

Northern Michigan FruitNet 2014

Northwest Michigan Horticultural Research Center

Weekly Update

July 15, 2014

CALENDAR OF EVENTS

- 7/22-24 35TH Annual Ag Expo
Michigan State University
- 8/15 Hops Field Day
- 9/4 NWMHRC Open House – 35th Anniversary

GROWING DEGREE DAY ACCUMULATIONS AS OF July 14 AT THE NWMHRC

Year	2014	2013	2012	2011	2010	2009	24 Yr. Avg.
GDD42	1579	1705	2200	1612	2036	1515	1722.7
GDD50	972	1101	1425	987	1270	868	1061.2

Growth Stages at NWMHRC (July 14, 2014, 1:30 p.m.)

- Apple:** Red Delicious – 40 mm fruit
Gala – No fruit
Yellow Delicious – 40 mm fruit
- Pear:** Bartlett: 22 mm fruit
- Sweet Cherry:** Hedelfingen: 21 mm fruit
Napoleon: 23 mm fruit
Gold: 19 mm fruit
- Tart Cherry:** 19 mm fruit
- Balaton:** 17 mm fruit
- Apricot:** 40 mm fruit
- Grapes:** Buckshot berry

NORTHWEST MICHIGAN REGIONAL REPORT

E. Pochubay, and N. Rothwell Extension Educators, MSU

Weather Report. The past week has been seasonable with daytime highs in the mid-70s and nighttime temperatures in the 50s and 60s. On Tuesday, 15 July, a cold front moved down from Canada, and daytime temperatures are expected to be in the mid- 50s. As we approach the middle of July, we have accumulated 1579GDD base 42 and 972GDD base 50. We are still behind our 24-year averages: 1722GDD base 42 and 1061GDD base 50. The NWMHRC recorded very little actual rainfall on two dates, but the forecast for today is predicted rain and isolated thunderstorms.

Crop Report. Stem-on sweet cherry harvest for the brine market has begun in northwest Michigan. Fruit size is relatively small but the quality for briners remains good. Growers are hoping that the rain will help size the large crop of cherries destined for the canner market. Growers have been diligent about keeping the crop disease free, particularly as cherries size and getting spray into tight clustering varieties becomes more challenging. Ethephon is going on now in sweet cherry orchards. Tart cherries are also ripening, and in blocks that have a light crop, fruit is ripening quickly. Some growers believe that they may harvest a light block of tart cherries before they harvest a heavy crop of canners. Ethephon is also going on in tart cherries. Apples are sizing, and the crop is looking good at this time. Strawberry harvest is over for most northern Michigan farms, and the season seemed shorter than in past years.

Pest Report. As mentioned previously, orchards continue to look clean and mostly free of diseases; we have not received reports of orchards that have been devastated by diseases or insects this season. Although the weather has been favorable for disease development throughout this season, growers have done an excellent job keeping tissue protected to prevent infection. American brown rot is evident in trials here at the NWMHRC, and we are able to find a few orchards with this disease in the fruit. Currently temperatures are cool and wet conditions are in the forecast for today; temperatures are predicted to warm up later this week which will once again be concerning for diseases. Growers should continue to keep tissue protected from **American brown rot** and **cherry leaf spot** infection through harvest and if possible, after harvest. We would like to remind growers that using an SDHI fungicide as the last spray before harvest will provide the longest effective ABR and CLS control post-harvest. In some areas, dark sweet cherry and tart cherry harvest might overlap and as harvest ramps up protecting fruit and leaf tissue may be challenging.

Spotted wing *Drosophila* (SWD) are active at the research station and in the region. We found a single female in a Montmorency tart cherry block at the station this week. So far this season, we have detected SWD in Grand Traverse, Leelanau, and Antrim counties in a vineyard, tart cherry orchard and in a strawberry patch, respectively. At this time cherries are susceptible to SWD egg-laying and growers should be protecting fruit from SWD, especially where this pest has been detected (Yuba area in Grand Traverse County, Ellsworth, and southern Leelanau County—near the NWMRHC, and East Leland, Leelanau County). The number of SWD that we have found in traps recently has been low, which could be a result of mortality due to cold temperatures over the winter and current cool conditions. However, we cannot be certain that the cold temperatures had a drastic impact on SWD populations, and SWD can develop rapidly as soon as temperatures warm. Therefore, protecting fruit from SWD egg-laying is critical for keeping SWD populations low as well as preventing infested fruit at harvest. At this time, small fruits (raspberries, blackberries, etc.) that begin ripening will be susceptible to SWD.

It has been several weeks since we first observed cherry fruit fly on a leaf at the research station, and we finally caught the first cherry fruit fly on a trap at the station this week. Last week, **cherry fruit fly** were detected in Leelanau County and on Old Mission and CFF were found on a trap on Old Mission again this week. Growers need to be diligent about controlling both SWD and CFF through harvest to prevent infested fruit at harvest. There are insecticides available that provide some control for both SWD and

CFF. The article, *Management Strategies for Cherry Fruit Fly and Spotted Wing Drosophila*, outlines the efficacy of some insecticides for SWD and CFF and is worth another read. We would like to remind growers to check PHI and processor restrictions to avoid having issues with detectable residues that exceed maximum residue limits.

Obliquebanded leafroller (OBLR) activity is ongoing and OBLR trap numbers remain low – seven moths per trap. Growers should consider a pre-harvest application targeting OBLR larvae in orchards where high (20+ moths per trap) OBLR numbers have been detected to prevent shaking larvae in trees into tanks at harvest.

Disease development and insect activity has been quiet in apples at the research station and we have not received reports of any major pest issues in the region. In our traps, we found a total of one **codling moth** and three **obliquebanded leafroller** moths. The second generation of **spotted tentiform leafminer** is underway with 40 STLM moths per trap at the station this week. **Green apple aphids** and **leafhoppers** have been active and some growers have been incorporating materials for **aphids** in sprays over the last few weeks. Most apple orchards are scab free; in orchards where primary infection occurred, growers may need to start their secondary **scab** program soon.

ETHEPHON ON CHERRIES

N.L. Rothwell, District Specialist, MSUE
J. Nugent, Retired District Horticulturist

Ethephon is a plant growth regulator, and its uses vary with plant species, chemical concentration, and time of application. Ethephon regulates phases of plant growth and development by application to various growth sites. This plant growth regulator has systemic properties where it penetrates the plant tissues and is decomposed to ethylene. This decomposition impacts the plants' growth processes. In cherry systems, ethephon promotes fruit loosening to facilitate mechanical harvesting. Ethephon, sold under the trade name Ethrel, has been used as a common management practice in both tart and sweet cherry harvest.

Ethephon releases ethylene, which penetrates plant cells and binds to receptors that affect expression of various genes. In the case of cherries, ethephon affects the gene that controls the synthesis/activation of cell wall loosening enzymes such as polygalacturonase and pectin methylesterase, thus dissolving the pectins between cells in the abscission layer. This chain-like reaction leads to cell separation in the developmentally-programmed abscission zone between pedicel and fruit or pedicel and spur. In short, ethephon loosens the cherries from the stem, which results in a gentle 'shaking' of the tree to remove the fruit.

One main concern in recent years has been the amount of ethephon-induced damage with the hot, dry weather conditions. Ethephon can have excessive activity under a certain set of conditions, which can result in tree injury. Trees under stress, particularly drought stress, become more susceptible to ethephon damage. Damaged trees exhibit excessive gumming, and branches lose their leaves.

Timing the ethephon application is an important factor. A lower rate of ethephon provides adequate loosening if given adequate time for action (10 to 14 days), while higher rates will loosen fruit to the same degree more quickly. Therefore, it is possible to substitute time for rate and obtain the same effect. Secondly, it is important that the chemical not be applied too early in the season. The fruit should be in Stage III of growth, where the fruit is growing rapidly and the grass-green color begins to yellow or take on a tinge of red. If ethephon is applied earlier than Stage III, the fruit may fail to grow further and has the potential to drop off the tree with the stems attached.

As mentioned above, both temperature and tree vigor are associated with the degree of response achieved. At higher temperatures during the 72 hours following application, the magnitude of response is increased and at lower temperatures it is decreased. Trees low in vigor or under stress respond to a greater extent, and gumming and leaf abscission may result.

The following recommendations should be used when applying ethephon to cherries:

1. **Rate:** Vary the rate depending on anticipated temperatures for 72 hours after application, days before harvest, tree stress and past experience. *Lower rates decrease the likelihood of tree injury.*
 - A. **Light sweets** -- When applied concentrate (80 gals. water/acre or less), 1 to 2 pts/acre applied 10-14 days before anticipated harvest should provide adequate loosening. Rates up to 2.5 pts/acre may be necessary for harvesting in less than 10 days. When applied dilute, use no more than $\frac{3}{4}$ pt/100 gals or 3 pts/acre.
 - B. **Dark sweets** -- When applied concentrate, use 1.5 to 2.5 pts/acre applied 10-14 days prior to anticipated harvest. Rates up to 3 pts/acre may be necessary for harvesting in less than 10 days. When applied dilute, use no more than 1 pt/100 gals. or 4 pts/acre.
 - C. **Tart cherries** -- When applied concentrate, use 0.5 to 1 pt/acre applied 7 to 14 days prior to anticipated harvest. When applied dilute, apply no more than $\frac{1}{3}$ pt/100 gals or 1 pt/acre.
2. **Time of Application:** Apply approximately 7 to 14 days before anticipated harvest. Do not harvest within 7 days of application (7-day PHI).
3. **Temperature:** Avoid application when high temperatures are expected to exceed 85° F or remain below 60° F for the 72 hour period after application. Use relatively high rates when high temperatures are expected to be in the 60's ° F and lower than normal rates when highs are expected in the lower 80's.
4. **Tree stress:** Do not spray trees that are low in vigor or under stress conditions.
5. **Do not** spray trees that had serious gumming the previous year.
6. **Crop load:** Heavy crop load, ie, low leaf to fruit ratio, is more difficult to loosen so use relatively higher rates or expect a longer time to achieve desired loosening.
7. **Concentrate spraying:** Applying ethephon with concentrate sprayers (i.e., 80 gallons of water/acre or less) achieves the same level of loosening at lower rates per acre than does dilute applications. Uniform coverage is important.
8. **Tree size:** Suggested rates/acre are based on full-sized trees. Adjust rates downward when treating blocks with smaller trees.

MICHIGAN BROWN MARMORATED STINK BUG REPORT FOR JULY 10, 2014

A statewide brown marmorated stink bug monitoring effort in fruit and vegetable crops is underway, but so far none have been detected.

Posted on **July 10, 2014**, **MSUE News**, by **Julianna Wilson and Larry Gut**, Michigan State University, Department of Entomology



Pheromone-baited pyramid trap being used to monitor for brown marmorated stink bug.

This is the first weekly report of the Michigan State University Extension brown marmorated stink bug (BMSB) statewide monitoring effort for 2014. A network of traps has been deployed across more than 50 sites since June 30 and more are being added this week. Pyramid-style, pheromone-baited traps have been placed 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 near riparian areas and/or are 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. More sites will be added as the season progresses.

Up to this point, BMSB have been detected in very low numbers in Michigan, generally by homeowners who have found them overwintering in their homes. Our network of traps is being used to provide early warning should population increases of BMSB occur in areas where susceptible crops are grown.

To learn more about how to monitor for the brown marmorated stink bug, 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 GREEN](#) 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, Hal Hudson, Karen Powers, and Nikki Rothwell.

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).

HOW TO GET THE MOST OUT OF YOUR FUNGICIDE SPRAYS

Consider these tips in improving fungicide spray efficacy and efficiency.

Posted on **July 8, 2014, MSUE News**, by [Annemiek Schilder](#), Michigan State University Extension, Department of Plant, Soil, and Microbial Sciences

With the high cost of pesticide applications in terms of product cost, fuel and labor, as well as environmental impact, it is important to get as much benefit from them as possible. There are several things [Michigan State University Extension](#) recommends you consider in improving fungicide spray efficacy and efficiency.

Use an appropriate sprayer for the crop and calibrate your sprayer so you know you are applying the right amount of product per acre. This should be done at the beginning of the growing season. A good time to calibrate is in early spring. Check for worn disks and be sure that all nozzle tips have the same angle and capacity rating. Use the right kind of nozzles for the intended application. Nozzles that produce very fine droplets may lead to more drift and less deposition on the target. The use of wettable powder sprays enlarges nozzle openings, so calibration of each nozzle is essential. Use only clean water when calibrating sprayers. Calibration instructions can be found in the "[2014 Michigan Fruit Management Guide](#)" (E154).

Adjust sprayer nozzles to aim at the intended target, i.e., the part of the plant most likely to be affected; reduce speed or airflow to get more fungicide on the target and less drift. Remember all products that drift away are lost for the purposes of disease control and may contaminate non-target areas and crops. A "patternator" can help you understand where most of the spray is ending up. You can also place water-sensitive spray cards in different positions in the canopy to evaluate spray coverage.

Apply the fungicide in a sufficient volume of water to obtain thorough coverage, but not to run-off; any fungicide that runs off the plant is lost and is more likely to contaminate ground water. Coverage is especially important for protectant fungicides. Spray volume should be increased as a crop canopy expands, e.g., for an airblast sprayer in grapes, it is recommended to start out with 30 gpa early in the season then increase to 50 gpa after bloom and maybe as high as 75 gpa at veraison. Spray every row. For instance, with an airblast sprayer, insufficient product is deposited on the second and third rows to get good disease control.

Check the pH of the spray solution, especially when using alkaline well water. While most fungicides are stable over a range of pH values, some fungicides, like captan, mancozeb, can degrade under alkaline conditions. For instance, the half-life of captan is 32 hours at pH 5, eight hours at pH 7, and 10 minutes at pH 8. The half-life of mancozeb is 32 hours at pH 5, 17 hours at pH 7, and 34 hours at pH 9 (insecticides in general are more sensitive to pH than fungicides). For a list of pesticides and their sensitivity to pH, see the "[2014 Michigan Fruit Management Guide](#)," page 65-66. The pH can be adjusted with an acidifying/buffering agent. Avoid letting the spray sit overnight in the spray tank. Fungicides should, whenever possible, be mixed and sprayed as soon after mixing as possible.

Use an appropriate fungicide for the diseases you want to control. Regularly scout vineyards to know what diseases are present and if you are not sure what the problem is, send a sample to [MSU Diagnostic Services](#). Use disease models if they are available, such as [MSU Enviro-weather](#), to estimate disease risk so as to optimize application timing. For best post-infection activity, apply fungicides as soon as possible after an infection period, weather permitting.

During rainy periods, systemic fungicides perform better than protectant/contact fungicides since they are less susceptible to wash-off by rain, although eventually a portion of systemic fungicides also gets washed off by rain. To get the most curative (post-infection) action from a systemic fungicide, apply the highest labeled rate since activity is concentration dependent. The same goes for

preventive action; usually a higher rate often extends the residual period. You may need to reapply protectant fungicides after 1-2 inches of rain. Systemic fungicides can last a bit longer.

Add an adjuvant (surfactant, sticker, penetrant) if this is recommended on the label. Some adjuvants have ultraviolet (UV) light blockers that slow UV degradation of pesticides. However, many modern fungicides are formulated in such a way that adjuvants are not necessary. In fact, some fungicide labels prohibit the use of adjuvants due to the increased potential for phytotoxicity. In our experience, most biocontrol agents like Serenade do benefit from the use of stickers or extenders, such as Nu-Film P. In some cases, adjuvants have a disease-suppressive effect because they are detrimental to pathogens, i.e., surfactants zoospores of downy mildew pathogens to explode. Do consider that some adjuvants have pre-harvest intervals (PHI) listed on the label, i.e., Nu-Film 17 has a PHI of 30 days as this product can extend pesticide residues longer than permitted.

Apply protectant fungicides like Captan, Manzate or Bravo during sunny, dry conditions to allow for quick drying onto the leaves. In fact, it appears that protectant fungicides become better adsorbed to the plant surface and more rainfast over several days after application. Any dew formation at night will help redistribute product over the plant surface. While it is better to have protectant fungicide applications on before a rain or heavy dew event which could represent an infection period, avoid putting on protectant fungicides within several hours before a rainstorm as you may lose much of it to wash-off.

Apply systemic fungicides like Abound under humid, cloudy conditions when the soil is moist. That way, the cuticle, or waxy layer covering the plant surface, will be swelled up and allows the active ingredients to quickly pass through. Under extended hot, dry conditions, the cuticle becomes flattened and less permeable; any product that is not absorbed may remain on the plant surface and break down due to UV light or microbes or get washed off by rain.

Spraying fungicides when there is a light breeze, 2-6 miles per hour at nozzle level, is actually better than spraying during still conditions, because even without wind there may be updrafts and eddies caused by the spray equipment leading to fungicide off-target movement. A little wind will aid deposition; you will know where the spray is going and can adjust your spray configuration accordingly. If conditions are not good for spraying, it is better to wait an extra day for better conditions than to lose most of the product to drift.

Another important timing consideration is the time of day, particularly as it relates to temperature and humidity relationships. Both temperature and humidity can affect fungicide drift. The higher the temperature and lower the relative humidity, the greater the opportunity for fungicide evaporation or volatilization. This can be avoided by spraying early in the morning when temperatures are lower and the relative humidity is higher. In addition to the reduced drift hazard from fungicide volatilization early in the morning, drift may also be minimized in the morning hours due of calmer winds and lower convective air turbulence.

If you are not getting the control you used to get with a particular product, do consider the possibility of fungicide resistance. This could be an issue with pathogens that have a high reproductive potential, like powdery mildews and rusts, which have been exposed to repeated sprays of systemic fungicides, such as the strobilurins (Abound) or MBCs (Topsin M). However, you must first rule out poor spray timing and coverage as possible causes of poor fungicide performance. Ways to reduce the risk of fungicide resistance include alternating or tank-mixing fungicides with different modes of action and avoiding spraying systemic fungicides at below-label rates.

Also, try to avoid applying systemic fungicides on heavily sporulating colonies as the probability of selecting mutants increases with higher pathogen population densities. Use a contact fungicide first or in the tank-mix, if appropriate, to kill spores.

Tank-mixing certain fungicides can increase the risk of phytotoxicity. For instance, do not tank-mix sulfur and oil-containing products or spray them within two weeks of each other. Do not apply sulfur to sensitive crop cultivars or at temperatures above 80 degrees Fahrenheit. Do not apply copper under cool, slow-drying conditions. Also, do not tank-mix phosphorous acids such as Prophyt or Phostrol with copper, as copper can become more available and phytotoxic in acidic solutions. Also, do not apply phosphorous acids to plants that are stressed, due to heat or drought stress. Captan can become phytotoxic when applied with oil or within four days of an oil spray.

Tank-mixing some fungicides can inactivate one or both. For instance, don't tank-mix copper with the biofungicide Serenade (*Bacillus subtilis* – a bacterium), since copper is toxic to bacteria and can inactivate Serenade. While part of the activity of Serenade is due to antibiotics resulting from the fermentation process used to produce Serenade, some of the efficacy is related to activity of live bacteria. Similarly, the biofungicide RootShield (*Trichoderma harzianum* - a fungus) is incompatible with the fungicides Orbit (propiconazole), Elite (tebuconazole) and Procure (triflumizole), which can kill the *Trichoderma* spores. Also, don't tank-mix bicarbonates with phosphorous acids or use lime with Captan as fungicide activity will be reduced. Fixed copper formulations and lime should not be used with Guthion, Imidan, Sevin, Thiodan, Bayleton or Captan as efficacy may be lessened and the risk of phytotoxicity increased.

Chemical compatibility also needs to be considered. For instance, fungicides in dissolvable bags are incompatible with spray oils and boron-containing fertilizers because these materials prevent the bags from dissolving. In addition, chemical incompatibility may cause products to go out of solution/suspension and precipitate in the bottom of the tank. When tank-mixing chemicals, read the label for indications of incompatibility with certain products.

Also, add products in the following order unless otherwise directed on the product label:

- Small amount of water, and begin agitation.
- Water-soluble packets.
- Wettable powders as a slurry.
- Dry flowables or water-dispersible granules.
- Liquid flowables.
- Emulsifiable concentrates (oil concentrates).
- Remaining water.

Do not apply systemic fungicides to dead or partially dead leaves; this also applies to leaves in which the veins have been killed. Systemic products cannot move around in dead tissue or through dead leaf veins and therefore will not be distributed well in the plant.

Pruning/training plants to have a more open and exposed canopy will aid in disease control by reducing moisture and humidity and improving spray penetration.

Dr. Schilder's work is funded in part by [MSU's AgBioResearch](#).

This article was published by [Michigan State University Extension](http://www.msue.msu.edu). 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).

CONTROLLING RASPBERRY CANE BORERS

Wilting shoot tips signal that this easy to control pest has found your raspberry patch.

Posted on **July 8, 2014**, MSUE News, by [Mark Longstroth](#), Michigan State University Extension



Wilting primocane shoot tip after girdling. Note the two girdles in the background. Photo credit: Mark Longstroth, MSU Extension

This time of year, [Michigan State University Extension](http://www.msue.msu.edu) educators, including myself, get calls from homeowners complaining that the shoot tips of their raspberries are dying. I ask if there are two rings cut into the stem below the wilting. If the answer is yes, I know they have the raspberry cane borer.

Raspberry cane borer, *Oberea bimaculata* Oliver, is a beetle pest of raspberries that is widespread in Michigan. The beetle lives its life feeding on raspberries. The adults emerge in June. They feed on the tender shoot tips of new raspberry canes. The females lay their eggs about 6 inches below the tips of the new primocanes (first year shoots emerging from the ground). First, she chews two rings around the stem about 0.5 inches apart. Then she lays an egg between the girdles. The girdling causes the stem tip to wilt.

Control is easy and organic, just remove the portion of the stem between the two girdles and throw it in the trash. If not removed, the larvae burrows down the cane to the base and into the crown the next summer. Affected canes are weak and often break or die the next year. The larva pupates in the soil and emerges the next year to attack the shoot tips.

This pest seldom requires insecticide sprays and can be controlled by scouting for wilting shoot tips in the summer and removing the stem sections with the eggs before the larvae can burrow into the cane. If there is a severe pest infestation, pesticide sprays are targeted on the adults in the immediate prebloom period, just before the flowers open.



Left, Close up of raspberry cane borer adult and recently chewed girdles, marking where the egg will be laid. Right, Raspberry cane borer larvae boring into raspberry cane. Photo credits: Mark Longstroth, MSU Extension

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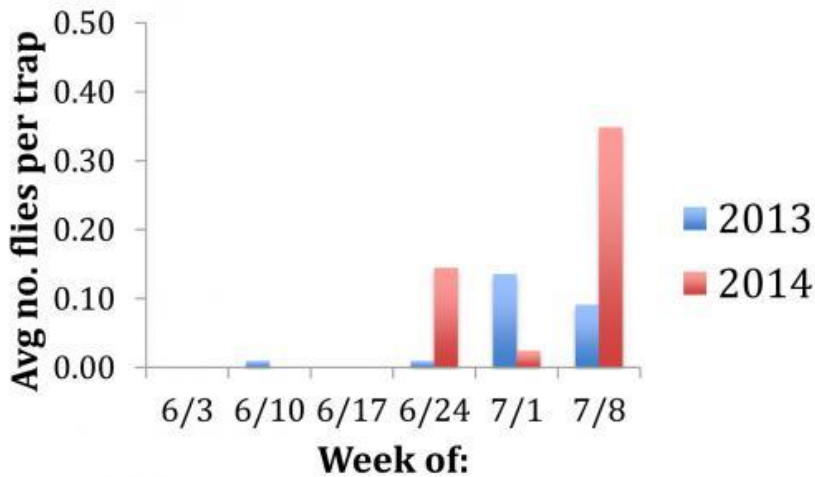
MICHIGAN SPOTTED WING DROSOPHILA REPORT for July 8, 2014

Spotted wing Drosophila continues to be caught in southwest Michigan and has been detected in two northwest counties this week.

Posted on **July 8, 2014**, **MSUE News**, by [Julianna Wilson](#), and Rufus Isaacs, Michigan State University Extension, Department of Entomology

This is the third weekly report of the [Michigan State University Extension spotted wing Drosophila](#) (SWD) statewide monitoring effort for 2014. Our network of traps across more than 80 sites was checked during the week of June 30 and has revealed continued activity of this pest in Michigan, and some new detection locations. There were a total of 11 males and 20 females trapped from the following Michigan counties: Berrien, near strawberries and raspberries; Allegan, near blueberries, raspberries and tart cherries; Ottawa, near blueberries; Kent, near raspberries; Leelanau, near grapes, tart cherries and sweet cherries; and Antrim, near grapes. This is the first detection of SWD activity in northwest Michigan this season.

Comparison of average trap catches by week between 2013 and 2014



The majority of traps in the network, 85 percent, caught no SWD. Of the traps that did catch SWD, one fly per trap was typical. This indicates that SWD numbers are still generally low, but that growers should continue to be on alert for this pest as their susceptible fruit crops start or continue to ripen. This is a similar trend to last year at this time and SWD flies have been trapped at the same rate using the new commercial lure versus the yeast-baited traps.

SWD can only infest berries when they are ripening or ripe, so currently the focus of SWD monitoring and management efforts should be on ripening strawberries, early summer raspberries, sweet cherries, blueberries and tart cherries. Susceptible fruit that are just starting to be ripe should be carefully monitored and 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 GREEN](#) 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](#).

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NCR-SARE ANNOUNCES THE 2014 "NCR-SARE Hero" Award, Honors Dale Mutch

NCR-SARE is pleased to announce Dale Mutch of Portage, Michigan is being honored as a 2014 “NCR-SARE Hero.”

Coordinated by the NCR-SARE Alumni Organization, this recognition honors the leadership, vision, contributions, and impact that these heroes have made in the field of sustainable agriculture in the north central region. The NCR-SARE Hero Award recognizes individuals who 1) have provided service to NCR-SARE, sustainability, and/or national SARE, 2) have shown leadership in sustainable agriculture locally and regionally, and 3) have made lasting impacts to sustainability in the North Central region.

Dr. Dale Robert Mutch is a retired Michigan State University Extension (MSUE) Senior Extension Educator and Adjunct Professor in the Plant, Soil and Microbial Sciences Department—applying practical, research-based information to meet the needs of Michigan residents. He spent more than three decades as an IPM vegetable scout, agricultural agent, district and state field crop integrated pest management coordinator, senior district Extension educator specialist, and coordinator, consultant, and professor for the Department of Crop and Soil Sciences. As a founding member of the Midwest Cover Crops Council, Dale championed the promotion and demonstration of cover crops to improve soil health and create more sustainable agricultural practices throughout the region and nationally.

Dale has been an avid and enthusiastic leader in the NCR-SARE organization since 1997 when he received his first Research and Education grant. He served on the Administrative Council from 2000- 2004, as the Michigan SARE state coordinator from 2007– 2013,. During his tenure as the Michigan State Coordinator, Michigan was awarded 75 SARE grants, and he distributed over 130 travel/mini grants to advance educator training in sustainable farming practices. He provided leadership for a number of important regional SARE initiatives.

[Learn more](#) about Dale, other award recipients, and this award on the NCR-SARE website.

Nominations for the NCR-SARE Hero Award may be submitted by anyone. An official nomination form is available on the NCR-SARE website and must be included with a nomination. The NCR-SARE Alumni Heroes Committee will review and recommend candidates to the NCR-SARE Administrative Council. Applications received will be maintained on file NCR-SARE and maintained for consideration in additional years.

NCR-SARE is one of four regional offices that run the SARE program, a nationwide grants and education program to advance sustainable innovation to American agriculture. Since 1988, NCR-SARE has helped advance farming systems that are profitable, environmentally sound and good for communities through a nationwide research and education grants program. The program, part of USDA's National Institute for Food and Agriculture, funds projects and conducts outreach designed to improve agricultural systems.

MASTER GARDENER PROGRAM

Helping People and Communities Grow

Do you enjoy being outdoors and working in the soil?

Would you like the opportunity to learn more about growing plants?

Are you excited about the chance to share your time and talents with others and spend time with people who share your interests?

If so, you might want to become part of the Michigan Master Gardener Program (MGP). This horticulture education and volunteer training program is offered by Michigan State University Extension (MSUE) and provides home gardening information to Michigan residents through a network of trained Master Gardener volunteers. All you need to get involved in the MGP is an interest in plants, a personal commitment to volunteering and an enthusiasm for sharing your knowledge with others.

During the last 35 years, more than 30,000 Michigan residents have taken part in the MGP, improving their communities through gardening, teaching thousands of children, adults and senior citizens the joy of gardening, learning how to garden using environmentally sustainable practices and making lifelong friends.

Access to World Class Gardening Knowledge

The MSU Extension Master Gardener Program connects gardeners across the state to Michigan State University's faculty and resources. Participants have access to information generated at one of the nation's top plant science teaching and research universities and the chance to use this knowledge to improve their communities and enrich their lives.

Master Gardener volunteers start by completing a 14-session course that provides a solid knowledge base grounded in university-generated data. Training is offered through MSU Extension and covers the topics of Introduction & Volunteerism, Plant Science, Soil Science, Integrated Pest Management, Diagnostics for Master Gardeners, Annual and Perennial Flowers, Woody Plants, Lawns, Vegetable, Small Fruit, Tree Fruit, Indoor Plants, Household and Nuisance Pest, and Gardening Practices to Protect Water Quality.

An Opportunity to Serve

After completing the course, Master Gardener trainees must complete 40 hours of horticulture-related service within one year to earn their Master Gardener certification. That community service may include:

- working with students to design an elementary school garden
- creating a horticulture therapy program at a senior center
- helping a neighborhood association create an urban garden.
- Sharing environmentally-friendly gardening practices at community events
- Establishing vegetable gardens to meet local nutritional needs
- Beautifying community sites for special events or community activities that attract local residents and tourists

Community based MGP coordinators and facilitators assist trainees in exploring opportunities that meet their interests, schedules and comfort levels. Most of all, Master Gardener trainees get the chance to get outdoors and spend time with other gardening enthusiasts in challenging and rewarding activities.

Connecting with Others

Master Gardener volunteers love to have fun! Many gardeners establish lifelong friendships and connections when they join local programs that beautify their community and bring personal fulfillment

and satisfaction. Many counties offer ongoing educational programs, garden tours, lectures and other social activities in which volunteers learn and share their knowledge while interacting with others.

Next Steps

The Master Gardener Program welcomes anyone interested in learning about gardening, community service and working with other volunteers. No prior knowledge or experience in gardening is required. Join this exciting program by participating in the fall 2014 training session in the Traverse City area. Registration must be completed online anytime before August 21, 2013 at the following website: <http://events.anr.msu.edu/event.cfm?folder=f2014traversecitymqp>.

Fall, 2014 MSUE Master Gardener Program in the Traverse City area

August 28th – December 4th, 2013

Thursdays from 4:30 pm – 8:30 pm

Northwest Michigan Horticultural Research Center

6686 S. Center Highway

Traverse City, MI 49684

Cost: \$300.00 (includes the 1,000-page training manual, speakers and facilities)

Scholarships are available.

For more information, contact:

Matthew Bertrand, Master Gardener Volunteer Coordinator
Leelanau MSU Extension office
phone: 231-256-9888
email: bertra28@anr.msu.edu

More detailed information and registration information is available online at:
www.msue.msu.edu/leelanau and
<http://events.anr.msu.edu/event.cfm?folder=f2014traversecitymqp>.

MICHIGAN HOPS UPDATE– July 8, 2014

Growers should be on the lookout for increasing potato leafhopper populations and Japanese beetles, as well as continue scouting for downy mildew.

Posted on July 8, 2014, MSUE News, by [Erin Lizotte](#), Michigan State University Extension



Trained bines with leaves showing necrotic symptoms of “hopper burn” along the margins. Photo credit: Erin Lizotte, MSU Extension

Hop bines around Michigan have continued to thrive with warm temperatures and substantial rainfall supplementing irrigation. Growing degree day (GDD) accumulation is significantly different along the western portion of the state where the majority of hop acreage is located. So far this season, the Michigan State University [Benton Harbor Enviro-weather station](#) has accumulated 1,103 GDD50 with 2.4 inches of rain over the past week; the [Clarksville Enviro-weather station](#) has recorded 992 GDD50 with 2.04 inches of rain; the [Bear Lake Enviro-weather station](#) has accumulated 841 GDD50 with 0.62 inches of rain; and the [Northwest Michigan Horticultural Research Center](#) has accumulated 841 GDD50 with just under 0.62 inches of rain this past week. Despite some significant rainfall, growers will need to continue to water to meet the substantial water demands of hops.

Growers should carefully monitor their hops for potato leafhopper populations as significant populations are being observed. Potato leafhopper adults and nymphs move in all directions when disturbed, unlike some leafhoppers that have a distinct pattern of movement. Right now the adults and nymphs appear a fluorescent green color. Some very small nymphs are actually clear, but have the characteristic shape of the larger nymphs when viewed using a hand lens.

Potato leafhoppers can't survive Michigan's winter and survive in the Gulf States until adults migrate north in the spring on storm systems. Although hop plants are susceptible to potato leafhoppers, they can tolerate some level of feeding. 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.

Growers needing to treat for potato leafhoppers can utilize products containing neonicotinoids (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, refer to the [Michigan State University Extension](#) publication "[Pesticides registered for use on hops in Michigan](#)" and always read the label.



Left, Underside of hop leaf with leafhopper and burn symptoms present. Right, Multiple nymph stages of potato leafhoppers and the associated hopper burn symptoms around the leaf margin. Note that leafhoppers can be very small and clear at some leaf stages. Photo credits: Erin Lizotte, MSU Extension (left) and Mario Mandujano, MSU (right)

Most growers are seeing rose chafer adult activity subsiding just in time for Japanese beetles to arrive. 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.



Left, Japanese beetle adult. Note the white tufts along the abdomen and emerald thorax. Right, Japanese beetle feeding damage on hop leaves leaving a lace-like appearance. Photo credits: David Cappaert, MSU, Bugwood.org (left) and Erin Lizotte, MSU Extension (right)

There are no established treatment thresholds or data on how much Japanese beetles 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 flower 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. Neonicotinoids (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.

With the substantial rainfall comes increased disease pressure for downy mildew. Many growers have been proactive in applying protectant early sprays as basal spikes emerged this spring and have continued to keep tissue covered with protectant fungicide applications every 10-21 days, depending on product and weather. Despite conservative and consistent spray programs, active downy mildew infections are present at this time. 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 appears 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.



Left, Angular downy mildew lesions. Middle, Gray-brown fuzzy appearance of downy mildew fungus on the underside of a hop leaf. Right, Advanced downy mildew infection of the underside of the leaf. Photo credits: Erin Lizotte, MSU Extension

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-AI, 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 retained 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.



Round, white colonies of the powdery mildew fungus on the upper surface of hop leaves. Photo credit: David Gent, USDA-ARS, Bugwood.org

This article was published by [Michigan State University Extension](http://www.msue.msu.edu). 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).

2014 HOPS FIELD DAY & TOUR – August 15

MSU Extension is offering a **Hops Field Day and Tour on Friday, August 15 from 8 a.m. – 5 p.m.** Participants will meet at the MSU Horticultural Research Center (6686 South Center Highway, Traverse City, MI 49684), board a chartered bus and travel to **Empire Hop Farm** on the Leelanau Peninsula to tour one of the largest hop yards in Michigan and a new hop processing facility. The group will then travel to **Northport Brewing Company**, for lunch and a tour. In the afternoon participants will travel by bus to tour **New Mission Organic's** hop yard and processing operation near Omena and then onto **K & K Farm** south of Suttons Bay.

Throughout the tour hop growers will be on site to discuss all aspects of hop production; initial costs, plant care, disease and insect management, short and tall trellis systems, trellis construction, and organic and conventional growing practices. The group will then return to the Research Center for an educational beer tasting led by Executive Director, **Scott Graham**, of the Michigan Brewers Guild, along with several Michigan brewers.

The cost is \$85 per person which includes lunch, charter bus transportation and handouts. **Pre-registration is required by debit/credit card online and space is limited. Due to the popularity of this event, payment is due at the time of online registration. Because of liability issues and space, participants will NOT be allowed to drive their personal vehicle on this tour; please don't ask.**

To register, go online to hops.msu.edu.

Once you are registered, you will receive confirmation immediately by email, and an agenda and directions the week prior to the event by email.

Don't delay, this tour fills quickly! If you have any questions, contact **Rob Sirrino**, or **Annette Kleinschmit** at the Leelanau MSU Extension office at 231-256-9888 or msue45@msu.edu.

We thank our gracious program sponsors: Empire Hop Farm, Michigan Brewers Guild, Michigan Hop Alliance, New Mission Organics, K & K Farm and Northport Brewing Company.

Hoppy day,

Annette

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WEB SITES OF INTEREST:

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://agbioresearch.msu.edu/nwmihort/faxnet.htm>

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 has moved to MSU News

<http://news.msue.msu.edu>