

# **Northern Michigan FruitNet 2018**

## **Northwest Michigan Horticultural Research Center**

Weekly Update

**FruitNet Report – July 10, 2018**

### **CALENDAR OF EVENTS**

**8/23**

**NWMHRC Open House**

### **What's new?**

- **Northwest Regional Report – July 10, 2018**
- **Predicted 2018 Apple Harvest Dates**
- **Pre-Harvest Planning Announcement**
- **Project GREEN Drone Workshops**

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### **New articles**

**Northwest Regional Report – July 10, 2018**

*Sweet cherry harvest is beginning in northwest Michigan, and tart cherries are ripening quickly with the continued heat.*

Nikki Rothwell and Emily Pochubay, MSU Extension

**GROWING DEGREE DAY ACCUMULATIONS AS OF July 9, 2018 AT THE NWMHRC**

Year	2018	2017	2016	2015	2014	2013	28 Yr. Avg.
<b>GDD42</b>	1681	1569	1612	1496	1454	1558	1579.3
<b>GDD50</b>	1101	929	986	884	887	995	959.3

**2018 Growth Stages – NW Michigan Horticultural Research Center July 9, 2018**

**Bartlett Pear** – 27 mm fruit

**Potomac Pear** – 34 mm fruit

**Mac** – 42 mm fruit

**Gala** – 34 mm fruit

**Red Delicious** – 37 mm fruit

**HoneyCrisp** – 42 mm fruit

**Montmorency** – 21 mm fruit

**Balaton** – 20 mm fruit

**Hedelfingen** – 19 mm fruit

**Gold** – 17 mm fruit

**Napolean** – 16 mm fruit

**Riesling** – Buckshot berries

**Weather Report**

This season continues to be warm and dry. Last weekend, we hit daytime highs in the 90s, and over the past weekend, we were slightly cooler in the mid-80s. The forecast is predicting continued warmth in the mid to high-80s. Conditions have also been humid. We have accumulated 1681 GDD base 42 and 1101 GDD base 50; we are currently ahead of our 28-year average of 1579 GDD base 42 and 959 base 50.

The most pressing weather situation is the lack of moisture. The region has dried out, and grass has almost seemed to brown overnight. Soils are dry and dry quickly following the little amounts of rainfall that we have received recently. Trees with a large crop load look particularly drought stressed, and fruit size is small as a result of lack of moisture and hot weather. Young trees are also showing signs of drought stress. The last substantial rainfall in the region was 1 July where the NWMHRC Enviroweather station recorded 0.33" of rainfall. Rainfall totals at the NWMHRC for June and thus far into July

are 2.2" of rain. According to Dr. Jeff Andresen, longer-term forecasts are predicting cooler and wetter weather around the third week of July. However, we will keep our eye on this forecast, as forecasts change quickly and frequently. There were brief rain showers recorded in East Leland (0.13"), Kewadin (0.05"), Old Mission (0.03"), and Northport (0.01") last night 9 July.

## Crop Report

Sweet cherry harvest has begun in the north. Again, fruit is on the smaller size as a result of the lack of moisture and likely a shortened growing season. With little rainfall, there is very little cracking in most sweet cherry blocks. Some brown rot is evident in bird-damaged fruit, but overall this disease level is low in the region. Some blocks of sweet cherries have a good crop load, and some orchards look like they have a very large crop. Many tart cherries also have a big crop load on them. Tart cherries seem to be ripening quickly, and there may be some logistical challenges to harvest tart and sweet cherries this season. Many growers will be relying on ethephon to manage the harvest timing. We remind growers to lighten up ethephon rates if the hot weather continues.

Apples are sizing well. Many growers are pleased with their thinning efforts. There is some hand thinning underway. Strawberry harvest has finished.

## Pest Report

The weather has continued to remain dry and warm over the last week with several windy days, and these conditions have posed few challenges in terms of disease and pest management. This stretch of dry weather has been welcomed as it has provided growers with opportunities to maintain adequate coverage particularly for insect pests.

In cherries, we have received reports of phytotoxicity showing up in blocks where the product Syllit and/or copper products were used for **cherry leaf spot** management. Most areas have not had a leaf spot infection period since early last week; infections were possible during last night's rain in East Leland, Northport, and Old Mission. Overall disease incidence remains low with a few isolated cases of orchards with moderate infections. We have continued to find low levels of **American Brown Rot** in fruit clusters and overall incidence in the region remains low; drier weather has not been conducive for rapid development of American brown rot. However, dry weather has been favorable for **powdery mildew** in orchards with ongoing mildew infections.

**Spotted wing drosophila** (SWD) numbers in traps have increased dramatically since our last regional report. At the station, we found a total of 3 flies two weeks ago, and 180 flies last week. Regional trap numbers also increased from zeros two weeks ago, up to 90 flies last week. Additionally, we found a larva in untreated fruit at the station on Friday 6 July. Maintaining coverage will be critical from now through harvest. Conditions have been dry which has helped growers keep fruit protected from possible SWD egg-laying. However, some pyrethroid materials could break down quickly in the recent hot, sunny

weather, and we encourage growers to avoid stretching intervals too far between sprays of these materials.

**San Jose scale** crawlers are still active in both sweet cherry and apples at the station. However, many sweet cherry blocks are fast approaching harvest and insecticide pre-harvest intervals will limit control options. We will trap for the second flight of scale males that typically occurs in late summer (August); we will also monitor for the second emergence of crawlers. Some growers with heavy scale infestations in sweet cherry blocks have considered making a post-harvest application to target the late summer/early fall crawlers when they emerge.

**Two spotted spider mite** numbers have been building in tart cherry blocks at the station. This season's hot and dry weather has been particularly conducive for mites.

**Obliquebanded leafroller** (OBLR) flight is ongoing with a decrease in activity at the station over the last two weeks. We have received reports of low numbers of obliquebanded leafroller larvae in commercial orchards.

**Cherry fruit fly** has not been detected at the station this season, but we have received reports that this pest was detected in our region last week.

In apples, **fire blight** disease progress has slowed recently. Previously infected shoots have dried and are noticeable in orchards, but we have not received reports of new ooze production.

The first flight of **codling moth** flight is ongoing, and we found an average of three moths per trap in apples at the station. Two weeks ago, there was a lull in our trap counts likely as a result of cooler evening temperatures that inhibited moth activity; with recent warmer evening temperature, activity has picked up. As mentioned in last week's report identifying distinct codling moth generations has been difficult due to relatively low pressure at the station. Based on our biofix 28 May, we have reached 798 GDD base 50 degrees F, and second-generation flight typically occurs 1060 GDD base 50 after biofix.

We have not detected **apple maggot** at this time; apple maggots have been detected in other regions of the state, and anecdotally, numbers seem to be high this season in those areas. After emergence, apple maggot flies undergo a 7-10 feeding period prior to egg laying, and this 7-10 day period is an optimal management timeframe.

We have not detected **brown marmorated stink bug** in orchards in the northwest region this season. In more southerly regions (north of Grand Rapids), brown marmorated stink bug exploratory feeding has been observed in apples. We encourage growers, scouts, and consultants to be on the lookout for this pest this season. At this time of the year, colleagues in the Grand Rapids area have observed that this pest seems to be particularly attracted to common buckthorn, an invasive shrubby plant. These insects attack many crop and non-crop hosts including several tree fruits. Although we did not find the pest in

orchards last season, we observed feeding damage on apples in a commercial block that was suspect of brown marmorated stink bug.

**Table 1. Avg. number of cherry and apple pests in the NWMHRC trap line by date.**

<b>Cherry - NWMRHC</b>	<b>7- May</b>	<b>14- May</b>	<b>21- May</b>	<b>28- May</b>	<b>4- June</b>	<b>11- June</b>	<b>18- June</b>	<b>25- June</b>	<b>2- July</b>	<b>9- July</b>
APB	0	0	5	6	7	7	6	0	1	7
LPTB			Set	4	11	11	3	1	12	4
GPTB				Set	1	0	1	0	0	1
OBLR					Set	0	8	19	10	1
CFF					Set	0	0	0	0	0
<b>Apple - NWMHRC</b>	<b>7- May</b>	<b>14- May</b>	<b>21- May</b>	<b>28- May</b>	<b>4- June</b>	<b>11- June</b>	<b>18- June</b>	<b>25- June</b>	<b>2- July</b>	<b>9- July</b>
OFM	Set	0	0	0	0	0	0	0	0	0
STLM	Set	13	18	32	25	1	1	4	5	10
CM		Set	0	1	8	1	3	0	1	3
OBLR					Set	0	2	3	1	1
AM									Set	0

APB = American Plum Borer

LPTB = Lesser Peachtree Borer

GPTB = Greater Peachtree Borer

SJS = San Jose Scale Adults

CFF = Cherry Fruit Fly

OFM = Oriental Fruit Moth

STLM = Spotted Tentiform Leafminer

CM = Codling Moth

AM = Apple Maggot

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## Predicted 2018 Apple Harvest Dates

Philip Schwallier, District Horticulture Educator

Amy Irish-Brown, District ICM Educator

## Clarksville Research Center

The predicted harvest dates for every MAWN weather station is now available on Enviroweather web site at Michigan State University. This spring was colder than average which delayed the development of spring foliage. Then warmer weather arrived and bloom developed 7 behind normal in the south to 2 days behind normal in the north part of the state. Record hot temperatures followed thus advancing harvest dates to predict near normal dates for 2018 for the state. In general, 2018 Predicted Harvest Dates are roughly normal in the south and a few days early in the north. Bloom dates this spring were late across the state.

As always, the weather seems to be unusual each year and 2018 was no different. It began with what appeared to be another very late spring. Most areas bloomed late except northern areas of the state. During April very cold weather moved in several times leaving low areas and sensitive varieties with minor frost damage. In general, apple blocks have a mix of cropload, some light areas but mostly moderate to heavy cropload. Blocks with light croploads will mature 3 or 4 days sooner than the predicted harvest dates. Heavy croploads will mature 7 days later than the predicted dates. If hot stressful weather occurs in August or September, apple maturity will be advanced. The 2018 predicted harvest dates are listed in Table 1. This year 2018, we are a few days behind last year. Table 2 lists this year's predictions compared to normal and last year.

The normal harvest dates for other varieties are listed in Table 3 for the Grand Rapids area. This year's 2018 predicted dates for other non-modeled varieties are a rough estimate based on the McIntosh, Jonathan and Red Delicious predicted dates. Other areas of the state should adjust non-predicted varieties based on their own history. ReTain application should be applied 30 DBH (days before harvest). Harvista can be applied 3 to 7 DBH. Use Table 3, 2018 Predicted Harvest Dates for Other Varieties, to time ReTain applications and adjust for varieties and locations.

**Table 1. 2018 predicted peak harvest dates.**

Full bloom date 2018				Predicted harvest date 2018			
Station	McIntosh	Jons	Reds	McIntosh	Jons	Reds	Observer
SWMREC	11-May	13-May	14-May	8-Sep	24-Sep	1-Oct	Shane
Deerfield	8-May	9-May	10-May	5-Sep	22-Sep	29-Sep	Tritten
Romeo	13-May	14-May	15-May	10-Sep	25-Sep	30-Sep	Tritten
Peach Ridge	16-May	17-May	17-May	14-Sep	26-Sep	2-Oct	Irish-
Hart	21-May	22-May	23-May	19-Sep	30-Sep	7-Oct	Irish-
NWMHRS	22-May	23-May	23-May	20-Sep	2-Oct	8-Oct	Rothwell

**Table 2. 2018 predicted peak harvest dates compared to normal and last year.**

Days ahead of normal				Days ahead of last year		
Station	McIntosh	Jons	Reds	McIntosh	Jons	Reds
SWMREC	-1	-3	-3	-11	-9	-9

Deerfield	3	-1	3	-7	-4	-4
Romeo	3	0	3	-8	0	1
Peach Ridge	1	0	3	-9	1	2
Hart	-1	3	7	-6	0	-1
NWMHRS	2	4	9	-1	6	6

**Table 3. Normal and 2018 peak harvest dates for varieties for the Grand Rapids area**

Variety	Normal date	2018 predicted date
Paulared	8/24	8/24
Gingergold	8/26	8/26
Gala	9/10	9/10
McIntosh	9/15	9/14
Honeycrisp	9/18	9/18
Empire	9/24	9/24
Jonathan	9/26	9/26
Jonagold	9/26	9/26
Golden Delicious	10/2	9/28
Red Delicious	10/5	10/2
Idared	10/10	10/9
Rome	10/15	10/14
Fuji	10/25	10/25
Braeburn	10/25	10/25
Goldrush	11/1	11/1

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## **Pre-Harvest Planning Announcement**

Please join us for breakfast and a short pre-harvest planning meeting to get you thinking about preparing for a successful apple harvest for 2018

When: Tuesday, July 17, 2018

7:45 AM – Coffee

8:00 AM – Breakfast buffet

8:30 AM – 10:30 AM – Various presentations related to predicted harvest dates and pre-harvest management applications, late season pest considerations, etc.

Presenters include:

Gregory Clarke, Valent USA

Phil Schwallier, MSU Extension

Todd Einhorn, MSU Department of Horticulture

Amy Irish-Brown, MSU Extension

Where: English Hills Country Club, 1200 4 Mile Road NW, Walker, MI 49544

No registration necessary – please just come join us. I hear there might be a door prize or two.

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## Project GREEN Drone Workshops

**Background:** Thanks to a grant from AgBioResearch at MSU, RS&GIS and Dr. Bruno Basso will be conducting a series of **free** Drone workshops over the next two years, for growers across the state. Through these workshops, growers will develop an understanding of drone- based data collection and analysis with specific application to their commodity groups. Each of the 2-day workshops will target a specific commodity group including: tree & bush fruits, viticulture, nursery stock, and row crops.

Registration: <https://goo.gl/forms/UQDAnHWxBpRtnopz2>

Agricultural Specialization (Commodity Group)	Location	Date
Tree / Bush Fruit	Southwest MI Extension Center, Benton Harbor	August 9 -10, 2018
Grapes	Northwest MI Horticulture Research Center, Traverse City	September 13 – 14, 2018
Nursery Stock	Michigan State University, East Lansing	September 6-7, 2018
Row Crops	TBD	TBD

### Overall Attendees will:

- Learn the essential elements required to safely conduct commercial flight and mapping operations in the National Airspace System including flight planning and preparation
- Take part in hands-on drone flights both manual and autonomous.
- Develop an understanding of analysis techniques and applications in precision ag
- Gain a brief overview of Remote Sensing and its management applications.
- Leave the course with a clear understanding of the Drone-to-GIS workflow, including planning and completing missions, processing data and analyzing said data in GIS

Space is limited, if you are interested in attending please register and answer the questions at: <https://goo.gl/forms/UQDAnHWxBpRtnopz2>

Interested parties must sign up by July 25, 2018, we will confirm your spot by August 1, 2018.

Please contact Erin Bunting ([ebunting@msu.edu](mailto:ebunting@msu.edu)) or Bruno Basso ([basso@msu.edu](mailto:basso@msu.edu)) for more information

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## Articles featured in past FruitNet Reports

### A note from the CIAB

Dear FruitNet Subscribers,

Please see the following note from the Cherry Industry Administrative Board Executive Director, Mollie Woods:

*The CIAB met today in Grand Rapids. The Board has recommended a preliminary restriction of 31% (or 96 million lbs). Field staff are prepared to begin diversion activities immediately. Please contact your field supervisors if you anticipate needing diversion assistance. Field staff contact information is available from our office, or you can find a link on our website at [www.cherryboard.org](http://www.cherryboard.org), under contacts and field staff. Additional information about the Board meeting will be forthcoming in our newsletter.*

*Best Wishes,  
Mollie Woods*

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### 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.

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## **First SWD Larvae Detected in Unsprayed Cherries at NWMHRC**

July 6, 2018

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.

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## **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 phytotoxicity 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.

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## **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  $\frac{3}{4}$  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](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>