

Northern Michigan FruitNet 2013

Northwest Michigan Horticultural Research Center

Weekly Update

May 14, 2013

GROWING DEGREE DAY ACCUMULATIONS AS OF May 13th AT THE NWMHRC

Year	2013	2012	2011	2010	2009	2008	23yr. Avg.
GDD42	298	591	256	500	332	350	371.3
GDD50	159	291	98	221	141	160	170.0

Growth Stages at NWMHRC (May 13, 4:00 p.m.)

Apple: Red Delicious – Early pink

Gala – Early pink

Yellow Delicious – Early pink

Pear: Bartlett: Popcorn

Sweet Cherry: Hedelfingen: Full bloom

Napoleon: Full bloom

Gold: Full bloom

Tart Cherry: First bloom

Balaton: First bloom

Apricot: Late petal fall

Grapes: Early bud burst

NORTHWEST MICHIGAN REGIONAL REPORT

N.L. Rothwell, NWMHRC

The Mother's Day cold temperatures had marginal impact on Northwest Michigan fruit.

The Sunday night/Monday morning temperatures dipped down into the freezing range, but most of the NW weather stations did not report many hours below 32F. The two exceptions were the Bear Lake and Benzonia weather stations. Bear Lake was the coldest site here in the north, and the lowest temperature dipped down to 23.9F between 3 and 4am. This station also sustained these mid-20s temperatures for 9 hours throughout the evening, but this weather station is in a notoriously low spot, which may not accurately reflect the fruit sites around this area. Benzonia's temperatures were not as cold as Bear Lake's, but this station did record 10 hours below the freezing mark during this time period. We did observe some damage in apple in a low site on Monday, and another grower did sustain some damage in apples closer to the lake. Many growers in this area obtained Promalin, and applied this product in hopes to minimize the impacts of the frost.

Compared with last week's nice summer like weather, a cold front moved through the region and brought cool and wet conditions to the area over the weekend. Daytime highs were in the low 40's, and on Sunday we did not even hit the 40F mark; these temperatures were a sharp departure from the 70 weather we experienced earlier last week. Bees were flying up until Thursday afternoon, but with the cold temperatures that began on Friday, there was little bee activity in the orchards. Temperatures are predicted to rise this week, and there is less than a 50% chance of rain across the region; as tart cherries are just coming into bloom, we hope temperatures warm to promote good bee activity for pollination. We received some rainfall over the weekend, and 0.61" of rain fell at the NWMHRC on Friday and less than ¼" was recorded on both Saturday and Sunday. So far this season, we have accumulated 298GDD base 42 and 159GDD base 50.

Apple. Growers are moving back into the orchard to cover up for **scab** following the wet conditions over the weekend. Growers should also be including a spray for **powdery mildew** in this next application. As mentioned above, growers that had cold temperatures and some damage in apple are applying Promalin. This PGR has shown to increase fruit set if the material is applied at 1pt/acre within 24H of the frost event. Promalin is in short supply in the northwest, and many growers have obtained it from other areas of the state.

Cherry. Unfortunately, this past weekend was good for development of two important pathogens in cherry: **bacterial canker** in both sweets and tarts and **European brown rot** (EBR) in tarts, particularly Balaton. Both of these pathogens favor cold and wet conditions, which were not in short supply over the weekend. As there is no control for canker, we will have to wait and see if the weekend's conditions caused any infections. However, most growers with Balatons looked at the forecast and applied Indar for EBR control prior to the weekend's wetting events.

Growers should also begin their **cherry leaf spot** (CLS) control program as there is adequate leaf area present in both Montmorency and Balaton. The CLS pathogen can infect in stomata of open leaves, and in most orchards, at least some of the bract leaves are fully open on the tree. As we saw in 2012, protecting these bract leaves is important in achieving season-long control of CLS. This early coverage is similar to our thinking in covering for apple scab at green tip: start early to control this disease, even with the small amount of tissue available for infection and the CLS spore load is typically less early in the season, any infection that occurs early will result in severe consequences later in the season. This is because lesions initiated at early on bract leaves will be producing secondary spores (conidia) at a petal fall timing when we typically see the highest spore concentration from overwintering leaves. Thus, early infections can be devastating because they compound the spore load in an orchard. Although there is not a lot of green tissue present in orchards early in the season, CLS spores can find that tissue—for any spores released at this timing, their primary function is to land on that susceptible tissue (open bract leaves) and infect. Please see this week's article by Michigan State University Extension (Sundin and Rothwell) for more on cherry leaf spot control.

Wine Grapes

Duke Elsner, Grand Traverse County MSUE

The cooling trend that hit late last week slowed bud development to a crawl, with many cultivars just getting to bud break. It appears that the freezing temperatures on the night of May 12-13 in some parts of NW Michigan did not have a significant impact on vineyards.

No pest activity has been seen or reported as of yet. The rain/snows of the weekend may have initiated the release of powdery mildew spores, but the cold conditions and lack of green tissue to infect likely kept this from being an infection period.

Please see the announcement for a Vineyard Weed Identification and Management Workshop coming up at the research center on June 7th.

ASSESSING FROST AND FREEZE DAMAGE TO FLOWERS AND BUDS OF FRUIT TREES

How to assess the impact of a freeze on early fruit development.

Posted on **May 14, 2013, MSUE News**, by **Mark Longstroth**, Michigan State University Extension

As the trees begin growth in the spring the buds begin to swell and lose the ability to withstand cold temperatures. As the buds develop, warmer and warmer temperatures (still below freezing) can damage them. The killing temperature is often called the critical temperature and is defined as the temperature that buds can withstand for a half-hour. Please see my [Michigan State University Extension](#) article on [bud development and cold hardiness](#) in the spring and tables of critical bud temperatures.

In general, there is a range of temperatures over which damage occurs with more and more buds and flowers damaged at lower and lower temperatures until all the fruit buds are killed. Often the freeze will only damage some of the flowers such as the most developed ones or flowers in the bottom of the tree.

After a freeze, people often want to know how bad the damage was. It takes several hours for the symptoms to develop. As frozen tissues thaw, they will turn brown or black if they were damaged or killed by the cold, revealing the extent of the damage. Experienced fruit growers can quickly assess the damage in the days following a freeze. This article contains pictures of frost damaged flowers for growers and home fruit growers who wish to determine frost damage after a freeze.

At or near the bloom stage, the critical temperature is the same for almost all fruits and flowers. Freezing temperatures of 28 degrees Fahrenheit will result in about a 10 percent loss and 24 F in a 90 percent loss. In a radiation freeze with clear, calm conditions, fruit on higher sites or in the tops of trees will be less damaged than those at lower sites. The percent of flowers killed in a frost may or may not relate directly to lost yield later in the season. With large-fruited fruits such as apples, peaches, plums and pears, the loss of 50 percent of the flower is not devastating since we may only want a small percentage of the flowers to become fruit. For small-fruited fruits such as cherries, blueberries and grapes, many small fruit are needed for good yields and a full crop. Crop losses due to freezing temperatures are almost always significant in cherries.

Stone fruit (apricots, cherries, peaches and plums)

Stone fruit have a very simple flower structure. The flower contains a single pistil (the female part of the flower that will become the cherry fruit) that is exposed inside a cup formed by the sepals and petals of the flower. If the pistil is brown or black after a freeze, that flower will not develop into a cherry because the pistil has been killed. Early in the season, when the buds have swollen but not opened, the flower buds are often cut open across the bud to inspect the pistil. If this is black, the flower has been killed and the fruit will not form. A healthy green pistil means this cherry is alive. Both the pistil and the style are green in this photo of a sweet cherry below. This flower was not damaged by a freeze.



Fig. 1: This cherry flower was not damaged by a freeze the day before. Photo credit: Mark Longstroth, MSU Extension

Often you can look into the center of the flower to see if it is black, or you can tear it open to see if the pistil has been killed. The entire pistil of the sweet cherry in the photo below was killed by a freeze the day before this picture was taken. By the next day, damage was easy to see. The pistil has turned black and shriveled.



Fig. 2: The pistil of this cherry flower was killed by a freeze the day before and has shriveled and turned black. Photo credit: Mark Longstroth, MSU Extension

Peach flowers are harder to assess because of the fuzz on the pistil. Since peaches are large fruit, only a small number of flowers are needed for a full crop. The loss of a large number of flowers does not mean the crop is severely impacted. An important factor in peach yields is the number of flowers on the tree, i.e., is bloom heavy or light.

After flowering, small stone fruit are in the shuck. The shuck is formed by the floral cup. The shuck provides a little protection from the cold when the fruit is small and not touching the sides of the cup. When the fruit fills the shuck, the shuck provides no protection at all.

Apples and pears

Apples and pears are very different than stone fruit. The buds of stone fruit trees are either flowers or leaf buds, and not a mixture of both. In cherries and plums where there is more than one flower, all the flowers in a bud are about the same age. In apples, the fruit buds are really small shoots with both flowers and leaves. An apple flower cluster is shown in the photo below. In apples, the flower in the center of the flower cluster is the oldest and most developed and will be the first flower to bloom.

This central flower is called the king bloom and is the most desirable of the flowers in the cluster. The king bloom has the potential to be the largest fruit.



Fig. 3: The king bloom of the apple flower cluster has opened, but the side blooms are still closed. The king bloom is more susceptible to freeze injury at all stages of the apple bud development in the spring and is often the first flower killed in the cluster. Photo credit: Mark Longstroth, MSU Extension

Since the king bloom is also the most advanced flower in the cluster, it is most likely to be killed in a frost. Another difference between apples and stone fruit is that the pistil is buried inside the base of the flower and not exposed above it as in stone fruit. This means that it is often necessary to tear the flower apart to see if the center of the flower is brown or black. The flower in the photo below is a king bloom killed by frost.



Fig. 4: The dark brown center of this apple flower indicates it was killed by a freeze. Photo credit: Mark Longstroth, MSU Extension

When checking apples from frost damage, check the king and side blooms separately. Many times the king blooms are killed and many of the side bloom are undamaged.



Fig. 5: The dark brown centers and signed appearance of the petals indicate that both kind and side blooms were killed in a freeze the morning this picture was taken. The king bloom in the center of the cluster has lost its petals. Photo credit: Mark Longstroth, MSU Extension

Also see:

- ["Freeze damage depends on tree fruits stage of development"](#) - Damage from freezes depends on the development state of the fruit crop. These tables allow you to quickly asses the risk of your tree fruit crops.
- [Critical Spring Temperatures for Tree Fruit Bud Development Stages](#) - Table with photos
- [Critical Spring Temperatures for Tree Fruit Bud Development Stages](#) - Table

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CHERRY LEAF SPOT: GET AN EARLY START ON PROTECTION BEFORE THE FUNGUS GETS STARTED ON INFECTION

It's critical to protect tart cherry trees early in the season from cherry leaf spot infection. Protection at the bract leaf stage with chlorothalonil will get your control season off to an excellent start.

Posted on **May 14, 2013, MSUE News**, by **George Sundin**, Michigan State University Extension, Department of Plant, Soil, and Microbial Sciences, and **Nikki Rothwell**, Michigan State University Extension

For effective cherry leaf spot management, [Michigan State University Extension](#) used to suggest that the first fungicide application must be made around tart cherry petal fall to adequately protect the first fully-expanded leaves from fungal infection. The cherry leaf spot fungus infects leaves through stomata, and these parts of the leaf structure are not open and functional until the first leaves are mature. However, as we found in 2012 when we sustained early and epidemic levels of cherry leaf spot, the past strategy did not take the first bract leaves into account. Bract leaves open at and during bloom (Photo 1), and open bract leaves can be infected early, prior to petal fall.



Photo 1. Bract leaves opening.

In 2012, we observed many orchards in Northwest Michigan with severe leaf spot infection by mid- to late-June. This situation was somewhat surprising because environmental conditions were not exceptionally conducive for leaf spot infection. However, upon further examinations of infected trees, we found significant infection of these early forming bract leaves (Photo 2), and as we have been saying with early apple scab infection, these early infections can drastically jump-start an epidemic.



Photo 2. Infected early forming bract leaves. There are two main reasons that early infection can result in a fungal epidemic:

1. Once fungal infection occurs in the tree, the fungus will produce tremendous spore numbers from lesions established on the leaves, and in most cases, there are usually more spores developing from lesions than ascospores that are coming up from leaves overwintering on the ground.

2. Spores from lesions on the leaves are much more likely to find new leaf targets within the tree than spores coming up from the ground. The distance from one leaf to another leaf on a tree is minimal, and the potential for spores to infect by moving from one leaf to an adjacent leaf is “easier” than for spores shot from ground level to hit the leaf target up in the tree canopy (Photo 3). This early infection from leaf to leaf can result in a major infection event.



Photo 3. Adjacent leaves are at risk of being infected with spores.

The goal of our cherry leaf spot sprays is to prevent or delay initial infection events. As with all other diseases, cherry leaf spot infection will rise to epidemic proportions under conducive weather conditions, and with less infection early, there will be less inoculum in the tree that growers will have to control during times with more optimal conditions for cherry leaf spot development. Thus, the purpose of early season sprays is to prevent or significantly delay initial infection events. Early season control will help with disease control prior to harvest (severe, early season infection can affect fruit ripening) and help trees hold leaves into September. **At the bract leaf stage, trees must be covered to prevent infection prior to rain events that could trigger a cherry leaf spot infection**, according to [Enviro-weather](#).

Prior to shuck split, the recommended fungicide for cherry leaf spot management is chlorothalonil (Bravo and generics). This fungicide is a multi-site protectant and is excellent for leaf spot control and is not at risk for fungicide resistance development. At least two applications of chlorothalonil should be made before shuck split with the goal to minimize the potential of infection at this early timing.

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

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POST SHUCK SPLIT APPLICATIONS OF BRAVO WEATHERSTIK FOR CHERRY LEAF SPOT CONTROL

N.L. Rothwell, NWMHRC

J. Wise, Dept. of Entomology and TNRC

Growers can use Bravo WeatherStik past the typical shuck split timing on mechanically harvested tart cherries only

Because of fungicide resistance issues and the season-long challenge of controlling cherry leaf spot (*Blumeriella jappii*) (CLS), growers can use the fungicide Bravo WeatherStik past the typical post-shuck split timing on mechanically harvested tart cherries. The old Bravo label prohibited this fungicide from use past shuck split, but with new residue information provided by Michigan State University Extension, this label has been changed to provide Michigan tart cherry growers with an additional tool for controlling CLS.

In 2011, Dr. John Wise worked with the Michigan cherry industry and Syngenta to determine the levels of residues of chlorothalonil, the active ingredient of Bravo, on machine harvested cherries that had spent time on a cooling pad. This situation simulates what a grower would do in the 'real world': harvest tart cherries into water and place on a cooling pad for a time period before delivering fruit to the processor. The study confirmed that when tart cherries were harvested and handled in water, they had less chlorothalonil residue than fruit not harvested in water.

As a result of this work, the Michigan Dept. of Agriculture and Rural Development granted a Section 24 (c) special local need registration for allowing use of Bravo WeatherStik past the old shucksplit timing on mechanically harvested tart cherries that are handled in water. *However, to ensure that post-shucksplit applications do not result in illegal residues (<0.5ppm), there are use restrictions that growers must follow:*

- The minimum pre-harvest interval (PHI) is 21 days.
- Cherries must be mechanically harvested.
- Cherries must spend at least 2 hours on the cooling pad.
- The initial flow rate on the cooling pad must be 8-10 gallons of water per minute (gpm). After this period, the flow rate can be reduced to 4-6gpm.
- Rinse water generated during the cooling process must not drain or channel toward aquatic areas.
- Cherries cannot be used fresh; they must be processed by a commercial processor.
- This special registration is for Bravo WeatherStik only! Even though there are other generics of chlorothalonil available, this label applies only to Bravo WeatherStik.
- This special registration cannot be used on cherries harvested dry for the juice or other markets; fruit must be harvested in water and cooled on a cooling pad.
- Cooling pad rules need to be followed explicitly—the MSU data that were collected specified fruit would be on a cooling pad for two hours, so the resulting regulations were based on this information. Even if a grower cools cherries for a shorter amount of time, this time specification is important to follow to remain in compliance.
- Growers should check with his/her processor if fruit is to be harvested in a special manner (i.e. dry) if the grower wants to take advantage of this special registration.
- ****Important step!** Growers that want to use this special registration must go through a training affidavit online at the MDARD website and complete steps 2 and 3 (www.michigan.gov/cherrysln). If a grower participated in this special use label last year, he or she *WILL HAVE to go through the training affidavit process again* due to some language issues on the 2012 affidavit. The new affidavit will be available on the MDARD website at the URL above by May 24, 2013. The language of the Bravo WeatherStik label states that to use this product post-shucksplit, a grower must sign this affidavit *EVERY YEAR*.

If growers do not have access to a computer, please call Nikki @ 231-946-1510 for assistance.

To reiterate, growers need to follow these steps to ensure that they will be in compliance of this special use label. Cherries that are harvested 21 days after the last application of Bravo WeatherStik *will* have illegal residues—growers must follow label carefully to ensure the residues on fruit are reduced to a legal level (<0.5ppm). Illegal residues would violate federal law and would have serious consequences for the grower, processor, and the Michigan cherry industry as a whole.

APPLE BLOSSOM THINNING FOR 2013 APPLE CROP

A potential heavy set warrants a try for apple blossom thinning in 2013.

Posted on **May 7, 2013, MSUE News**, by **Phil Schwallier** , and Amy Irish-Brown, Michigan State University Extension

The 2013 apple crop will be heavy. [Michigan State University Extension](#) says growers should consider thinning early to reduce the crop. Usually the first thinning begins at petal fall with standard post-bloom thinners. However, this season blossom thinning is an additional time to start reducing the crop load. I am not very impressed with the blossom thinning results from past trials in Michigan, but blossom thinning does work. It does thin fruit numbers on average 24 percent; however, fruit size is larger but less than expected, perhaps due to the thinners leaf injury or other factors.

There are two blossom thinning treatments that can be used:

1. LSO (lime sulfur and oil)
2. ATS (ammonium thiosulfate) fertilizer

The LSO is applied at the rate of 2 gallons of lime sulfur and 2.5 oil per 100 gallons and at 100 gallons solution per acre. The ATS is applied at 2 gallons per 100 gallons at 100 gallons solution per acre. LSO thins by three effects: it burns the stigma and pistils; it prevents pollen germination and fertilization; and it depresses photosynthesis for several days. ATS only burns the stigma and pistils.

The LSO blossom thinners are timed for full bloom the day after king bloom has opened and the king flowers are assumed to be pollinated. A second, third and fourth application can be made every seven days if needed. These second, third and fourth applications will each thin more fruits off and it is difficult to know when to stop. This year with a heavy crop predicted, at least three sprays will be needed, but your personal experience with your orchard is the best guide. Organic growers need to use lime sulfur and fish oil. ATS is timed the same; the next day after the king flowers are assumed to be pollinated. ATS is only applied one time.

These blossom thinners will thin between 10 and 30 percent of the crop load. The fruits will be larger, but my experience is that fruit size does not increase as much as expected from the thinning effect. These blossom thinning treatments can be followed by standard chemical thinning treatments at petal fall and 10 mm. If LSO is used at blossom time, then I would expect standard thinner treatments to be a bit more effective at 10 mm (perhaps 5 percent more effective). Weather conditions such as high temperatures and high humidity affect the caustic burning effect of these blossom thinners. Use caution when conditions are hot and humid.

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FIRE BLIGHT RISK INCREASING THIS WEEK: TREATMENT OPTIONS IN EASTERN MICHIGAN AND THE BENZIE-MANISTEE

The risk for blossom blight infection is extreme this week as of May 14, 2013. Streptomycin is the best material available for control in orchards in regions in counties not currently impacted by streptomycin resistance.

Posted on **May 14, 2013, MSUE News**, by **George Sundin**, Michigan State University Extension, Department of Plant, Soil, and Microbial Sciences

This article is written for growers in those counties where Kasumin is not available for use such as locations in eastern Michigan and in the Benzie-Manistee region, central Michigan, and in northern counties such as Charlevoix County, etc. The contents of this article also apply to pear growers since the Section 18 for Kasumin does not allow use on pear.

With predicted temperatures in the high 70s to low 80s for most of Michigan for the next seven days, this will be a critical period for potential [fire blight](#) infection. We have not experienced these types of temperatures for this duration during bloom in many years. **Temperatures in the high 70s to low 80s are optimal for growth of the fire blight pathogen on apple flower stigmas.** At these temperatures, populations of the pathogen can double in size every 30 to 45 minutes on stigmas. Pollinators are also quite active as well, and will also increase the movement of the pathogen around in orchards and facilitate colonization of new flowers.

Last week, conditions were present for a fire blight infection in most regions of the state; however, these fire blight-conducive conditions were quickly followed by the freeze event in the morning of Monday, May 13. After a freeze, the [MaryBlyt fire blight model](#) resets the EIP value to zero because cold temperatures are inhibitory to growth of the pathogen. Also, since this possible infection was relatively early in the bloom period for most, there was likely not a strong buildup of pathogen cells in most orchards.

What typically happens when temperatures get cold is that the pathogen cells remain on flowers, but do not grow. As the open flower ages to five to six days after opening, the flower reaches a state where the pathogen cannot infect it. Thus, we can escape infection of that flower. However, those pathogen cells do not disappear; they remain on the flower and can serve as inoculum for subsequent infection if they are disseminated to newer recently-opened flowers.

Therefore, I think our risk in this coming week (May 15-22) may actually be higher than we think because of the potential that more inoculum is present in orchards from the buildup of last week.

Be sure to use the [fire blight model](#) on the [MSU Enviro-weather](#) website to see what the EIP values are as predicted from the weather station closest to your orchard. The current predicted MaryBlyt EIP values for later this week are very high in most regions, ranging up to 200. These numbers change every day as predicted high temperatures change. They have increased for most stations from yesterday. EIP values around 200 are higher than [Michigan State University Extension](#) has seen during bloom for a number of years. **This indicates the risk of blossom blight infection will be at a critical point later this week.** Any rain that occurs during this period (as little as 0.01 inch of rain) will trigger a fire blight infection event.

The higher the EIP value gets, the higher the risk of infection. When the number reaches 100, this indicates the potential for significant infection. At an EIP of 200, the risk is extreme. For historical reference, during the last significant fire blight year we had in 2005, EIP values peaked at 255 for Bainbridge, Mich., and 182 in Sparta, Mich. Of course, weather will play an important role in the potential for fire blight epidemics and subsequent shoot blight infection, but we do know that the occurrence of blossom blight puts trees at significant risk for further infection events of shoots during the summer.

What is the relationship between EIP values and choices for blossom blight control? The main choices

we have are streptomycin (Agri-Mycin, FireWall), oxytetracycline (Mycoshield, FireLine), and the biological control Serenade MAX. Of these, streptomycin is by far the superior choice in terms of disease control efficacy.

In general, if EIP values are less than 50, any of the three would be effective as we would be under low fire blight pressure. For EIP values ranging from 50 to 90, either oxytetracycline or streptomycin would be a good choice. Remember that oxytetracycline inhibits growth of the pathogen and must be applied in advance of rains. For EIP values greater than 90, streptomycin is the best choice as our field data indicates that streptomycin has better efficacy than oxytetracycline under high disease pressure.

For this upcoming week, the warm-up is slated to begin Wednesday, May 15. The best strategy would be to protect trees with streptomycin prior to any rain event. Streptomycin is also partially systemic in the flower which further increases the protective capability. The interval between the first streptomycin application and the next one should be tight (two to three days) as this will be a period of rapid pathogen growth and new flowers will continue to open that were not protected with the first streptomycin application. The streptomycin rate is 8 ounces per 100 gallons, making a 100 ppm solution.

There may be some value in tank-mixing streptomycin with oxytetracycline for resistance management purposes. However, the reality is that streptomycin is the better material and there is no evidence available suggesting that if we limit our use of streptomycin to the bloom period (three to four applications max per year) that resistance will develop. In addition, oxytetracycline is degraded rapidly by sunlight and would not last too long on flowers anyway under warm, sunny conditions. If you do tank-mix streptomycin and oxytetracycline, do not reduce the rates of either material, **USE FULL RATES** of both.

Finally, as we approach king bloom petal fall, I strongly suggest that you incorporate Apogee into your spray to initiate your shoot blight protection program. Please see two previous articles on Apogee from 2012: "[Use of Apogee for shoot blight control in 2012](#)" discussing fire blight control, and "[Applying Apogee in 2012](#)" discussing timing and rates. **Treat 2013 as a severe risk year** and consider increasing the rate for your first application to 150 percent of a split rate.

Also see:

- "[Fire blight risk increasing: treatment options in counties affected by Section 18 for Kasumin](#)"

This article was published by [Michigan State University Extension](#). For more information, visit <http://www.msue.msu.edu>. To contact an expert in your area, visit <http://expert.msue.msu.edu>, or call 888-MSUE4MI (888-678-3464).

MITICIDES USED IN CONTROLLING MITES IN FRUIT

There are many options available for mite control in fruit crops.

Posted on **May 8, 2013, MSUE News**, by **John Wise**, Rufus Isaacs and Larry Gut, Michigan State University Extension, Department of Entomology

Mites can be significant pests of fruit crops. There are many miticides available for control of European red mites (ERM), two-spotted spider mites (TSSM) and rust mites (RM), as well as apple and pear rust mites, pear blister mite, plum nursery mite, blueberry bud mite, but according to [Michigan State University Extension](#), their performance characteristics are not all alike.

To see a table that summarizes several key variables that can help you determine which miticides are optimal for your [integrated pest management](#) program, visit [http://msue.anr.msu.edu/news/miticides used in controlling mites in fruit](http://msue.anr.msu.edu/news/miticides_used_in_controlling_mites_in_fruit)

Drs. Wise, Isaacs and Gut's work is funded in part by [MSU's AgBioResearch](#).

This article was published by [Michigan State University Extension](#). For more information, visit <http://www.msue.msu.edu>. To contact an expert in your area, visit <http://expert.msue.msu.edu>, or call 888-MSUE4MI (888-678-3464).

PLUM CURCULIO EARLY SEASON MONITORING AND PHENOLOGY

Fruit growers can better control plum curculio with early season monitoring and understanding the phenology of this pest.

Posted on **May 10, 2013, MSUE News**, by **Mark Whalon** , Pete Nelson, Michigan State University Extension, Department of Entomology

Plum curculio early season monitoring

Plum curculio over-winter as adults in the soil, litter, ground cover trash in orchards and surrounding areas. As soon as daytime and evening temperatures exceed 60 degrees Fahrenheit, plum curculio will begin to move especially when a light, misty rain or humid nights co-occur with early spring warming trends. The weevils move into orchards and begin to feed as leaves begin to emerge. Their feeding activity expands to blossoms, stems and fruit as they become available.

Traps are a good indicator of likely plum curculio pressure in the area and should be placed on the borders of orchards where producers or scouts have observed damage in past years. Often these locations have woods, unsprayed orchards, feral trees or other sources of overwintering plum curculio populations.

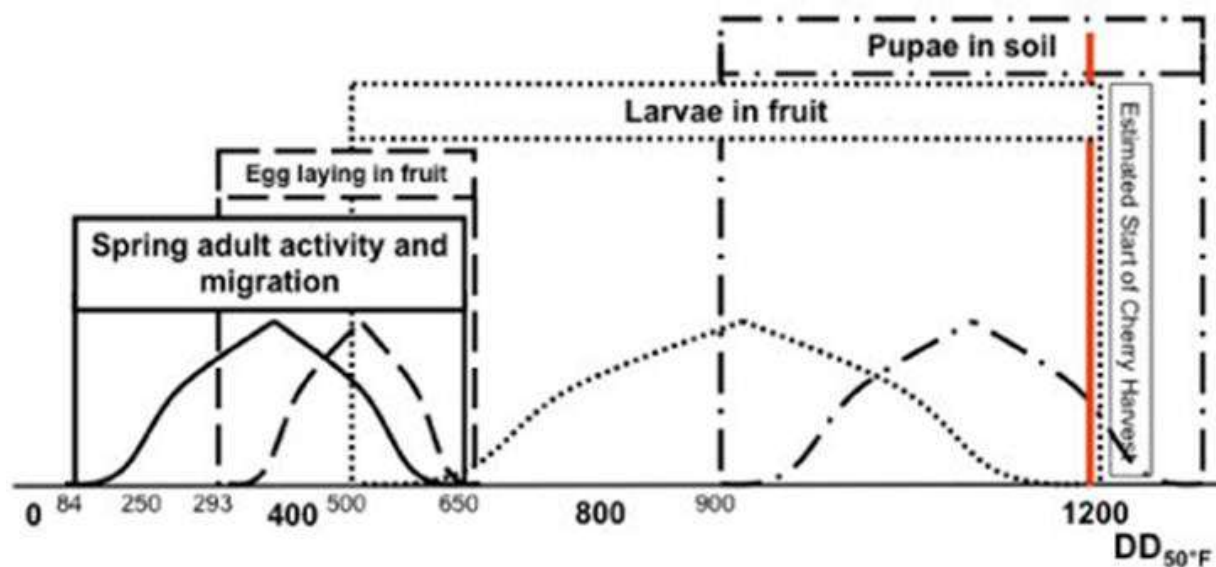
Population pressure rating: general trap catch per week bloom to 370 DD50 plum curculio

Rating	Apple		Cherry		Peach	
	Pyramid	Screen	Pyramid	Screen	Pyramid	Screen
V. Low	1	0	0	0	1	0
Low	2-3	1	1	0	2-3	1
Mod	4-7	2-3	2	1	4-7	2-3
High	8-11	>4	3-4	2	8-11	3-4
Extreme	>12	>4	>5	>3	>12	>4

Plum curculio phenology

The [Pesticide Alternatives Lab](#) at MSU has been working to improve capabilities for predicting life stages for a better understanding of when egg laying occurs and when larval instars are present. At 275 DD50 F from March 1, all female plum curculios should have at least one mature oocyte (egg). It can be expected that 340 DD50 F after petal fall (if petal fall = 500, then $500 + 340 = 840$ DD50 F), 40 percent of the cumulative oviposition cycle is completed in apples in New York. Larvae from this

overwintering brood will exit fruit into the soil, where they will pupate and emerge as summer generation adults.



Degree days accumulated as of 5.9.2013. Degree day data obtained from [Enviro-weather](#)

Site	Accumulated degree days (base 50 F)	Site	Accumulated degree days (base 50 F)
Bear Lake	167.9	Fennville	197.6
Benton Harbor	214.6	Hart	157.5
Benzonia	155.8	Hartford	220.8
Berrien Springs	218.5	Lapeer	198.2
Clarksville	186.5	Ludington	147.2
East Lansing	202.9	Northport	112.3
Eastport	145.5	NW Station	153.2
Elk Rapids	143.1	Sandusky	171.8
Emmett	179.1	Sparta	196.6

This article was published by [Michigan State University Extension](#). For more information, visit <http://www.msue.msu.edu>. To contact an expert in your area, visit <http://expert.msue.msu.edu>, or call 888-MSUE4MI (888-678-3464).

SOIL SAMPLING VINEYARDS AND GUIDELINES FOR INTERPRETING THE SOIL TEST RESULTS

Determine soil nutrient levels in your vineyard and save money by applying only the nutrients you need.

Posted on **May 7, 2013, MSUE News**, by **Diane Brown**, Michigan State University Extension

Spring is a good time to test the soil nutrient levels in your vineyard. For established grapes, you are monitoring changes in nutrients, pH and organic matter over multiple years. Organic matter content and pH impact nutrient availability in the soil. Extractable nutrients tend to be lower in fall after harvest. Soil pH tends to be higher in spring than fall. To be able to more easily compare soil nutrient changes in the vineyard from year-to-year, it is advisable to make soil tests at the same time of year. For established vineyards, testing every two to three years is adequate. [Michigan State University](#) offers soil testing services at the [Soil and Plant Nutrient Laboratory](#). There are also a number of private labs that can test soil.

To sample soils properly, you need a few tools: a soil probe, trowel or spade; a clean plastic pail; sample bags or boxes; a map of your vineyard; and a marker. Separate the vineyard into smaller sections with relatively similar soil texture, slope, organic matter and cropping history. Mark the areas you are testing on the map so that you can retest the same locations next time for comparison. Sample the vineyard in a zigzag fashion, five acres or less per sample. If your vineyard is very uniform, then no more than 10 acres per sample. Avoid sampling from the ends of the rows and the edges of fields. Collect soil to a depth of 8 inches from 15 to 20 locations, mix them thoroughly in the plastic pail and take out a pint of soil for testing. Testing forms and soil boxes for the [MSU soil lab](#) are available at your [Michigan State University Extension county office](#) or by [contacting the lab](#).

Cation exchange capacity (CEC) is a measure of the fertility or nutrient holding capacity of the soil. The CEC is calculated by adding together the amount of soil values of potassium (K), calcium (Ca), magnesium (Mg) and hydrogen (H) held on the soil particles. The greater the clay and organic matter content of the soil, the higher the CEC. Nutrient levels and pH tend to be more stable in soils with higher CEC. In soils with a CEC less than 6me/100g K, Ca and Mg may change more rapidly.

Loamy sands and sands usually have a CEC less than 8. The CEC of sandy loams frequently falls between 8 and 12. Loams, clay loams and clays usually have a CEC greater than 12. As the soil pH changes, the CEC value will also vary somewhat. The higher the CEC, the greater the capacity of the soil to hold nutrients.

Soil pH for grapes. pH is a scale used to measure acidity or alkalinity. The pH scale is from 0 to 14. A value of 7 is neutral, less than 7 acidic and greater than 7 alkaline. A soil pH in the range 5.5 to 6.5 is considered optimum for grapes and generally has better nutrient balance for plant growth than soils that are more acidic or alkaline. Vines will grow from pH 4.0 to 8.5, but a pH below 5.5 and above 8 will depress yields and create vine problems. Soil pH affects the availability of nutrients and microbial activity in the soil. The availability of many micronutrients (Mn, Cu, Zn and B, for example) decreases as soil pH increases. Soil pH often drifts down over time with the use of fertilizers and sulfur.

- American varieties (Concord, Niagara, etc.): 5.0 to 6.5 (5.6 or higher is preferable)
- French Hybrid: 5.5 to 6.5 (will tolerate a pH up to 7.0)
- **Adjusting soil pH**
- Below 5.5: Bring up to 6.0 or 6.5 with lime. Dolomitic limestone will also help raise the magnesium value if it is low. Calcitic limestone will help raise calcium levels.
- Above 7.0: Consider lowering to 6.5 or 6.0 with sulfur, or using acidifying fertilizers such as urea or ammonium sulfate.

Soil organic matter. Organic matter (OM) improves soil structure, moisture retention and fertility. Two to 3 percent is considered ideal for grapes. Nitrogen is released from organic matter at approximately 20 pounds N per acre per year for each 1 percent of organic matter present. So at the optimum 2 to 3 percent OM for grapes, there is 40 to 60 pounds N per acre per year released from the

soil. Grapes grown on high organic soils tend to be less winter hardy. With the indeterminate growth habit of grapes, excessive N promotes vegetative growth late into fall, and shoots don't have time to acclimate for winter.

Recommended application amounts for potassium and phosphorus will be listed on the soil test results. Nitrogen recommendations will also be listed. Usually, half the nitrogen should be applied at bud break and the other half at bloom. Nitrogen applications should be completed by veraison, allowing vines to take up and use the nitrogen during the growing season. Nitrogen applied during the mid to late summer will encourage vegetative growth into the fall season, when vines should be hardening off and preparing for dormancy.

Test	Desirable soil test ranges for grapes
pH	5.5-6.5
Organic matter	2-3 percent
Phosphorus (P)	40-50 ppm
Potassium (K)	250-300 ppm
Magnesium (Mg)	200-250 ppm
Boron (B)	1.5-2.0 ppm
Zinc (Zn)	8-10 ppm

Source: Midwest Grape Production Guide

References

- [Wine Grape Production Guide for Eastern North America](#), Tony Wolf et al.
- [Grapevine Nutrition](#), Mark Chien, Penn State Cooperative Extension
- [Midwest Grape Production Guide](#), Ohio State University
- [Ontario Crop IPM soil diagnostics](#)
- [Monitoring grapevine nutrition](#), USDA-ARS and Oregon State University
- [Raising Soil pH and Soil Acidification](#), University of Minnesota
- [MSU Soil and Plant Nutrient Laboratory](#)

This article was published by [Michigan State University Extension](#). For more information, visit <http://www.msue.msu.edu>. To contact an expert in your area, visit <http://expert.msue.msu.edu>, or call 888-MSUE4MI (888-678-3464).

MSU Extension AABI Fruit Production Educator Seminar Presentations

May 23, 2013

4:00 P.M.

Nathaniel Walton

5:00 P.M.

Emily Pochubay

20 Minute Presentation with 10-15 Minute Q & A

Seminar Topic

"Collaborating to deliver cutting edge integrated crop management (ICP) information to Michigan's tree fruit industry"

Seminars presented at:

Northwest Michigan Horticultural Research Center

6686 S. Center Highway, Traverse City, MI 49684

Public and interested parties are welcome to attend

VINEYARD WEED ID and MANAGEMENT WORKSHOP

June 6 - SW Michigan (SWMREC) - 11:30am-5:30pm

June 7 - NW Michigan (NWMHRC) - 11:30am-5:30pm

\$25 per person, includes lunch, handouts and 4 RUP credits. For information on the guest speakers and registration, please see [attached flyer](#).

INPUT REQUESTED FOR NEW AND IMPROVED WEBSITES

Got opinions or feedback for updating MSU's apple and cherry websites?

We will be rehauling www.cherries.msu.edu and www.apples.msu.edu during the next few months to better serve the needs of growers. Whether you are a regular web user or new to these sites, please give us your perspective through the brief survey

at: www.surveymonkey.com/s/FruitWebsitesFeedback

[Read an article about this effort](#).

WEBSITES OF INTEREST

Insect and disease predictive information is available at:

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

60 Hour Forecast

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

Information on cherries is available at the new cherry website:

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

Fruit CAT Alert Reports have moved to MSU News

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