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Northern Michigan FruitNet 2010
Weekly Update
NW Michigan Horticultural Research Station

Nikki Rothwell, District Horticulturist
Erin Lizotte, District Fruit IPM/IFP Agent
Bill Klein, Farm Mgr, NWMHRS
Duke Elsner, Agricultural & Regional Viticulture Agent

April 2, 2010

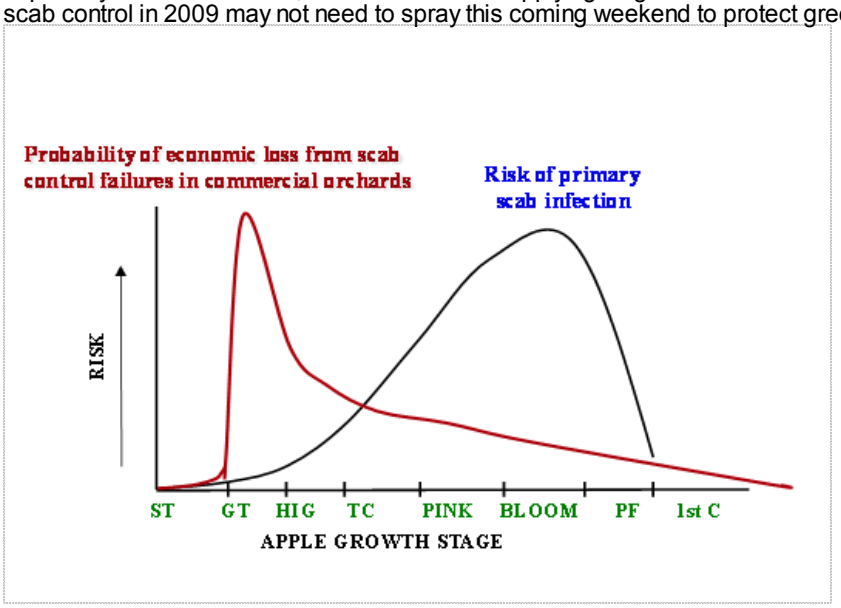
GROWING DEGREE DAY ACCUMULATIONS through April 2nd at the NWMHRS

Year	2010	2009	2008	2007	2006	2005	20 yr. Avg.
GDD42	145	47	11	106	55	49	52.0
GDD50	61	11	0	32	15	11	16.0

SCAB ALERT

APPLE SCAB ARRIVES EARLY?
Erin Lizotte and Dr. Nikki Rothwell, NWMHRS

Many growers have observed green tissue in their apple orchards due to the unseasonably warm weather in northwest Michigan . With rain in the forecast and confirmed strobilurin resistance in the region, the time for early season control with copper is now (copper should not be applied past ¼- ½ " green). Prior to this predicted rain event, we cannot confirm if the overwintering apple scab ascospores are mature and/or will discharge with this first rain of the season; however, a full cover of a protective copper application is recommended, particularly in sites with high levels of scab infection and/or documented strobilurin resistance in 2009. Early season control of primary scab is vital to mediating infection later in the season as leaf area expands (see figure below). The mantra of the season for Michigan growers is to control scab *early*. In many years, we apply scab sprays at green tip, but following a season like 2009, we are concerned with the high levels of inoculum in orchards. Growers should get a jump on scab control by not allowing the fungus to infect the evident green tissue in the orchard. With high levels of inoculum, the warm temperatures, and predicted rain over the weekend, growers need to be on top of primary scab this season, even if that means applying fungicides earlier than normal. Growers that had good scab control in 2009 may not need to spray this coming weekend to protect green tissue.



To explain the above risk curve, green tip scab infections can cause economic loss because fruit and leaves, which are expanding rapidly, are at maximum susceptibility. Scab that infects early in the season will produce more generations before the summer heat shuts down the scab epidemic. Hence, the earlier the scab fungus takes hold in the orchard, the harder to stop later in the season, and likely without the help from the strobilurins.

APPLE SCAB CONTROL WITHOUT STROBILURIN FUNGICIDES
George Sundin, Plant Pathology
Amy Irish-Brown, MSU Extension Educator

During 2008-2009 growing season samples of apple scab were collected and strobilurin resistance in all major apple growing regions of the state was confirmed. It is important to remember that resistance to strobilurins conferred by the G143A mutation is complete, meaning that these fungi will not be affected at all by this class of fungicides. Thus, even in orchards currently harboring a lower level of resistant isolates, use of a strobilurin (Flint or Sovran) would be predicted to result in the rapid increase in resistance frequency. Furthermore, increasing the rate of a strobilurin will not increase effectiveness – this is an all or nothing type of

resistance.

What classes of fungicides are left for scab control in affected orchards? The number of different fungicide modes of action is dwindling as we lose compound classes to resistance (Table 1).

Table 1. Fungicide modes of action registered for apple scab control in Michigan .

Fungicide	Mode of action	Risk of resistance development
Anilinopyrimidines Scala, Vangard	Single site	High
Captan	Multi-site	Low
Copper	Multi-site	Low
EBDCs Dithane, Manzate Polyram, Penncozeb	Multi-site	Low
Sterol Inhibitors Procure, Rally	Single site	High
Sterol Inhibitors* Indar, Inspire Super**	Single site	High
Sulfur	Multi-site	Low
Ziram	Multi-site	Low

* Indar and the sterol inhibitor fungicide component of Inspire Super are reported to control sterol inhibitor-resistant isolates of the apple scab fungus better than traditional sterol inhibitors.
** Inspire Super is used as a tank mix of a sterol inhibitor fungicide as well as Vangard (anilinopyrimidine), thus mixing two modes of action.

Here are a few notes on the various fungicide classes available for scab control in 2010:

1. **Copper**. A good scab protectant fungicide; however, use of copper is discouraged after about one-half of an inch green tip because of russeting problems on fruit. May have a place as the first scab fungicide application of the season and also provide fire blight control of inoculum emerging from cankers if fire blight was active in the orchard in the previous two seasons.
2. **Anilinopyrimidines**. Effective scab materials, but at risk for resistance development. At a minimum, should be tank-mixed with a three lbs/acre rate of EBDC for resistance management. This class of fungicide is more effective in colder weather. Highly systemic material that doesn't redistribute well and is not as effective in controlling scab on fruit. Good choice for early-season scab control.
3. **EBDCs, Captan**. Both excellent scab protectants, five to six days of protectant activity when used at full rates. Excellent choice for scab control; remember that intervals will be tighter when relying on these materials.
4. **Sterol inhibitors**. Resistance to sterol inhibitors in the scab fungus is fairly well distributed in Michigan orchards. However, this resistance is quantitative which means each orchard contains fungal isolates with a range of sensitivities. Thus, some control will be observed when using these fungicides. Two sterol inhibitors, Indar and Inspire Super (which contains an sterol inhibitor plus Vangard), are reported to control sterol inhibitor-resistant strains and they do to some degree. However, continued use of these fungicides is predicted to increase the overall level of sterol inhibitor resistance in orchards.
5. **Sulfur and Ziram**. Both are weaker protectants with a shorter duration of protectant activity meaning more applications required.

There are several keys for successful apple scab control in 2010 in orchards impacted by strobilurin resistance:

Start control early. The first fungicide must be applied before the first scab infection after budbreak. Once scab becomes established in orchards, it is difficult to rein in, and we are lacking another tool for management.

Fungicides must be used in a protectant strategy, i.e. applied prior to rains and scab infection periods. The protectant strategy ensures a fungicide barrier is present protecting susceptible tissue from apple scab spores. This strategy also accomplishes a secondary goal for resistance management in which we want to kill the scab fungus and not allow any growth – because any growth increases the chances that the scab fungus can mutate to fungicide resistance.

Keep spray intervals tighter (seven days or less) to maximize control.

Spray all middles. Full coverage is necessary to ensure the presence of the chemical barrier.

If we experience extended periods of wet weather during primary scab season, several fungicides can be sprayed under light rain conditions including mancozeb (Dithane), Captan, Polyram, and Sulfur. This practice again will maintain a protective barrier.

Increasing problems with fungicide resistance in Michigan will require more grower action to achieve the same levels of apple scab control we were accustomed to. Stay ahead of the game in 2010.

2010 IPM THINK TANK ON COVER CROPPING AND SOIL QUALITY
Erin Lizotte, IPM/IFP District Educator

Since our last IPM Think Tank in 2008, there has been a great deal of interest in orchard floor management and so in 2010 it seems fitting that we revisit the ever evolving science behind cover cropping and orchard floor management.

For the 2010 IPM Think Tank, we are fortunate to host Dr. David Granatstein, the statewide coordinator for the Center for Sustaining Agriculture and Natural Resources at the Tree Fruit Research and Extension Center in Wenatchee , Washington . Dr. Granatstein has studied the use of compost as a soil amendment, mulches, cover crops for nutrient improvement and for beneficial insect habitat, the Swiss sandwich technique, and rodent repellent plants and will address how growers can improve upon the standard of sod alleys and weed spray strips. We will also hear from Dr. George Bird, Michigan State University specialists and growers utilizing cover crops. The meeting will be held at the **Northwest Michigan Horticultural Research Station** on April 7, registration begins at 8:45 AM and the program will run until 4:00 PM. There is a $25 registration fee that includes lunch. Please call Jackie Baase at (231)946-1510 to

register. Deadline for registration is **April 5th.**

WEBSITES OF INTEREST

Insect and disease predictive information is available at:
http://www.enviroweather.msu.edu/home.asp

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ACTUAL AND PREDICTED DEGREE-DAY
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Bill Klein, kleinw@msu.edu

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April 6, 2010

GROWING DEGREE DAY ACCUMULATIONS through April 5th at the NWMHRS

Year	2010	2009	2008	2007	2006	2005	20 yr. Avg.
GDD42	186	47	24	106	57	72	59.8
GDD50	82	11	4	32	15	22	18.8

WEATHER

Degree-day accumulations have been moving right along this season. We have accumulated 186GDD base 42 and 82GDD base 50. These accumulations are noticeably different than 2009 (a cool year) where at this time we had only accumulated 47GDD base 42 and 11GDD base 50. The 2010 numbers even look high compared to our 20-year average: 60GDD base 42 and 19GDD base 50. Our accumulations are also on par with the SWMREC in Benton Harbor , where they have recorded 201GDD base 42 and 91GDD base 50.

APPLE SCAB HAS ARRIVED EARLY

Erin Lizotte and Dr. Nikki Rothwell, NWMHRS

Many growers are showing various lengths of green tip in their apple orchards due to the unseasonably warm weather. *Venturia inaequalis* sexual spores (the causal agent of primary apple scab) have been released based on spores trapped in an apple orchard in Leelanau County . With the continued wet weather last night and today, rain in the forecast, and confirmed strobilurin resistance in the region, the time for early season protective control strategies such as copper is now (copper should not be applied past ¼"- half inch green). Although relatively few spores have been released with this first wetting period, protective copper or fungicide applications are recommended, particularly in sites with high levels of scab infection in 2009. Early season control of primary scab is vital to mediating infection later in the season as leaf area expands.

EUROPEAN BROWN ROT AND AN EARLY SEASON

N.L. Rothwell and E.M. Lizotte, NWMHRS

Cool, wet weather and cherry bloom is the perfect combination for European brown rot (EBR) to invade tart cherries. Although this pathogen (*Monilinia laxa*) rarely infects Montmorency, it can be a problem under the right conditions. The current weather conditions could potentially cause EBR when the blossoms open; however, the major difference this season is the warm weather. Growth stages here at the NWMHRS have moved along quickly, and as of yesterday, we are at early bud burst in Balaton and late green tip in Montmorency. 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 (fenbuconazole) is the most efficacious fungicide for EBR based on research data. Growers that have Balaton should be particularly careful as this pathogen has the potential

to reach epidemic levels in cultivars like Meteor, English Morello, and Balaton. Regions of orchards in low spots or along hedgerows can be problematic, so growers should keep an eye on locations that do not dry off quickly.

PEACH LEAF CURL

M. Longstroth, District Educator, MSU-E
N. Rothwell, District Horticulturist, MSU-E

Peach leaf curl is an infrequent but occasionally severe disease of peach and nectarine. The pathogen infects peach buds from bud swell to bud opening under wet conditions and air temperatures in the 50^{o} to 70^{o}F range. By the time growers observe the leaf curl symptoms, the treatment window has passed. If orchards have this disease in the past or conditions are wet in the spring, growers should treat in early spring before bud break. Bravo (chlorothalonil), Ferbam (carbamate), Ziram, and copper compounds are all effective against this disease. Copper compounds also have the benefit of providing some suppression of bacterial spot.

However, the key to good peach leaf curl control is these early spring applications that suppress fungal growth as the bud opens and before rain washes the overwintering spores into the bud. Good coverage is necessary to control this disease. Once leaves are infected in the spring, there is no later treatment as the leaves are infected inside the bud and once leaves emerge, they are no longer susceptible to infection. Infected leaves appear thick and crinkled and turn orange or red. When the fungus sporulates, leaves take on a powdery appearance.

Damaged leaves will eventually fall off and the tree will grow new ones. Peach leaf curl weakens the tree by removing leaves, and leaf loss may

also cause fruit drop and can reduce the size of the remaining fruit.

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.

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 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). Growers with young orchards should be diligent about controlling these larvae as they can quickly defoliate strong trees. The newly hatched larvae are obvious in orchards now and should be controlled sooner rather than later.

2010 FRUIT INSECTICIDE REGISTRATION UPDATE

Drs. John Wise, Rufus Isaacs and Larry Gut
Michigan State University
March 29, 2010

This is a summary of insecticide/miticide label new additions and corrections to the 2010 MSU Fruit Management Guide. Agri-chemical labels and regulations can change quickly so use this information within the context of each compound's actual label.

Insecticide 2010 additions, label changes, restrictions:

Compound	Label Changes/Restrictions	Crop	Target pests
Avaunt 30WG	New Labeled Use	blueberries	fruitworms, plum curculio
Centaur 70WDG	New Labeled Use	cherries, plums	scale insects, leafhoppers
Tourismo 3.5SC	New Labeled Use	grapes	grape berry moth, leafhoppers
Lorsban/Chlorpyrifos		Label restriction	apples – one spray per season
Movento 2F	Interim Cancellation Order	pome and stone fruits, grapes	
Kelthane MF	Discontinued	pome fruit, grapes, strawberries	
Ecozin	Discontinued	fruit crops	

New insecticide label information for compounds listed in 2010 E-154: {MSU Fruit Management Guide E-154 product numbers in ()}

Movento (91) (spirotetramat) belongs to a new class of insecticides called the tetramic acid derivatives, and was registered in pome fruits, stone fruits and grapes for control of aphids, scale insects, mealy bugs, phylloxera and pear psylla. **EPA issued an Interim Cancellation Order** for Movento and Ultor. The order states that "use of product in the possession of the applicators is permitted provided such use is consistent with the previously approved labeling for the products." Growers can continue to use material they have purchased and is in their possession. EPA also stated "as of today's date (3/12/2010), it is unlawful to sell or distribute these products except for the limited purpose of return to the manufacturer, or for proper disposal."

Lorsban (32) (chlorpyrifos) is an organophosphate insecticide that has great affinity for organic matter such as bark or soil. Chlorpyrifos is registered for use as a trunk spray on apples, cherries, peaches, and nectarines to control American plum borer, dogwood borer, and lesser and greater peachtree borers (See table below). Foliar applications may be used dormant/delayed-dormant (pre-bloom) in pome and stone fruits for scale, leafroller, psylla, and aphid control, either alone or in combination with oil. **In apples, chlorpyrifos can be used only once per season**, either pre-bloom or post-bloom as a trunk spray. Chlorpyrifos is registered for post-bloom foliar use on sour cherries only. Lorsban also has a special local needs 24(c) label in grapes for pre-bloom control of climbing cutworms (effective 2004), targeted at the trunks of the vines. Lorsban also has limited label use in cranberry and strawberries.

Lorsban uses by Formulation:	Apples	Pears	Cherries		Plums	Peaches	Nectarines
			Tart	Sweet			
Pre-bloom foliar	4E, Adv, 50W,75W	4E, Adv, 75W	4E, Adv, 50W,75W	4E, Adv, 75W	4E, Adv, 75W	4E, Adv, 75W	4E, Adv, 75W
Post-bloom foliar	none	none	50W,75W	none	none	none	none
Trunk spray	4E, Adv, 75W	none	4E, Adv, 75W	4E, Adv, 75W	none	4E, Adv, 75W	4E, Adv, 75W

* Adv refers to Lorsban® Advanced

2010 WINEGRAPE IPM KICKOFF!

Erin Lizotte, Nikki Rothwell and Duke Elsner, NWMHRS

A day-long program to kick off the growing season for winegrape growers and vineyard managers will be held at the Northwest Michigan Horticultural Research Station from 10:00 AM to 4:00 PM on April 16. We are fortunate to be able to bring in Dr. John Reganold from Washington State University where he is a professor in the Department of Crop and Soil Science. Dr. Reganold's farming systems research measures the effects of alternative and conventional farming on sustainability indicators: soil health, crop quality, financial performance, environmental quality, and energy efficiency. In addition to Dr. Reganold, we will be joined by MSU winegrape faculty and extension staff to help us all prepare for the 2010 season. There is a $25 fee for this program and registration is required by April 12. Please call Jackie Baase at 231-946-1510 to register. We hope you can join us!

IPM TREE FRUIT KICKOFF

Erin Lizotte, NWMHRS

There will be a Tree Fruit Kickoff held on April 19 at the Northwest Michigan Horticultural Research Station from 7-9 pm. We will review label and management changes for the 2010 season for apple and cherry growers. This meeting is ***free*** and no registration is required. I hope to see you there!

WEBSITES OF INTEREST

Insect and disease predictive information is available at:
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60 Hour Forecast
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April 13, 2010

GROWING DEGREE DAY ACCUMULATIONS through April 12th at the NWMHRS

Year	2010	2009	2008	2007	2006	2005	20 yr. Avg.
GDD42	219	54	52	106	104	144	84.0
GDD50	90	11	15	32	37	57	28.6

Growth Stages at NWMHRS (4/12/10- 3:00pm)
Apple: McIntosh & Red Delicious – Early tight cluster
Gala & Yellow Delicious – Early tight cluster
Pear: Bartlett: Green cluster
Sweet Cherry: Hedelfingen: Bud burst
Napoleon: Early white bud
Gold: Late bud burst
Tart Cherry: Early bud burst
Balaton: Bud burst
Apricot: First bloom
Plum: Green cluster
Grapes: Early bud swell

WEATHER REPORT

As in other parts of the state, northwest Michigan has been unseasonably warm. On 31 March, 1 and 2 April, we hit the high 70s and low 80s, which are extremely high temperatures for this time of year. In terms of growing degree days, we are at 219GDD base 42 and 90GDD base 50. At this same time in 2009, a cool year, we had only accumulated 54GDD base 42 and 11GDD base 50. We are also well ahead of our 20-year average: 84GDD base 42 and 28.6GDD base 50. We received 0.21" of rain on 3 April and 2" on 11 April. Very little rain fell in March (~0.3"), so the 2" rain was much needed in early April.

CROP REPORT

Due to these high temperatures, we are further along in our tree phenology than in a typical year. Pears are at green cluster, and apples are at early tight cluster here at the NWMHRS. Montmorency trees are at early bud burst, and Balatons are at bud burst. There is some variation in different sweet cherry cultivars: bud burst in Hedelfingen, late bud burst in Golds, and early white bud in Napoleon. We expect to be in bloom in sweet cherries by the weekend, and growers are placing bees into sweet cherry blocks at this time. Chardonnay vines at the station are at early bud swell, plums are at green cluster, and apricots are at first bloom.

We have observed damage in many different crops, and the results are dependent on the site. Some growers have reported severe damage in tarts, and upon cutting buds from Benzie County and Old Mission Peninsula, we had damage to half of the buds. There is also damage in sweet cherry, but from our results, we had less than anticipated. Approximately 45% of the Balatons at the NWMHRS have some level of damage. So far, apples are faring well. Growers are still pruning, and there has been a mad dash to remove brush from the orchard in order to put on copper sprays on sweet cherry and apples.

PEST REPORT

Apples. As the weather is unseasonably warm and degree days accumulate, we expect to see insects and diseases follow suit. The wetting events over the past weeks did not trigger the model to predict apple scab infection periods; however, as we move through the week, rain is in the forecast. Growers should also be aware that we have already trapped *Venturia inaequalis* spores (the causal agent of primary apple scab) in a Leelanau apple orchard. Based on a biofix of 4/2 (Macintosh green tip), 22% of ascospores are estimated to become mature and 6% discharged by the end of the week. Apple tissue should be kept covered with a protectant strategy in mind. The 2010 season may be a challenging scab season with strobilurin resistance confirmed and many regional orchards experiencing high pressure in 2009.

Cherry. In cherry, we are catching green fruitworm in the Station trap line, with an average of 17 moths per trap. Oil applications for San Jose Scale should be applied in sweet cherry before white bud or popcorn. Growers should also be

thinking about applications for European brown rot control, with one application at white bud and one at bloom particularly useful on susceptible varieties (Balaton, Meteor, and occasionally Montmorency). Eastern tent caterpillar is back with vengeance in many area orchards. Insecticides are generally ineffective against mature larvae, so growers need to use chemical controls, they should target young caterpillars. Growers should spray the foliage as caterpillars leave the nest to feed to ensure contact with the insecticide. Spraying nests will 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).

Grape. Winegrape growers should be considering dormant applications for disease management as southwest Michigan is reporting some green tissue showing.

WINEGRAPE IPM KICK-OFF

Erin Lizotte, Nikki Rothwell and Duke Elsner

A day-long program to kick off the growing season for winegrape growers and vineyard managers will be held at the *Northwest Michigan Horticultural Research Station* from 10-4 on **April 16.** We are fortunate to be able to bring in Dr. John Reganold from Washington State University where he is a professor in the Department of Crop and Soil Science. Dr. Reganold's farming systems research measures the effects of alternative and conventional farming on sustainability indicators: soil health, crop quality, financial performance, environmental quality, and energy efficiency. In addition to Dr. Reganold, we will be joined by MSU winegrape faculty and extension staff to help us all prepare for the 2010 season. There is a $25 fee for this program. . Please call Jackie Baase or Karen Powers at 231-946-1510 to register. We hope you can join us!

6TH ANNUAL TREE FRUIT IPM KICK-OFF

Erin Lizotte, IFP/IPM District Educator

Dr. Nikki Rothwell, District Horticulturalist, MSU-E

The 6th Annual Tree Fruit IPM Kick-off has been scheduled for **April 19th** from 7-9 pm at the NW Michigan Horticultural Research Station. This year's program will include updates on insecticide and fungicide labels for the upcoming season, as well as some emerging areas of pest and disease management including new chemistries for codling moth. This program is *free* and no registration is required. Hope to see you there!

WEBSITES OF INTEREST

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April 20, 2010

GROWING DEGREE DAY ACCUMULATIONS through April 19th at the NWMHRS

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GDD42	284	107	111	127	192	237	127.6
GDD50	121	35	43	38	81	108	49.2

Growth Stages at NWMHRS (4/19/10- 2:30pm)
Apple: McIntosh - Pink
Red Delicious – Early pink
Gala – Tight cluster
Yellow Delicious – Early pink
Pear: Bartlett: White bud
Sweet Cherry: Hedelfingen: 80% bloom
Napoleon: Full bloom
Gold: 50% bloom
Tart Cherry: Early white bud
Balaton: White bud
Apricot: Petal fall
Plum: First bloom
Grapes: Early bud swell

WEATHER REPORT

Last Thursday, our temperatures reached up to 80°F, then dropped on Friday down to a high of 50°F. The weekend was cold and windy, and Monday was in the low 60's. We had two hard frosts on Sunday and Monday nights. Overall, we are still further ahead this season compared to our 20-year average; 2010: 284GDD base 42 and 121GDD based 50, and 20-year average: 127GDD base 42 and 49GDD base 50. We have had no significant precipitation since the 2" prior to11 April.

CROP REPORT

Things are still moving along up here despite some of the recent cold temperatures. Pears are at white bud to first bloom. Macs are at pink, Gala tight cluster, Red and Gold Delicious are at early pink. Montmorency are at early white bud, but some blossoms are now visible in some warmer orchards. Sweets at the NWMHRS are at 50%-100% bloom depending on variety. Chardonnay grapes are at early bud swell, plums at first bloom, and apricots are at petal fall.

Growers are reporting damage in tart cherries, although there seems to be a range of injury depending on the orchard. Orchards just south of the NWMHRS in Leelanau County look better than orchards north of the station. Benzie County has reported moderate damage, and Antrim County has spots where damage is more apparent than initially reported. However, we are still in the beginning of the year, and we really cannot make conclusive damage assessments. Sweet cherries look like they have made it through the last few nights' frosts, but we have observed dead flower parts in low spots in the orchard. Pollination may be a concern in sweets because of the cold windy weather over the weekend. However, yesterday and today are predicted to be in the 60's, sunny, and with little wind. We are hoping the bees will be busy in the next two day as we are predicted to go back into wet, windy weather at the latter part of the week. Growers are working hard to clean up orchards and prepare for the early season.

PEST REPORT

Apples. With the dry weather in the north, we haven't had any apple scab infections over the past week. According to the forecast, our next chance of rain will come on Saturday. Based on a biofix of 4/2 (Macintosh green tip), the model is predicting 27% maturity by that date. Apple tissue should be kept covered with a protectant strategy in mind. The 2010 season may be a challenging scab season with strobilurin resistance confirmed and many regional orchards experiencing high pressure in 2009.

Cherry. We are catching green fruitworm in the Station trap line, with an average of 20 moths per trap. Growers should be applying popcorn and bloom sprays for European brown rot control, with one application at white bud and one at bloom being recommended on susceptible varieties (Balaton, Meteor, and occasionally Montmorency). American brown rot

applications are also recommended during bloom.

Grape. Winegrape are at bud swell.

2010 HANDS-ON TREE FRUIT SUMMER IPM UPDATE SERIES
Erin Lizotte, District IFP/IPM Educator, MSU-E

A series of hands-on IPM workshops will be held throughout northwest Michigan for the 2010 growing season. For these meetings, growers are encouraged to bring examples of pests and damage found on the farm. Examples of pests include insects, leaf, shoot, or root samples, damage samples, disease symptoms on plant, and insect trap examples. Samples will be diagnosed on-site and control strategies will be discussed. Recommendations as a result of diagnosis will be based on integrated pest management strategies, and they may include the following: 1) delay of pesticide applications if trap counts or disease symptoms are below thresholds, 2) discussion of thresholds for specific tree fruit pests, 3) proper identification of insects/diseases, which may eliminate chemical control, 4) conversation on insect life cycle for proper timing of insecticides, 5) use of weather information technology in northwest Michigan to precisely time and/or eliminate chemical applications, 6) discussion of alternative control tactics (mating disruption, viruses, organic products, entomopathogenic nematodes, insect growth regulators [IGR's], trap and kill practices), 7) information on resistance management, and 8) discussion of cultural control tactics to reduce pest populations. Each week will characterize a different time in the season and distinct weather patterns, which in turn will present a unique set of pest problems and management strategies.

In addition to the samples brought by the growers, I will bring examples of insect and disease pests for identification and discussion purposes. Weekly trap catches will also be presented for threshold information, and control strategies based on these trap counts will be discussed. As fruit growers, extension agents, and pest management scouts will be present at these meetings, comprehensive weekly IPM plans can be established for growers to take back to their respective farms.

Leelanau County
Location: Jim and Jan Bardenhagen, Pertner Road, Suttons Bay
Dates: May 12, May 19, May 26, June 2, June 9, June 16, June 23
Time: 1-3pm

Grand Traverse County
Location: Josh Wunsch Farm, Old Mission Peninsula, Phelps Road, Traverse City
Dates: May 12, May 19, May 26, June 2, June 9, June 16, June 23
Time: 4-6pm

Benzie County
Location: Loy Putney Farms, 4286 Raymond Rd, Frankfort
Dates: May 11, May 25, June 8, June 22
Time: 3-5pm

Antrim County
Location: Jack White Farm, M-31, just south of Elk Rapids on the right, Elk Rapids
Dates: May 11, May 25, June 8, June 22
Time: 11-1pm

SAVE THE DATE FOR THE 2010 IPM GRAPE UPDATES!
Erin Lizotte, Nikki Rothwell, and Duke Elsner

Dates have been set for the Summer Grape IPM Updates. Topics to be covered include horticulture, pathology and entomology. Feel free to bring along insect and disease samples for diagnosis and management recommendations. These free updates run from 3-5 PM and Pesticide Recertification Credits will be available. Dr. Annemiek Schilder will be at the Longcore Vineyard (11545 Bluff Rd, Traverse City) on **May 7** to discuss protectant strategies for disease management, with special emphasis on powdery mildew. Additional Updates will be held on **June 4** (Duke Elsner at the NW MI Horticultural Research Station), **July 9** (Dr. Paul Jenkins and Dr. Paolo Sabbatini at 2 Lads Winery), **August 6** (Dr. Sabbatini at the Ligon Farm at 3130 Old Mission Rd), and **September 3** (Dr. Rufus Isaacs at Mawby's). We hope to see you all there!

WEBSITES OF INTEREST

Insect and disease predictive information is available at:
http://www.enviroweather.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:
http://www.cherries.msu.edu/

Fruit CAT Alert Reports
http://www.ipmnews.msu.edu/fruit/

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, 2010

Please send any comments or suggestions regarding this site to:
Bill Klein, kleinw@msu.edu

Last Revised: 4-20-10

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Northern Michigan FruitNet 2010
Weekly Update
NW Michigan Horticultural Research Station

Nikki Rothwell, District Horticulturist
Erin Lizotte, District Fruit IPM/IFP Agent
Bill Klein, Farm Mgr, NWMHRS
Duke Elsner, Agricultural & Regional Viticulture Agent

April 27, 2010

GROWING DEGREE DAY ACCUMULATIONS through April 26th at the NWMHRS

Year	2010	2009	2008	2007	2006	2005	20 yr. Avg.
GDD42	335	147	222	209	272	264	179.8
GDD50	140	53	107	80	120	115	73.5

Growth Stages at NWMHRS (4/26/10- 2:30pm)
Apple: McIntosh – Late Pink
Red Delicious – Pink
Gala – Pink
Yellow Delicious – Pink
Pear: Bartlett: Full bloom
Sweet Cherry: Hedelfingen: Full bloom
Napoleon: Early petal fall
Gold: Full bloom
Tart Cherry: 80% Bloom
Balaton: Full bloom
Apricot: Late petal fall
Plum: Full bloom
Grapes: Early bud swell

Weather

The north region experienced cold night time temperatures last week, and on 4/22 and 4/23, temperatures dropped down into the mid to high 20's. Daytime temperatures have been more typical in the past week, where highs have been in the 50's and low 60's. We have had lots of sunshine in the past few days, and we are still well ahead of our 20-year average: 335GDD base 42 and 140GDD base 50. Rain was extremely variable this past weekend; Benzonia and Bear Lake weather stations received 1.14" and 0.85" respectively while the remainder of the more northerly stations received <0.25"; three stations recorded no wetting event over the weekend.

Crops

Please see list of development above. Honeybees have been placed in all cherry orchards, but there was little flight over the weekend with the clouds and wind. During the sunny days, there has been increased flight but temperatures have been cool, so the bees do not fly until later in the afternoon. As far as crop damage, there are lots of reports of damage to tart cherries. However, growers have commented on the variability of damage between orchards as well as within the same orchard: lots of damage in one orchard or on one tree and adjacent orchards and/or tree within one block look untouched. Most damage in tarts is presumed to have come in prior to last week's frost events. Last week's cold temperatures have caused damage to sweet cherries, particularly in the lower spots in the orchard; brown petals and flower parts were not hard to find in NWMHRS sweet cherry blocks. Growers have also reported damage in apple in low sites. Frost fans have been used heavily this spring.

Pest Report

Apples. The majority of the weather stations in the region received under 2/10" of rain over the weekend, which did not trigger an apple scab infection period according to the apple scab model. We also did not capture any spores where we monitor in an abandoned Leelanau orchard. However, further south, the model predicted light infection periods at Bear Lake and Benzonia, where they had 0.85" and 1.14" of rainfall respectively. According to the forecast, our next chance of rain will be on Friday. Based on a biofix of 4/2 (McIntosh at green tip), the model is predicting 40% maturity and 15% discharge of spores by today. Apple tissue should be kept covered with a protectant fungicide. The 2010 season may be a challenging scab season with strobilurin resistance confirmed, and many regional orchards experiencing high pressure in 2009. Spotted tentiform leafminer have begun to emerge with an average of 104 per trap this past week.

Cherry. In cherry, we are catching green fruitworm in the NWMHRS Station trap line, with an average of 11 moths per trap-- down from 20/trap over the past two weeks. The first American plum borers were detected this week with an average of 2 per trap at the NWMHRS. American and European brown rot application for susceptible varieties should be

applied as the region moves into bloom. For European brown rot control, fungicide applications should be sprayed at white bud and again one week later. American brown rot applications should be targeted at 10-20% bloom to provide control. If temperatures are above 60F and moisture is available, the risk of severe American brown rot infection increases. If these conditions occur in an unprotected orchard, use the maximum rate of Indar up to 24-48 hours after the beginning of the wetting period. Refer to the E-154 MSU Bulletin 2010 Michigan Fruit Management Guide for specific fungicide recommendations

Grape. In northwest Michigan, winegrapes are still at bud swell. Growers are concerned about frost and cold damage. Bud swell provides a potential time for delayed dormant fungicide applications that can kill fungi and insects that have overwintered on the plant. Refer to the E-154 MSU Bulletin 2010 Michigan Fruit Management Guide for further recommendations. Additionally, growers should be on the lookout for grape flea beetle and climbing cutworm, both of these insects feed on and damage buds. Visit grapes.msu.edu for more information on these pests.

EUROPEAN BROWN ROT
Erin Lizotte, NWMHRS

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 with 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.

SPECIAL LOCAL NEED REGISTRATION GRANTED ON INDAR FOR AMERICAN BROWN ROT CONTROL
Dr. George Sundin, 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 for the 2010 growing season. 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. 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 2010 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 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.

THERE IS STILL TIME FOR A DELAYED "DORMANT" SPRAY AGAINST PHOMOPSIS IN GRAPES
Dr. Annemiek Schilder
Dept of Plant Pathology, MSU

There is still time for delayed dormant sprays in grapes thought the vines are technically no longer dormant. The goal of the dormant spray is to kill fungal pathogens that overwinter in the woody parts of the vine. While it is not possible to kill all of the fungus inoculum, it is possible to make a dent in spore-production, reducing disease pressure during the growing season. In most years we have seen a benefit from dormant sprays, but the degree has varied (from 10-70%). Results tended to be better during relatively dry springs than very wet springs. An early mancozob spray (1-2" shoot growth) may also work to kill fungus inoculum in addition to protecting new growth.

In 2005, we tested whether applying "dormant" sprays at 1-2 inches of shoot growth was still effective at reducing Phomopsis in 'Niagara' grapes (Table 1). The difference in spray timing was only 11 days that year, however. A reduction in rachis infection at harvest was seen for both Sulfur 6L and Cuprofix. While Cuprofix at 1-2" shoot appeared somewhat less effective, the differences were not statistically different, which means that they could have been due to natural variation in the vineyard. The season-long fungicide spray program was the most effective at reducing Phomopsis at harvest.

Trial in 'Niagara' grapes in Lawton, MI, 2005		**Phomopsis rachis infection at harvest**	
Treatment, rate/A	Application timing*	Severity (%)	Control [%]***

Untreated.....		26.9	a**	
Sulfur 6L 10 pt.....	Budswell (single spray)	10.6	b	[61]
Sulfur 6L 10 pt.....	1-2" Shoot growth (single spray)	9.6	b	[64]
Cuprofix Disperss 3 lb.....	Budswell (single spray)	7.4	b	[73]
Cuprofix Disperss 3 lb.....	1-2" Shoot growth (single spray)	12.2	b	[55]
Dithane Rainshield 3 lb Abound 2.08 SC 12 fl oz Ziram 76 DF 3 lb.....	1", 6-10", 10-16" shoot Bloom 2nd postbloom 1st postbloom 3rd postbloom	2.7	c	[90]

*Budswell spray: April 14, 2005; 1-2 inch shoot spray: April 25, 2005
**Values in the same column that share a letter are not significantly different from each other at the 95% confidence level.
***Percent control relative to the untreated check.

We did not see any phytotoxicity as a result of the treatments in 'Niagara' grapes, even when applied at 1-2 inch shoot growth. 'Niagara' and 'Concord' are only slightly copper sensitive. The risk of copper phytotoxicity to green leaves is greater under cool, wet, slow-drying conditions which allow copper ions to be absorbed by the leaves. Concord is sulfur sensitive, but sulfur phytotoxicity is much more likely at temperatures above 85-90ºF which are unusual at this time of the year.

To get the maximum benefit out of dormant sprays, it is important to ensure thorough coverage of the canes by focusing nozzles of spray equipment only on the cordon, lowering air intake, slowing down and spraying at a sufficiently low volume (e.g., 20-30 gpa) that allows good coverage of the canes but no run-off. This ensures that the product is not diluted too much. Spraying every row is advised.

Dormant sprays should not be used as a stand-alone disease control measure. One or two mancozeb or captan sprays around mid-May when Phomopsis is expected to be most active may be beneficial. A strobilurin fungicide, such as Abound, Pristine or Sovran, applied at bloom or 1st post-bloom is also recommended to provide additional protection of the clusters against Phomopsis as well as black rot, powdery mildew, and downy mildew. Phosphorous acid fungicides also have good efficacy against Phomopsis and can be used throughout the growing season, either alone or in combination with other fungicides (do not tank-mix with copper).

WEBSITES OF INTEREST

Insect and disease predictive information is available at:
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60 Hour Forecast
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Information on cherries is available at the new cherry website:
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Fruit CAT Alert Reports
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ACTUAL AND PREDICTED DEGREE-DAY ACCUMULATIONS SINCE MARCH 1, 2010

Please send any comments or suggestions regarding this site to:
Bill Klein, kleinw@msu.edu

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