# Northern Michigan FruitNet 2017
# Northwest Michigan Horticultural Research Center

## Weekly Update

**FruitNet Report – May 9, 2017**

## CALENDAR OF EVENTS

| | |
|---|---|
| **5/19** | **Save the Date: Apple Thinning Meeting**<br>NWMHRC, 10 – 1 PM, **RSVP by May 17**<br>More information to come! |
| **5/9 – 6/27** | **Leelanau IPM Updates**<br>Jim and Jan Bardenhagen's Farm, 12PM – 2PM |
| **5/9 – 6/27** | **Grand Traverse IPM Updates**<br>Wunsch Farms Packing Shed, 3PM – 5PM |
| **5/10 – 6/28** | **Antrim IPM Updates**<br>Jack White Farms, 10AM – 12PM |
| **5/10 – 6/28** | **Benzie IPM Updates**<br>Blaine Christian Church, 2PM – 4PM |

## What's New?

- **Northwest Regional Fruit Report – May 9, 2017**
- **Select Max labeled for tree fruit**
- **How integrated pest management helps Michigan grape growers**
- **Spraying Promalin (Valent)/Perlan (Fine Americas) on Frost Damaged Apples, 2017**
- **MSU Enviroweather serves Michigan grape and wine industries**
- **Retain Use to Increase Sweet Cherry Yields**

# Northwest Regional Fruit Report – May 9, 2017

*Fruit damage assessments are underway following two nights of freezing temperatures in the region.*

**Emily Pochubay and Nikki Rothwell**

## GROWING DEGREE DAY ACCUMULATIONS AS OF MAY 8, 2017 AT THE NWMHRC

| Year | 2017 | 2016 | 2015 | 2014 | 2013 | 2012 | 27 Yr. Avg. |
|---|---|---|---|---|---|---|---|
| **GDD42** | 284 | 279 | 309 | 146 | 274 | 528 | 303.1 |
| **GDD50** | 113 | 109 | 145 | 41 | 147 | 260 | 135.1 |

## 2017 Growth Stages as of 5/8/17

Bartlett Pear – White bud
Potomac Pear – Ear. white bud
Mac – Early pink
Gala – Pink
Red Delicious – Pink
HoneyCrisp – Pink
Montmorency – Ear. white bud
Balaton – Ear. white bud
Hedelfingen – Full bloom
Gold – 10% bloom
Napoleon – Full bloom
Riesling – Early bud swell

**Weather Report**

Unfortunately, the NW region of Michigan recorded some low overnight temperatures for the past two nights, 7-9 May. During the early morning of 8 May, the Bear Lake weather station recorded temperatures in the mid-25 degree F range for five hours. Benzonia, East Leland, Eastport, and Elk Rapids weather stations also fell below freezing. Kewadin, Northport, Old Mission, and the NWMHRC weather stations did not record temperatures below freezing on that evening. The next evening and into this morning, 9 May, all northwest Michigan Enviroweather stations recorded temperatures below

freezing. The East Leland weather station recorded the lowest temperatures in the region, and temperatures hit a 23.2 degree F low at 6 AM this morning.

Overall temperatures have been cool over the past week. The weekend also brought very cold winds from the north; these winds continued into Monday but then the wind died down on Monday into Tuesday morning when the region became dead calm overnight. We have accumulated 284GDD base 42 and 113GDD base 50. With the recent cool temperatures, we have fallen behind on our growing degree accumulations compared with our long-term average.

**Crop Report**

Plant development has been extremely slow with the recent cool temperatures over the past week—development seems to be at a stand still. However, temperatures are expected to warm this week into the 60s, and plant development will move along quickly under these conditions. Currently, we are at various stages of bloom in sweet cherries depending on variety and location across the region. We are just starting to see the first white in tart cherries, and apples are just approaching the pink stage. Hopefully, we will see less damage from the frost/freeze events since we are not as far along in development. In tart cherry early white bud, we typically see damage at 24-28 degrees F, and 25-28 degrees F at first bloom in sweet cherries (Figure 1). Apples at pink will have damage at 24-28 degrees F. Due to cool temperature, some growers are considering ReTain applications to extend blossom life and encourage pollination. Apple growers in frosted areas are weighing their options for Promalin (Valent)/Perlan (Fine Americas) applications in hopes to set parthenocarpic (i.e. seedless) fruit.

**Pest Report**

The weather has been dry since last week's report and as a result these conditions have not been favorable for disease development. The coming forecast looks mostly dry with a slight possibility for rain toward the end of the week. Hence, the coming week is for-the-most part a positive outlook for low chances of infections of most tree fruit diseases.

Bacterial canker is a concern in areas with freezing temperatures that killed blossoms and in some cases cherry foliage. Although copper is phytotoxic on sweet cherry foliage, growers that had blossom and foliage damage in sweet cherries are considering a copper application to reduce bacterial canker populations. As frozen tissues thaw, the bacteria can move into woody tissue; hence, minimizing the surface populations with a copper spray could help to lessen infections.

The last apple scab infection period occurred during the first few days of May and growers should continue to monitor the forecast to determine when to put on their next scab spray. Warmer conditions are predicted which should accelerate growth, and as the season progresses, we can expect higher numbers of spore discharge and increased risk of infection in future rains when they come.

At this time the forecast (i.e. dry weather with moderate temperature) is not looking particularly favorable for European or American brown rot. Additionally, the inoculum load in most orchards is low coming into this season. However, if Balaton or Montmorency orchards had EBR last season and the forecast changes to cool wet conditions, growers may want to consider an EBR spray. Similarly, growers may want to consider management in orchards if they had ABR infected fruit last season and warm wet conditions arise during bloom. Again, conditions do not look particularly favorable for either brown rots at this time.

Bract leaves are present and these small leaves are susceptible to cherry leaf spot when conditions favor CLS infection periods. Fortunately, leaf spot infections were low last season in the region and recent conditions have been cool and dry which does not favor CLS development. Temperatures above 46 degrees Fahrenheit are needed for this pathogen to develop and sufficient rains are required for spore release.

As temperatures are predicted to warm up this week, we are anticipating that apple blossoms could open quickly. If this is the case, growers should be ready to start fire blight sprays. Last season was highly favorable for fire blight and infections were widespread in the region. We encourage growers to monitor the epiphytic infection potentials (EIP) values on Envrioweather's MaryBlight model if we do move into bloom quickly.

Cooler temperatures have slowed insect activity in the last week. We found an average of six green fruitworm moths at the NWMHRC in our American plum borer traps in cherries. In apples, oriental fruit moth and spotted tentiform leafminer traps are up with no catches thus far and we will begin monitoring for San Jose scale and codling moth later this week.

**Wine Grapes**
*Duke Elsner*

In the research vineyard all varieties are showing bud swell to some degree. Some of the earliest hybrids, such as LaCrescent, have pushed to the point that the edges of the first leaves are showing. There was no injury from the Monday or Tuesday morning frosts, but there may have been injury at other sites in northwest Michigan where temperatures in the low 20's were recorded. No pest insect activity has been seen. The window for dormant or delayed dormant applications for powdery mildew will be over soon.

**Saskatoons**
*Duke Elsner*

Very little change has occurred since last week; most sites I've seen are just beginning to show the white tip stage of bud development. No pest insect activity has been seen. We are not certain of the prime infection periods for Entomosporium leafspot or saskatoon-juniper rust, but these fungal diseases may now be releasing spores if rainy weather occurs.

## CRITICAL SPRING TEMPERATURES FOR TREE FRUIT BUD DEVELOPMENT STAGES

| Pome Fruit (Apples and Pears) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Apples** |  |  |  |  |  |  |  |  |  |
| **Apples** | **Silver tip** | **Green Tip** | **Half inch green** | **Tight Cluster** | **First Pink** | **Full Pink** | **First Bloom** | **Full Bloom** | **Post Bloom** |
| **Old temp** | **16** | **16** | **22** | **27** | **27** | **28** | **28** | **29** | **29** |
| **10% kill** | **15** | **18** | **23** | **27** | **28** | **28** | **28** | **28** | **28** |
| **90% kill** | **2** | **10** | **15** | **21** | **24** | **25** | **25** | **25** | **25** |
| **Pears** |  |  |  |  |  |  |  |  |  |
| **Pears** | **Bud scales separating** | **Blossom buds exposed** | **No name** | **Tight cluster** | **First White** | **Full White** | **First Bloom** | **Full Bloom** | **Post Bloom** |
| **Old temp** | **18** | **23** | **No data** | **24** | **28** | **29** | **29** | **29** | **30** |
| **10% kill** | **15** | **20** | | **24** | **25** | **26** | **27** | **28** | **28** |
| **90% kill** | **0** | **6** | | **15** | **19** | **22** | **23** | **24** | **24** |

| Stone Fruit (Apricots, Peaches and Plums) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Apricots** |  |  |  |  |  |  |  |  | |
| **Apricots** | **Swollen Bud** | **Tips separate** | **Calyx red** | **First White** | **First Bloom** | **Full Bloom** | **In the shuck** | **Green Fruit** | |
| **Old temp** | -- | 23 | -- | 25 | -- | 28 | -- | 31 | |
| **10% kill** | 15 | 20 | 22 | 24 | 25 | 27 | 27 | 28 | |
| **90% kill** | -- | 0 | 9 | 14 | 19 | 22 | 24 | 25 | |
| **Peaches** |  |  |  |  |  |  |  | | |
| **Peaches** | **Swollen Bud** | **Calyx Green** | **Calyx Red** | **First Pink** | **First Bloom** | **Full Bloom** | **Post Bloom** | | |
| **Old temp** | 23 | -- | -- | 25 | -- | 27 | 30 | | |
| **10% kill** | 18 | 21 | 23 | 25 | 26 | 27 | 28 | | |
| **90% kill** | 1 | 5 | 9 | 15 | 21 | 24 | 25 | | |
| **European Plums** |  |  |  |  |  |  |  |  | |
| **European Plums** | **First Swelling** | **Side White** | **Tip Green** | **Tight Cluster** | **First White** | **First Bloom** | **Full Bloom** | **Post Bloom** | |
| **Old temp** | -- | -- | -- | -- | 23 | 27 | 27 | 30 | |
| **10% kill** | 14 | 17 | 20 | 24 | 26 | 27 | 28 | 28 | |
| **90% kill** | 0 | 3 | 7 | 16 | 22 | 23 | 23 | 23 | |

| CRITICAL SPRING TEMPERATURES FOR TREE FRUIT BUD DEVELOPMENT STAGES | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Cherries | | | | | | | | | |
| Sweet Cherries |  |  |  |  | No picture |  |  |  | |
| Sweet Cherries | Swollen Bud | Side Green | Green Tip | Tight Cluster | Open Cluster | First White | First Bloom | Full Bloom | Post Bloom |
| Old temp | 23 | 23 | 25 | 28 | 28 | 29 | 29 | 29 | 30 |
| 10% kill | 17 | 22 | 25 | 26 | 27 | 27 | 28 | 28 | 28 |
| 90% kill | 5 | 9 | 14 | 17 | 21 | 24 | 25 | 25 | 25 |
| | | | | | | | | | |
| Tart Cherries |  |  |  |  |  |  |  |  |  |
| Tart Cherries | Swollen Bud | Side Green | Green Tip | Tight Cluster | Open Cluster | First White | First Bloom | Full Bloom | |
| 10% kill | 15 | 24 | 26 | 26 | 28 | 28 | 28 | 28 | |
| 90% kill | 0 | 10 | 22 | 24 | 24 | 24 | 24 | 24 | |

Old standard temperature is the lowest temperature that can be endured for 30 minutes without damage. This chart also shows the temperature that will kill 10 % and 90 % of normal fruit buds.
These numbers were taken from Washington (WSU) and Michigan (MSU) Bulletins. Apple - WSU EB0913, Pears - WSU EB0978, Sweet Cherries - WSU EB1128, Peaches - WSU EB0914, Apricots - WSU EB1240, Tart Cherries - MSU Research. Rpt. 220,

Compiled by Mark Longstroth, MSU Extension Educator, all photos by Mark Longstroth (MSUE)

See Tree Fruit Critical Temperatures (pdf)

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## Retain Use to Increase Sweet Cherry Yields

N.L. Rothwell and E. A. Pochubay, NWMHRC

In recent years, many growers have started to use ReTain in their sweet cherry blocks to increase fruit set and ultimately increase their yields. ReTain is a plant growth regulator that has been shown to extend flower viability in cherry by reducing ethylene production in cherry flowers and delaying flower and stigmatic senescence. Due to this effect, flowers that last longer have a higher likelihood to be successfully pollinated, and increased pollination results in a higher yield. Research has shown that ReTain works best if used before poor pollinating conditions (wet, cool, windy weather or low honeybee activity) or on varieties that tend to be shy-bearing.

Recent cool weather has extended bloom time throughout the region and temperatures are predicted to warm up into the 60s as we move into this week and next. Sweet cherries are currently at 10% to full bloom at the NMWHRC and depending on variety and location sweet cherries in the region are close to that spectrum of development. Data have shown that ReTain applications are more effective when applied early and with the predicted moderate temperatures ReTain applications could help improve yields this year.

We conducted a ReTain trial at three grower farms in 2014. ReTain was applied in two Balaton blocks and one sweet cherry var. Regina block. Each block was approximately 10 acres where half of the block was treated and the other half untreated. ReTain was applied at the recommended rate of 1 pouch per acre (11.7 oz/A) at popcorn to early bloom stage at 100 gal/A. No surfactants or fungicides were tank mixed with the product. We found that ReTain significantly improved yields in the Regina orchard (Figures 1 and 2) and one of the Balaton orchards; in both of these trials, ReTain was applied at <10% bloom. In the second Balaton orchard, the ReTain application was made at 70% bloom, and the PGR had no effect on yield. Therefore, we recommend making ReTain applications early: popcorn to first bloom.

A team from Washington State University and Oregon State University has also conducted ReTain trials. ReTain was applied at four stages during bloom: popcorn, 10 percent full bloom, 50 percent full bloom, and full bloom. The ReTain treatment at 10 percent full bloom gave as much as a 20 percent increase in fruit set compared with the control. That was a gain of almost 9 pounds per tree or 2 tons per acre. Tests with Tieton also resulted in significant increases in fruit set. However, unlike the results we observed in Michigan, the western team found that each of the application timings improved fruit set, though there was no consistent trend. They concluded that there could be a broad window when the treatment can be effective. Some of the variability in results could have been attributable to the weather at the time of or immediately after application as warm temperatures would have hastened the senescence of the ovule.

Although the results varied from our trials in Michigan, we are still recommending that ReTain be sprayed early in the season, either popcorn or first bloom. The rate of ReTain is one pouch per acre (11.7oz/acre). The more tissue on the tree, the better the response, but the key timing is early based on our results and past recommendations by the Valent Company. The spray volume is recommended at 100 gal/acre. ReTain cannot be used after petal fall, and it is not recommended if rain is expected within eight hours of application. Temperature should be monitored during application timing as the effectiveness of plant growth regulators decrease at low temperatures. Also, we recommend applying ReTain under slow drying conditions. According to the Valent representatives, they have found that treating a larger block is more effective than treating rows within a block; the overall effectiveness of the active ingredient in ReTain is improved with broad coverage.

Figure 1: ReTain-treated Regina

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## Spraying Promalin (Valent)/Perlan (Fine Americas) on Frost Damaged Apples, 2017

N. Rothwell, P. Schwallier, and E. Pochubay

Growers are currently assessing the frost damage from the cold overnight temperatures on 7-9 May. The Michigan State University critical temperature charts shows that apples can be damaged at 24-28 degrees F at the tight cluster stage, which is where we are in development at the NWMHRC. Some of the MSU Enviroweather station recorded temperatures lower than these critical temperatures, and as a result, there are likely variable amounts of damage in apple blocks across the region. Because we are not very far along in development, it will be difficult to determine the level of damage in each block, particularly because tops of trees fared better than lower regions of the trees at most sites. With these recent cold events, growers need to assess whether they should apply Promalin (Valent)/Perlan (Fine Americas) to frosted blocks.

Promalin (Valent)/Perlan (Fine Americas) is a mixture of naturally occurring plant growth regulators (PGR), most specifically a gibberellic acid 4 and 7 (GA4+7), which causes cells to enlarge. This PGR can impact apples in many ways depending on when it is applied. In the case of apple trees that have been frosted, these gibberellins can stimulate parthenocarpic fruit development. Parthenocarpy is the natural or artificially induced production of fruit without fertilization of ovules. Fruit that develop through this method are seedless. In laymen's terms, Promalin (Valent)/Perlan (Fine Americas) will help set fruit on frost-damaged bloom. However, growers need to keep in mind that these fruits may have reduced quality compared to unfrosted fruits.

Much of the research recommends applying Promalin (Valent)/Perlan (Fine Americas) within 24 hours of the frost event. However, Phil Schwallier has found that the application timing is longer than the 24 hours, perhaps as much as 4 days. From his observations, he has seen Promalin (Valent)/Perlan (Fine Americas) work when applied within a few days after the frost event and still increase fruitset. This product can be

applied from pink to petal fall; once the fruit has been fertilized and begins to size (4-20mm), Promalin (Valent)/Perlan (Fine Americas) will provide little to no benefit. Therefore, growers must assess their crop and determine the stage of development prior to applying Promalin (Valent)/Perlan (Fine Americas). The application can be made up to four days from the 9 May frost event, so growers will have a bit of time to determine the level of damage and their stage of development for each of their blocks.

We recommend that Promalin (Valent)/Perlan (Fine Americas) be used 1 pt/acre. As with most PGRs, temperatures should be warm (65+F) before application. The weather forecast is predicting temperatures into the mid-60s for a few days then back down to the high 50s and low 60s. These temperatures might be our best shot for a Promalin (Valent)/Perlan (Fine Americas) application. We do not want the fruitlet to whither on the cool days; earlier sprays will start the setting process and late sprays in some years might allow the fruitlet to die. As with other PGR applications, temperatures on the day of application are important, but the days following are even more critical. In the case of Promalin (Valent)/Perlan (Fine Americas) this season, the sooner the application can be made, the more optimistic we are about setting fruit. In addition to setting fruit in frosty conditions, Promalin (Valent)/Perlan (Fine Americas) will do the following: 1. Increase cell division, 2. Increase fruit weight, 3. Increase apple typeyness, 4. Increase fruitset, and 5. Start the thinning process. Lastly, growers need to consider their crop insurance policy before making Promalin (Valent)/Perlan (Fine Americas) applications.

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## Williamsburg Enviroweather tower not fully functional – UPDATE

**UPDATE - The tower is not scheduled to be fixed until sometime on Monday, May 8, 2017, which is unfortunately is after the expected cold on Sunday into Monday.**

This Tuesday, the Enviroweather tower located in Williamsburg, was struck by lightning. It has been discovered that 20 meter sensor appears to have suffered damage. All other functions appear to be working at this time.

Currently, the 20 meter sensor seems to be recording temperatures 10 degrees below the actual temperature. MSU Extension is working on getting replacement parts as quickly as possible, and we hope to have a new part in place by this weekend. We will plan on sending out an update via FruitNet on Friday afternoon, regarding the status of reconstruction.

We apologize for this interruption during this critical time.

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## Clarifications on Worker Protection Standards:

# Central Posting for Pesticide Application Information versus Decontamination Station Requirements for Agricultural Workers

Eric McCumber, MDARD
Emily Pochubay and Nikki Rothwell, MSU Extension

Both MDARD and MSU have received recent questions about the requirements to display pesticide application information at a central posting area. Growers also have questions about what should be included at designated decontamination stations. This article is intended to clarify such questions because we have heard misinformation that pesticide application information should be posted within a ¼ mile of where agricultural workers are working in a treated block—this type of posting is *not* required to meet WPS regulations. This confusion may be related to regulations for decontamination stations; according to WPS, **decontamination stations** are required with ¼ mile from where agricultural workers will be working during the REI or for 30 days thereafter of the application of a WPS-labeled pesticide. Although we will cover the key points for these two issues in this article, more detailed information can be found in the How To Comply Manual (HTCM) at www.pesticideresources.org. In the HTCM, central posting location information is on page 21 and decontamination station information can be found on page 48. The information presented below is relevant to agricultural employers of agricultural workers. Supplies needed for handlers' decontamination sites are different and we encourage employers and handlers to review this information as needed (page 74-75 of the HTCM).

## Central Posting

**Central posting locations** serve as the hub for pesticide application information, and this central posting location is the *only* location on the farm that is required to contain the information outlined below. *According to MDARD, central posting locations* are areas where all farm employees can find any information related to pesticide applications. If a WPS-labeled pesticide has been applied, or if a restricted-entry interval (REI) has been in effect within the past 30 days, then the agricultural employer must display the required information (see below) at a central posting location whenever any agricultural worker is on the agricultural establishment. The location of the central posting is determined by the agricultural employer, but it should be placed in a location where employees congregate such as the workshop, office, break room, or an area where they check in for work. Agricultural workers must be informed where the designated central posting location is located and must be allowed unrestricted access to the posted information during employment hours.

Agricultural producers are required to display at the central posting area the following information. Again, agricultural workers must have unimpeded access to the information during work hours.

- **Pesticide application information including:**

- ✓ Brand name of the pesticide(s) applied.
- ✓ Active ingredient(s).
- ✓ EPA Reg. No.
- ✓ REI.
- ✓ Crop/site treated.
- ✓ Location and description of treated area(s).
- ✓ Date(s) and time(s) application started and ended.

- **Safety Data Sheets** (SDS) for each pesticide product.

- **Pesticide Safety Information**. Prior to the updated WPS, this information was required to be displayed in a poster format (known as pesticide safety poster). Agricultural employers are no longer required to display a poster, but must provide information about certain WPS safety concepts-about preventing pesticides from entering the body. The required 7 safety concepts include:

  - ✓ Avoid getting pesticides on your skin or into your body. Pesticides may be on plants, soil, irrigation water, equipment, or may drift from nearby applications.
  - ✓ Wash before eating, drinking, using chewing gum or tobacco, or using the toilet.
  - ✓ Wear work clothing that protects your body from pesticides, such as long-sleeved shirts, long pants, shoes, socks, and a hat or scarf.
  - ✓ Wash or shower with soap and water, shampoo hair and put on clean clothes after work.
  - ✓ Wash work clothes separately from other clothes before wearing them again.
  - ✓ If your body is contaminated by pesticides wash immediately, and as soon as possible, wash or shower with soap and water and change into clean clothing.
  - ✓ Follow directions about keeping out of treated or restricted areas.

  In addition, the updated safety information that will be required in the future must include:

  - ✓ Instructions for seeking medical attention as soon as possible after being poisoned, injured or made ill by pesticides.
  - ✓ Name, address and telephone number of state or tribal pesticide regulatory authority. In Michigan, the agency is the Michigan Department of Agriculture and Rural Development, 525 West Allegan Street, P.O. Box 30017, Lansing, MI. The phone number is 800-292-3939.
  - ✓ If pesticides are spilled or sprayed on the body use decontamination supplies to wash immediately, or rinse off in the nearest clean water, including springs, streams, lakes or other sources if more readily available

than decontamination supplies, and as soon as possible, wash or shower with soap and water, shampoo hair, and change into clean clothes.

- ✓ Follow directions about keeping out of treated areas and application exclusion zones.
- ✓ The term "emergency medical facility" should be revised to "a nearby operating medical care facility." Include name, address, and telephone number for the medical facility. This information should be clearly identified as emergency medical contact information on the display.
- ✓ The point that there are federal rules to protect workers and handlers is self-evident and is no longer required to be part of the safety information

**NOTE:** The updated pesticide safety information content is not required until 1/4/18, but employers can begin using the updated version immediately. Details are shown on page 23 of the How To Comply Manual. The EPA is in the process of developing a poster version of the pesticide safety information.

Agricultural producers are only required to have *one central posting area*, but must provide unrestricted access to agricultural workers during work hours. It can be impractical for farms that are many miles apart to give unrestricted access, so agricultural producers may set up different central posting areas for distinctly different farm locations at their discretion. Agricultural employers may also provide the central posting information electronically, as long as content, accessibility, display, legibility, location, and retention requirements are met. Employers would need to ensure that agricultural workers have access to the information, such as through a smart phone or dedicated computer, and are instructed in how to access the information.

## Decontamination sites

Agricultural employers must make sure that decontamination supplies are provided to workers doing tasks that involved contact with anything that has been treated with the pesticide including soil, water, or plants in a pesticide-treated area where, within the last 30 days, a WPS-labeled pesticide product has been used or a REI for such pesticide has been in effect.

Decontamination supplies that must be provided include:

- ✓ Water – the employer must provide at least 1 gal of water per worker at the beginning of the work period and at a quality and temperature that will not cause injury or illness if it contacts skin or eyes, or is swallowed.
- ✓ An adequate supply of soap and single use towels. Hand sanitizers or wet towelettes *do not* meet the requirement for soap or towels.

## Duration of the Decontamination Site

If the REI of an applied pesticide is greater than 4 hours, decontamination supplies must be provided until 30 days after the end of the REI expires. If the REI is less than 4 hours, decontamination supplies must be provided until 7 days after the REI expires.

Location of Decontamination Sites

All decontamination supplies for agricultural workers must be located together and be reasonably accessible to where the workers are working (generally within ¼ miles of the workers) and be outside of any treated area or an area under a REI. For worker tasks performed more than ¼ mile from the nearest point reachable by vehicles or more than ¼ mile from a non-treated area, the decontamination supplies may be at the nearest vehicular access point outside any treated area or area under REI (page 48 of the HTCM).

Remember that in addition, the Pesticide Safety Information (formerly referred to as the Pesticide Safety Poster) must be displayed at any permanent decontamination site, or any decontamination site that services 11 or more workers (page 21, HTCM).

In summary, central posting locations are the main hub for pesticide application information, and the information that must be displayed at the central posting locations is not required in other agricultural areas (i.e. ¼ mile from workers working in treated fields, or at decontamination stations). It is the responsibility of the employer to train employees on how and where to access the central posting information. Although not required, some growers may choose to provide additional pesticide application information to their workers by having additional posting sites or virtual access to this information. Potable water, and an adequate supply of soap and single use towels, and possibly pesticide safety information (if the decontamination site is a permanent location or services more than 11 workers) must be provided at decontamination

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# Apple Frost Guide 2017

**Philip Schwallier and Amy Irish-Brown**

When frost conditions occur in fruit orchards, what are activities that you can do to help minimize the potential damage and what are minimizing characteristics?

Apple Critical Minimum Temps for 10% Kill

| | |
|---|---|
| Petal Fall | 30°F |
| Full Bloom | 30°F |
| Pink | 28°F |
| Open Cluster | 27°F |

**Activities:**

- Frost fans will provide warming by mixing warm into the orchards. (Perhaps 5°F)

- Under-tree micro-sprinkler will provide heat from well water into the orchard. Start system a couple of hours before temps get too cold and freeze up the system. (Perhaps 4°F)
- Over-tree sprinkler will protect plants coated with ice. (Uses large amounts of water)
- Herbicide strips. Bare Soils will absorb heat and provide radiation heat to trees overnight. (Perhaps 2°F)
- Mowing orchards short. Short grass will allow sod to absorb heat all day from sunny conditions to release all night to the trees. (Perhaps 2°F)
- Nutrient sprays will strengthen fruitlets to resist freezing temps. (Perhaps 1°F)
- Burning wood and hay will provide heat to the orchard for only small areas near the fire. (Perhaps 4°F). Place small piles of firewood down the center of every or row and light every other pile at 3 am and then at 5 am start the other piles. Each will burn to roughly 2 hours.
- Wetted soil, run irrigation to wet the soil as much as possible before the frost event. Start trickle early enough to thoroughly wet orchard before the frost. Run irrigation (trickle) the all night of the freeze. Trickle will probably freeze up during the frost event. Wet soil absorbs heat and radiates heat best.
- Frost protection spray products can be useful but not consistent.

**Minimizing Characteristics:**

- Flowers pointing downward will not radiate their heat as much and flowers pointing toward the sky. These tend to survive cold frost events
- Abundant bloom. Numerous flowers will survive the light to moderate frost event.
- Flowers at a wide stage of development (Pink to Petal Fall) will have different critical minimum temperatures and will survive frost events.
- Abundant foliage. Leaves will provide protection to flowers hiding under the leaf. It will reduce radiation of heat.

**Other Information:**

- Smoke is of no value. The heat will radiate skyward right through the smoke.

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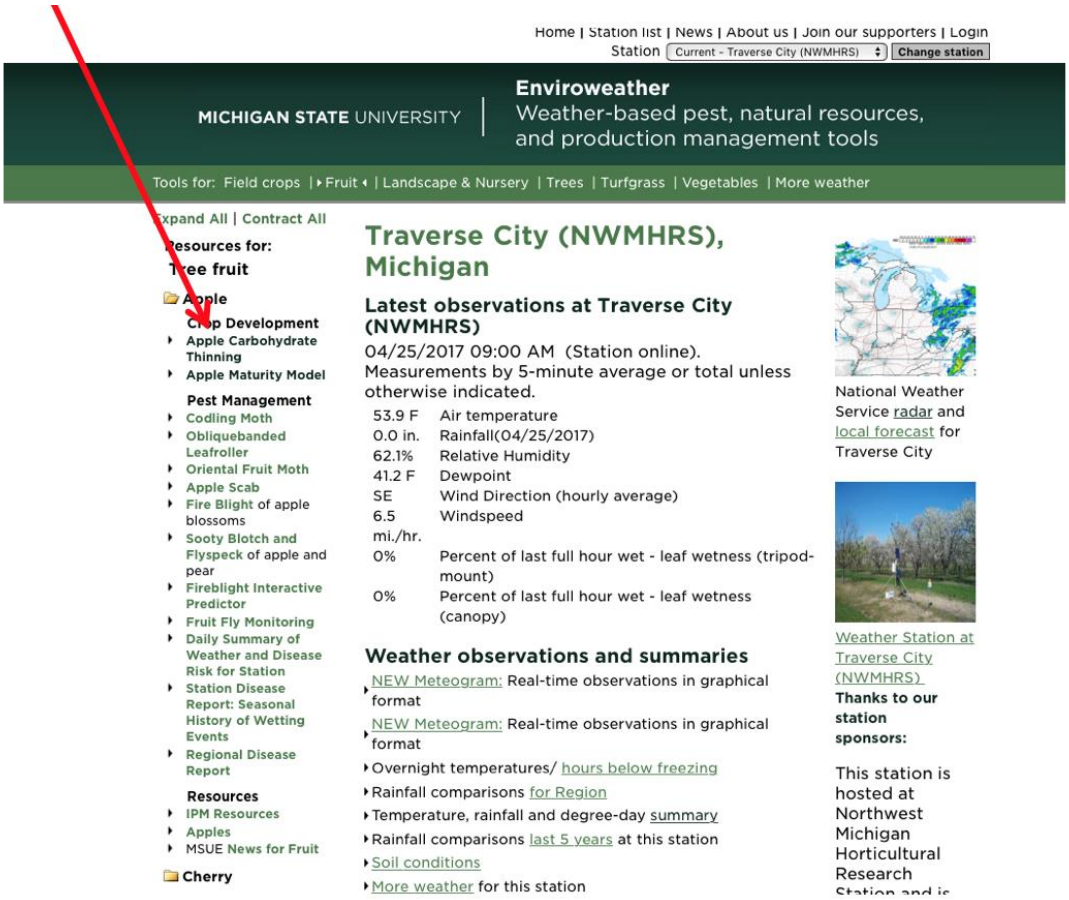
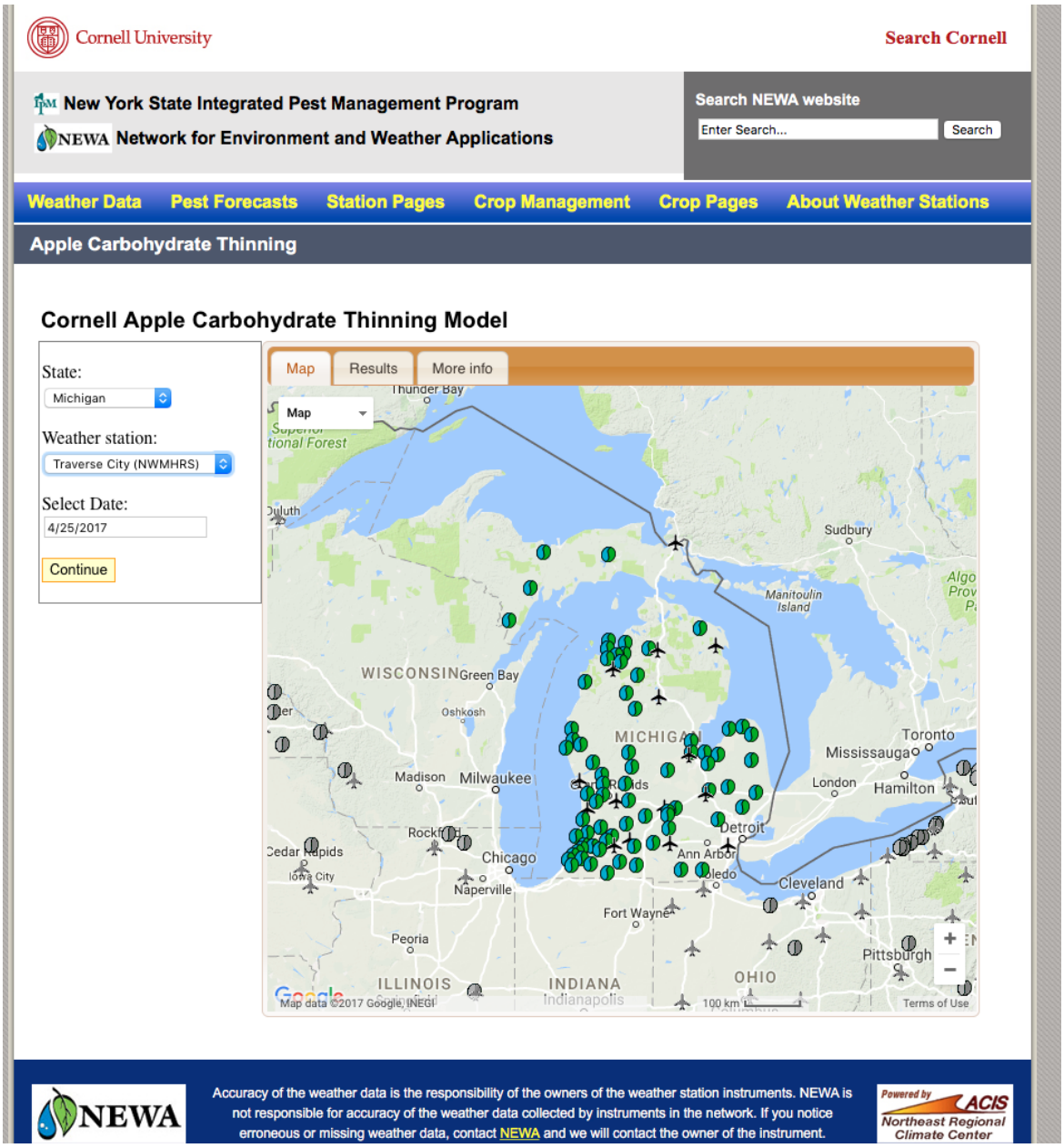
## Save the Date: Apple Thinning Meeting

The NWMHRC and MSU Extension will be holding an apple thinning meeting at the NW Station on May 19, 2017 from 10AM – 1PM. We will be talking about when to start thinning, products and rates to use; timing windows of thinners; how to determine crop load; and precision crop load management strategies. We will also focus on how to use the carbohydrate model, which is now an added feature on the MSU Enviroweather site (please see pictures below). Michigan State University Extension educators Phil Schwallier and Amy Irish-Brown will be our featured speakers.

**Lunch will be provided and sponsored by Crop Production Services. Please RSVP by 5PM on May 17, 2017 to guarantee a lunch: Jenn Zelinski 231-946-1510 or goodr100@anr.msu.edu.**






## 2017 IPM Update Schedule

**Emily Pochubay and Nikki Rothwell**
**Michigan State University Extension**

Tree Fruit IPM Updates beginning the second week of May through June will highlight management of the seasons current potential pest challenges dictated by weather and pest biology. Attendees are encouraged to bring examples of pests and damage found on the farm to these workshops for identification and discussion. Additionally, we are

planning to revisit some of the new Worker Protection Standards as well as host invited speakers from local organizations and MSU at this year's meetings. Workshops will be held weekly in Leelanau, Grand Traverse, Antrim, and Benzie counties. Tree fruit growers and consultants are welcome to attend meetings at any of the locations and times that are most convenient (see below). These workshops are free and do not require registration. Restricted use pesticide applicator recertification credits (2 credits per meeting) and Certified Crop Advisor credits will be available. We are looking forward to seeing you in a few weeks! For more information, please contact Emily Pochubay (pochubay@msu.edu), 231-946-1510.

**Leelanau County**

**Location:** Jim and Jan Bardenhagen, 7881 Pertner Road, Suttons Bay
**Dates:** May 9, 16, 23; June 6 (tentative), 13, 20, 27
**Time:** 12PM – 2PM

**Grand Traverse County**

**Location:** Wunsch Farms, Phelps Road Packing Shed, Old Mission
**Dates:** May 9, 16, 23; June 6 (tentative), 13, 20, 27
**Time:** 3PM – 5PM

**Antrim County**

**Location:** Jack White Farms, 10877 US-31, Williamsburg (south of Elk Rapids on the southeast side of US-31)
**Dates:** May 10, 17, 24; June 7 (tentative), 14, 21, 28
**Time:** 10AM – 12PM

**Benzie County**

**Location:** Blaine Christian Church, 7018 Putney Rd, Arcadia, MI 49613
**Dates:** May 10, 17, 24; June 7 (tentative), 14, 21, 28
**Time:** 2PM – 4PM

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## Respirator Guidelines to Meet New Worker Protection Standards

*Growers will need a medical evaluation and respirator fit test to handle and apply some pesticides this season.*

**Emily Pochubay and Amy Irish-Brown, MSU Extension**

Requirements for a medical evaluation, fit testing, and specific training for use of respirators and the associated record keeping became effective on January 2, 2017. At this time, most growers are aware of this revision to the Worker Protection Standard (WPS) regulation that requires pesticide handlers and applicators to wear a respirator during mixing/handling, spray applications, and potential other uses as outlined on pesticide labels. Additionally, those who use pesticides with respirator requirements must receive documentation from a physician or licensed health care professional (PLHCP) that has 'respirator evaluation' as part of his/her license to ensure that the pesticide handler is medically able to use a respirator. Not all PLHCPs are qualified to provide the respirator evaluation, but primary care physicians should be able to refer patients to appropriate medical personnel. Alternatively, growers can contact local occupation and environmental health professionals who are more likely to have the credentials needed to provide the appropriate respirator medical evaluation and documentation. Please review the following guidelines to help address some of the recent questions we have received from growers.

**Who needs to receive a medical evaluation and how often?**

Employees that could be exposed to hazardous airborne contaminants may be required to wear a respirator; respirators and respirator use requirements will be outlined on individual pesticide labels. Some pesticides may require respirators for employees that mix spray material and/or require applicators to wear a respirator during applications of certain pesticides. Employers are responsible for ensuring that employees receive the appropriate equipment, evaluation, respirator fit test, training, and record keeping that conforms to OSHA standards.

According to the EPA, the medical evaluation is required one time per employee unless another evaluation is required due to one of the following reasons:

- The medical determination is only good for a specified length of time.
- The employee reports medical signs or symptoms related to respirator use.
- The PLHCP, supervisor, or program administrator recommends a re-evaluation.
- Fit-test or other program information indicates a need for re-evaluation.
- When changes in the workplace increase respirator stress on an employee.
- The initial medical examination demonstrates the need for a follow-up medical examination.

**Who provides the evaluation? What kind of evaluation and documentation are needed?**

A physician or licensed health care professional (PLHCP) with respirator evaluation as part of their license will provide the appropriate evaluation using a medical questionnaire or exam that conforms to the OSHA standard. Contact the PLHCP to determine whether a questionnaire or exam will be used and to receive appropriate paperwork. Prior to completing the questionnaire or exam, employers must provide employees with:

- The type and weight of the respirator that the handler will use.

- How long and how frequently the handler will use the respirator.
- How much physical work the handler will do while using the respirator.
- Other PPE the handler will use.
- The temperature and humidity extremes of the working environment.

Contact a primary care physician to receive a referral for a licensed professional, if necessary. Another low-cost (~$25) and fast alternative for a medical evaluation is OshaMedCert ( http://www.oshamedcert.com/Default.aspx), an online service that involves filling out a form and sending it for approval or denial by a PLHCP; individual's health information remains confidential throughout the process. A respirator fit test (see below) will be needed after receiving the medical determination from OshaMedCert.

A written medical determination of the respirator evaluation for each employee is required before the employee can use the respirator. The employer must keep the medical determination documentation for two years. According to the EPA, the required written information to be provided by the PLCHP to the employer must only include:

- Whether or not the employee is medically able to use a respirator.
- Any limitations on respirator use in relation to the medical conditions (if any) of the employee or workplace conditions.
- Need for any follow-up medical evaluations.
- A statement that PLCHP provided the employee with written recommendation; in some cases, this recommendations may simply state that the applicator/person that will use the respirator is capable of wearing a respirator.

Again, the information outlined above is the *only* information that should be provided in the PLHCP's recommendation to the employer to protect the employee's private medical information and avoid violation of HIPAA laws.

**What's Next? Respirator Fit Tests.**

After receiving a medical evaluation, a fit test is needed to ensure that the respirator forms an adequate seal with an employee's face to provide appropriate inhalation exposure protection. A new fit test is required annually or whenever there is a change to the respirator or a physiological change to the employee that could affect the seal between the respirator and the user's face. Furthermore, fit tests are required for each type of respirator that will be used as indicated by pesticide labels. Finally, employees must undergo the fit test using a respirator with the exact specifications of the respirator that will be used on the job.

Fit tests must follow OSHA protocols, and there are two methods for fit testing. The quantitative fit test (QNFT) requires special equipment and a trained person to conduct the testing. Fit test kits are also available to perform qualitative fit tests (QLFT) by a person that can accurately prepare test solutions, calibrate equipment, perform the test properly, recognize invalid tests and ensure test equipment is working properly. Sources for fit tests include pesticide suppliers or companies such as Gempler's or Grainger.

A primary care physician may be able to provide additional options and referrals for fit test providers in the area. We confirmed that Munson Medical Center's Occupational Health and Medicine Clinic (550 Munson Ave. Traverse City, MI 49686; Ph: 231-935-8590) is equipped to perform the appropriate respirator exam (~$80.00) and the fit test (~$25.00) in one visit by appointment only. Spectrum Health Services in other areas of Michigan provide similar services. Patients that wish to only receive a fit test need to provide appropriate respirator exam result documentation prior to the test.

Additional information regarding respirator requirements and other WPS revisions can be found in the EPA's *How to Comply with the 2015 Revised Worker Protection Standards for Agricultural Pesticides* (https://www.epa.gov/sites/production/files/2016-10/documents/htcmanual-oct16.pdf).

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## Select Max labeled for tree fruit

**The graminicide may be used for grass control in all pome and stone fruit.**

Posted by **Bernard Zandstra**, Michigan State University Extension, Department of Horticulture, MSUE News

The U.S. Environmental Protection Agency (EPA) has approved a new Supplemental Label for use of the graminicide Select Max 0.97 EC (clethodim) for use in several crops, including pome and stone fruit. This includes apples, pears and all other pome fruits, and apricots, cherries, nectarine, peaches, plums and related hybrids. The label also includes low-growing berry crops (except cranberry and strawberry), including low-bush blueberry.

Select Max is similar in activity to the other graminicides labeled in fruit crops (Poast, Fusilade), and can be used in in rotation with the other herbicides. Each of the graminicides has a slightly different weed spectrum, so it is a good practice to rotate them. Select Max is effective against all annual grasses, and is especially effective against annual bluegrass, which Poast tends to miss. Select Max at the highest labeled rate is moderately effective against quackgrass, orchardgrass and other perennial grasses.

The label allows use of 12 to 16 fluid ounces (0.09-0.12 pounds active ingredient) per acre of Select Max in each application, with a maximum of 64 fluid ounces per acre per year. There is a 14 day pre-harvest interval (PHI) for all the tree fruit. The PHI for small fruit is 45 days. Always include 0.25 percent v/v non-ionic surfactant in the herbicide solution. That is 1 guart in 100 gallons of spray solution, or 25 fluid ounces in 20 gallons of solution.

Select Max is similar to the other graminicides, in that it kills grasses slowly. Visual symptoms (yellowing of the leaves) appear about one week after application. Normally, about four to five days after application, the tallest part of the grass plants can be pulled off and will have yellow discoloration at the node where it breaks off. Large, well-established grasses, especially perennials, may need a second application of Select Max or other grass herbicide three to four weeks after the first application to kill them completely.

The Select Max Supplemental Label is part of the Select Max Section 3 Federal label. The Supplemental Label expires in May 2019. By then these uses should be included on the Federal label attached to containers. The new Supplemental Label is available from the internet at CDMS.

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

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# How integrated pest management helps Michigan grape growers

## Video highlights how MSU grape team brings pest and disease information to growers in a timely and accessible way.

Posted by **Rufus Isaacs**, Michigan State University Extension, Department of Entomology, MSUE News

Grape berry moth damage to young red grapes. Image courtesy of Brad Baughman, MSU Extension.

Over the past decade, Michigan State University grape team members have collaborated to bring information about pests and diseases to growers in a timely and accessible way. This has been a collaboration between campus-based researchers Rufus Isaacs, Keith Mason and Annemiek Schilder, with MSU Extension educators Brad Baughman and Duke Elsner. The group works with Joy Landis and her team in the MSU IPM Program to deliver information through the MSU Grapes website. We recently developed a short video, "Grape IPM Program," to highlight what this program has done, what we are continuing to do and how this helps the Michigan grape industry.

In this brief video, we highlight scouting information and how that has been combined with newer insecticide options to greatly reduce the economic impact of key pest insects and diseases in this industry, including grape berry moth, downy mildew and black rot. As part of these projects, we also scout vineyards through the summer and report those results through the MSU Extension website. See the most recent report (at the time this article was published) at "Southwest Michigan grape scouting report – May 3, 2017."

We will also be out at Extension meetings through summer to talk about this project and some of our pest-focused research. The grape IPM project will continue through this year with support from the Michigan Grape and Wine Industry Council.

To access "Grape IPM Program" and other wine grape research videos on a variety of topics, go to the MSU Extension Grapes Research page.

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

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## MSU Enviroweather serves Michigan grape and wine industries

**Video presents how grape growers can use MSU Enviroweather, a weather-based information system for pest and vineyard management.**

Posted by **Jeff Andresen**, Beth Bishop, Tracy Aichele, Jim Brown, Steve Casey, Mike Kiefer, Joy Landis, Steve Marquie and Aaron Pollyea, Michigan State University, MSUE News

Image courtesy of Mark Longstroth, MSU Extension

The overarching mission of Michigan State University's Enviroweather is to provide relevant, dependable and sustainable weather-based information to support agricultural pest, production and natural resource management decision-making in Michigan. Such information allows for more efficient and profitable farming and for the state's agricultural and green industries to remain competitive in global markets and economies.

Enviroweather collects, processes and archives detailed weather data from an automated meso-network of 85 sites across the state and provides a web-based framework for its use in a variety of applications and products. Weather variables monitored at each station site include air temperature and relative humidity, rainfall, wind speed and direction, solar radiation, soil temperature, volumetric soil moisture, and leaf wetness.

Observations at each station are taken automatically every 3-60 seconds (depending on sensor) and downloaded to a central computer via cellular-IP phone telemetry for dissemination to the public through via the MSU Enviroweather website. Data are updated on a real-time basis throughout the growing season at 30-minute intervals and every 3 hours November through February. The system is available for free.

The number of weather-driven applications available on the Enviroweather site has increased from 19 in 2007 to more than 60 today. The applications are generally organized by commodity type and function and range from forecasts of insect phenological stage to estimates of crop water use to tabular comparisons of recent past weather conditions with previous years. At the website, users select a nearby weather station and then are provided access to products and applications via pop-up menus. Many of the applications are interactive and some require user input (e.g., scouting observations, biofixes). Several are designed specifically for use in vineyard management.

Thanks to funding from the Michigan Grape and Wine Industry Council, vineyard growers can watch a short video about Enviroweather with some user examples: "Strategic modernization of Enviroweather stations serving the Michigan grape and wine industries."

To access "Strategic modernization of Enviroweather stations serving the Michigan grape and wine industries" and other wine grape research videos on a variety of topics, go to the Michigan State University Extension Grapes Research page.

For questions or further information regarding Enviroweather, please contact the Enviroweather project coordinator, Beth Bishop, at 517-432-6520 or bishop@msu.edu

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## Leelanau County HOUSEHOLD HAZARDOUS WASTE & ELECTRONICS COLLECTIONS

**NOW ACCEPTING A MAXIMUM OF 10 - ONE GALLON CONTAINERS OF LATEX PAINT**

The collections are for Leelanau County Households and covered as part of the $29 recycling fee on winter taxes. The collections are held from 8 AM – 2 PM and registration is required. Please call the Planning Dept. at 231-256-9812 to register.

**2017 Saturday Collections**

**5/20 - Leelanau County Government Center**

**7/15 - Glen Lake School**

**8/19 - Peshawbestown**

**10/7- Elmwood Twp., Cherry Bend Park off Avondale Lane**

We are always looking for volunteers to help with the collections, please let us know if you are interested.

Thanks,

Leelanau Planning Department

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

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

Information on grapes:
http://grapes.msu.edu

Fruit CAT Alert Reports:
http://news.msue.msu.edu