


[Home](#)
[Background  
& Projects](#)
[Calendar](#)
[Directions](#)
[InfoVideos](#)
[Links](#)
[Extension  
Expert Search](#)
[Publications](#)
[Staff](#)

## Northern Michigan FruitNet 2009 Weekly Update NW Michigan Horticultural Research Station

[Nikki Rothwell](#)
[Erin Lizotte](#)
[Bill Klein](#)

District Horticulturist

District Fruit IPM/IFP Agent

Farm Mgr, NWMHRS

[Duke Elsner](#)

Agricultural &amp; Regional Viticulture Agent

**April 28, 2009**

### GROWING DEGREE DAY ACCUMULATIONS AS OF April 27th AT THE NWMHRS

Year	2009	2008	2007	2006	2005	2004	19yr. Avg.
<b>GDD42</b>	161	222	214	277	264	170	188.9
<b>GDD50</b>	62	107	81	120	115	58	78.5

### GROWTH STAGES AT NWMHRS (4/27/09—8:00am)

**Apple:** McIntosh & Red Delicious – Green tip

Gala & Yellow Delicious – 1/4" Green

**Pear:** Bartlett: Bud burst

**Sweet Cherry:** Hedelfingen: Early bud burst

Napoleon: Early bud burst

Gold: Early bud burst

**Tart Cherry:** Green tip

**Apricot:** Bud burst

**Plum:** Bud burst

**Grapes:** Early bud swell

### WEATHER

The weather has been cold with intermittent warm days. We have accumulated 161 GDD base 42 and 62 base 50; these numbers are slightly lower than our accumulations from last season (222 base 42 and 107 base 50). We have had multiple rain events in April: 1) the first week of the month we had 0.43" of rain, 2) during the week of the 19th, we had 0.70 inches of rain, and 3) 26 and 27 April, we have had just over 1". The rainfall totals for April are 2.21 inches, which are less than April 2008 (3.06"). We still have piles of snow in shaded or north facing areas.

### CROP REPORT

As the temperatures have been variable, we are further along than most growers have anticipated. Pears are at bud burst. In apples, Macintosh and Red Delicious are at green tip, and Gala and Golden Delicious are at 1/4 inch green. Montmorency are at green tip and all varieties of sweet cherries are at early bud burst. Plums and apricot are at bud burst. Chardonnay vines are at early bud swell. We have seen a bit of winter injury in the area, but nothing extensive to report at this time. Lots of pruning is taking place in the northwest.

### PEST REPORT

The NWMHRS trap line was put up yesterday, and plum curculio (PC) emergence traps are also in place. No PC were captured in the traps yesterday (27 April). Many growers that had San Jose scale in sweet cherry last season are applying oil this week. Copper and EBDC applications have been made for scab prevention in apple. Based on weather predictions around the region, the model is showing that ascospore maturity and discharge will really pick up this weekend and early next week.

### SAN JOSE SCALE IN SWEET CHERRY

N.L. Rothwell, District Horticulturist, MSU-E

In 2007 and 2008, we observed large populations of San Jose Scale on sweet cherries. Sweet cherries are considered hosts of this introduced pest, but more commonly, we see San Jose scale in apple, peach, pear and plum. Scales are unusual insects with a very unique life cycle that makes them difficult to control. Adult females live underneath a waxy, turtle-like covering, giving birth to live young rather than laying eggs—these nymphs are the crawler stage of the life cycle. Because crawlers do not possess any waxy covering, this is one optimal stage for control. Crawler females will eventually develop wax coverings; males develop wings for dispersal.

San Jose scale spend the winter as partially grown scales where they adhere themselves tightly to the bark. When the sap begins to run in the spring, the scales grow, and they reach full grown status in late May. At this time of the year, male scales come out from under the scale to mate with females. Females will start to produce young, and are each capable of bearing 150-500 offspring. These crawlers start to suck sap with their needle-like mouthparts. In three weeks,

the young crawlers molt and lose their old skins, legs, and antennae to become a flattened sac with waxy caps. They remain attached to the trees with their mouthparts.

An oil application during pre-bloom is highly effective at targeting adults. The oil at this dormant or delayed-dormant timing works because it suffocates the scales under their waxy covers. Based on sweet cherry tree phenology, we recommend a rate of oil at 1-2%. The 2% rate will work best to smother the scales, and this rate is acceptable if trees are still dormant and as we approach white bud, this rate needs to be reduced to 1%. Because we have little data on San Jose scale on sweet cherry, we can use the peach recommendations as a guide to oil use: 2% v/v oil at dormant, 1.5% v/v oil at bud swell, and 1% v/v oil at first pink (or white bud in cherry). Oils that are effective for scale control are superior or damoil type oils.

#### **BACTERIAL CANKER AND COLD SPRING TEMPERATURES**

Nikki Rothwell, District Horticulturist  
Erin Lizotte, IFP/IPM Educator  
George Sundin, Plant Pathology, MSU

Bacterial canker is caused by the bacterium *Pseudomonas syringae*, and this pathogen can infect sweet and tart cherry and plums throughout Michigan. This disease is most problematic in sweet cherries, and epidemics often occur in conjunction with cold, frost-prone weather in the spring. Freezing temperatures can also dispose cherry tissues to bacterial canker infection, especially if the freeze event is followed by wet weather. Therefore, growers should be particularly diligent about early bacterial canker control in the coming weeks after these cold spring temperatures.

Early copper sprays are the most common methods of control for bacterial canker on cherry. However, sweet cherry tissues are extremely sensitive to copper, and the sprays must be adequately timed to reduce *P. syringae* inoculum without causing phytotoxicity. If the trees are still in the dormant stage, two copper applications can be applied at 1-2 week intervals at a rate 1.2-2 lbs of metallic copper with either one pint of spray oil per 100 gallons of water or 6-9 lbs of hydrated lime per acre. Copper products sprayed during the dormant stage should have good retention properties to enhance disease control as longer residuals for copper should translate into an extended period of bacterial disease suppression after the spray is applied (Rosenberger, 2007). If the trees have broken dormancy and are in the pre-bloom stage (bud swell through white bud), copper rates should be reduced to 25-35% of the dormant rate. Up to two copper applications with a one week interval should be used at this time. In tart cherries, copper compounds can be used at the 1.2-2 lb actual copper rate at bud burst with weekly repeated applications until late May. Some of these later sprays may result in some leaf yellowing, bronzing, and potentially defoliation. Adding hydrated lime at 6-9 lbs/acre will reduce the phytotoxic effects of copper..

#### **Literature cited:**

Rosenberger, D. 2007. Early season copper sprays. Scaffolds Fruit Journal. April 9. 16:4.

#### **FUNGICIDE UPDATE FOR FRUIT CROPS**

Dr. Annemiek Schilder, Dept of Plant Pathology, MSU

In the past year or two, various new fungicides have been labeled for use in berry crops and grapes; you may already be familiar with some of these, but others will be new. Not all of the new products represent new chemistries. Four major developments have driven new fungicide registrations of late and demonstrate that the disease situation in other crops can affect the availability of fungicides for berries and fruit crops as well. First of all, the threat of soybean rust has pushed along the review and registration of sterol inhibitor fungicides by the US Environmental Protection Agency (EPA); as a result, we finally received registrations for the fungicides Indar and Orbit for blueberries and cranberries. In addition, Orbit is labeled for a range of other berry crops. Various new sterol inhibitor fungicides are currently in the pipeline as well. Secondly, an outbreak of cucurbit downy mildew has driven the development of downy mildew fungicides, and currently we have three new products, Presidio, Revus, and Tanos, in our downy mildew control arsenal for grapes. Thirdly, patents have run out on a number of proprietary fungicide products and "generic" versions are now available or being developed for some commonly used fungicides. Generic products tend to be more economical, but may not have been separately evaluated and therefore you may not find them specifically recommended in the E-154 Fruit Management Guide. Do read the pesticide label carefully, as generic products may have different labels from brand name products and from each other. Lastly, as competition by generic products in the agrichemical industry increases, some companies are starting to market pre-mix products. Mixtures of two or more active ingredients may extend patent rights if companies can claim novel synergistic effects of the components in the mixture. This has led to the registration of a number of pre-mix fungicides, such as Adament, which is a mixture of Flint and Elite. Below some of the newer fungicides and products with expanded or modified labels:

**Adament** (tebuconazole and trifloxystrobin) is a mixture of a systemic (tebuconazole) and surface-systemic (trifloxystrobin) fungicide. It is a broad-spectrum fungicide that is labeled for control of multiple diseases on grapes, cherries, peaches, and nectarines. Adament is rainfast when dry, generally within 2 hours. Adament is effective against cherry leaf spot, brown rot, and powdery mildew on cherries, and powdery mildew in grapes. It has been moderately effective against Botrytis bunch rot. More research is needed to evaluate its efficacy against Phomopsis in grapes. Adament is best used as a protectant. Do not apply this product on 'Concord' grapes, as crop injury may result. Do not make more than two consecutive applications or a total of six (grapes) and four (stone fruit) applications per season.

**Equus** (chlorothalonil) has the same active ingredient as Bravo and is available as Equus 720 SST, Equus DF, and Equus 500 ZN. It is labeled for stone fruit, blueberry, and cranberry. The efficacy of this product has not been specifically evaluated in Michigan.

**Indar** (fenbuconazole) is a systemic SI fungicide labeled for control of a wide range of diseases, including those caused by *Monilinia* spp., in apples, cherries, peaches, nectarines, plums, apricots, blueberries, and cranberries. Indar is available in a 2F (flowable) or 75WSP formulation. Indar has preventative and curative properties, but it is best to use it on a preventative program. Do not make ground or aerial applications within 75 feet of bodies of water. The PHI is 30 days in blueberries and cranberries.

**Nevado** (iprodione) has the same active ingredient as Rovral. It is labeled for use in stone fruit, grapes, strawberries, raspberries, blackberries, currants, and gooseberries. The efficacy of this product has not been specifically evaluated in Michigan.

**Orbit** (propiconazole) is a systemic SI fungicide labeled for a wide range of diseases in blueberries, raspberries,

blackberries, cranberries (OR, WA, and WI only), gooseberries, currants, strawberries, and stone fruit. Orbit has preventative and curative properties. The PHI is 30 days in all berry crops, except cranberries (PHI is 45 days) and strawberries (PHI is 0 days). Do not apply Orbit to 'Stanley' plums within 21 days of harvest.

**Orius** (tebuconazole) has the same active ingredient as Elite. It is labeled for use in stone fruit and grapes and is available as Orius 45DF and Orius 45WP. The efficacy of this product has not been specifically evaluated in Michigan.

**Presidio** (fluopicolide) is a new systemic fungicide which is active against diseases caused by downy mildews and other oomycetes in grapes and vegetables. This fungicide has a novel mode of action and has protective, curative, eradicated, and antisporeulant properties. Presidio is locally systemic and translaminar and moves systemically via xylem tissue. Furthermore, Presidio is compatible with many fungicides and insecticides and is rainfast in 2 hours. The PHI for grapes is 21 days; no more than two sequential applications are allowed. A tank mix with another fungicide with a different mode of action must be used with Presidio for resistance management.

**Prop Imax** (propiconazole) is a systemic SI fungicide similar to Orbit that is labeled for control of a range of diseases in blueberries, raspberries, blackberries, cranberries (OR, WA, WI only), and stone fruit. Do not apply PropiMax to cherries or "Stanley-type" plums. PropiMax has not been specifically evaluated in Michigan. The PHI is 30 days for berries other than cranberries (45 days).

**Revus** (mandipropamid) is a new systemic fungicide which is active against downy mildew in grapes and vegetables. It has preventative and limited curative properties. A maximum of four sprays and two sequential sprays is allowed. The addition of a spreading/penetrating type adjuvant such as a non-ionic based surfactant or crop oil concentrate is recommended. The PHI is 14 days for grapes.

**Serenade Max** (*Bacillus subtilis*) is a protectant biofungicide that is OMRI listed and therefore can be used in organic production. Serenade Max is a more concentrated version of Serenade. It is labeled for use against a variety of blueberries, strawberries, raspberries, blackberries, cranberries, gooseberries, currants, pome fruit and stone fruit. Serenade has a 0-day pre-harvest interval and a 4-hour re-entry interval. Serenade has been fairly effective against mummy berry and anthracnose in blueberry; and downy mildew, black rot, and Phomopsis in grapes. Adding a non-phytotoxic spray adjuvant, such as NuFilm is recommended.

**Sonata** (*Bacillus pumilis*) is a protectant biofungicide that is OMRI listed and therefore can be used in organic production. Sonata is labeled for use on grapes, blueberries, strawberries, raspberries, blackberries, gooseberries and currants. The label lists control of leaf rust and powdery mildew in berry crops, and powdery mildew in strawberries and grapes. Sonata has a 0-day pre-harvest interval and a 4-hour re-entry interval. Sonata has been moderately effective against powdery mildew, downy mildew, and Phomopsis in grape trials in Michigan. Adding a non-phytotoxic spray adjuvant, such as NuFilm is recommended.

**Tanos** (famoxadone and cymoxanil) is a new, broad-spectrum fungicide for control of downy mildew in grapes and suppression of anthracnose, Pseudomonas blight, and spur blight in raspberries and blackberries. It has curative and locally systemic properties against downy mildews. Tanos rapidly penetrates into plant tissues and is rainfast within 1 hour of application. It must be tank-mixed with a contact fungicide labeled for that crop (e.g., mancozeb, captan or copper). A maximum of 9 applications of Tanos including other group 11 (strobilurin) fungicides is allowed per season. The PHI is 30 days for grapes and 0 days for raspberries and blackberries.

**Tebuzol** (tebuconazole) has the same active ingredient as Elite and is available as Tebuzol 45DF. It is labeled for use in stone fruit and grapes. The efficacy of this product has not been specifically evaluated in Michigan.

**Thiophanate Methyl** (thiophanate methyl) has the same active ingredient as Topsin M. It is labeled for use in apples, pears, stone fruit, grapes, and strawberries. The efficacy of this product has not been specifically evaluated in Michigan.

## CONTROL OPTIONS FOR MITES IN FRUIT CROPS

MSU Trevor Nichols Research Complex  
John Wise, Rufus Isaacs and Larry Gut

Mites can be significant pests of fruit crops. There is an array of miticides available for control of the European red mite (ERM), two-spotted spider mite (TSSM) and rust mites (RM)(apple and pear rust mites, pear blister mite, plum nursery mite, blueberry bud mite), but their performance characteristics are not all alike. The following table is designed to summarize several key variables that can help you determine which miticides are optimal for your Integrated Pest Management program.

<u>Compound</u>	<u>Fruit crop</u>	<u>Mites</u>	<u>Life stage target</u>	<u>Seasonal timing</u>	<u>Residual activity</u>
Superior, Stylet Oils	all above	ERM, RM	egg/larvae	Early (pre-bloom)	4-6 weeks
Lime-Sulfur	pome, stone	RM3	motiles*	Early (delayed-dormant)	4-6 weeks
Savey	pome, stone	ERM	egg/larvae	Early***	8-12 weeks
	pome, stone, caneberry, strawberry	TSSM	egg/larvae	Mid (or threshold)**	6-8 weeks
Onager	stone fruits	TSSM	egg/larvae	Mid (or threshold)**	6-8 weeks
Apollo	pome, cherry, peach	ERM	egg/larvae	Early***	8-12 weeks
		TSSM	egg/larvae	Mid (or threshold)	6-8 weeks
Zeal	pome, cherry	ERM	egg/larvae	Early****	8-12 weeks
	pome, straw, grape, cherry	TSSM	egg/larvae	Mid (or threshold)**	6-8 weeks
Agri-Mek	pome, plum, grape,	ERM, RM	motiles*	Early****	8-12 weeks
	strawberry	TSSM	motiles*	Mid (or threshold)	6-8 weeks
Envidor	pome, plum, grape	ERM, RM	egg, motiles*	Early**** or thres.	8-12 weeks

	stone fruits	TSSM	egg, motiles*	Mid (or threshold)	6-8 weeks
Nexter	pome, stone1, grape	ERM, RM	motiles*	Mid (or threshold)**	6-8 weeks
		TSSM	motiles*	Mid (or threshold)	6-8 weeks
Portal	pome	ERM, RM	motiles*	Mid (or threshold)**	6-8 weeks
		TSSM	motiles*	Mid (or threshold)	6-8 weeks
Kanemite	pome	ERM	motiles*	Mid (or threshold)**	6-8 weeks
	pome, strawberry	TSSM	motiles*	Mid (or threshold)	6-8 weeks
Acramite	pome, peach, plum	ERM	motiles*	Mid (or threshold)**	6-8 weeks
	pome, peach, plum, grape, strawberry	TSSM	motiles*	Mid (or threshold)	6-8 weeks
Danitol	apple, grape	ERM	motiles*	Mid (or threshold)**	4-6 weeks
	apple, grape, strawberry	TSSM	motiles*	Mid (or threshold)	4-6 weeks
Brigade	pear	ERM	motiles*	Mid (or threshold)**	4-6 weeks
	pear, grape, caneberry	TSSM	motiles*	Mid (or threshold)	4-6 weeks
Oberon	strawberry	TSSM	egg, motiles*	Mid (or threshold)	4-6 weeks
Vendex	pome, stone	ERM	motiles*	Mid (or threshold)**	4-6 weeks
	pome, stone, grape, cane-, strawberry	TSSM	motiles*	Mid (or threshold)	4-6 weeks
Endosulfan	pome, stone, blueberry2	RM3	motiles*	Mid (or threshold)**	4-6 weeks
Sulforix	pear, blueberry	RM3	motiles*	Late (post-harvest)	4-6 weeks

\* Motile forms include mite larvae, nymph and adult stages.

\*\* Optimally used petal fall through fifth cover when mites reach threshold.

\*\*\* Optimally used pre-bloom through first cover.

\*\*\*\* Optimally used petal fall through second cover.

1 300 day phi for cherry

2 post-harvest only for blueberry

3 including pear blister mite

#### **FIRST FRIDAY WINEGRAPE UPDATE THIS FRIDAY!!**

Dr. Paolo Sabbatini will be at the 2 Lads Winery on **Friday May 1st** from **3-5 PM** for the *First Friday Grape Update!* Paolo will discuss Nutrition Management: How Much "Gas" Does a Vine Need? – and talk about N, cover crops, foliar fertilization. Pesticide Recertification Credits will be available at this free program! Feel free to call the NWMHRS for more info (231)946-1510.

#### **ARE YOU READY FOR A USDA GAP AUDIT?**

**Monday, May 4th** MSU Extension will be hosting a GAP meeting to introduce our new USDA GAP Workbooks and help growers develop their own food safety plans to meet USDA standards. The meeting will be held from 1-4 PM at the NWMHRS with no fee or registration necessary. See you there!

#### **WATER TESTING FOR GAP GROWERS**

Just a reminder, if you are becoming GAP certified this year, it is time to get your water tested! There are a number of testing facilities available, including: Great Lakes Water Quality (1.888.371.3335), Pure Water Works Inc (1.231.941.7873), SOS Analytical (1.231.946.6767). Call the lab of your choice to get the proper water sampling protocol.

This issue and past issues of the weekly FruitNet report are posted on our website at:

<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](mailto:kleinw@msu.edu)

Last Revised: 4-29-09

**Home | Site Map | Contact | Indicia | Logos**  
AgBioResearch • 109 Agriculture Hall • East Lansing, MI 48824 • Ph: 517-355-0123

© 2010 Michigan State University Board of Trustees