestation of summer raspberry fruit, particularly in fields not being treated for this pest. In blueberries, all conventionally-managed commercial fields sampled for SWD had no larval infestation. Unsprayed fields with ripe fruit are now showing infestation, showing up as younger larvae in a low percentage (2-10 percent) of the berries. This highlights the need for protection of ripe berries over the coming weeks as the SWD population grows.

SWD can only infest berries when they are ripening or ripe, so the focus of SWD monitoring and management efforts should be in susceptible fruit that should be treated only if SWD are detected to minimize the risk of developing pesticide-resistant populations of SWD. In addition

to the use of monitoring traps to detect the adult flies, a simple salt solution of 1 cup of salt per gallon of water can be used to assess fruit for larval infestation.

For more information on SWD monitoring and management strategies, and to read past reports, visit MSU's Spotted Wing Drosophila website.

The weekly SWD statewide monitoring report has been funded through Project GREEEN and Michigan State University Extension. This output is generated through a network of MSU Extension field staff and campus specialists. We would like to acknowledge the following team members and thank them for their weekly scouting efforts and input into this report: Rufus Isaacs, Keith Mason, Steve VanTimmeren, Larry Gut, Peter McGhee, Michael Haas, Bob Tritten, Mark Longstroth, Brad Baughman, Carlos Garcia, Karen Powers and Nikki Rothwell.

Dr. Isaacs' work is funded in part by MSU's AgBioResearch.

MICHIGAN BROWN MARMORATED STINK BUG REPORT FOR AUGUST 1, 2014

We are back to no brown marmorated stink bug detections this week as the statewide monitoring program continues in fruit and vegetable production areas across Michigan.

Posted on **August 1, 2014, MSUE News,** by **Julianna Wilson**, Larry Gut, Michigan State University Extension, Department of Entomology

This is the fourth weekly report of the Michigan State University Extension brown marmorated stink bug (BMSB) statewide monitoring program for 2014. Out of the more than 80 sites being monitored throughout the state, no BMSB were captured or reported this week.

The monitoring network uses pyramid-style, pheromone-baited traps set up at farms that grow a variety of fruit and vegetable crops including apples, tart cherries, sweet cherries, peaches, blueberries, raspberries, tomatoes, peppers and sweet corn. Sites have been selected that are known to favor BMSB near riparian areas or along major transportation corridors in the following counties: Monroe, Lenawee, Oakland, Macomb, Livingston, Ingham, Lapeer, Saginaw, and Bay on the east side of the state, and Antrim, Grand Traverse, Leelanau, Benzie, Oceana, Newaygo, Kent, Ionia, Ottawa, Allegan, Van Buren, and Berrien on the west side of the state.

Although we continue to catch little to no BMSB in our trapping network, we know that BMSB are present in Michigan because of reports that have come mainly from homeowners in various parts of the state, and from sweep netting conducted in the edge of soybean fields. This monitoring network has been set up to provide early warning should BMSB start showing up in greater numbers in fruit and vegetable production areas.

To learn more about how to monitor for brown marmorated stink bugs, distinguish it from other similar-looking stink bugs, what crops it favors, and management strategies should populations

reach the threshold where management is necessary, visit MSU's Brown Marmorated Stink Bug website.

The weekly BMSB statewide monitoring report has been funded through Project GREEEN and Michigan State University Extension. This output is generated through a network of MSU Extension field staff and campus specialists. We would like to acknowledge the following team members and thank them for their weekly scouting efforts and input into this report: Peter McGhee, Michael Haas, Bob Tritten, Mark Longstroth, Brad Baughman, Carlos Garcia, Amy Irish-Brown, Lina Rodriguez Salamanca, Ben Philips, Ben Werling, Mark Whalon, Karen Powers, and Nikki Rothwell.

ENSURING HIVE SUCCESS THIS AUGUST 2014

Honey is coming off and swarms are continuing later this year. Here's some tips for moving bees out of the supers.

Posted on **July 30, 2014, MSUE News,** by **Ben Phillips**, Michigan State University Extension, Walter Pett, Michigan State University Extension, Department of Entomology

This is a recap of Michigan State University Extension visits with commercial and hobby beekeepers over the last month with a look to the future. Knapweeds, white and yellow sweet clover, wild carrot, vine crops, birdsfoot trefoil, and early goldenrods and buckwheat are providing a fine honey crop this time of year, and beekeepers around the Bay and Thumb areas are harvesting honey. But, what's the best way to get the bees out of the super?

Tips for moving bees out of supers

Moving bees out of the supers can be a challenge, but there are a few techniques that work well. Bee blowers force air through the frames of a super that is stood on its end, and blows the bees out into the bee yard. These require some sort of power source at the bee yard.

A more flexible solution is a fume board, which can easily be made from scrap hive top materials and some absorbent fabric. A small amount of chemical repellent is applied to the absorbent material in a zig-zag pattern and when the fume board is placed on the top of the honey super, the repellent drives bees down into the lower boxes. Common repellents include butyric anhydride-based products (Bee Go, Honey Robber), and benzaldehyde-based products (Bee-Quick, Bee Dun). Both work well, but benzaldehyde smells much better for the clumsy beekeeper that gets it on their hands. To make the repellent work faster, paint the top of the fume board black so that it heats up in the sun. Don't apply it to the frames, and don't over-soak the absorbent fabric.

A homemade fumeboard with an old sweater turned inside out, stretched and held in place by thin slats of wood on all sides.

If you only have a few colonies a bee brush is the answer. Remove one frame at a time, shake the bees off and brush off the remaining bees. Put the bee-free frame in an empty super and cover it. Repeat with the next frame. You may have a few bees that stay on the frames, but they'll go to the windows or lights in the room your extracting in.

More late swarms this year

This year has been providing lots of late swarms, compared to other years. If it's an easy catch, it may be worth grabbing. They may not build up enough to overwinter themselves, but you could take some brood from one of your strongest hives to boost the late swarm hive. Commercial keepers would use such a hive to ship to California for the winter and earn some money for almond pollination. Or, you could use a late swarm as a source for brood and honey frames to build up your other hives. However, when mixing with bees of an unknown background, you always risk spreading diseases to your good hives.

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MICHIGAN HOP UPDATE – July 31, 2014

Two-spotted spider mite populations are high and growers should carefully monitor for this pest that can affect cone quality and act as a contaminate pest at harvest. Potato leafhopper and downy mildew continue to be observed.

Posted on **August 1, 2014, MSUE News,** by **Erin Lizotte**, Michigan State University Extension

Hop development in the experimental yard at the Northwest Michigan Horticultural Research Center as of July 30, 2014. Photo credit: Erin Lizotte, MSU Extension

Growing degree day accumulation (GDD) is significantly different along the western portion of the state with the weather drying out for most areas. As of July 31, the Benton Harbor Enviro-weather station has accumulated 1,505 GDD50 with 0.19 inches of rain over the past week; the Clarksville Enviro-weather station has recorded 1,359 GDD50 and 0.13 inches of rain; the Bear Lake Enviro-weather station has accumulated 1,181 GDD50 and 0.03 inches of rain; and the Northwest Michigan Horticultural Research Center accumulated 1,199 GDD50 with just over 0.5 inches of rain this past week. Cones and burrs are visible on many varieties around the state with growers reportedly cutting nitrogen rates at this stage.

Some hopyards are exhibiting yellow, chlorotic leaves on the bottom 2-5 inches of bines that may be associated with higher than optimal soil pH levels limiting nutrient availability for the plant. Growers with soils at a pH level above 7.4 and bines that are exhibiting these symptoms may consider adjusting soil pH after harvest or in the spring to correct for this. Soil pH greatly affects the solubility of nutrients with the availability of most nutrients being increased in more acid soils. If soil pH is not an issue, growers should consider a nutrient deficiency in general.

As the weather has dried out across the state, growers should remain vigilant in scouting for two-spotted spider mites. Populations are increasing steadily and have reached very high levels in some hopyards with a significant number of eggs present and causing concern as harvest approaches for some growers. Two-spotted spider mites are a significant pest of hops in Michigan and can cause complete economic crop loss when high numbers occur by decreasing the photosynthetic ability of the leaves and causing direct mechanical damage to the hop cones. Two-spotted spider mites feed on the liquid in plant cells, eventually causing visible symptoms. Leaves take on a bronzed and white appearance and can defoliate under high pressure conditions. Intense infestations weaken the plant and reduce yield and quality. Infested cones develop a reddish discoloration, do not hold up to the drying process, and commonly have lower alpha levels and shorter storage potential. Additionally, the mites themselves act as a contaminate issue for brewers.

Left, Early symptoms of two-spotted spider mite damage on hop. Middle, Advanced symptoms of damage. Right, Damage on young hop leaves from nursery plants. Photo credit: Erin Lizotte, MSU Extension

Two-spotted spider mites thrive under hot conditions with the pace of development increasing until an upper threshold around 100 degrees Fahrenheit is reached. Conversely, cold and wet weather is not conducive to development. . Two-spotted spider mites are very small, but can be observed on the underside of leaves using a hand lens. They may be hard to see even using a hand lens, and growers are encouraged to look for movement to help them locate the mites. The eggs look like tiny, clear spheres and are most commonly found in close proximity to adults, cast skins and larvae. The larvae themselves are small, translucent versions of the adults that begin the season with a distinctly orange hue which changes over to translucent, yellow or green as they feed. Adults also have two dark spots.

When you are observing the underside of leaves, keep an eye out for beneficial, predatory mites that actually feed on two-spotted spider mites. Predatory mites are often translucent, larger than two-spotted spider mites and move at a much faster speed across the leaf surface. Predatory mites play an important role in balancing the two-spotted spider mite population and should be protected when possible.

Left, Underside of hop leaf with a dusty appearance caused by two-spotted spider mites, a large adult mite is also visible. Right, Clear, spherical eggs and larvae (immature), and white cast skins of two-spotted spider mites on hop. Photo credits: Erin Lizotte, MSU Extension

Growers should be scouting for mites season long and keep in mind that only when mites reach an economically significant level should cultural and chemical intervention be considered. Use a

hand lens to evaluate two leaves from 20 plants per yard. Thresholds developed in the Pacific Northwest have established that more than two adult mites per leaf in June indicate the need to implement a pest management strategy. By mid-July, the threshold increases to five to 10 mites per leaf. Remember that if cones are not infested, hop plants can tolerate a good deal of damage from mites. Removal of the lowest 3 feet of foliage may help prevent mites from readily moving up into the canopy.

Growers needing to treat for mites at this time are encouraged to avoid applying pyrethroids insecticides which are hard on beneficial mites and have been shown to flare pest mite populations. Products containing abamectin, bifenezate, dicofol, spirodiclofen, fenpyroximate, hexythiazox, sulfur and etoxazole have varying levels of activity. For a complete list of registered products with these active ingredients, refer to the Michigan State University Extension publication, "Pesticides registered for use on hops in Michigan," and always read the label. Be sure to carefully note the pre-harvest interval if growers are approaching harvest.

Growers should carefully monitor their hops for potato leafhopper populations as significant numbers continue to be observed. Potato leafhopper adults and nymphs (wingless immatures) move in all directions when disturbed, unlike some leafhoppers that have a distinct pattern of movement. Some very small nymphs are actually clear, but have the characteristic shape of the adults when viewed using a hand lens. The nymphs and adults may also appear bright yellow-green in color.

Potato leafhoppers can't survive Michigan's winter and survive in the Gulf States until adults migrate north in the spring on storm systems. There is no set economic threshold for potato leafhoppers in hops; however, some hopyards are seeing significant damage at this time. Although hop plants are susceptible to potato leafhoppers, they can tolerate some level of feeding and growers should be conservative in the application of insecticides. Potato leafhopper feeding causes what growers have termed "hopper burn," a necrosis of the leaf margin in a v-shaped pattern giving leaves a yellowed or stunted appearance. Growers can agitate the bines and look for adults to take flight as a quick spot check, but should confirm their presence and prevalence by flipping leaves over and looking for adults and wingless nymphs on the underside of leaves.

Trained bines with leaves showing necrotic symptoms of "hopper burn" along the margins.

Growers needing to treat for potato leafhoppers can utilize products containing neonicitinoids (imidacloprid or thiamethoxam), pyrethroids (bifenthrin or beta-cyfluthrin), which may increase pest mite populations, organophosphates (malathion) or spinosyns (spinosad). Organic growers can utilize spinosad labeled as Entrust or pyrethrin labeled as Pyganic, both of which are OMRI-approved products for potato leafhopper management. For a complete list of registered products, see "Pesticides registered for use on hops in Michigan" and always read the label. Growers with quickly approaching harvest dates should also carefully consider the pre-harvest interval.

Most growers are seeing Japanese beetle adult activity subsiding. Japanese beetle adults are considered a generalist pest that affects many crops found on or near grassy areas, particularly irrigated turf. Japanese beetle grubs feed on grass roots in early spring and again in the fall and can cause significant damage to turf. They prefer moist soil conditions and do not survive prolonged periods of drought.

Adult Japanese beetles emerge in early July and feed on hundreds of different plant species. Adult beetles feed on the top surface of leaves skeletonizing the tissue. If populations are high, they can remove all of the green leaf material from between the veins on entire plants.

Japanese beetle adults are a substantial insect and measure 0.375 to 0.5 inches long. The thorax is green and wing covers are copper colored. There are five tufts of white hairs on both sides of the abdomen and a pair of tufts on the end of the abdomen that can help distinguish Japanese beetles from other look-alike species. The legs and head are black. Visual observation of adults or feeding damage is an effective scouting technique. Growers should scout along a transect through hopyards at least weekly until detection. Because of their aggregating behavior, they tend to be found in larger groups and are relatively easy to spot. Pheromone and floral baited traps are available and can help indicate the arrival of adults and estimate the potential pest pressure but are not considered effective for trapping out Japanese beetles. Growers considering the traps should remember that they may attract Japanese beetle adults from the surrounding area and contribute to damage.

There are no established treatment thresholds or data on how much Japanese beetle damage hops can sustain. Well-established and vigorous bines will likely not require 100 percent protection, but younger bines with limited leaf area will need to be managed more aggressively. Also, if flowers burrs are present and being fed on heavily growers should consider management.

Managing Japanese beetles can be a frustrating endeavor as they often re-infest from surrounding areas, especially during peak adult emergence in July. This re-infestation is often misinterpreted as an insecticide failure, but efficacy trials have shown that a number of insecticides remain effective treatment options. Malathion is effective, but can take up to three days to take effect and provides 10-14 days of residual control. Pyrethroids (bifenthrin or beta-cyfluthrin) have good knockdown activity, and seven to 10 days of residual control, but can be problematic in hopyards where mites are a concern. Pyrethroid use has been shown to flare spider mite populations, killing predatory mites which help keep pest mite populations in check. Neonicitonoids (imidacloprid or thiamethoxam) have contact toxicity for two to five days, and then a longer residual period of plant protection during which they act as an anti-feedant.

OMRI-approved organic options include neem-based products (azadirachtin), which have a one- to two-day residual and good knockdown activity, as well as Surround (kaolin clay), which

has had good results in blueberries and grapes and acts as a physical barrier and irritant. For a complete list of registered products, see "Pesticides registered for use on hops in Michigan" and always read the label.

Growers should continue to scout for and protect against downy mildew. Downy mildew management should begin as the first basal spike emerge and continue through harvest if necessary. Growers should be proactive in applying protectant early sprays as basal spikes emerged in the spring and continue to keep tissue covered with protectant fungicide applications every 10-21 days depending on product and weather. Downy mildew is caused by *Pseudoperonospora humuli* and can cause significant yield and quality losses, depending on variety and when infection becomes established. In extreme cases, cones can become infected and the crown may die.

Typically, downy mildew infections appear early in the season on the emerging basal spikes. Spikes then appear stunted, brittle and distorted. Infected leaves have angular water soaked lesions that follow leaf venation. Eventually, the water-soaked lesions turn brown and necrotic with fuzzy and gray-black asexual spore masses developing on the underside of infected leaf lesions. As bines continue to expand, new tissue becomes infected and fails to climb the string. Growers can attempt to retrain new shoots, but often incur yield loss as a result. At this time the most prevalent symptom of downy mildew is stunted side arm growth and dieback. We are also seeing downy mildew infections of cones in some areas.

The causal agent of downy mildew overwinters in dormant buds or crowns, moving into buds during early spring and then into the tissue of the basal spikes as shoots expand. The pathogen produces copious spores on the underside of infected leaves. According to "A Field Guide for IPM in Hops," infection is favored by mild to warm temperatures of 60 to 70 degrees Fahrenheit when free moisture is present for at least 1.5 hours, although leaf infection can occur at temperatures as low as 41 F when wetness persists for 24 hours or longer.

It takes a multipronged approach to manage for downy mildew. Growers should utilize a protectant fungicide management strategy to mitigate the risks of early and severe infections. Keep in mind that varieties vary widely in their susceptibility to downy mildew and select the more tolerant varieties when possible. Clean planting materials should also be selected when establishing new hopyards since this disease is readily spread via nursery stock. It is also recommended that growers pull all basal foliage during spring pruning. All pruning materials should be removed from the hopyard and covered up or burned to reduce inoculum.

Cultural practices alone are not enough to manage downy mildew. Well timed fungicide applications just after the first spikes emerge and before pruning have been shown to significantly improve infection levels season long. Subsequent fungicide applications should be made season long and in response to conducive environmental conditions (temperatures above 41 F and wetting events). Protectant fungicide strategies are particularly important during the year of planting to minimize crown infection and limit disease levels in the future. Fungicides containing copper, boscalid, pyraclostrobin, phosphorous acids, and a number of biopesticides have varying activity against downy mildew.

For organic growers, OMRI-approved copper formulations are the most effective. Washington State University has documented resistance in the downy mildew pathogen, *Pseudoperonospora humuli,* to fosetyl-Al, the active ingredient in Aliette. Based on these findings, growers are cautioned from relying on Aliette for downy mildew management.

Aliette is not compatible with copper. For a complete list of fungicides labeled for the control of downy mildew on hops, see "Pesticides registered for use on hops in Michigan."

If you already have downy mildew established in your hopyard, cultural practices will be very important in regaining ground as the season progresses. According to Oregon State University, diseased shoots on the string should be removed by hand and healthy shoots retrained in their place. Remove superfluous basal foliage and lower leaves to promote air movement in the canopy and to reduce the duration of wetting periods. If there is a cover crop, it should be mowed close to the ground. If yards have no cover crop, cultivation can help dry the soil and minimize humidity. Keep nitrogen applications moderate.

It is important that growers do not mistake downy mildew for powdery mildew as the effective pesticide classes are completely different. Powdery mildew has **not** been confirmed in Michigan and is caused by *Podosphaera macularis*, a completely different pathogen than what causes downy mildew. If you think you have powdery mildew in your hopyard please contact Erin Lizotte at taylo548@msu.edu.

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MICHIGAN CHESTNUT UPDATE – July 31, 2014

European red mite populations are building in area orchards and potato leafhopper damage is becoming more apparent. Growers should be scouting for these pests regularly and monitoring pressure.

Posted on **August 1, 2014, MSUE News,** by **Erin Lizotte**, Michigan State University Extension

Chestnut development in northwest Michigan as of July 30, 2014. Photo credit: Erin Lizotte, MSU Extension

Growing degree day (GDD) accumulation is significantly different along the western portion of the state with the weather drying out for most areas. As of July 31, the Benton Harbor Enviro-weather station has accumulated 1,505 GDD50 with 0.19 inches of rain over the past week; the Clarksville Enviro-weather station has recorded 1,359 GDD50 and 0.13 inches of rain; the Bear Lake Enviro-weather station has accumulated 1,181 GDD50 and 0.03 inches of rain; and the Northwest Michigan Horticultural Research Center accumulated 1,199 GDD50 with just under 0.52 inches of rain this past week. Burrs are sizing nicely in the northwest.

Spider mite populations have increased over the past weeks as the weather has dried out. At this time we are observing a large number of adults, larvae and eggs in Michigan orchards. Chestnut trees are susceptible to feeding damage from a number of spider mite species including European red mite and two-spotted spider mites. Affected leaves appear mottled or bronzed and become brittle leading to early defoliation and reduced photosynthetic activity (see photos below). Reduced photosynthesis can lead to reduced nut size and return crop load in subsequent years as well as increased sensitivity to winter injury. At this time, no treatment thresholds are established for mites in chestnut, but evidence from crops like cherries indicate that some level of feeding is likely tolerable and that higher populations can be tolerated as the season progresses through summer.

Left, Chestnut leaves bronzing from European red mite feeding. Note the mites are visible as tiny, red specks. Right, Magnified European red mite adult with egg next to leaf vein. Photo credits: Erin Lizotte, MSU Extension

European red mites overwinter as eggs in bark crevices and bud scales. Eggs are small spheres, about the size of the head of a pin with a single stipe or hair that protrudes from the top (this is not always visible). Eggs can be viewed with a hand lens or the naked eye once you have established what you are looking for. Growers can scout for overwintering eggs early in the spring to assess population levels in the coming season. As temperatures warm, overwintering eggs hatch and immature mites called larvae move onto the emerging leaves and start feeding. Adult European red mites are red and have hairs that give them a spikey appearance (see photo above of European red mite). The larvae appear as smaller versions of the adult.

Adult and larval feeding occurs on the upper leaf surface in chestnut, likely due to the velvety underside of the leaves. The first generation is the slowest of the season and typically takes a full three weeks to develop and reproduce. This slow development is due to the direct link between temperature and mite development. Summer generations, favored by the hot and dry

weather, are able to complete their lifecycles much faster with as little as 10 days between generations under ideal conditions.

Growers should also be looking for two-spotted spider mites when scouting. Two-spotted spider mite larvae and adults have two distinct spots located on the front half of the body. Eggs are spherical and translucent and are often found along leaf veins. Nymphs and adults can be a variety of colors, depending on the time of the year and stage of development. Potential colors include orange, brown, pale yellow or green, so growers are encouraged to use the spots as the key identification characteristic.

Two-spotted spider mites overwinter as adults around the base of trees in the duff. As the weed or grass cover under the trees dries out, two-spotted spider mites start to move back up into the canopy in higher numbers from tight cluster through harvest. Like European red mites, two-spotted spider mites damage the tree by feeding on the foliage and give the leaves a dirty appearance when populations become high and leaf surfaces are coated in eggs, discarded exoskeletons from molting and webbing.

Two-spotted spider mite adult alongside clear, hatched egg. Photo credit: Erin Lizotte, MSU Extension

Mite control starts with monitoring early in the spring, looking for the overwintering European red mite eggs and two-spotted spider mite adults and includes tracking the mite pressure over time. Ideally, growers should limited broad spectrum insecticides (e.g., pyrethroids) in their insect management programs as that helps protects beneficial mite populations which provide for natural control. If pest mite populations are high enough to require control, dormant superior oil applications are an effective method of treatment and should be applied in the spring. Ensuring adequate coverage is critical to attaining optimal control on problem sites as oil alone acts to smother mites and eggs. If you are applying an oil with an additional insecticidal property, such as those containing the neem extract azadirachtin, coverage is still critical as many are insect growth regulators and have antifeedant properties. Oil application comes with a risk of phytotoxicity, particularly as green tissue emerges.

It is recommended that growers do a small test spray if they have not used dormant oils in the past. Keep in mind that different cultivars may have different sensitivities and proceed with caution. Severely stressed trees should never be sprayed with oil and growers are advised to keep in mind that temperature and humidity also play a role in the risk of phytotoxicity. Temperatures above 80 degrees Fahrenheit and slow drying time (high humidity) increase the chance of damage. Oil also has some potential compatibility issues growers should be aware of including Captan and sulfur.

Lastly, it is not recommended that oil be applied within a 48-hour window prior to and following freezing temperatures due to decreased efficacy and potential plant damage. Read and follow all label directions carefully to minimize the risk of spray damage.

If populations build to damaging levels in the summer months, growers should focus on applying true miticides when treatment is necessary. Active ingredients with activity against mites include abamectin, fenpyroximate, pyridaben, spirodiclofen, etoxazole, hexythiazox, acequinocyl, and bifenezate. Refer to the Michigan State University Extension publication, "Pesticides Registered for Edible Chestnuts, 2014" for labeled products containing these active ingredients. Again, growers should avoid the application of pyrethroids to reduce future mite flaring.

As growers are scouting, they are encouraged to remember that not all mites are bad. Consider documenting the levels of predacious mites in your orchard. If healthy populations of mite predators exist, they will continue to feed on plant parasitic eggs and nymphs and can be an effective component of your mite management program. The three most important predaceous mites are *Amblyseius fallacis* (Phytoseiidae), *Agistemus fleschneri* (Stigmaeidae), and *Zetzellia mali* (Stigmaeidae). See "A Pocket Guide for IPM Scouting in Michigan Apples" for pictures. Predaceous mites are smaller than adult European red mites and two-spotted spider mites, but they can be seen with a hand lens and typically move very quickly across leaf surfaces.

Potato leafhopper populations continue to thrive with a significant number of adults, nymphs and eggs on many host crops around the state. Like many plants, chestnuts are sensitive to the saliva that potato leafhoppers inject while feeding. Damage to leaf tissue can cause reduced photosynthesis, which can impact production, decrease nut quality and damage the tree.


Left, A cupped leaf with necrotic edges caused by potato leafhopper feeding. Right, a wingless potato leafhopper nymph on the underside of a leaf. Photo credits: Erin Lizotte, MSU Extension

Early detection is important to prevent injury. Spring scouting should be performed following storm systems originating in the southern United States and weekly after first detection to monitor populations and treatment efficacy. For every acre of orchard, growers should select five trees to examine and inspect the leaves on three shoots per tree, a total of 15 shoots per acre. The easiest way to observe potato leafhoppers is by flipping the shoots or leaves over and looking for adults and nymphs on the underside of leaves. Pay special attention to succulent new leaves on the terminals of branches. Growers may also shake branches and watch for the winged adults to take flight as a quick test.

Symptoms of feeding appear as whitish dots arranged in triangular shapes near the edges. Heavily damaged leaves are cupped with dead or yellowing chlorotic margins and eventually fall

from the tree. Severely infested shoots produce small, bunched leaves with reduced photosynthetic capacity.

The most common classes of insecticides recommended for control of potato leafhoppers include the pyrethroids (bifenthrin, beta-cyfluthrin, cyfluthrin, gamma-cyhalothrin, lambdacyhalothrin, pyrethrins, zeta-cypermethrin, deltamethrin and fenpropathrin), carbamates (carbaryl), neonicotinoids (imidacloprid, thiamethoxam, acetamiprid and clothianidin) and organophosphates (malathion and phosmet). Refer to "Pesticides Registered for Edible Chestnuts, 2014" for labeled products containing these active ingredients. Carbamates and organophosphates are broad spectrum and can disrupt natural enemies, so only use when necessary to rotate insecticidal mode of action or to target another pest at the same time. Pyrethroids are also effective at controlling potato leafhoppers and remain relatively inexpensive. However, pyrethroids have been shown to cause increases in mite populations in other crops and should be used judiciously, particularly early in the season when mite populations have time to build over the season. Neonicotinoids are longer lasting and narrow spectrum making them a solid choice for management.

Japanese beetle activity is subsiding for most growers; some reported relatively high populations this season. **Obliquebanded leafroller** activity is picking up again with larvae of various sizes rolling leaves in area orchards. Obliquebanded leafrollers feed on leaves and are not considered to be of economic significance for chestnut producers.

Left, Chestnut leaf tip rolled under by an obliquebanded leafroller. Right, Obliquebanded leafroller larva. Photo credits Erin Lizotte, MSU Extension

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Time to scout for chestnut blight on European and Japanese hybrid cultivars

‘Colossal,’ ‘Nevada,’ ‘Precoce Migoule’ and other cultivars are susceptible and should be checked for chestnut blight cankers in July.

Posted on **August 1, 2014** by **Dennis Fulbright**, Michigan State University Extension, Department of Plant, Soil and Microbial Sciences

Photo 1. A chestnut blight canker at the base of European X Japanese hybrid cultivar ‘Colossal’ in a Michigan orchard. The canker symptom can appear anywhere on the tree, however cankers at the base of the trunk and in the crotches of the trees are common.

There are few diseases of chestnut trees in North America. However, the one disease chestnut trees have, chestnut blight, is still thought of as one of the worst tree diseases in history.

Chestnut blight has killed more chestnut trees around the world than any other forest disease. The fungus that causes chestnut blight can be traced from China and Japan where it did not cause much disease when compared to North America and Europe where it killed several billion trees. More recently it was found in Australian chestnut orchards and they destroyed several orchards and thousands of trees to hopefully eradicate this disease.

Chestnut blight has the deserved reputation of being impossible to manage when growing chestnut blight-susceptible trees, such as American chestnut. The only species with resistance to the blight fungus are Chinese and Japanese chestnut trees. In Michigan, we primarily grow Chinese trees or European X Japanese hybrid cultivars. While the Chinese trees are chestnut blight-resistant, the European X Japanese hybrid cultivars are not. Some European X Japanese hybrid cultivars may be more tolerant to the disease than others. Tolerance means the blight may take a longer time to infect the tree, or the blight may infect, but the tree does not die.

We know that the cultivar ‘Colossal,’ our highest yielding tree producing the largest nut, is blight-susceptible. It may be slightly less susceptible than American chestnut, but it will still die from chestnut blight. The cultivars ‘Nevada’ and ‘Precoce Migoule’ are also susceptible and we have observed blight in orchards with these trees. We are hopeful that other European X Japanese hybrid cultivars will show more resistance than ‘Colossal,’ ‘Nevada,’ and ‘Precoce Migoule.’ The cultivar ‘Labor Day,’ which can pollinize European X Japanese hybrid cultivars, is blight-resistant and we have not observed blight on the other European X Japanese hybrid cultivars in our orchards.

We could inoculate the trees with specific blight strains to determine if they are resistant, tolerant or susceptible, but that is very hard on the trees and those tests may not give an accurate, natural response. For example, even the chestnut blight-resistant Chinese chestnut trees can act susceptible when directly inoculated with the blight fungus. So, we will wait and see the natural response of the various European X Japanese hybrid cultivars that we will be planting in Michigan's future orchards. These might include the cultivars 'Bouche de Betizac,' 'Marki,' 'Marsol,' 'Maraval' and 'Marigoule.' 'Bouche de Betizac' and 'Marki' are both pollen sterile, but the others produce pollen.

What does chestnut blight look like?

For those of you who have planted 'Colossal,' 'Nevada' (most of these have died from cold winters), 'Precoce Migoule' and other European X Japanese hybrid cultivars, you should scout your trees closely for chestnut blight symptoms (Photo 1).

The primary symptom is called a canker and it is a bark infection where the fungus is actively growing within the bark. As the canker enlarges and begins to girdle the branch or stem, other symptoms such as yellowing leaves, small leaves, leaf drop, dying branches, shoots developing on branches within the canopy of trees may occur. These shoots usually form beneath the canker and can be used as signals of infection higher up in the tree.

One of the most common symptoms can be a massive amount of sprouting at the base of the tree. Many things can cause sprouting to occur other than chestnut blight, and just because you have basal sprouts does not mean you have chestnut blight, but you need to check periodically. This is a good time to scout for blight as the active cankers are producing spores now (Photo 2). The spores come from an orange, very small structure in the outer bark called stroma.

Photo 2. Close-up of a chestnut blight canker producing spores.

These fungal reproductive structures are bright orange this time of year and are easy to see. If you are growing European X Japanese hybrid cultivars and wonder if you have chestnut blight, walk your orchard and scout for the cankers where orange stroma may be appearing. Sometimes sunscald or southwest disease is similar to the kind of symptom caused by chestnut blight. If you allow the chestnut blight cankers to get to large before you contact your nearest Michigan State University Extension expert, you may lose the tree.

What can be done?

First, you can remove the branch or the tree and burn or bury it. If you do not dispose of the infected bark, the blight spores will continue to spread within the orchard. Second, the most advanced treatment for chestnut blight on European X Japanese hybrid cultivars is to treat the cankers with a biological control discovered in Michigan on surviving American chestnut trees. Michigan is the only state in North America where American chestnut trees are surviving chestnut blight due to this natural biological control. We know this biological control can spread on a tree and between trees. We have pursued research on the spread of this naturally occurring biological control in a Wisconsin American chestnut forest.

To make a long (20 years) story short for this article, we make wounds in the bark around the canker on the tree and apply a salve made up of the chestnut blight fungus naturally infected with a virus found in the Michigan recovering American chestnut stands. The virus we are testing is from a stand of trees from Grand Haven, Michigan. This virus, called a “hypovirus,” only infects the chestnut blight fungus. When present, it weakens the blight fungus and the fungus has trouble causing disease—the tree can survive the infection. When the hypovirus infects the fungus, we say the fungus is hypovirulent or less able to kill the tree. So, when we find cankers, we wound the outside of the canker, place the hypovirus containing blight strain on the canker, the hypovirus moves into the strain causing the canker, and the tree begins to heal the canker with wound tissue.

In 2011, we began research using this Michigan-based, naturally occurring biological control on European X Japanese hybrid cultivars on the MSU campus. We are also willing to treat cankers in chestnut orchards that may provide research opportunities for us. In 2014, we have been working in seven different European X Japanese hybrid cultivar orchards around the state. Photo 3 shows how, within a year, the chestnut blight canker, treated with the biological control, slows down the expansion of the canker allowing wound tissue to heal over the canker. In the photo, it can be seen that the canker was scratched and then the hypovirulent fungus applied. The swelling at the edges is due to wound tissue produced by the tree. There is a reduction of orange stroma indicating the blight fungus is not reproducing and the expansion of the canker is stopped.

Photo 3. A side view of a chestnut blight canker on 'Colossal' treated with the naturally occurring biological control. The canker stops expanding around the trunk. Few reproductive structures called stroma are present. A ridge of wound tissue swells at the edge of the canker

If you think you have chestnut blight, email Dennis Fulbright at fulbrig1@msu.edu , and then you can send a sample. Simply cut a small piece of the bark off the tree the size of a postage stamp. The bark must have the orange pimples or stroma present on it. Mail to Dennis Fulbright, Dept. of Plant, Soil and Microbial Sciences, 612 Wilson Rd., East Lansing, MI 48824-1312. Email Dennis Fulbright at fulbrig1@msu.edu with additional photos or questions.

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SOUTHWEST GRAPE PRE-HARVEST MEETING

Date: August 21, 2014
Time: 5:00 pm - 8:00 pm
Location: Lemon Creek Winery, 533 E. Lemon Creek Rd., Berrien Springs, MI 49013
Contact: Brad Baughman, Berrien County Horticulture Extension Educator.
baughm30@anr.msu.edu (269)-944-0157

Southwest Grape Preharvest Meeting Thursday, August 21st 5-8 p.m. Lemon Creek Winery 533 E. Lemon Creek Road, Berrien Springs, MI 49103. This meeting is an opportunity for the grape grower and processor community of Southwest Michigan to discuss the challenges and successes of the growing season thus far, spray decisions leading up to harvest, recovery from 2013-2014 winter injury, and other issues with each other and with experts from Michigan State University (MSU). Dinner is included in registration and will be served at 5 p.m. 2 RUP recertification credits have been requested. Topics and speakers will be: "Rebuilding winter-injured vineyards" (Tom Zabadal, SW Michigan Research and Extension Center), "Pre-harvest insect management decisions" (Rufus Isaacs, MSU Department of Entomology), "Late-season disease management" (Annemiek Shilder, MSU Department of Plant, Soil, & Microbial

Sciences), "Canopy management after winter injury" (Paolo Sabbatini, MSU Department of Horticulture) Cost: $15 per person.

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WEBSITES OF INTEREST

This issue and **past issues of the weekly FruitNet** report are posted on our website:
http://agbioresearch.msu.edu/centers/nwmihort/nwmihort_northern_michigan_fruit_net

Insect and **disease** predictive information is available at:
http://enviroweather.msu.edu/homeMap.php

60 Hour Forecast:
http://www.agweather.geo.msu.edu/agwx/forecasts/fcst.asp?fileid=fous46ktvc

Information on **cherries** is available at the new cherry website:
http://www.cherries.msu.edu/

Information on **apples**:
http://apples.msu.edu/

Fruit CAT Alert Reports have moved to MSU News:
http://news.msue.msu.edu