

# Northern Michigan FruitNet 2013

## Northwest Michigan Horticultural Research Center

### Weekly Update

May 28, 2013

#### GROWING DEGREE DAY ACCUMULATIONS AS OF May 28th AT THE NWMHRC

Year	2013	2012	2011	2010	2009	2008	23yr. Avg.
<b>GDD42</b>	512	895	446	807	537	480	569.1
<b>GDD50</b>	283	494	198	424	250	217	279.2

#### Growth Stages at NWMHRC (May 28, 8:30 a.m.)

**Apple:** Red Delicious – Petal fall

Gala – Petal fall

Yellow Delicious – Petal fall

**Pear:** Bartlett: 7 mm

**Sweet Cherry:** Hedelfingen: 9 mm

Napoleon: 7 mm

Gold: 6 mm

**Tart Cherry:** In the shuck

**Balaton:** In the shuck

**Apricot:** 11 mm

**Grapes:** 4-8 " shoots

## NORTHWEST MICHIGAN REGIONAL REPORT

N.L. Rothwell, NWMHRC

The pleasant temperatures have brought cherries out of the shuck—looks like we have a good set so far.

The Memorial Day weekend was pleasant for both tourists as well as the growers here in the northwest Michigan. Daytime temperatures were in the mid-60s, and we hit the low 70s on Monday. Each day was sunny with little wind in the mornings, and growers took advantage of these conditions for spraying. We have not received any precipitation since 23 May, but the forecast is predicting rain today and into tomorrow. We did have some cold overnight temperatures on Friday and Saturday nights, and the East Leland site was the coldest station in NW Michigan. Frost fans were running in many locations on both nights. We have accumulated 512GDD base 42 and 283GDD base 50 so far this season.

**Apple.** Growers are covering up for **scab** and **powdery mildew** with the rapid shoot growth in apples. We were at green tip on 29 April here at the station, and according to the model, 90% of the apple scab spores are mature and 59% of the spores have been discharged. This model suggests that we still have a ways to go before we can call the end to primary scab. With the majority of spores at maturity, the predicted rains in the coming two days will discharge many of the spores. Growers should be sure to put on a protective scab spray prior to the rains. As of today, we have not observed scab in any apple orchard.

Today is cooler than what was originally in the forecast, so the **fireblight** model is not predicting a fireblight infection until Thursday, 30 May, but the EIP levels will be VERY high. By Thursday, the EIP

is predicted to be in the mid-200s with a 71% chance of rain. All growers with open apple blossoms will need to be protected against fireblight by Wednesday evening. Growers in Antrim, Leelanau, and Grand Traverse are highly encouraged to use Kasumin since MSU E researchers have detected streptomycin-resistance fireblight bacteria in these three counties. The time for Apogee applications is also here, and many blocks are at king bloom petal fall. This spray is highly recommended for shoot control but also to minimize fireblight infection. Lastly, growers need to start their thinning program as recommended by Phil Schwallier; nibble thinning is the best method for good thinning this year. Growers should be starting their thinning program at petal fall (which is now or close to now) rather than waiting until 10mm.

Insects are still slow to emerge, but with the warm weather and nights predicted, **codling moth** should begin flying this week. One CM was caught in Benzie County last Friday. **Plum curculio** should also become more active this week with the optimal conditions for movement. **Cherry.** No **cherry leaf spot** lesions have been detected in the region, but growers should be protected against the next rains with the warm temperatures. The conditions will be conducive for a CLS infection, and there is a lot of new growth on the trees that will need to be covered. We are approaching shucksplit and into first cover, tart cherry trees will also need to be protected against **powdery mildew** (PM). Our data show that this early season timing is the best way to protect against PM; once we can see the white mycelium on the leaves, it is too late and we do not have materials that will eradicate a PM infection. Materials that have work against both CLS and PM are recommended at this first cover timing. The newer materials are best used at first cover as they are our most efficacious products against both diseases (Merivon, Luna Sensation, Fontelis). Dodine (Syllit) is a good product for CLS control but will not work against PM. If growers are still in the shucksplit timing, a copper or dodine might be a good application to save the newer materials for the first cover timing. All chlorothalonil applications can also be made up until shucksplit. After shucksplit, growers that want to continue to use chlorothalonil, they must use Bravo WeatherStik only.

As cherries are coming out of the shuck, particularly in sweet cherries, plum curculio will be the insect to watch. The warm temperatures and predicted rainfall will cause these insects to move into orchards and begin looking for oviposition sites. For growers using the P.I.T.S. model ([www.enviroweather.msu.edu](http://www.enviroweather.msu.edu)), we were in bloom on 16 May, and have accumulated only 108GDD. **European brown rot** is showing up across the region in Balatons and Montmorency. Since we are at shucksplit in most orchards, there are no control options for this disease at this time. **Plum curculio** stings have been observed in sweet cherry in NW Michigan. The first **lesser peachtree borer** moth was caught this week.

At this time, sweet cherry set looks good in many blocks, but growers are concerned about pollination. When sweet cherries were in bloom, we had a few good pollinating days, but we also had our fair share of cool and wet weather during this critical time. Tart cherries have just started coming out of the shuck, and we will know more about the crop next week. In the Hart area, the tart cherry crop looks good.

### **Wine Grapes**

Duke Elsner, Grand Traverse County MSUE

We are probably past all threat of frosts in the Grand Traverse area, and I have received no information of significant spring frost injuries this year. Vines are now into a period of rapid shoot growth which will really pick up with this week's warmer weather. Rapid increases in leaf size and number will make it difficult to maintain effective surface residues of pesticides.

Rainy weather predictions for the rest of the week will likely produce **powdery mildew** infection periods. No significant insect activity is expected for the week ahead, but growers need to be on the lookout for the possible arrival of adult **potato leafhoppers** in the storm fronts – this could happen at any time now.

Our registration numbers for the **Vineyard Weed Identification and Management Workshop** scheduled for **June 7th** are rather low – please, if you are considering participating in this workshop, send your registration in as soon as possible so we can plan accordingly.

## PLUM CURCULIO MANAGEMENT IN STONE AND POME FRUITS

**Growers have many options for plum curculio control, but all have different modes of action.**

Posted on **May 21, 2013, MSUE News**, by **John Wise**, Michigan State University Extension, Department of Entomology, Nikki Rothwell, Michigan State University Extension, and Mark Whalon, Michigan State University Extension, Department of Entomology

Plum curculio is a key early season pest on pome and stone fruits. There are many insecticides (and an organic option) available for control of plum curculio, but according to [Michigan State University Extension](#), their performance characteristics vary greatly compared to our traditional broad-spectrum chemistries. These conventional insecticides, such as organophosphates (OP) and pyrethroids, work primarily as lethal contact poisons on plum curculio adults in the tree canopy. Avaunt also works primarily by lethal activity, but ingestion is the important means for delivering the poison. Neonicotinoids are highly lethal to plum curculio via contact for the first several days after application, but as these systemic compounds move into plant tissue, they protect fruit from plum curculio injury via their oviposition (egg-laying) deterrence and anti-feedant modes of activity. Neonicotinoids and OP's can also be used as rescue treatments because they have a curative action that can kill eggs and larvae that are already present in the fruit.

Voliam flexi can be used for plum curculio control, but only the neonicotinoid (Actara) component will be effective against plum curculio. Also, growers should remember that 4.5 to 5.5 ounces of Actara is the recommended rate for plum curculio control, and Voliam flexi is labeled at 4 to 7 ounces; growers should be sure to apply an adequate amount of Voliam flexi to meet these recommended rates. Leverage (imidacloprid + cyfluthrin) and Voliam Xpress (Chlorantraniliprole + Lambda-cyhalothrin) are other pre-mix materials labeled for plum curculio control.

For organic growers, Surround WP can reduce plum curculio injury to fruit if applied to attain a heavy coating on the tree canopy; this kaolin clay product works as a plum curculio repellent. Building up and maintaining several coats of the clay on fruit as the fruit continues to grow is key to successful use of this product.

The following table is designed to summarize several key variables that can help growers determine how to optimize the performance of various insecticides for [integrated pest management](#) (IPM) programs. Several other compounds, like Rimon, Esteem and Delegate, are commonly used in tree fruit pest management programs and have limited activity on plum curculio worth noting. Rimon, when targeted to control obliquebanded leafrollers or codling moth at petal fall, will effectively sterilize plum curculio eggs when adults are exposed to residues in the tree canopy. These sub-lethal effects will not prevent injury to fruit from adults, but will result in nonviable plum curculio eggs, thus no live larvae. Delegate, when ingested by plum curculio adults, will cause moderate levels of mortality. Esteem, when used approximately two weeks post-harvest in cherries (San Jose scale crawler timing), will reduce female plum curculio overwintering viability. However, Rimon, Esteem and Delegate are **not** labeled for stand-alone plum curculio control, but when used in pest management programs may contribute to overall plum curculio population management. For control materials for plum curculio to go:

[http://msue.anr.msu.edu/news/plum\\_curculio\\_management\\_in\\_stone\\_and\\_pome\\_fruits](http://msue.anr.msu.edu/news/plum_curculio_management_in_stone_and_pome_fruits)

Optimal timing and order selection of insecticides for plum curculio management is based on matching the performance characteristics of each chemistry with plum curculio lifecycle development and tree phenology. Because organophosphates and pyrethroid insecticides are contact poisons, they can be used as early as petal fall to knock beetles out of the tree canopy. However, we do caution the use of pyrethroids as they are toxic to mite predators. Plum curculio adults feed on tree parts during bloom and petal fall, so Avaunt can be used at this petal fall timing.

The performance of neonicotinoids is optimized when sprays are made after fruit set (pome fruits) or shuck-split (stone fruits), so that fruit and foliage are both covered. Surround will not work unless the tree and fruit are completely covered, so multiple sprays are needed on the tree prior to plum curculio

oviposition activity. If plum curculio infestation occurs and a rescue treatment is needed, organophosphates and neonicotinoids can provide curative action up to two weeks after plum curculio infestation, although in some cases dead cadavers can still be found in fruit.

*Dr. Wise'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).

## **NEW STINGER HERBICIDE LABEL FOR APPLES**

**Stinger labeled for post-emergence weed control in established apples.**

Posted on **May 21, 2013, MSUE News**, by **Bernard Zandstra**, Michigan State University Extension, Department of Horticulture

[EPA](#) has approved a Supplemental Label for use of Stinger (clopyralid, Dow AgroSciences, Indianapolis, IN) for post-emergence weed control in well-established, non-bearing and bearing apple trees. Stinger is effective against members of the Asteraceae family (composites), including heath aster, burdock, cocklebur, common groundsel, dandelion, goldenrod, horseweed, pineappleweed, sowthistle and Canada thistle. It is also active against all legumes, including alfalfa, birdsfoot trefoil, clovers and vetch. It also controls members of the nightshade family, including eastern black nightshade, hairy nightshade and groundcherry. It stunts horsenettle, smartweeds including prostrate knotweed and plantains. Stinger has virtually no activity against other herbaceous or woody plants.

Stinger is a hormonal herbicide that translocates throughout the plants. It can cause some curling and twisting of leaves and new shoots, so the label advises to avoid direct application to apple foliage, fruit or trunks. Slight contact with apple plants will not cause permanent crop injury. There is a 30-day preharvest interval.

The label expires Sept. 27, 2015, and hopefully the apple use will be included on the Section 3 (Federal) Label by then. The [Supplemental Label for Stinger](#) on apples can be downloaded from [CDMS.net](#).

*Dr. Zandstra'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).

## **MORE INFORMATION ON STINGER FOR WEED CONTROL IN APPLE**

**Courtesy of Leslie Abbot, Dow Agrosiences**

At this time Michigan and Washington are the only states where Stinger will be labeled on apples.

There is also a list of all of the weeds controlled by Stinger, as listed on the federal label. If you have dealt with any other supplemental labels for Stinger, you will remember that the supplemental label does not include the full list of weeds controlled.

We recommend that you would print the label on one side and the “weeds controlled” list on the other. Remember that the grower is required to have this label in their possession if they apply Stinger on apples.

Notice that the label calls for a *minimum* swath width of 3 feet. This means that if you want to treat the entire orchard floor to eliminate things like dandelion or thistle, you can still do that. I hope that the federal label will be worded a little differently.

Some general reminders for Stinger:

- Since it is a growth regulator herbicide, we like 6 hours of drying time after application
- Do not mix with a desiccant-type herbicide (Gramoxone) because it will interfere with adequate uptake of Stinger
- We do not call for specific adjuvants but do not prohibit them- your experience with adjuvants will be the best guide
- What Stinger controls it controls impressively, but if the weed is not on the label it is most likely that Stinger will not touch it!
- List of weeds controlled by Stinger
- artichoke, Jerusalem
- buckwheat, wild
- buffalobur\*
- burdock, common
- chamomile, false (scentless) chamomile, mayweed (dog fennel) clover sp.
- cocklebur, common
- coffeeweed
- cornflower (bachelor button) dandelion
- dock, curly
- galinsoga groundsel, common
- hawksbeard, narrowleaf
- hawkweed horseweed (marestail)
- jimsonweed
- knapweed sp ladythumb\*
- lettuce, prickly
- locoweed, white
- locoweed, Lambert
- marshelder
- nightshade, Eastern black nightshade, cutleaf nightshade, hairy
- oxeye daisy pineappleweed
- ragweed, common ragweed, giant
- salsify, meadow (goatsbeard) sicklepod
- smartweed, green\*
- sorrel, red
- sowthistle, annual
- sowthistle, perennial\* starthistle, yellow
- sunflower
- teasel, common
- thistle sp.
- vetch
- volunteer alfalfa volunteer beans volunteer lentils volunteer peas
- wormwood, biennial

\*These weeds may only be suppressed.

## A FEW TIPS ABOUT APPLYING APOGEE

Phil Schwallier, MSUE

Nikki Rothwell, NWMHRC

Apogee® is a plant growth regulator composed of prohexadione-calcium that can be used in apples with significant advantages to the grower. Prohexadione-calcium is a compound that is part of a new class of gibberellin biosynthesis inhibitors called the cyclohexanetriones. Prohexadione-calcium reduces terminal growth by inhibiting important enzymes that help form growth-specific gibberellins. This group of plant hormones is primarily responsible for regulating shoot elongation in apple trees. In laymen's terms, Apogee helps control tree vigor. Controlling vigor can reduce the amount/intensity of pruning, decrease internal shading, a major proponent to properly color apples, and reduce canopy density for thorough pesticide coverage. In one Canadian study, properly timed Apogee applications eliminated the need to summer prune. This product has also been a reliable tool for minimizing impacts of shoot blight caused by the fireblight pathogen, *Erwinia amylovora*. Shoots that have less growth are not as susceptible to fire blight. When applying Apogee to apples, growers should consider the following: timing, rate per acre, thinning relationships, and compatibility with other chemistries in the tank.

### Timing

Apogee should be applied when vegetative shoot growth is less than three inches. To best time the application, there is a 7 to 10-day window beginning at king bloom petal fall. This timing applies to most varieties in most years. Two more applications should be made at two-week intervals following the bloom application. Sometimes a fourth application is needed when excessive rainfall or light crops increase vegetative growth.

### Rate

The rate per acre is usually calculated on a tree row volume basis and can be adjusted to two-thirds of the full-rate. The two-thirds rate is the starting rate growers should consider if they have not had experience with using Apogee. Growers with past experience will know if this  $\frac{2}{3}$  rate is too high or too low for a particular block. This suggested two-thirds rate per acre is a season-long rate. For example, if trees are at 75% tree row volume, then 24 ounces per acre is the seasonal rate ( $48 * \frac{2}{3}$ ).

Best results are achieved when the seasonal rate is split into three or four sprays. For example,  $8 + 8 + 8$  oz per acre for a total of 24oz per acre per season. This season, I would recommend a higher dose of Apogee given that the fire blight risk is and has been severe this season. When the fireblight risk is high, the first application of Apogee at king bloom petal fall timing should be increased to as much as 150 percent of the split rate. For example, the rate should be increased from 8oz per acre to 12oz per acre. If the first spray rate is increased, subsequent sprays (second and third sprays) should be reduced. The seasonal application would be  $12 + 6 + 6 = 24$  ounces per season instead of  $8+8+8=24$ oz.

### Thinning

Apogee tends to increase fruit set, hence more aggressive thinning is often needed. If using Apogee, growers should increase thinning by 10 or 15%. For example, if the rate to thin was 1 pt Sevin + 8 ppm NAA, the thinning rate in blocks where Apogee has been used should increase to 1 pt Sevin + 10 ppm NAA.

### Compatibility

Apogee is not compatible with calcium or boron in the tank. We also recommend that Apogee be applied after thinner application. If the two-week timing interval is also the ideal time to thin, make the thinning application first and follow with Apogee a few days later. Growers should be sure to follow the label recommendations for AMS and surfactants.

To conclude, Apogee is an excellent tool to help control vegetative growth, which decreases the need for summer pruning and can suppress the spread of fireblight among shoots and within shoots. The above recommendations are the best way to maximize the use of Apogee.

## **CARBOHYDRATE MODEL PREDICTIONS FOR THE NEXT SEVERAL DAYS**

**Nikki Rothwell, NWMHRC**  
**Philip Schwallier, MSUE**

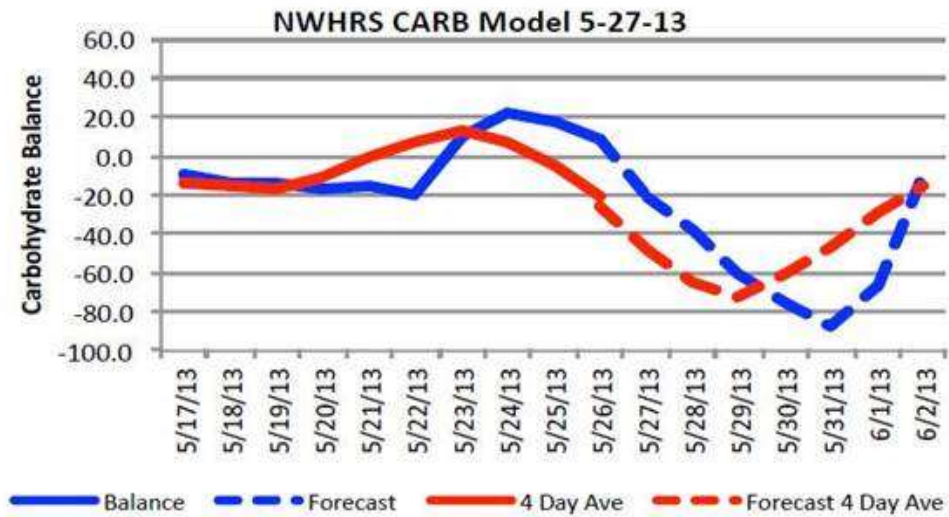
The weather forecast for the next several days is for cloudy and really warm temperatures, and based on these conditions, the carbohydrate model is predicting stressful conditions May 27 thru May 30. We are recommending that growers on the Ridge reduce their rates by 30 to 50% if they thin during these four days because they are at the optimal time for thinning. For our area, most apples are only at petal fall, so growers should use the STANDARD RATE. Remember, for those growers that did not have a crop last year, those trees are going to want to bear biennially—we need to break this potential biennial cycle by making sure we thin adequately. To this end, we are recommending the nibble thinning approach (be sure to read Phil's piece on Apple Thinning Pointers for 2013). Additionally, trees that had no crop have a lot of leaves on them—these leaves will strengthen the trees and these trees will be more difficult to thin. In orchards with no crop last year, this nibble thinning approach is key, and this approach is to start at petal fall. However, normal rates of thinners are recommended at this stage. Thinning at petal fall is a lower risk than thinning later when fruitlets become more sensitive (8-10mm). For example, if Sevin (full rate: 1 qt/acre) is used at petal fall, we typically see a 15% thinning impact. If the same rate is applied 3-4 days later at ~6mm fruit, we see that thinning jump to 25%. This approach really nibbles away at the crop rather than dropping lots of fruit at once.

For orchards that had a crop last year, the nibble approach is still a good idea if we have optimal thinning conditions at petal fall, which the carbohydrate model says we will. Fruit is easiest to thin at the 8-13mm stage. This stage is when trees are at the most sensitive thinning window, and this period usually remains open for 10 days. In many orchards, we will be at this stage in a week or so, but if the temperatures do reach into the 80s for the next few days, this window could sneak up on us. Growers should assess the bloom in orchards that had a crop last year: if the bloom is not huge (a snowball bloom), then maybe growers will want to wait until we are out of this sensitive time for thinning in the next four days and thin over the weekend when it is cooler.

Either way, the nibble thinning approach will work for orchards with or without a crop last year—again, just taking off a little at a time rather than waiting for the 'magic' window, which as many of you know, we may not get the perfect conditions for optimal thinning. If the crop looks like it is going to be big (lots of bloom) and you had good pollinating weather, the nibble approach may be the right one for your orchard.

As mentioned above, the carbohydrate model predicts stress on May 28 and 29 due to forecasted cloudy weather and warm day and night temperatures (80's and mid 60's). The model suggests growers should be careful with these conditions. If cloudy conditions do not occur, normal thinning should be applied. Reduce rates during this time period if you are at the sensitive thinning window. For growers at petal fall, a normal rate of thinner is recommended because this stage of fruit development is not as sensitive compared with the 8-10mm fruit. \

NW Carbohydrate Model for this week:



Carbohydrate daily output and daily recommendations. Recommendation are based on the optimal thinning window timing only (8-10mm).

NWHR5	Solar Rad	Min	Max	Carb Balance	4 Day Ave	Recommendation
5/20/13	17.2	55	85	-16.7	-10.7	Use Standard Rate
5/21/13	16.0	54	82	-15.2	-0.9	Use Standard Rate
5/22/13	6.0	50	64	-20.3	7.2	Increase 30%
5/23/13	15.9	38	51	9.5	13.0	Increase 30%
5/24/13	28.5	34	57	22.2	6.7	Increase 30%
5/25/13	28.6	35	65	17.5	-5.3	Use Standard Rate
5/26/13	26.7	38	69	7.9	-20.8	Reduce 15%
5/27/13	13.0	43	71	-21.9	-48.7	Reduce 30%
5/28/13	5.0	47	65	-38.1	-65.2	Reduce 50%
5/29/13	9.0	55	78	-59.8	-72.4	Reduce 50%
5/30/13	13.0	62	83	-75.1	-59.7	Reduce 30%
5/31/13	9.0	63	82	-87.8	-46.7	Reduce 30%
6/1/13	9.0	58	78	-66.6	-29.2	Reduce 15%
6/2/13	13.0	49	63	-9.3	-15.5	Use Standard Rate

*Example of Thinning Percent at Different Times During Season and Stress Levels with an Aggressive Combination of Thinners:*

0	-20	-40	-60	-80	-100		
Petal Fall	0%	10%	15%	25%	35%	50%	
6 mm	5%	20%	30%	40%	50%	60%	
10mm	15%	30%	40%	50%	60%	80%	
15 mm	15%	30%	40%	50%	60%	80%	
20 mm	10%	20%	30%	40%	45%	50%	
25 mm	3%	10%	15%	20%	30%	35%	
30 mm	0%	0%	2%	5%	10%	15%	

**Table 1. Thinning Rate Reductions and Predicted % Thinning for Combination Treatments.**

Thinning Level	Sevin + MaxCel	Predicted %	Sevin + NAA	Predicted %
	(1 qt + ppm)	Thinning	(1 qt + ppm)	Thinning
30% Increase	1 + 150 + 1 qt Oil	38	1 + 15 + 1 qt Oil	40
Aggressive	1 + 150	32	1 + 15	35
Standard	1 + 100	30	1 + 10	32
10% Reduction	1 + 75	28	1 + 7	29
20% Reduction	1 + 50	25	1 + 5	26
30% Reduction	1 qt Sevin	20	1 qt Sevin	20
50% Reduction	MaxCel 150	13	NAA 20	20
55% Reduction	MaxCel 100	10	NAA 15	17
60% Reduction	MaxCel 50	8	NAA 10	12

## **APPLE THINNING POINTERS FOR 2013**

**Guidelines to help you make good apple thinning decisions.**

Posted on **May 17, 2013, MSUE News**, by **Phil Schwallier**, and Amy Irish-Brown, Michigan State University Extension

This 2013, apple thinning season factors are unique, as always, and will need consideration before performing thinning. [Michigan State University Extension](http://www.maes.msue.edu/) educators suggest growers plan on making multiple thinning treatments this year to achieve your target crop load. We currently have the potential for a very large apple crop and starting your thinning early at petal fall is highly recommended for 2013.

The extremely low crop set in 2012 has triggered the biennial bearing cycle that apples are notorious for (on 2013, off 2014, on 2015 and on). We need to break this potential biennial cycle by thinning this crop down and then use summer NAA to promote return bloom for 2014.

We had no crop last year, which has produced a "green" snowball bloom this year and is expected to strengthen trees and fruit set for the 2013 apple crop. The "green" bloom refers to the abundant

amount of leaves that are present on the trees before and during bloom. Last year, hot and very droughty weather has caused some minor reduction in bloom on limbs, trees and on a few varieties such as Red Delicious and Empire. This is the exception and only in minor areas.

Frost occurred on May 13, 2013, with minimum temperatures at 24 degrees Fahrenheit which caused some damage to flowers. Growers will have to carefully assess frost damaged sites and adjust their thinning program accordingly. Excellent sites and frost-protected areas have almost no frost damage and need to be thinned aggressively. Bee activity, pollination and even fertilization appear to be good. Temperatures for the next seven to 10 days are forecasted to be warm; ideal for excellent fruit set.

#### **Thinning factors:**

1. No crop 2012 (more resistant to thinning 2013).
2. Hot, dry 2012 summer (can weaken 2013 bloom, we don't expect weak 2012 flowers).
3. Biennial bearing cycle triggered, we must break the cycle.
4. Strong snowball bloom, many large showy flowers.
5. Abundant leaves ("green" snowball bloom, strengthens set).
6. Good bee activity, predicted good pollination and fertilization.
7. Frost on May 13, near 24 F in unprotected areas (access your own bud strength).
8. Good sites and frost protection (helicopters, wind machines, sprinklers and bale burning) have almost no damage and will need aggressive thinning approach.
9. Some minor areas of reduced bloom (insignificant).
10. Weather forecasts are for warm temperatures over the next several days and colder during the 10 millimeter stage.
11. Leave CHECK trees.
12. "Nibble" thinning, thin early and often to gradually reduce the crop.
13. Promalin treatments.
14. Multiple thinning should be considered to get the job done for 2013.

#### **Thinning approach: nibble thinning**

"Nibble" thinning is a strategy to chemically thin often and multiple times throughout the bloom and fruit set window. Technically, nibble thinning begins with blossom thinning (lime-sulfur and oil or ATS). This treatment seems to be less successful in Michigan and is not practiced very much. The real first thinning period occurs at petal fall to 6 millimeters. At petal fall, trees are not very sensitive to thinning, and most years no significant thinning occurs. This year with warm temperatures forecasted for the next several days, some good thinning is predicted at the petal fall timing – perhaps perfect thinning for some sites.

This first thinning will nibble off perhaps up to half of the target thinning of this excessive crop load. Usually, additional thinning will be required at the 10 millimeter stage. The next chance to thin will occur at 10 to 12 millimeter and the last will be at 18 millimeters. This process of reducing the crop gradually will result in a better consistent thinning with a reduce risk of over-thinning or under-thinning.

#### **Other considerations:**

- **Oil** can be added to thinners to increase the thinning by 10 percent.
- **Oil** is not compatible with Captan and sulfur. Where this is a concern, use a surfactant instead of oil.
- Agri-Mec and **oil** can cause additional thinning when mixed with thinners.
- Cloudy, warm weather will increase fruit drop.
- Sunny, cold weather will increase set.

**Table 1. Thinning materials and recommendation for multiple thinning.**

Variety		Petal fall to 6 mm	10 to 12 mm stage		Variety comment
			If needed	If more aggressive thinning is needed	
<b>Frost Damage</b>	Kings dead	Sevin or NAA 10 ppm	Standard Rates	—	—
	Significant damage	Wait to access set	Tops only, mild rates	Standard Rates	—
<b>Easy to thin varieties</b>	Cortland, Gingergold, Idared, Jonathan, Jonagold, McIntosh	Use Standard Rates Sevin or NAA 10 ppm	NAA 10 ppm	Sevin + NAA 5 ppm	Easy to thin
	Jonathan with MaxCel	Sevin	Sevin	Sevin + MaxCel 50 ppm	Small Fruited Easy to thin
<b>Intermediate to thin varieties</b>	Empire	Sevin + MaxCel 100 ppm	Sevin + MaxCel 100 ppm	Sevin + MaxCel 150 ppm	Small Fruited
	Honeycrisp	Sevin + NAA 10 ppm	Sevin + NAA 10 ppm	Sevin + NAA 15 ppm	Tend to set multiple fruits/cluster, biennial
	Reds	Sevin + MaxCel 100 ppm	Sevin + MaxCel 100 ppm	Sevin + MaxCel 150 ppm	Biennial, Sensitive to NAA
<b>Difficult to thin varieties</b>	Gala	Sevin + MaxCel 100 ppm	Sevin + MaxCel 100 ppm	Sevin + MaxCel 150 ppm	—
	Goldens, Paulared	Sevin + NAA 10 ppm	Sevin + NAA 15 ppm	Sevin + NAA 15 ppm	Biennial
	Rome	Sevin + NAA 10 ppm	Sevin + NAA 15 ppm	Sevin + NAA 20 ppm + 1 qt Oil	Tend to set multiple fruits/cluster.
	Fuji	Sevin + MaxCel 100 ppm	Sevin + MaxCel 150 ppm	Sevin + MaxCel 150 ppm + 1 qt Oil	Biennial, Sensitive to NAA

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

## PREPARING FOR ROSE CHAFER MANAGEMENT IN VINEYARDS

Rose chafers can quickly damage vines. To better manage this pest, know the biology and lifecycle, and available options for control.

Posted on **May 21, 2013, MSUE News**, by **Rufus Isaacs**, Michigan State University Extension, Department of Entomology

### Introduction

In the past few years, populations of the rose chafer beetle, *Macrodactylus subspinosus*, have been abundant in some regions of southwest Michigan. These beetles can be found in grape growing regions across Michigan and beyond; however, outbreaks in the Lawton, Mich., region in recent years have been causing some high levels of damage to clusters during the bloom period. With this recent history, it is a good time to review the biology and lifecycle of this pest and review the available options for control.

### Biology

The rose chafer is a light-tan beetle with a darker-brown head and long, spiny legs. It is about 0.5 inches long. The adult beetles have only one generation per season with emergence from the soil starting in late May and June, and with the beetles living for up to a month. While grapes are a preferred host, there are also many other plants it will feed on including roses, strawberries, peaches, cherries, apples, raspberries, blackberries, clovers, hollyhocks, corn, beans, beet, peppers, cabbage, peonies and many more plants, trees and shrubs.



Fig. 1: Rose chafers are tan-colored beetles with long, spiny legs.



Fig. 2: Rose chafers feeding on grape clusters.

This vineyard pest is distributed throughout the eastern United States with greatest abundance in areas with sandy soils and grass. This is because the female beetle, once mated, selects grassy and sandy areas for laying her eggs. Those eggs hatch into larvae that feed on grass roots through the summer, moving down away from the frost line during the winter. In spring they feed again, pupate, and then emerge in late May and June. Emergence of adult beetles typically coincides with bloom of grapevines. The beetle's ability to skeletonize leaves until only the midribs are left, and consume the young tender clusters, makes it an economically-significant pest of grape production.



Fig. 3: Skeletonized leaf after feeding by rose chafers.

### **Rose chafer management**

The rapid arrival of rose chafer beetles and the potential for high populations in hotspots underscores the need for regular vineyard monitoring. By scouting areas that have had this pest in the past, growers can protect clusters when the beetles start emerging rather than waiting until severe damage has occurred. Establish a route for checking vines and travel this route looking for the beetles on vines, ideally twice a week. The beetles are easy to see and direct counts on vines are possible. There is also a trap developed and marketed for rose chafer monitoring or trapping-out, but [Michigan State University Extension](#) does not recommend using this except as a single trap for monitoring in a location away from vineyards as the trap can draw beetles to the vineyard.

There is no formal economic threshold developed for this pest, but [Ohio State University](#) recommends an average of two rose chafers per vine as a working action threshold for initiating a control program. Below this there is likely to be only a small amount of damage that doesn't warrant the expense of a spray. However, as mentioned above, the population of this pest can rise rapidly, and I have observed over 200 rose chafers per vine in one winegrape location in northwest Michigan, and this is clearly going to cause damage to that vine. Rose chafers can also be very locally distributed such that one corner or one edge of a vineyard has high populations, usually adjacent to a grassy area. This highlights the need to sample different areas of a vineyard to know the pest distribution. If there are hotspots, a targeted spray may be sufficient to control the beetles without needing a blanket application across the whole vineyard.

### **Control**

As mentioned above, rose chafer beetles are attracted to sandy and grassy areas during their egg-laying period. It may not be feasible, but if areas that are obvious sources of the beetle can be changed into a non-grass cover crop or can be fallow for the period of late May until early June, this might force the beetles to seek egg-laying sites elsewhere. Small numbers of beetles can also be hand-removed and placed into soapy water if you have a small enough vineyard that this manual control is possible.

For chemical control, there are a number of options to consider. Assail, Sevin and Danitol are all ranked as providing excellent control of this pest. These have some different properties with the neonicotinoid insecticide Assail providing protection due to it knocking down the beetles and also because it is a systemic insecticide that is taken into the vine making it resistant to wash-off and providing good residual activity.

In a 2003 MSU research trial in Leelanau County, we found that Assail provided longer control than Sevin. The carbamate insecticide Sevin and the pyrethroid insecticide Danitol both have contact activity against rose chafers, providing knockdown of the beetles on contact and with Sevin also having some activity as a stomach poison after being eaten by the beetles.

Additional broad spectrum insecticides such as the pyrethroids Baythroid and Mustang Max are expected to also have good activity, as is the organophosphate Imidan. Under the high spring temperatures we have been having recently, the residual control of pyrethroids is expected to be shorter than under cool conditions. However, we also expect there to be a shorter period of rose chafer activity during hot conditions, allowing for a shorter period needed for vine protection against this pest.

The timing of rose chafer activity also can overlap with early season grape berry moth activity and early potato leafhopper infestation. The insecticides mentioned above will also provide some control of these other insect pests at the same time.

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

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## ASSESSING GROWING DEGREE DAYS WITH ENVIRO-WEATHER

**Understanding and using accumulated growing degree days can help you know when to expect pests. This is one of the services Enviro-weather offers Michigan growers.**

Posted on **May 23, 2013, MSUE News**, by **Beth Bishop**, MSU Enviro-weather

One thing is for sure about Michigan's weather: it's always different. Just compare this spring (2013) to last spring. This time last year the season was two weeks or more ahead of normal in most of Michigan. This year, the majority of the state is days or even weeks behind normal.

This variability means that each year the development of crops, weeds, insects and diseases is different. One year the crabapples bloom in late April; another year they are blooming mid-May. This makes it hard to predict when to expect critical events, such as the growth of a crop or the appearance of insects, diseases and weeds. Luckily, we can estimate the relative progress of the growing season using a measure of accumulated heat called growing degree days.

Most living things depend on external temperatures to fuel their growth and development. Unlike birds and mammals, they do not have the ability to generate internal heat and maintain their temperature. This means, for example, that a crabapple tree won't grow when it is cold. It won't begin to develop until a minimum temperature is reached (the lower developmental threshold), and the amount and the rate of subsequent growth depends on how warm it is and how long (accumulated heat).

Growing degree days are a way of measuring accumulated heat above a certain temperature threshold (minimum temperature below which development stops). One growing degree day is equivalent to one degree above that temperature threshold for one day. Growing degree days are accumulated, or added, each year beginning either Jan. 1 or March 1.

Both the lower developmental temperature threshold, referred to as the base temperature, and the number of accumulated growing degree days required for a growth stage varies depending on the particular plant or animal. Many insect pests and plants have a lower developmental threshold of near 50 degrees Fahrenheit. Some, however, grow at even lower temperatures, for example 48, 42 and 38 F!

You can find the required growing degree day accumulations for various growth stages of many plants and animals, as well as the lower developmental threshold in various places (for example, see the [growing degree days of landscape insects](#)).

Go to [MSU's Enviro-weather](#) website to check the current growing degree day accumulations for your area. Go to the [Enviro-weather website](#) and select a nearby weather station by clicking on the yellow dot that is closest to your station. You will be taken to the "station page" for that location.

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**Enviro-weather**  
Weather-based pest, natural resources,  
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## East Lansing (HTRC), Michigan

**Latest observations at East Lansing (HTRC)**  
05/22/2013 02:00 PM (Station online). Measurements by 5-minute average or total unless otherwise indicated.

69.0 F	Air temperature
0.03 in.	Rainfall(05/22/2013)
77.7%	Relative Humidity
61.7 F	Dewpoint
SSW	Wind Direction (hourly average)
6.0 mi./hr.	Windspeed
Dry	Leaf wetness (tripod-mount)

**Weather observations and summaries**

- Overnight temperatures/ [hours below freezing](#)
- Rainfall comparisons [for Region](#)
- Temperature, rainfall and degree-day [summary](#)
- Rainfall comparisons [last 5 years](#) at this station
- [Soil conditions](#)
- [More weather](#) for this station

**Degree-day tools**

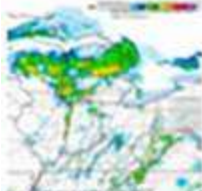
- [Current degree day maps](#)
- Degree Day accumulations [for Region](#)
- Degree Day accumulations [for Region](#) (alfalfa and corn development)
- [Average degree day summary](#)
- Temperature, rainfall and degree-day [summary](#)
- Degree day comparisons: [Compare 2 sensors](#)
- Degree day comparisons: [last 5 years](#) at this station
- Degree day comparisons: [last 5 years](#) at this station (alfalfa and corn development)

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- Michigan State University Extension
- Michigan State University AgBio Research
- Project GREEN

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National Weather Service [radar](#) and [local forecast](#) for East Lansing



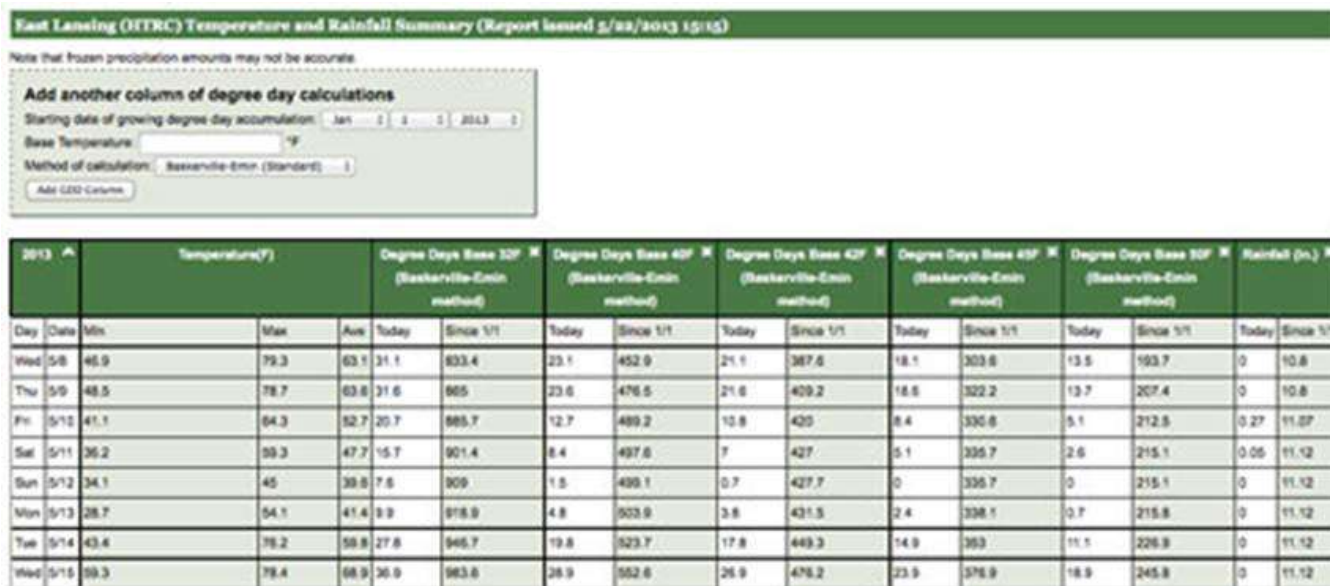
Weather Station at East Lansing (HTRC)

**Photo 1. East Lansing station page on Enviro-weather.**

This page contains a wealth of weather information for that location, including current conditions and weather summaries. It also lists several different growing degree day applications under the heading "Degree-day tools."

Clicking on the first tool, "Current degree-day maps" (see circle in Photo 1), will take you to a page that displays the current growing degree day totals (base 50 F) throughout Michigan. Additional maps show how far ahead or behind normal we are in terms of growing degree days.

Selecting the "Temperature, rainfall and degree-day summary" tool (see arrow in Photo 1) provides you with a daily summary of temperatures (maximum, minimum and average), rainfall (current day and cumulative) and growing degree days for base 40 F, 42 F, 45 F and 50 F. Growing degree days are given as each day's accumulation **and** as the total cumulative growing degree days for the time period. You also have an option of adding another growing degree day column with a different temperature base.



**Photo 2. Temperature, rainfall and degree day summary for East Lansing on Enviro-weather.**

[Enviro-weather](#) provides a suite of weather-based pest and production management tools online. Enviro-weather is funded by [Michigan State University Extension](#), [MSU AgBioResearch](#), [Project GREEN](#) and private donors.

If you have questions or an idea of how [Enviro-weather](#) can help you, please contact Enviro-weather coordinator Beth Bishop at 517-432-6520 or [eweather@msu.edu](mailto:eweather@msu.edu).

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## 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>