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Northern Michigan FruitNet 2009 Weekly Update NW Michigan Horticultural Research Station

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[Erin Lizotte](#)

[Bill Klein](#)

District Horticulturist

District Fruit IPM/IFP Agent

Farm Mgr, NWMHRS

[Duke Elsner](#)

Agricultural & Regional Viticulture Agent

May 5, 2009

GROWING DEGREE DAY ACCUMULATIONS AS OF May 4th AT THE NWMHRS

Year	2009	2008	2007	2006	2005	2004	19yr. Avg.
GDD42	223	267	295	384	282	213	250.9
GDD50	85	124	120	179	118	79	108.2

Growth Stages at NWMHRS (5/4/09- 1:00pm)

Apple: McIntosh & Red Delicious – Tight cluster

Gala & Yellow Delicious – Tight cluster

Pear: Bartlett : Green cluster

Sweet Cherry: Hedelfingen: Early white bud

Napoleon: Early white bud

Gold: Late bud burst

Tart Cherry: Early bud burst

Balaton: Late bud burst

Apricot: 90% Bloom

Plum: Bud burst

Grapes: Early bud swell

Weather

The weather has been slightly warmer during the days this week, but nights remain cool. We have accumulated 223 GDD base 42 and 85 base 50—a considerable jump from last week. We have had no rainfall since 26 April when we had just under a half inch of rain. Overall, things are pretty dry in the north, but the snow has finally melted. Rain is predicted for later in the week.

Crop Report

Pears are at green cluster. All apples are at tight cluster. Montmorency are at early bud burst and Balatons are at late bud burst. Hedelfingen and Napoleon are at early white but and Golds are at late bud burst. Apricots are at 90% bloom. Chardonnay vines are still at early bud swell. Winter injury is showing up in sweet cherry in lower lying areas, and a few orchards have a bit of tip dieback. Mouse damage is visible in many blocks. Growers are still pruning, and lots of trees have been planted this week.

Pest Report

Apple pests are showing up in the region as well as in the Research Station trap line. Spotted tentiform leafminer are beginning to emerge, and the first Oriental fruit moth was caught in a station trap over the weekend (we will have to wait until we achieve sustained catch for biofix). Oblique-banded leafroller larvae are out in small numbers, and European red mite nymphs have been observed. Additionally, the first rosy and green apple aphids have been observed. Reports from Lansing showed the first plum curculio catch in apple at 170 DD50, the north region is currently at 85 DD50. As we move through the week, rain is in the forecast and based on a biofix of 4/25 (Macintosh green tip), apple tissue should be kept covered as scab spores are maturing quickly and 9% discharge is forecasted by 5/12. Be sure to keep tissue covered during the wet period.

In cherry, we are catching green fruitworm in the Station trap line, where we had an average of 19 moths per trap. Oil applications for San Jose Scale are going on sweet cherry before white bud or popcorn. East Lansing researchers reported their first trap catch of plum curculio in cherry at 170 DD50. Applications for European brown rot should be applied in two applications, one at white bud and one at bloom on susceptible varieties (Balaton, Meteor, and occasionally Montmorency). American brown rot blossom sprays will be going on soon with recommendations for application at 10-20% bloom. Growers should be vigilant this year due to the high infection levels experienced in sweet cherries during the 2008 season. Infection at white bud is rare, but may occur where a large number of brown-rot infected fruit are present from the previous season and we have prolonged periods of warm (above 60°F), wet weather. If these conditions occur in unprotected orchards, use a maximum application of Indar or another sterol inhibitor 24-48 hours after the beginning of wet weather and continue at 2-4 day intervals while wet, rainy weather continues through

bloom. Remember a Rovral application may be made to fight resistance development but should be applied at 75% bloom, as Rovral does not redistribute well and works best on open flowers. Do not apply Rovral past petal fall.

The grape trap lines are out at four sites around the northwest region. We will be looking for potato leaf hopper and grape berry moth over the coming week. Delayed dormant fungicide applications (at or before bud break) can kill fungi and insects that overwinter on the vine. Dormant applications of lime sulfur, copper, or sulfur directly to the codon will reduce the inoculum of Phomopsis, powdery mildew, black rot, anthracnose, and mites. Liquid sulfur formulations tend to work better than powdered sulfur. Do not apply lime sulfur to green tissue, and be sure to check varietal susceptibility to fungicides on page 130 of the Michigan Fruit Management Guide.

EUROPEAN BROWN ROT

Nikki Rothwell, District Horticulturist, MSU-E

Erin Lizotte, District IFP/IPM Educator, MSU-E

As we move into bloom, be on the look out for cool, wet weather favorable for European brown rot to invade tart cherries. Although the pathogen (*Monilinia laxa*) rarely infects Montmorency, it can be a problem in years under the right conditions. Montmorency trees infected with European brown rot are often found in low areas of the orchard or along hedgerows, locations that do not dry off quickly. This pathogen is a major disease in other cultivars like Meteor, English Morello, and Balaton.

European brown rot infects and kills blossoms and spurs when wetting events last for a day or more. The infected blossoms turn brown, and the leaves are also killed by the pathogen. Eventually, the pathogen moves into the spur and causes a systemic infection. Cankers form at the end of the infected spurs, which can infect the tree again in the following season.

To control this disease, two fungicide sprays should be applied; the first spray is at the popcorn stage, followed by a second spray seven days later. Indar at the 2 oz rate is the most efficacious fungicide for controlling European brown rot. Pruning the infected spurs during dormant months will reduce inoculum for the following season.

SIGN UP NOW FOR THE GRAPE IPM SCOUTING REPORT

We will again be scouting the region for pest and diseases of winegrape during the 2009 season. This newsletter includes relevant horticultural and management information throughout the season based on current, regional conditions. To sign up for the report, e-mail Steve VanTimmeren at vantimm2@msu.edu.

WEBSITES OF INTEREST

Insect and disease predictive information is available at:

<http://www.enviweather.msu.edu/home.asp>

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:

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Fruit CAT Alert Reports

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<http://www.maes.msu.edu/nwmihort/faxnet.htm>

[ACTUAL AND PREDICTED DEGREE-DAY
ACCUMULATIONS SINCE MARCH 1, 2009](#)

Please send any comments or suggestions regarding this site to:

Bill Klein, kleinw@msu.edu

Last Revised: 5-5-09

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May 12, 2009

GROWING DEGREE DAY ACCUMULATIONS AS OF May 11th AT THE NWMHRS

Year	2009	2008	2007	2006	2005	2004	19yr. Avg.
GDD42	308	328	420	481	390	285	339.8
GDD50	129	149	193	230	180	114	155.3

Growth Stages at NWMHRS (5/11/09- 11:30 am)

Apple: McIntosh & Red Delicious – Pink

Gala – Tight cluster

Yellow Delicious – Early pink

Pear: Bartlett : White bud

Sweet Cherry: Hedelfingen: Full bloom

Napoleon: Full bloom

Gold: 80% Bloom

Tart Cherry: 15% Bloom

Balaton: 1st Bloom

Apricot: Late petal fall

Plum : 2nd Bloom

Grapes: Bud swell

Weather

For the past two nights, we have seen some cold temperatures throughout the region. On Sunday night, we recorded temperatures down into the high 20's and low 30's. The lowest temperature recorded on MAWN was 24.1°F at the Elk Rapids site. This location also recorded the lowest temperature on Monday night with 29.4°F. When communicating with growers around the area, certain blocks had extremely low temperatures. For instance, a grower just north of Suttons Bay recorded a temperature of 19°F in his apple block.

We have seen crop damage in both apple and sweet cherry. Sweets are in full bloom in the southern reaches of the region, and many of the flowers were damaged by the Sunday night freeze. At this time, the damage is variable throughout the region. Apples are in tight cluster to pink depending on variety – reports of lost king bloom is evident in many orchards.

At this time, we have accumulated 308 GDD base 42 and 129 GDD base 50. These accumulations are only slightly behind where we were last year at this time. We are almost right on a 19-year average as well. Like every else around the state, we are extremely dry. We have received almost no rainfall since the first of May, and growers are hoping for the anticipated rain on Wednesday.

Crop Report

Despite the cool temperatures, things seem to be progressing. Pears are at white bud to 1st bloom. Again apples are at varying stages: pink in Macs and Red Delicious, while Galas are at tight cluster and Golden Delicious are at early pink. Mont cherries have just begun to bloom at the NWMHRS while sweets are at 80% to full bloom. Apricots are at petal fall, and Chardonnay vines are at bud swell. Strawberry growers have been frost protecting for the past two nights. We have good growth in red raspberries. Bee activity in sweets has been slow due to cool air temperatures and the somewhat breezy conditions. Growers are still planting, and many are assessing the potential losses due to the past two nights' low temperatures.

Pest Report

Apple - **Spotted tentiform leafminer** flight continues at the NWMHRS (~ 75 adults per trap), **Oriental fruit moth** traps were empty this week, compared with one moth caught during the first weekend in May (we will have to wait until we achieve sustained catch for biofix). **Eastern tent caterpillar** webbing and larvae are visible throughout the region at higher levels than commonly seen in many of the fruit blocks. Under high pressure Eastern tent caterpillar can be a pest

of apple and may require management this season. Small **oblique-banded leafroller** larvae are out and feeding, and **European red mite** nymphs have been observed. A high level of **green fruitworm** bud damage has been reported from regional crop consultants in apples.

As we move through the week, rain is in the forecast and based on a biofix of 4/25 (McIntosh green tip), apple tissue should be kept covered with scab ascospores maturing quickly and 20% spore discharge is forecasted by 5/18. As we approach bloom, growers should keep a close watch on the fire blight model and be prepared to make streptomycin applications when the epiphytic infection potential exceeds 100, rain is forecast, and blooms are open.

Cherry - In cherry we are catching **green fruitworm** in the Station trap line, with an average of 22 moths per trap. **Climbing cutworm** damage has also been reported in a young tart cherry orchard. Applications for **European brown rot** should be applied with two sprays at white bud and one two weeks later on susceptible varieties (Balaton, Meteor, and occasionally Montmorency). **American brown rot** blossom sprays should be going on with recommendations for application at 10-20% bloom. Rovral should be used in order to limit the number of back-to-back sterol inhibitor applications for resistance management. We want to preserve SI's for brown rot infection closer to harvest. Despite its cost, Rovral should be part of a brown rot program this season. Growers should be vigilant this year due to the high infection levels experienced in sweet cherries during the 2008 season. Infection at white bud is rare, but early treatment may be necessary where a large number of brown-rot infected fruit are present from the previous season and we have prolonged periods of warm (above 60°F), wet weather. If these conditions occur in unprotected orchards, use a maximum application of Indar 24-48 hours after the beginning of wet weather and continue at 2-4 day intervals while wet, rainy weather continues through bloom. The first **plum curculio** was caught in a Leelanau tart cherry orchard. Despite cool temperatures, they are on the move.

Grape - The grape trap lines are out at **four sites around the northwest region**. We will be looking for **potato leafhopper** and **grape berry moth** over the coming weeks. Delayed dormant fungicide applications (at or before bud break) can kill fungi and insects that overwinter on the plant. Dormant applications of lime sulfur, copper, or sulfur directly to the cordon will reduce the inoculum of Phomopsis, powdery mildew, black rot, anthracnose, and mites. Liquid sulfur formulations tend to work better than powdered sulfur. Do not apply lime sulfur to green tissue, and be sure to check varietal susceptibility to fungicides on page 130 of the Michigan Fruit Management Guide. For an updated version of the pest report during the week, call (231)947-3063.

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Last Revised: 5-12-09

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May 19, 2009

GROWING DEGREE DAY ACCUMULATIONS AS OF May 18th AT THE NWMHRS

Year	2009	2008	2007	2006	2005	2004	19yr. Avg.
GDD42	381	394	495	548	430	379	422.5
GDD50	162	177	230	256	194	166	198.6

Growth Stages at NWMHRS (5/18/09- 4:00 p.m.)

Apple: McIntosh & Yellow Delicious – 80% King bloom

Gala & Red Delicious – 50% King bloom

Pear: Bartlett : Full bloom

Sweet Cherry: Hedelfingen: Late petal fall

Napoleon: Late petal fall

Gold: Early petal fall

Tart Cherry: Early petal fall

Balaton: Early petal fall

Apricot: Early shuck split

Plum: Early petal fall

Grapes: Bud swell

Weather

We continue to be cool and dry in the north. Last Wednesday and Thursday, we received just under a ½" of rain, but the ground is still dry. On Saturday we had about 10 drops of rain – just enough to kick off a few infection periods. We have accumulated 381 GDD base 42 and 162 base 50. We are behind the 19-year average, which is 422.5 GDD base 42 and 198.6 GDD base 50. We had some overnight cold temperatures during the evening of May 17, and the low temperature in the area was ~ 28°F at the Elk Rapids MAWN site.

Crop Report

Pears are at full bloom to early petal fall. All varieties of apples are at king bloom: 50-80%. Montmorency and Balatons are at early petal fall and sweets are at late petal fall at the NW Station. As we move north, cherries are in full bloom. Plums are at early petal fall and apricots are at early shuck split. We have seen a bit of frost damage in apples and sweets. However, bee activity is the main issue now, as conditions have been extremely windy and on the cold side.

Pest Report

Apple - Spotted tentiform leafminer flight has slowed at the station with catches down to 10 adults per trap, compared with 75 per trap last week. **Eastern tent caterpillar** webbing is visible throughout the region at higher levels than commonly seen. Under high pressure Eastern tent caterpillar can be a pest in apple and cherry and may require control this season. There are many management options for Eastern tent caterpillar – anything that works on caterpillars will work. Pyrethroids would be economical and effective. Early last week the first report of **plum curculio** in pyramid traps came out of a Leelanau County tart cherry orchard despite the cool overnight temperatures. With warmer weather overnight forecasted for this week, we expect to see increased plum curculio activity in the coming days. High levels of **green fruitworm** were reported in early May, but crop consultants have reported that insecticide applications have controlled most populations. At the research station we have been catching adult green fruit worm in **American plum borer** traps, but numbers are down slightly this week.

As we move through the week, rain is again in the forecast and based on a biofix of 4/25 (Macintosh green tip), apple tissue should be kept covered with ascospores maturing quickly and an average of 40% spore discharge forecasted by Friday. Based on forecast data, we have had a couple of false **scab** infection alarms over the past weeks; scab infection periods were predicted but never occurred due to cooler temperatures. Temperatures will not be a limiting factor in apple scab infection this week, and tissue should be kept covered. As we see king bloom opening in the Traverse City

area, growers should keep a close watch on the **fire blight** model and be prepared to make streptomycin applications when the epiphytic infection potential (EIP) exceeds 100, rain is forecasted, and blooms are open. Based on forecast data, EIP will come close to 100 this Thursday. If temperatures on your farm are different from weather station reading, be sure to try out the new Fire Blight Interactive Predictor Model at www.enviroweather.msu.edu. The interactive model allows you to input your own data and determine the risk of fire blight for your individual farm.

Cherry - In cherry we are catching **green fruitworm** in the Station trap line, with an average of 10 moths per trap this week, down from 22 last week. We also caught the first American plum borer this week (10 moths/trap). Early last week the first report of **plum curculio** in pyramid traps came out of Leelanau county despite the cool overnight temperatures the region has been experiencing. With warmer overnight temperatures forecasted for this week, we expect to see increased plum curculio activity in the coming days. As leaf tissue begins to emerge, growers should keep an eye on the cherry leaf spot infection model. Remember, leaves must be unfolded, exposing the stomata for leaf spot infections to occur.

Grape – We have yet to catch **potato leafhopper** or **grape berry moth** in trap lines around the region. **Climbing cutworm** damage has been reported from one area vineyard, and we continue to see a few **grape leafhopper** on sticky traps. For an updated version of the pest report during the week call (231) 947-3063.

SPECIAL LOCAL NEED REGISTRATION GRANTED ON INDAR FOR AMERICAN BROWN ROT CONTROL

Dr. George Sundin, Dept of Plant Pathology, MSU

A Special Local Need [EPA 24(c)] registration has been granted for the use of increased rates of Indar 2F for brown rot control. The basis for this request was from our observations that populations of the American brown rot fungus (*Monilinia fructicola*) are shifting in Michigan towards decreased sensitivity to sterol inhibitor fungicides (see [March 31 Fruit CAT Alert](#) article). Note: this special registration only applies to Indar 2F.

Fungal sensitivity/resistance to sterol inhibitor fungicides acts in a quantitative manner, meaning that a fungus with a decreased sensitivity to one rate can be controlled by a higher rate of the same fungicide. Results from an orchard survey conducted by Erin Lizotte indicated that there was clear shifting in the American brown rot population, and that some orchards harbored American brown rot isolates that were close to the resistance threshold. The use of higher rates of a sterol inhibitor fungicide acts as a hedge against resistance development. The higher rates are effective against fungal isolates that show decreased sensitivity; controlling these isolates then decreases the chance of further shifting to resistance.

Currently, the use of Indar 2F at the original label rate of 6 fl. oz. per acre should provide excellent control of American brown rot in most orchards. However, as a hedge against further shifting of the American brown rot population in most orchards, my suggestion is to use a rate of 8 fl. oz. per acre in 2009 for control of fruit infections. Growers whose American brown rot orchard populations are closer to the resistance threshold should consider using a 9-10 fl. oz. per acre rate. It is essential, especially this year after the heavy American brown rot infections observed in 2008, that fungicide coverage is excellent. This will ensure a uniform exposure of the fungus to the higher rate of fungicide.

The 24(c) registration allows as high a rate as 12 fl. oz. per acre. A maximum of 48 fl. oz. per acre is allowed per season, i.e., no more than eight applications at 6 fl. oz. per acre or four applications at 12 fl. oz. per acre. Do not graze livestock in treated areas or feed cover crops grown in treated areas to livestock. Do not apply Indar 2F through any type of irrigation system. Always read and follow the label carefully when applying any pesticide.

CHERRY LEAF SPOT

Erin Lizotte, IFP/IPM District Educator, MSU-E

Cherry leaf spot (CLS) is arguably the most damaging fungal pathogen of tart cherry. CLS primarily infects foliage and reduces the photosynthetic ability of a tree through tissue degradation and early defoliation. When significant defoliation occurs before harvest, fruit may be soft and immature, have low soluble solids and ripen unevenly. For a point of reference, at least two leaves are needed to effectively ripen each cherry and defoliation that reduces leaf numbers to below that threshold can cause damage to the current year's crop. Blossom production may also be reduced in subsequent years and following severe defoliation, trees are more susceptible to winter injury because of the loss of stored carbohydrates in the roots.

CLS overwinters in fallen leaves on the orchard floor and produces apothecia (sexual spore-bearing structures) in the spring. Ascospore (sexual spore) dispersal occurs during the drying period that follows a wetting event and temperatures between 60-85°F. Infection occurs through the leaf stomata, which remain susceptible throughout the growing season. The primary infection period may last 2-6 weeks depending on conditions. Following infection, acervuli (asexual spore-bearing structures) develop on the underside of the leaf and produce a visible mass of asexual spores called conidia. Spores are dispersed from leaf to leaf by wind or rain and this secondary infection cycle can be repeated several times within a season, depending on conditions. All commercial cherry cultivars are susceptible to CLS. CLS is resistant to sterol inhibitor fungicides (Indar, Elite, Orbit) in all the major fruit producing areas of Michigan.

The table below lists season long recommendations for management; we are currently heading into the timing for a petal fall application in northern Michigan. Remember to alternate the use of fungicide classes during the season to manage against resistance development. To monitor for cherry leaf spot using a disease forecasting model visit www.enviroweather.msu.edu.

TAILORING FIRE BLIGHT PREDICTIONS TO YOUR SITE: THE FIRE BLIGHT INTERACTIVE PREDICTOR

Originally published in the Fruit Crop Advisory Team Alert

Bill Shane, District Extension Fruit Educator

Tracy Aichele, Enviroweather

A new feature for predicting fire blight disease of apples blossoms has been added to the Michigan on-line weather

Cherry Leaf Spot Management Recommendations		
Timing	Fungicide	Notes
Petal fall	Bravo	
Shucksplit	Bravo	
Covers	Pristine*, Gem*, copper, Syllit or Adamant**	*These strobilurins also provide powdery mildew control
Preharvest	See above list but be aware of the pre harvest intervals	Reminder: SI applications for the control of brown rot will not control CLS
Postharvest	Bravo	
Adapted from Cherry Leaf Spot Recommendations by G.W. Sundin		
**Adamant is a mixture of Gem and Elite, depending on the rate used you may be applying a lower than recommended rate of these materials, a concern for resistance development.		

system [Enviroweather](http://www.enviroweather.msu.edu) (www.enviroweather.msu.edu). The new tool, dubbed the Fire Blight Interactive Predictor, allows the user to modify temperature, rainfall, bloom dates, and other factors to more closely match conditions on your farm. We will explain the features of the Fire Blight Interactive Predictor on Enviroweather and how we think this can be useful to growers, consultants and others involved with fire blight.

The underlying model for blossom blight in the Fire Blight Interactive Predictor model is the same as is used in the Fire Blight Assist Chart that has been on Enviroweather for several years. The Fire Blight Interactive Predictor version provides more versatility and allows the user to gain a better understanding of conditions that favor fire blight epidemics.

The Fire Blight Interactive Predictor is based on Maryblyt, a popular computer program developed by Dr. Paul Steiner and Mr. Gary Lightner, Department of Botany at the University of Maryland. The output for the Fire Blight Interactive Predictor version closely resembles the original Maryblyt model by Steiner. The basic model predicts blossom infection by fire blight on a day when four conditions are met:

- Open blossoms (B).
- Sufficient warm temperatures over the past several days to increase fire blight bacterial growth on blossoms (H).
- A wetting event such as rain, dew, fog or spraying (W).
- Average daily temperature of at least 60°F (T).

The fire blight risk for each day during bloom is given as low, moderate, high, or infection when one, two, three, or four of these conditions are met. For many users, this will be all they need to know to make spray decisions. Bactericide applications are definitely needed for predicted infections and possibly for high fire blight risk ratings. The Fire Blight Interactive Predictor keeps track of multiple infection events and calculates when symptoms are expected to show in the orchard. The Predictor is useful for summarizing fire blight conditions for past seasons, which helps in comparing years and unraveling reasons for disease outbreaks.

A feature in the module that will be prized by advanced users is the ability to temporarily change rainfall, temperature, bloom start and end dates, bactericide spray, and trauma events like hail or high winds to better match local conditions or to try "what if" scenarios.

For example, if the user suspects that the maximum temperature may or has been higher than predicted or recorded for a nearby Michigan State University MAWN weather station, the higher temperature can be substituted to see the resultant prediction. The Fire Blight Interactive Predictor can be used to work backwards to discover when the infection took place that was responsible for unexpected symptoms showing up in the field.

In some respects the Fire Blight Interactive Predictor is a step backwards closer to the original Maryblyt model by Steiner and Lightner still used by some growers and consultants in its original PC DOS format, the only version released and no longer available. The Predictor uses the essence of Maryblyt model in the MSU Enviroweather network to deliver real-time fire blight predictions to busy people.

REMEMBER TO CONTROL ROSY APPLE APHID EARLY!

Erin Lizotte, IFP/IPM Educator, MSU-E

The following has been modified from apples.msu.edu

Rosy apple aphid (RAA) feeding curls leaves, deforms shoots, and stunts and distorts fruit. We can have up to three generations of RAA in apple in Michigan. The first nymphs are present in the orchard when the trees are at 1/2 -inch green. Growers should begin monitoring for RAA at tight cluster through the pink stage: examine 5 clusters from the upper inside canopy on 10-20 trees per block. One infested cluster/tree indicates the need for treatment for susceptible varieties or if RAA had presented a problem in the past. Varieties that are particularly susceptible to RAA include Ida Red, Cortland, Rome, Rhode Island Greening, and Golden Delicious.

Treatments for infestations must be made early before the aphids are protected inside curled leaves. Chemistries rated as excellent against rosy apple aphid include Diazinon, Superior Oil, Lorsban 4 EC, Esteem 35 WP, Actara 25 WG, Assail, and Calypso. If using Esteem, applications must be made before egg hatch as there is no activity against adults. At this early application timing, be sure to check pesticide labels for bee toxicity if pollinators are in the orchards (Actara is highly toxic to bees). Also keep in mind that foliar Lorsban applications may only be made prebloom and that 70 sec. Superior Oil should only be applied between green tip and pre-pink to prevent plant injury. Always read and follow pesticide labels carefully before use.

Clarification of Lorsban rules for apple:

- ◆ Lorsban 75WDG

- Up to two applications per year
- Cannot exceed 2lb ai/acre (this amount includes trunk sprays!)
- Only two of three of above options

◆ Lorsban 4E and Dow Advanced label (new liquid formulation)

- Can only be used pre-bloom in apple
- Can also do a trunk spray



EASTERN TENT CATERPILLAR OUTBREAK

Ric Bessin, University of Kentucky
Duke Elsner, Agriculture Agent, G.T. County
Nikki Rothwell, District Horticulturist

The eastern tent caterpillar, *Malacosoma americanum*, is a native pest in North America. Populations fluctuate from year to year, and outbreaks occur every several years. Defoliation of trees, silken nests in trees, and thousands of caterpillars crawling over plants, walkways, and roads makes this insect a pest in the late spring/early summer of outbreak years. Eastern tent caterpillar nests are commonly found on wild cherry, apple, and crabapple but can be found on hawthorn, maple, cherry, peach, pear and plum. While tent caterpillars can nearly defoliate a tree when numerous, the tree will usually recover and put out a new crop of leaves. Larvae cause considerable concern when they begin to wander to protected places to pupate. They are a nuisance and can create a mess when they are squashed on driveways, sidewalks, and patios; however, wandering caterpillars do no additional feeding or damage.

The eastern tent caterpillar overwinters as an egg within an egg mass of 150 to 400 eggs. These masses are covered with a shiny, black varnish-like material and encircle branches that are about pencil-size or smaller in diameter. The caterpillars hatch about the time the buds begin to open, usually in early late April to early May in NW Michigan. These insects are

social; caterpillars from one egg mass stay together and spin a silken tent in a crotch of a tree although caterpillars from two or more egg masses may unite to form one large colony. Caterpillars emerge to feed on foliage in the early morning, evening, or at night when it is not too cold, but remain within the tent during the heat of the day or rainy weather.

The larvae are black, hairy with a white stripe down the back, brown and yellow lines along the sides, and a row of oval blue spots on the sides. As the larvae continue to feed, they increase the size of their nest until it is a foot or more in length. In 4 to 6 weeks the caterpillars reach 2 to 2-1/2 inches in size, and they begin to wander away from the nest in search of protected areas to spin a cocoon. The adult moth emerges from the cocoon about three weeks later. The moth is reddish-brown with two pale stripes running diagonally across each forewing. Moths mate and females begin to lay eggs on small branches, and the eggs will not hatch until next spring. There is one generation per year.

If possible, growers should remove and destroy the egg masses from fruit trees during winter as this tactic will greatly reduce the problem in the spring. In the early spring, small tents can be removed and destroyed by hand, and larger tents may be pruned out and destroyed. Duke Elsner says to be sure to wear gloves as the hairs of the caterpillars can sometimes cause skin irritation. Burning the tents out with a torch is not recommended since this control tactic can easily damage the tree.

Natural enemies play an important role in reducing eastern tent caterpillar numbers in most years. Caterpillars are frequently parasitized by various braconid, ichneumonid, and chalcid wasps. Several predators and a few diseases also help to regulate populations. These natural enemies can help account for the fluctuating populations from year to year.

Unfortunately, insecticides are generally ineffective against mature larvae. Therefore, if growers need to use



chemical controls in a particularly bad infestation in an orchard, they should target young caterpillars. Growers should spray the foliage as caterpillars leave the nest to feed and they would come into contact with the insecticide. Larvae within the tents are protected beneath the webbing and are more difficult to kill with an insecticide. Spraying nests will be not be effective if the insecticide needs to be ingested as they do not feed within the nest. Young larvae can be killed by applying an insecticide containing *Bacillus thuringiensis*, such as Dipel. Other insecticides that are labeled against Lepidoptera (caterpillars) should be effective at controlling eastern tent caterpillars (Assail, SpinTor, pyrethroids, organophosphates, or many others). Please call the

NWMHRS if you need help controlling these pests (231-946-1510).

MDA GAP AUDIT REQUEST FORM

Following is the *Good Agricultural Practices and Good Handling Practices* Audit Request Form for your use. For questions or to schedule a GAP/GHP audit, call the Grand Rapids office (616-356-0600). Your local Extension office can also answer many of your questions. Here is a link to the [form](#).

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Northern Michigan FruitNet 2009 Weekly Update NW Michigan Horticultural Research Station

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District Horticulturist

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Farm Mgr, NWMHRS

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May 26, 2009

GROWING DEGREE DAY ACCUMULATIONS AS OF May 25th AT THE NWMHRS

Year	2009	2008	2007	2006	2005	2004	19yr. Avg.
GDD42	516	454	625	628	543	466	518
GDD50	245	203	312	300	253	205	250

Growth Stages at NWMHRS (5/25/09- 12:00 p.m.)

Apple: McIntosh – Petal fall
Yellow Delicious – Early petal fall
Gala – Early petal fall
Red Delicious – Early petal fall

Pear: Bartlett : 6 mm fruit

Sweet Cherry: Hedelfingen: 11 mm fruit
Napoleon: 7 mm fruit
Gold: 8 mm fruit

Tart Cherry: Early shuck split

Balaton: In the shuck

Apricot: 12 mm fruit

Plum: Late petal fall

Grapes: 1-3" shoots

Weather

We finally had some warm weather over the past week but the dry conditions have continued. Rain is in the forecast through Thursday. Last Thursday, the region received some scattered showers with most regional stations reporting no more than 1/10" rain, the ground is still dry. We have accumulated 516 GDD base 42 and 245 base 50. We are almost equal to the 19-year average, which is 518 GDD base 42 and 250 GDD base 50.

Crop Report

Tree fruit

Pears are at 6mm, apricots are at 12mm and plums are at late petal fall. Apples are at petal fall. Montmorency and Balatons® are at early shuck and sweet cherries are at 7-11mm at the Northwest Station. We have seen tremendous bloom and great pollination weather in apple this year, which may make thinning a challenge.

In **apples**, **spotted tentiform leafminer** numbers are back up at the station with catches averaging 50 adults per trap, compared with 10 per trap last week. **Eastern tent caterpillar** webbing is visible throughout the region at higher levels than commonly seen. Under high pressure, Eastern tent caterpillar can be a pest in apple and cherry and may require control this season. We continue to catch **plum curculio** in low numbers around the region. The first **codling moth** catch was reported out of Benzie County late last week and we have caught our first codling moth at the research station this morning.

As we move through the week, rain is again in the forecast and based on a biofix of April 25 (McIntosh green tip), apple tissue should be kept covered with ascospores maturing approaching 100% and discharge forecast at 77% percent spore over the next week. A light-moderate **apple scab** infection period was predicted in some areas last Thursday and we will expect to see symptoms on June 3. With the small amount of rain on Thursday, we also saw a **fire blight** infection period predicted with EIP values well over 100. Many area growers applied their first streptomycin application of the season. If temperatures on your farm are different from the weather station reading, be sure to try out the new *Fire Blight Interactive Predictor Model* at www.enviroweather.msu.edu.

The interactive model allows you to input your own data and determine the risk of fire blight for your individual farm.

In **cherries**, we are hearing reports and observing very high levels of **green fruit worm** with a lot of larvae feeding on

foliage. We continue to catch **American plum borer** this week (37 moths per trap). Growers with infested blocks should be managing for this pest around petal fall in conjunction with adult flight in their blocks. We continue to catch **plum curculio** around the region. Growers should keep an eye on the **cherry leaf spot** infection model. Remember, leaves must be unfolded, exposing the stomata for leaf spot infections to occur.

Small fruit

For **grapes**, we have yet to catch **potato leafhopper** or **grape berry moth** in trap lines around the region. Climbing **cutworm** damage has been reported from one area vineyard, and we continue to see a few **grape leafhoppers** on sticky traps.

For an updated version of the pest report during the week, call (231) 947-3063.

CONSIDER NEMATODES WHEN ESTABLISHING ORCHARDS AND VINEYARDS

Fred Warner
Diagnostic Services

Many things need to be considered when establishing or replanting an orchard or vineyard, but the impact of plant-parasitic nematodes should not be ignored. Feeding by many species of nematodes will produce unthrifty trees and subsequent yield reductions. Unfortunately, often the cause of these symptoms is undetermined. Since all species of plant-parasitic nematodes are microscopic, the only way to diagnose nematode problems is to collect soil and root samples and to submit them to a nematode diagnostic lab for analyses. It is highly recommended new orchard or vineyard sites are sampled for nematodes before their establishment. Although this article focuses on pome fruits, stone fruits and grapes, the same is true for plantings of brambles, blueberries, strawberries and any other fruit.

The recent withdrawal of fenamiphos (Nemacur) as a post-plant nematicidal option on pome, stone and small fruit magnifies the importance of sampling prior to planting. In the past, if nematodes were abundant on a site at planting but went undetected or nematode-infested planting stock was purchased or used, Nemacur could be used as a rescue treatment and would provide adequate to excellent control of these pathogens. However, with the withdrawal of Nemacur, there are no post-plant chemical options for nematode control in bearing orchards, grapes or small fruit plantings, so most management strategies and tactics must be implemented prior to orchard or vineyard establishment.

If old orchards or vineyards are to be removed and replanted, growers should make observations prior to these events. Are some of the trees stunted and what are the possible causes? Do any of the symptoms appear to be caused by viruses? If the answer to either of these questions is "yes," nematodes may be implicated as causal agents or vectors. Proper identification of viruses is very important. Dagger and needle nematodes are common parasites of fruit and are notorious vectors of certain plant viruses. Where they are pathogens (cause disease), dagger nematodes, in particular, aren't extremely virulent (amount of disease). However, only one dagger nematode is necessary to transport viruses from one tree to another. Therefore, if old orchards or vineyards are infected with nepoviruses (nematode-transmitted polyhedral viruses), dagger and needle nematode control is vital before establishing new plantings. Many broadleaved weeds are also symptomless carriers of some nepoviruses, so observations about weed pressure are also important.

Typically, after removal of an old orchard or vineyard, some remediation of the site will occur before replanting. This is typically done by growing cover or rotational crops or even allowing sites to sit idle. These periods represent good windows for nematode control. However, it is virtually impossible to develop a sound rotational scheme or to choose the proper cover crops if the types of plant-parasitic nematodes present are not determined. For example, rape, cv. Dwarf Essex, is a great choice if dagger nematodes are present on a site, but it may not be real effective against lesion and northern root-knot nematodes. Pearl millet should be very effective against lesion nematodes but possibly poor against dagger nematodes. Therefore, the collection of soil and root samples is necessary for identification and enumeration of important nematodes present in any given location in order to design rotational schemes to reduce their population densities.

Maintaining good soil health is very important for proper nutrition and growth of plants. With orchards and vineyards, it is very critical to check soil pH deep in the soil prior to establishment because, on occasion, soils in the rooting zones of trees and vines are very acidic. At low pHs, heavy metals are much more mobile and in concert with other causal agents, such as nematodes, growth can be significantly reduced. In these types of situations, young trees may even die.

All your diligent work to avoid nematode problems prior to planting can be wasted if nematode-infested planting stock is used. Virus certification programs often work well to reduce or eliminate the sale of trees or plants infected with viruses, but nematodes often go unchecked. If sites are fumigated prior to planting nematode-infested stock, severe problems may result as nematode population densities can increase dramatically if unchecked by biocontrol agents or competing organisms.

Management of plant-parasitic nematode populations requires an integrated approach. However, it all begins with a sampling program. Once nematodes are properly identified informed decisions can be made regarding fumigation, cover crops, resistant rootstocks, etc. In Michigan, nematode samples can be sent to the [MSU Diagnostic Services](http://www.msu.edu/diagnostic_services) on campus. The fee is \$25 for a standard nematode analysis where all genera of plant-parasitic nematodes are identified and counted. Results typically will be available in seven to 14 days. Questions or concerns about nematodes can be addressed to Fred Warner at (517-432-1333) or Angela Tenney (517-353-8653) in Diagnostic Services or Dr. George Bird (517-353-3890) in the [Entomology Department](http://www.msu.edu/entomology).

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Agricultural & Regional Viticulture Agent

May 27, 2009

Following are two articles to help manage your apples this time of year.

APOGEE IN A NUTSHELL

Nikki Rothwell, District Horticulturist, MSU-E

Apogee is a plant growth regulator that helps regulate shoot elongation in apple trees.

Apogee helps control tree vigor, which can reduce the amount/intensity of pruning, decrease internal shading, and reduce canopy density for thorough pesticide coverage.

Apogee is a reliable tool for minimizing impacts of shoot blight caused by the fireblight pathogen. Shoots that have less growth are not as susceptible to fire blight.

Timing

Apply when vegetative shoot growth is less than three inches.

Optimal timing is king bloom petal fall.

Two more applications should be made at two-week intervals following the king bloom petal fall application.

Rate

Rate per acre is usually calculated on a tree row volume basis.

A two-thirds' rate is used season-long and is the starting rate for growers without experience using Apogee.

For example, if trees are at 75% tree row volume, then 24 ounces per acre is the seasonal rate ($48 \times 0.75 \times 2/3$).

Best results are achieved when the seasonal rate is split into three or four sprays: 8 + 8 + 8oz per acre for a total of 24oz per acre per season.

When fire blight is a severe risk, the first application at king bloom petal fall timing should be increased--the rate should be increased from 8oz per acre to 12oz per acre. If the first spray rate is increased, the second and third sprays should be reduced ($12 + 6 + 6 = 24\text{oz}$ instead of $8+8+8=24\text{oz}$).

Thinning

Apogee tends to increase fruit set, hence more aggressive thinning is often needed.

If using Apogee, growers should increase thinning products by 10 or 15%.

Compatibility

Apogee is not compatible with calcium or boron in the tank.

Apogee should be applied after thinner applications. 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.

Fireblight

Limits shoot blight strikes

Reduces # cankers

Controls shoot blight even if streptomycin-resistant strains present

THINKING ABOUT THINNING

Nikki Rothwell, District Horticulturist, MSU-E
Phil Schwallier, District Horticulturist, MSU-E, and
Coordinator, Clarksville Horticulture Experiment Station

Factors to Consider:

Crop from last year. Light crop last year results in increased flowering in present year. Blocks where fruit was light

will have increased bloom and an increased tendency to set fruit. We have observed tremendous bloom in apples around the region.

Frost damage. Some apple blocks were damaged on the evening of 3 May. If the frost took out the king bloom, thinning becomes more difficult.

Pollination and bee activity. Growers have reported improved hive quality this season over past years. Apple pollination weather has been excellent.

Weather conditions during thinning. Cold temperatures and sunny weather increase fruit set. Cloudy conditions increase thinning capabilities (See Table 1).

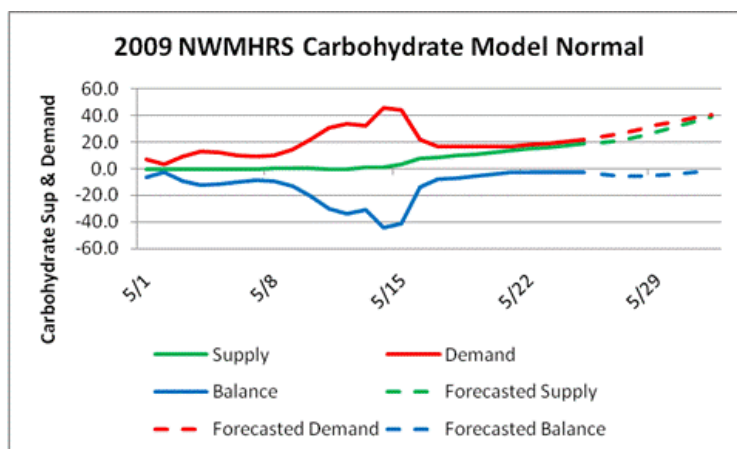
Tree vigor and growth. Trees that are growing vigorously with lots of leaves and lush growth present are harder to thin than less vigorous trees.

This year's apple crop for Michigan and the United States is expected to be large, and growers should be diligent with thinners as it will be important to produce larger apples to avoid growing juice apples. Plan on applying good thinning combinations of Sevin plus NAA or Sevin plus MaxCel where set will be heavy. Be ready at petal fall to apply thinners if warm weather occurs at that time. Petal fall is the first good time to thin when heavy fruitset is expected. A second thinning can then be applied at 10 mm if needed.

Table 1. Environmental conditions guide to fruitset and thinning sensitivity

Factor	Condition	Fruitset effect	Thinning sensitivity
High night temperature	>65°F	Greater drop	Sensitive
High day time temperatures	>85°F	Greater drop	Sensitive
Excessively cloudy conditions	Cloudy	Greater drop	Sensitive
Cold day temperatures	<65°F	Greater set	Resistant

This year, we have a new tool from Drs. Terrence Robinson and Alan Lasko of Cornell University. This tool is designed to help with thinning decisions using the theory that fruitset is based on carbohydrate supply and demand. Fruitlets need energy (carbohydrates) to set, and if they become deficient of energy, they more readily drop from the trees; fruitlets with less carbohydrates are also easier to thin. Stress at fruitset timing either from thinners, weather conditions, or tree energy levels will cause increased fruit drop. This new carbohydrate model helps predict energy levels based on current weather conditions as well as predicted forecasts to determine optimal times to thin.



5/26/09 - This model output is based on the energy supply of apple trees at the NWMHRS beginning at petal fall. The premise behind this model is that when the fruitlets are in an energy deficient situation (demand is greater than supply), the fruitlets are sensitive (easier) to thin. When the tree has excess energy (supply is greater than demand), fruitlets are more resistant to thinning. The

NWMHRS model output suggest that tree demand is higher than the supply, hence, we had opportunities for good thinning earlier in May, but as we approach the end of May, those lines move closer together

(supply is equal to demand), fruitlets will be more difficult to thin.

Most times the model will predict normal conditions, normal energy levels, normal tree sensitivity and normal thinning responses. However, thinning sensitivities can be abnormal during the thinning window, and the model is intended to help reduce mistakes of both over-thinning and under-thinning. If normal conditions are predicted, then growers can use their judgment of thinning level desired and adjust thinning aggressiveness to achieve ideal thinning. This model is under testing for Michigan conditions and should be used as a guide this year.

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