

Northern Michigan FruitNet 2018

Northwest Michigan Horticultural Research Center

Weekly Update

FruitNet Report – February 7, 2018

CALENDAR OF EVENTS

3/7

NW MI Agriculture Labor Meeting
NWMHRC, 9AM

What's New?

- **Watch the 2017 Spotted Wing Drosophila Summit Presentations Online**
- **Shining a light on agricultural solar energy development**
- **4-H Tractor Safety Registration Now Open!**
- **Learn About Emerging Tools for Visualizing, Mapping and Managing Land in Michigan**
- **2017 research update on managing brown marmorated stink bugs in U.S. specialty crops**

New Articles

Watch the 2017 Spotted Wing Drosophila Summit Presentations Online

Did you miss the Summit? View presentations online!

Spotted wing drosophila continues to be a top priority of Michigan's cherry industry. To provide the industry with the most up-to-date SWD information, MSU Extension and the Cherry Marketing Institute hosted the 2017 Spotted Wing Drosophila (SWD) Summit in late November. Growers, consultants, industry representatives, and researchers attended this day-long summit to learn about the accomplishments of the SWD Task Force's recent grant funded research – topics included SWD monitoring, insecticide testing, orchard modifications to reduce SWD populations in orchards, winter morphs, and on-farm management programs.

If you missed this important meeting, video recordings and PowerPoints of presentations of select presentations are now available online at

http://www.canr.msu.edu/nwmihort/nwmihort_resources_and_reports#2017SWD.

Shining a light on agricultural solar energy development

Meetings designed to assist farmers in understanding solar lease agreements and the implications on property rights and taxes / March 8 in Traverse City



Since the first part of the year, solar companies have been actively contacting farm owners in an effort to secure land for solar energy projects. This is in response to the Michigan Public Service Commission raising the avoided cost of electricity to 9.5 cents per kWh. At this rate, solar projects are profitable. The new tariff on imported solar modules will most likely have little effect on this activity. The prevailing industry thought is that the cost of a solar project will probably increase 10 to 15 cents per dc watt, which puts projects at about the same cost as they were in September 2016, a banner year for solar projects.

The real issues that need to be addressed are local government zoning provisions and the tax implications if a farmer chooses to sign a lease agreement for a solar project. In an effort to help farmers understand the renewable energy landscape, nuances of solar leases, zoning considerations and accompanying tax implications, MSU Extension and Michigan Farm Bureau are holding programs for farmers at various locations around the state. MSU Extension staff with lease agreement, tax and zoning expertise will provide

the educational content. Farmers who participate in the programs will leave with valuable, practical knowledge they can use to determine if a solar lease agreement is a sound decision for themselves and their community. The program will cover the following topics:

- The context for solar energy development on Michigan farmland
- A community vision for solar energy systems
- Zoning approaches for solar energy
- Siting considerations for utility-scale solar
- Integrating solar with existing ag systems
- Understanding solar energy lease agreements
- Taxation guidance including the impact on PA 116

Meetings will be held around the state on the following dates and locations:

- March 7 - Powers
- March 8 - Traverse City
- March 13 - Big Rapids
- March 14 - Frankenmuth
- March 15 - Tecumseh
- March 21 - Ionia
- March 22 - Three Rivers

All programs run from 10 a.m. - 2:30 p.m., except for Tecumseh, which begins at 10:30 a.m. (doors open for all other locations at 9:30 a.m.).

To register for a meeting or for further information, go to <https://events.anr.msu.edu/shine>. The registration deadline is midnight Sunday, March 4. The registration fee is \$20/person because of the generous financial support provided by Michigan Farm Bureau. Preregistration is required and registration will not be available onsite.

If you have questions about the agriculture solar leasing meetings or would like more information on energy efficiency practices or renewable energy projects, feel free to contact Charles Gould at 616-994-4547 or gouldm@msu.edu.

4-H Tractor Safety Registration Now Open!

Teens can improve their chances of employment by completing a tractor safety training. MSU Extension will host a **4-H Tractor Safety Program** for 14 and 15-year-old youth on **Wednesdays, April 4, 11, 18, 25 from 6-8:30 pm** at the NW Michigan Horticultural Research Center, (between Suttons Bay and Traverse City, Michigan in Leelanau County).

The written and driving **test** will be held on **Saturday, May 5 from 8:30am – 2:30pm.**

Participants must attend all five sessions to become certified. The cost is **\$85 per student**, which includes the \$20 4-H participation fee, classes, manual, certificate and lunch on test day. Some scholarships are available if finances are an issue. Youth must be 14 years of age by June 1, 2018. Space is limited. The registration deadline is March 23, 2018.

Registration is online only in a two-step process. First, register and pay at <https://events.anr.msu.edu/TractorSafety2018/>, and second, become a 4-H member and create a profile online at www.4honline.com. For more information, contact **Rosali Collier** Leelanau County 4-H Program Coordinator at collierr@anr.msu.edu or 231-256-9888.

Learn About Emerging Tools for Visualizing, Mapping and Managing Land in Michigan

Wednesday, February 21, 2018
6:30 – 8:30PM

Boardman River Nature Center Community Room
1450 Cass Road, Traverse City

A presentation by Trevor Hobbs, owner of Contour Geographic LLC for landowners, foresters, ecologists, conservationists, or anyone with a love for maps, land information, geography, geology and local natural history.

This presentation will focus on two mapping technologies that are rising in popularity and use in Michigan: LiDAR and UAV photogrammetry. LiDAR (which stands for “Light Detection and Ranging”) detects the shape of the terrain and the 3D composition of forests in unprecedented detail. The technology allows us to see very subtle glacial landforms and patterns on the landscape, which were not possible to visualize before – even from the ground with your own eyes. In addition to LiDAR, the rising use of the Unmanned Aerial Vehicles (UAVs or “drones”) has presented conservationists and land owners with new opportunities to map land and natural resources in even higher detail than LiDAR – simply by collecting a series of overlapping photos. With recent advances in digital image processing, aerial photos can be turned into accurate maps and 3D models of landscapes, forests, dunes, rivers – almost anything. Topics to be presented on include:

- Forest inventory and mapping
- Coastal dune monitoring

- A tour of glacial features in NW Lower Michigan
- Soils as seen from above
- Maps for landowners
- Presenting a few Forest Atlas for NW

This program has been reviewed and is approved for professional CFE credits by the society of American Foresters for 1.5 Category 1 credits. Cost is \$10/person due by February 19 by contacting klong@leelanaucd.org or 231-256-9783.

2017 research update on managing brown marmorated stink bugs in U.S. specialty crops

Highlights of the USDA NIFA project researching management options for brown marmorated stink bugs in U.S. specialty crops.

Posted by **Mike Haas**, and Larry Gut, Michigan State University, Department of Entomology, MSUE News

For more information contact haasm@anr.msu.edu



Brown marmorated stink bugs on an apple near Niles, Michigan. Photo by Bill Shane, MSU Extension.

The first report of [brown marmorated stink bug](#) in the U.S. came from Pennsylvania in the late 1990s. It has been found in most of the continental U.S. with the exception of a few states. Since it was first detected in Michigan in 2010, brown marmorated stink bugs have continued to spread and grow in numbers. It is likely present in all counties in the Lower Peninsula. We have seen it progress from a household nuisance pest to an agricultural pest that is responsible for localized tree fruit injury, primarily in apples, each

year. Michigan State University began conducting studies in 2011 to understand brown marmorated stink bug movement within the state and how this pest will affect the Michigan tree fruit industry.

This article provides a brief summary of some of the research produced by the institutions participating in a project titled “Management of Brown Marmorated Stink Bug in U.S. Specialty Crops” funded by the [United States Department of Agriculture](#) (USDA) and [National Institute of Food and Agriculture](#) (NIFA). It is not a detailed summary of all the work being conducted within this project, but provides highlights from areas of the project that may be of interest to Michigan growers.

Tracking movement by means of trapping

Researchers continue to track the movement and abundance of brown marmorated stink bugs. The largest populations and the most widespread damage to tree fruits is in the Mid-Atlantic region. In Michigan, we have seen brown marmorated stink bug numbers slowly build and currently the majority of the population is found in the southern third of the state with the highest numbers in the southern two tiers of counties. Damaging levels of brown marmorated stink bug do occur in localized areas north of this area and have produced fruit injury on individual farms north of Grand Rapids, Michigan, in the Ridge area.

The information required to detect the movement and relative numbers comes from trapping. A great deal of effort has gone into finding the most effective trap and lure. A variety of trap styles exist, but the pyramid trap baited with an attractant lure has been the standard way to detect brown marmorated stink bugs. Lures continue to be improved and the current standard is a two-part lure comprised of an aggregation pheromone and an attractant from a related stink bug.

A side-by-side comparison of the pyramid trap with an easier to use clear sticky trap on a 4-foot wooden stake using the same two lures has shown that the pyramid trap catches more stink bug adults than the clear sticky trap early in the season, and more adults and nymphs late in the season, but similar numbers mid-season. Importantly, the number of captured stink bugs on the clear sticky traps is positively correlated with the catch from the pyramid traps, which means the clear sticky traps could replace the pyramid traps and be used to determine presence, relative numbers and seasonal movement.

The pyramid trap was improved by replacing the dichlorvos strip killing agent with a piece of pyrethroid-impregnated netting. The pyrethroid in this case is deltamethrin. The netting is similar to mosquito netting used in malaria prevention programs and is commonly referred to as long-lasting insecticide netting. The benefits are that it lasts for the entire trapping season and is much safer to handle due to its low mammalian toxicity. Long-lasting insecticide netting also shows promise as a means of trapping brown marmorated stink bugs.

Using biological control agents

The most promising biological control agent continues to be a wasp parasitoid (parasites do not kill their host, but parasitoids do kill them) known as the samurai wasp, *Trissolcus japonicus*. This tiny wasp puts its own eggs into the stink bug's eggs, and the developing wasp larvae use the stink bug egg for food until they emerge. In Asia, where brown marmorated stink bug originally came from, 60-90 percent of the eggs are parasitized by this wasp. Researchers in the U.S. have determined that the wasp highly prefers brown marmorated stink bug eggs over one of our native stink bugs eggs, spined soldier bug, so they should have little-to-no impact on them.

The USDA has yet to approve the general release of these wasps, but it is under review and could potentially happen at any time. Interestingly, like brown marmorated stink bugs, this wasp has been transported across the ocean. To date, populations have been detected in some Mid-Atlantic states and the Pacific Northwest and are slowly spreading on their own. However, if permission would be given by the USDA, they could be mass-reared and released where they would produce the greatest benefit.

Additionally, other brown marmorated stink bug predators and parasites, ones native to the U.S., have been identified and are being evaluated for their effectiveness. The particular insects attacking brown marmorated stink bugs vary according to habitat in each area. So far, the incidence of attack for these homegrown natural enemies of brown marmorated stink bugs is low.

Protecting natural enemies

Another area of interest is looking for ways to protect natural enemies from the negative effects of control procedures used against brown marmorated stink bugs. By carefully managing insecticide use, natural enemies may be preserved. One way to manage insecticide use is by establishing threshold levels for the pest. Determining an accurate threshold level requires testing over several years and in many orchard environments.

Research in West Virginia apple orchards has shown that a threshold of 10 brown marmorated stink bugs per trap can lower insecticide use by 40 percent compared to a grower standard program. A different trapping study compared brown marmorated stink bug captures in traps placed adjacent to wooded areas next to orchards to traps placed within orchards. The interior placement resulted in fewer nymphs captured, but adult catch was similar. However, there is still no clear relationship between the number of brown marmorated stink bugs captured in a trap and the amount of injury this level will cause in the orchard.

Insecticide assays in North Carolina showed that out of four Organic Materials Review Institute (OMRI)-approved materials (Entrust, Neemix, Pyganic, Azera), Entrust was the most harmful to two native parasitoid wasp species, even when exposed to 0.1X of the field rate. However, when exposed to residues of sugar-laced pesticides, only the lowest rate of Neemix had no impact.

In an Oregon study, more than half of the wasps exposed to dry residues of Actara, Asana or Admire Pro died within an hour of exposure. After 24 hours, mortality was greater than 75 percent for those materials and for Entrust and Exirel, but not for Altacor.

Using perimeter sprays and insecticide netting

A promising management tactic is attract-and-kill using pheromone-baited perimeter trees that receive either a regular insecticide application or have long-lasting insecticide netting within the canopy. Seven- and 14-day spray intervals using attract-and-kill or perimeter sprays were compared to 10 adults per trap (cumulative) threshold sprays of two alternate row middle applications and to a control. If the cumulative threshold level was met in the attract-and-kill or in the threshold spray plots, it also triggered two consecutive alternate row middle sprays.

Fruit injury was significantly reduced in the apple blocks using the perimeter sprays on seven- or 14-day intervals in the blocks using attract-and-kill with sprays at seven- and 14-day intervals or with long-lasting insecticide netting, and in blocks treated after reaching threshold levels of brown marmorated stink bugs, compared to the grower standard. This suggests perimeter sprays are an effective management tactic to employ against brown marmorated stink bugs.

Long-lasting insecticide netting placed in attract-and-kill trees in a vertical orientation killed more brown marmorated stink bugs than when the fabric was oriented horizontally. The level of injury to peaches and apples under grower standard programs was similar to the injury found when just orchard perimeters consisting of the exterior row plus one row toward the interior were sprayed. This did not hold for peaches if the orchard was 10 acres or more in size.

Another use of long-lasting insecticide netting is to drape a 5-foot by 5-foot section of it over a pole or fence and attach an attractant to the netting. Several of these are placed on the orchard perimeter between woods and the orchard. Brown marmorated stink bugs attracted to the lure come into contact with the pesticide in the netting and die. This may allow for interception of the adults before they enter the orchard resulting in less fruit damage.

Multi-state research efforts allow researchers to quickly acquire information that would take individual states or regions many years by themselves. Most of these experiments will be repeated in 2018 and new ones will be added as we continue to grow the knowledge base that allows us to successfully meet the challenges that brown marmorated stink bugs bring to the tree fruit industry.

Collaborators in this work include participants from 17 states including tree fruit personnel from [MSU's Department of Entomology](#). The other participants are North Carolina State University; Penn State University; Oregon State University; University of Maryland; University of Georgia; Washington State University; Cornell University; Utah State University; Rutgers University; The Ohio State University; University of Kentucky;

University of California – Davis, Riverside and Berkeley; Virginia Tech; University of Minnesota; the North Central IPM Center and the Agricultural Research Service.

Articles featured in past FruitNet Reports

Save the date! March 7th NW MI Agriculture Labor Meeting

The Migrant Resource Council is partnering with MSU Extension to host a daylong program that will address current labor issues that challenge northwest Michigan agriculture communities. This year, we are pleased to host a variety of speakers to discuss how to attract, recruit, and retain farm workers as well as provide attendees with current migrant housing needs. This meeting will also feature childcare and education resources for children of farm workers and other organizations that can help employers ensure that their farm workers' families grow in healthy and safe environments. The meeting will kick off at 9:00 AM on March 7th at the Northwest Michigan Horticulture Research Center. Stay tuned for further details!

National team will present latest information on biological control of spotted wing *Drosophila*

The free Feb. 23, 2018, webinar will include an update on spotted wing *Drosophila* research in Michigan.

Posted by [Rufus Isaacs](#), Michigan State University Extension, Department of Entomology, MSUE News



Female spotted wing *Drosophila*. Photo by Danielle Kirkpatrick, MSU Entomology.

A team of researchers from across the United States, including those from [Michigan](#)

State University Department of Entomology, has been collaborating to improve management of spotted wing Drosophila. This invasive pest has challenged producers of berries and cherries across the United States and around the world in recent years. A key component of the project is to learn the role of biological control in controlling spotted wing Drosophila and to discover new biocontrol agents.

To update growers and other stakeholders, the team will report on the current state of their research during a one-hour webinar on Feb. 23, 2018, from 12 to 1 p.m. Titled “Good Bugs vs Bad: Using Biological Controls in SWD Management,” this webinar will include an overview of the project, an update on the native biocontrol agents that have been found in surveys at farms from Oregon to Maine, and the latest information on their search for parasitic wasps from Asia. Heather Leach of MSU Entomology will be one of the presenters on the webinar and will give an update on research in Michigan.

This webinar is free and open to all thanks to funding from the USDA Specialty Crop Research Initiative. Register with your name and email address at Good Bugs vs Bad: Using Biological Controls in SWD Management.



Good Bugs vs Bad: Using biological controls in SWD management



A webinar presentation from the
Sustainable SWD Management SCRI Project



February 23, 2018
12 – 1 pm ET



Register at: <http://bit.ly/2EhwgPf>



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WEB SITES OF INTEREST:

Farmer to Farmer - Connecting Farmers, Cultivating Community

<http://www.f2fmi.com>

Insect and disease predictive information is available at:

<http://enviroweather.msu.edu/homeMap.php>

This issue and past issues of the weekly FruitNet report are posted on our website:

http://www.canr.msu.edu/nwmihort/nwmihort_northern_michigan_fruit_net

60-Hour Forecast:

<http://www.agweather.geo.msu.edu/agwx/forecasts/fcst.asp?fileid=fous46ktvc>

Information on cherries:

<http://www.cherries.msu.edu/>

Information on apples:

<http://apples.msu.edu/>

Information on grapes:

<http://grapes.msu.edu>