Northern Michigan FruitNet 2018
Northwest Michigan Horticultural Research Center

Weekly Update

FruitNet Report – July 6, 2018

CALENDAR OF EVENTS

8/23	**NWMHRC Open House**

What's new?

- **Phytotoxicity Showing up in Region's Tart Cherries**
- **First SWD Larvae Detected in Unsprayed Cherries at NWMHRC**

New articles

Phytotoxicity Showing up in Region's Tart Cherries

With the recent past high temperatures, growers have been concerned about tank mix applications and the potential for phytotoxicity. Unfortunately, we are beginning to see

the effects of the hot weather showing up in the region's tart cherries. A Syllit and Captan tank mix seem to be one combination that has caused damage. We have heard reports of 50% leaf loss as a result of this tank mix application; both materials have caused phytotoxicity in past years. We are also observing phytotoxicity in tart cherries that have had copper applications. Most growers applied copper materials under earlier, cooler conditions, but with little rainfall, copper likely remains on the leaves and the recent hot weather caused some leaf burning. Sometimes we have leaf drop due to virus, but most of the damage we have observed this year is in a distinct spray pattern on the trees, suggesting phytotoxicity rather than virus. Damage also seems worse at row ends where growers make turns and more material is deposited. Defoliation as a result of this recent phytotoxicity could be an issue if there is significant leaf loss, particularly if the crop load is heavy. Ripening a big crop with less leaf area will be challenging. Trees may also be stressed from drought as we have had little rain in recent weeks. At this time, there is little growers can do to minimize the damage; irrigation will help minimize stress from drought. Surprisingly, we have not observed phytotoxicity in sweet cherries at this time.

First SWD Larvae Detected in Unsprayed Cherries at NWMHRC

We detected the first spotted wing drosophila (SWD) larva in unsprayed tart cherries at the NWMHRC. We have been collecting fruit three times weekly to determine when fruit is susceptible to SWD oviposition. On Mondays, Wednesdays, and Fridays, we collect fruit and analyze the cherries for color, firmness, brix, and penetration levels; we will use these data to establish thresholds for when SWD egg-laying begins in commercial orchards. We intend to use this information to help guide growers when to start SWD management programs.

We have been collecting cherry samples for three weeks, and this is the first time we have detected a larva in the multi-weekly 400-fruit sample. We expected to see SWD larvae in fruit next week, but were surprised to find a larva in our sample today. However, the adult trap counts increased significantly this week: 180 flies in 40 traps this week and 3 flies in 40 traps last week. We expect to observe more larvae in fruit samples next week. Again, this information is a reminder for growers to be diligent with SWD management programs as we begin the harvest season.

Articles featured in past FruitNet Reports

Spotted Wing Drosophila Update – July 5, 2018

Spotted wing drosophila numbers are on the rise across the region.

We checked traps in the five-county area today and found a total of 240 SWD in 40 traps. Up until this week, we have very few traps catching any flies and overall SWD numbers have been low. However, we saw a dramatic jump in SWD numbers this week. We only had one farm that did not catch any flies. Conversely, we had one farm in Benzie County that had 83 flies. With the sudden increase in SWD numbers, growers should be actively managing for this pest in sweet and tart cherry.

	wk of 5/15	wk of 6/25	wk of 7/2
North Manistee	trap set	0	16
Benzie	trap set	0	90
Yuba	trap set	0	40
Central Lake	trap set	0	1
Old Mission	trap set	0	12
Suttons Bay	trap set	1	3
Cedar	trap set	0	50
East Leland	trap set	0	25
Northport	trap set	1	15
NW Station	trap set	3	180

*-numbers are not yet complete.

Michigan spotted wing Drosophila update - July 3, 2018

SWD are still active, though traps caught low numbers due to the heat; ripening fruit must be protected against infestation.

July 3, 2018 - Authors: Julianna Wilson, Larry Gut, Rufus Isaacs

Blueberry harvest is just beginning in southwest Michigan. Still ripening fruit will be vulnerable to SWD infestation if not protected. Photo by Rufus Isaacs, MSU Extension.

Spotted wing drosophila (SWD) are still being caught in traps, but in lower numbers than the previous week with an average of one fly per trap for the sites reporting. This is likely due to the extreme heat we have been experiencing over the past week. That said, it is critical that ripening crops are protected from infestation, especially in blocks of sweet cherry, tart cherry, blueberry, and summer raspberries.

If you grow a crop that is at a susceptible stage, do not wait to apply a cover spray of an insecticide that is rated excellent against SWD to protect fruit. Fruit that is still green will not need protection until they start becoming ripe later in the summer. As always, be sure to rotate insecticide chemistries once you begin your spray program to prevent the risk of developing insecticide-resistant populations of SWD on your farm.

We will continue to monitor SWD as the season progresses. Our general regional reports provide an overview of the regional situation, but monitoring flies on your own farm provides a more relevant source of information on SWD activity. We are also recommending that growers check their fruit for infestation through the season.

Read the recently released guide to SWD management in organic systems.

For more information on effective insecticides registered for use to control SWD, refer to the MSU Extension Michigan Fruit Management Guide for 2018 (E-154).

Concerns about High Temperatures and Spray-Induced Phytotoxicity

Nikki Rothwell, Emily Pochubay, and Bill Klein, NWMHRC

Growers should use caution when applying ethephon in this heat; preliminary data suggest that tank mixes of Merivon and Danitol did not result in phytotoxicity in Ulster sweet cherry.

As the temperatures remain high across the region, growers have been concerned about tank mixes and/or the use of certain materials that may cause phytotoxcity in this hot weather.

Ethephon

Ethephon is the first product of concern, particularly as many growers are planning to harvest sweet cherries in the next week to two weeks in northwest Michigan. In past seasons, we have observed considerable damage to sweet cherries when ethephon has been applied under hot conditions. The damage appears as severe gummosis and is worse on trees that are already stressed by other issues, such as San Jose scale infestations or drought.

Ethephon applications are typically applied 7-14 days prior to harvest. However, we have been recommending that growers delay ethephon applications until after the heat moves out of the area. However, Saturday's extreme heat has been followed by more hot weather, and the forecast is predicting continued hot conditions for the remainder of the week. Therefore, growers will need to weigh the decision when to apply ethephon in this warm weather. Crop load is also a factor when determining what rate to use. Heavy crop loads are typically more difficult to loosen compared with light crop loads. Growers should vary the ethephon 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. Growers should reduce application rates when high temperatures are expected to exceed 80° F for the 72 hour period after application. Additionally, some growers have opted to make applications during times of day when temperatures are cooler (ex. evenings) to help lessen the risk of phytotoxic effects. Sweet cherries are more susceptible to ethephon-induced phytotoxicity, but we have observed damage in tart cherries in past years as well.

Merivon

We have had many questions regarding the current Merivon label, which caution use with adjuvants, additives, and/or other products that may cause injury to fruit within two weeks of harvest. As we are in the two-week window prior to sweet cherry harvest and with the current heat, growers are also concerned about using Merivon with emulsifiable concentrates (ECs). One combination of particular concern is mixing Merivon with Danitol (an EC insecticide). From our recent resistance screening and efficacy trials, Merivon has been the best material for cherry leaf spot and it is also rated excellent for American brown rot. With reduced sensitivity in the brown rot pathogen to Indar, we have been recommending an SDHI use for this disease. Danitol has a three-day PHI, and is rated as excellent for spotted wing drosophila (SWD) control. Sweet cherries have fewer materials available for SWD management, and this combination of Merivon and Danitol may be a good tank mix application as we approach the harvest timing. However, with the Merivon label language and the heat, we conducted a small-scale trial to help guide decision-making about the Danitol-Merivon tank mix option. Additionally, in communication with BASF, the language on the label was written conservatively as they have no local data to guide tank mix options. The label does say not to use Merivon with emulsifiable concentrates, crop oil concentrates, methylated seed oil, organosilicone, adjuvants, and nonionic surfactants within two weeks of harvest in cherries; caution should be used if using other tank mixed products.

On 29 June at 8:50 am, we applied the following applications to 11-year old sweet cherries, var. Ulster: 1) Merivon (5.5oz/A) + Danitol (21.3oz/A), 2) Merivon (5.5oz/A) + Danitol (21.3oz/A) + R11 (0.125% v/v), 3) Merivon (5.5oz/A) + Danitol (21.3oz/A) + Sylgard (0.03% v/v), and 4) UTC. Materials were selected because they were readily available. We evaluated fruit and leaves for potential phytotoxicity on 2 July, and we found no phytotoxicity in any of the treatments. The evaluation was done after the weekend's extreme heat when daytime highs reached 95 degrees F on Saturday, 30 June at the NWMHRC. These results are preliminary, but they suggest that tank mix combinations of Danitol and Merivon, even with additives did not cause phytotoxicity in Ulster sweet cherries. We will continue to evaluate phytotoxicity of different materials in the future.

Other Products

Lastly, we remind growers to use caution with all EC materials as we have observed phytotoxicity in past seasons. Syllit is another material where we have seen damage when applied in hot conditions. Copper products also should be avoided when temperatures reach into the 80s; these products are better placed when conditions are cool.

ETHEPHON ON CHERRIES

N.L. Rothwell, District Horticulturist
J. Nugent, Retired District Horticulturist
E.A. Pochubay, NWMHRC Fruit IPM Educator

Ethephon is a plant growth regulator (PGR), and results from its use vary with chemical concentration and time of application. As with many PGRs, ethephon = has systemic properties which allows it to penetrate plant tissue and is eventually decomposed to produce ethylene. In cherry systems, ethephon is used to promote fruit loosening to assist with mechanical harvest of fruit. Ethephon, sold under the trade name Ethrel, is a standard 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, 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 gentler 'shaking' of the tree to remove the fruit.

In years past, we have observed ethephon-induced damage in hot and dry weather. Ethephon can have excessive activity under hot and dry conditions, which can result in tree injury. We remind growers that we have observed ethephon damage under hot and dry conditions in the past, especially in sweet cherries. Of sweet cherry varieties, Golds were observed to be the most sensitive. If temperatures are in the high 70s to mid- or upper 80s and sunny during the 72 hours following application, this weather could be conducive for causing Ethrel damage; the magnitude of ethephon response is increased at higher temperatures following application. Tree vigor also influences the degree of response achieved by an ethephon application. Trees low in vigor or under stress due to drought, cold damage, San Jose scale infestation, disease, virus, phytotoxic injury, etc. will respond to a greater extent, and gumming and leaf abscission may result. Hence, growers may choose to reduce rates in orchards that are stressed, particularly if temperatures will be higher with the potential to cause injury.

Crop load is also a factor when determining what rate to use. Heavy crop loads are typically more difficult to loosen compared with light crop loads. Many orchards have a heavy crop load this season, and these growers may need to use a higher rate or leave extra time to achieve optimal loosening. Again, an increased rate could cause injury if temperatures are high following the application. Furthermore, growers should be prepared that if an orchard is taking a longer time to loosen, then the orchard may need to be treated with an insecticide that is effective against spotted wing drosophila to prevent larvae in fruit. Please review the 2016 Fruit Management Guide, the Managing Spotted Wing Drosophila in Michigan Cherry bulletin, and insecticide labels for additional information on efficacious insecticides and pre-harvest application intervals. Balancing SWD management and harvest will take increased consideration at the grower level and good communication between growers and processors.

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*. If temperatures 72 hours after application are predicted to be in the 80s, growers should reduce the Ethrel rates.*

A. **Light sweets** -- When applied concentrate (80 gal water/acre or less), 1 to 2 pt/acre applied 10-14 days before anticipated harvest should provide adequate loosening. Rates up to 2.5 pt/acre may be necessary for harvesting in less than 10 days. When applied dilute, use no more than ¾ pt/100 gals or 3 pt/acre. Reducing rates in light sweet cherries, particularly Golds, is recommended if predicted temperatures are in the 80s after application.
B. **Dark sweets** -- When applied concentrate, use 1.5 to 2.5 pt/acre applied 10-14 days prior to anticipated harvest. Rates up to 3 pt/acre may be necessary for harvesting in less than 10 days. When applied dilute, use no more than 1 pt/100 gal or 4 pt/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 1/3 pt/100 gal 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 (Ethrel has a 7-day PHI).
3. **Temperature:** Avoid application when high temperatures are expected to exceed 80° F or remain below 60° F for the 72 hour period after application. Growers should use lower than normal rates when highs are expected in the 80s.
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 loads (i.e. low leaf to fruit ratio) are more difficult to loosen than lighter crops. There is a heavy crop load in many orchards this season, and growers may need to use relatively higher rates or expect a longer time to achieve desired loosening. In trees with a light crop, reduced rates are recommended and rate reductions in light blocks will still achieve adequate loosening while minimizing the potential for injury in hot conditions this season.
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.

Growers should pay particular attention to the temperatures after the time of ethephon application. As evident from past experiences, hot temperatures can do damage to cherry trees. Growers that have had problems in the past years should reduce rates, especially if the trees showed serious gumming and leaf loss.

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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