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Northern Michigan FruitNet 2012
Special Alert
NW Michigan Horticultural Research Center

Nikki Rothwell, District Horticulturist
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March 19, 2012

Important Program Reminders

This is a friendly reminder that we have two great programs scheduled soon and deadline dates for registration are fast approaching. One program is the "Weather Workshop" on March 23rd, 8:00-1:30 p.m. with a **deadline** date of **March 20th** and the other program a "Sweet Cherry Pruning Demo" on March 28th, 8:30-1:30 p.m. with a registration **deadline** date of **March 26th**. Should you need additional information or would like to register for either or both of these programs, don't hesitate to call 231-946-1510.

Hope to hear from you soon!

P.S. Don't forget that there's also a "High Density Apple Pruning & Training Demo" at three orchards in Benzie county on **March 20th**. Tour will begin at Blaine Christian Church at 12:30 to carpool to first stop. For further information or to register, call Dave Smeltzer at 231-510-5998.

Honeybee Update with the Warm Temperatures

Today the MSU Fruit Team had a pre-season CAT call to discuss the recent warm weather. There were questions about honey bee supplies with this 'early spring'. Dr. Rufus Isaacs followed up with Mike Hansen from Michigan Dept. of Agriculture and Rural Development (MDARD). His response suggests that beekeepers are preparing to deliver bees to Michigan early, but growers should make contact with their beekeepers in order to achieve an on-time delivery for this potential early spring.

According to Mr. Hansen, bees are out of California at this time. Some honeybees are headed to the southern states for pollination services, but most bees are in Georgia and Florida preparing for the season in the north. Some beekeepers are planning to be in the state around the first of April rather than late April. Mr. Hansen stressed that growers need to be communicating with their beekeepers in order for beekeepers to adjust their bee feeding to have the bees ready to go when they arrive in Michigan. Additionally, growers need to communicate their needs to enable beekeepers to line up trucking services.

Record-breaking warm weather advances beginning of growing season

Recent, abnormally warm weather is putting us at least two or more weeks ahead of schedule, bringing most perennial crops and vegetation out of their protective dormant states.

Published March 15, 2012, MSU-E News - Fruit
Jeff Andresen and Aaron Pollyea, Michigan State University Extension, Department of Geography

Recent abnormally warm weather has resulted in a very early start to the growing season across the Great Lakes Region and much of the central and eastern USA. The trend towards warmer than normal conditions is not new, with above normal mean temperatures observed across Michigan during much of the period back to the middle of last November. The winter of 2011-2012 (December through February) was the fourth mildest on record.

The prolonged warm spell is the result of a very persistent jet stream configuration across North America that generally prevented cold, arctic-origin air masses from moving out of their high-latitude source regions southward into the central and eastern USA. This left the area under the influence of relatively mild Pacific-origin air masses. The current jet stream pattern, with deep troughing across the western USA and ridging across the east has accentuated the pattern. The result is record-breaking warmth brought northward from the Gulf States on southerly winds.

Looking like a record-breaking March

Characterizing the current warm spell as highly unusual is an understatement, both due to the magnitude of the warmth (recent high temperatures have exceeded 70ºF over many areas of the state) and due to its length. For climatological comparison, normal high temperatures during the third week of March range from the mid-30s far north to the middle to upper 40s south with lows from the mid-teens north to the upper 20s south. Thus, recent temperatures have been running in the range of 20 to 30°F or more above normal.

Short- and medium-range forecast guidance strongly suggests a general continuation of the current pattern with warmer and possibly wetter than normal weather likely through the end of the month. A map depicting forecast conditions across North America early next week is given in Figure 1. The upper air trough over western sections of the country, ridging across the Midwest and east, and strong southerly flow all suggest maximum temperatures into the 60s and 70s statewide through at least the middle of next week. Use of the latest forecast information suggests at least the potential for mean temperatures this March to exceed the existing record (1945 in most locations) for warmest on record in the state.

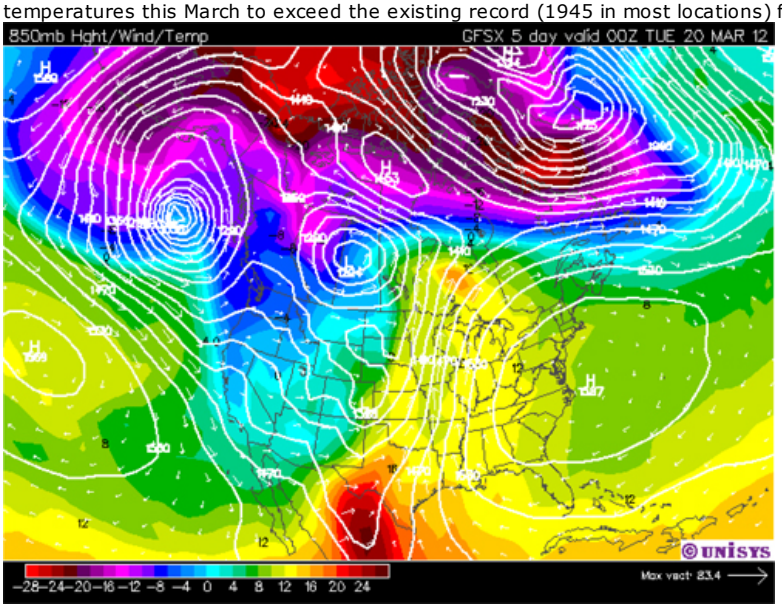

Figure 1. Projected weather conditions at approximately 5,000 feet above sea level, 8 p.m. on Monday March 19, 2012. Color contours depict temperature (°C) while winds are expressed in arrow/vector form on grid points in white (direction of arrow indicates direction, length of arrow depicts velocity). Solid white lines depict general pressure pattern and air flow. Figure courtesy of Unisys, Inc.

Base 50ºF growing degree accumulations during the ten warmest Marches on record at Benton Harbor, Mich., plus the current month are shown in Figure 2. A projection of accumulations through the end of March 2012 data was obtained with temperature forecasts from latest short- and medium-range National Weather Service forecast guidance, including the assumption that mean temperatures during the last week of the month averaged 10ºF above normal. With these assumptions, the GDD total by the end of the month exceeds 200 units as well as the old historical record of 146 set in 1945 and the normal value of 45. The abnormal warmth already has or will shortly bring most perennial crops and vegetation out of their protective dormant states. Given that this is taking place at least two full weeks or more ahead of normal, and that the relative susceptibility of plant tissue to frost and cold damage generally increases with increasing growth stage, there is an overall elevated risk of cold injury this spring season.

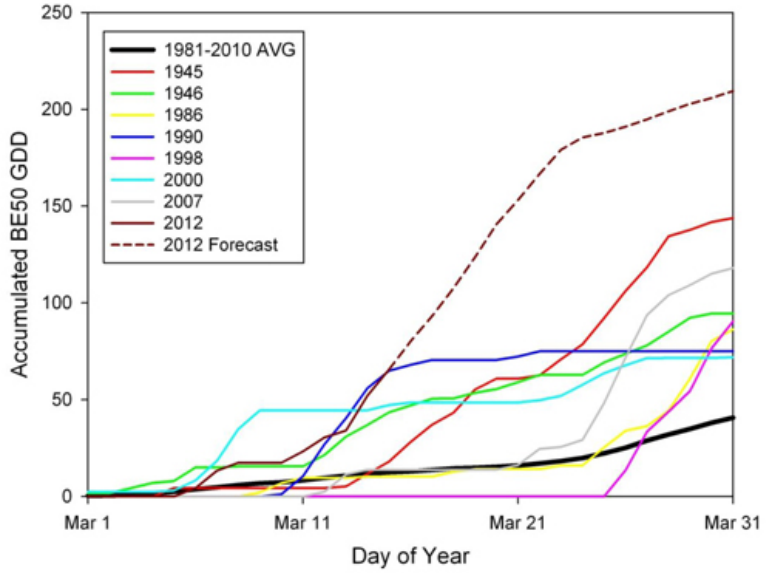

Figure 2. Observed (solid colored lines), normal (solid black line) and projected (dashed line) base 50°F growing degree accumulations for 10 warmest Marches on record at Benton Harbor, Mich. Projections for the 2012 data include latest short- and medium-range National Weather Service forecast guidance through March 31. Growing degree days are calculated with the Baskerville-Emin methodology.

What are the chances of a hard frost?
Relative risks of spring freezing temperatures across Michigan are given in Figure 3. Even though current long lead outlooks for April and the spring season call for more of the same warm pattern across Michigan, further cold weather at some point in the next several weeks is virtually a certainty (see Figure 3). The climatological average number of daily spring freeze events (32ºF or less) after March in a given season ranges from about eight in the southwest and southeast corners of the state to more than 20 in interior northern sections of the state. In terms of hard freezes, the average number of low temperature events of 28ºF or less for the same period ranges from four to more than 15. Very cold temperatures are still possible during the month of April, with lows below 10ºF in the south to the single digits below zero in the north.

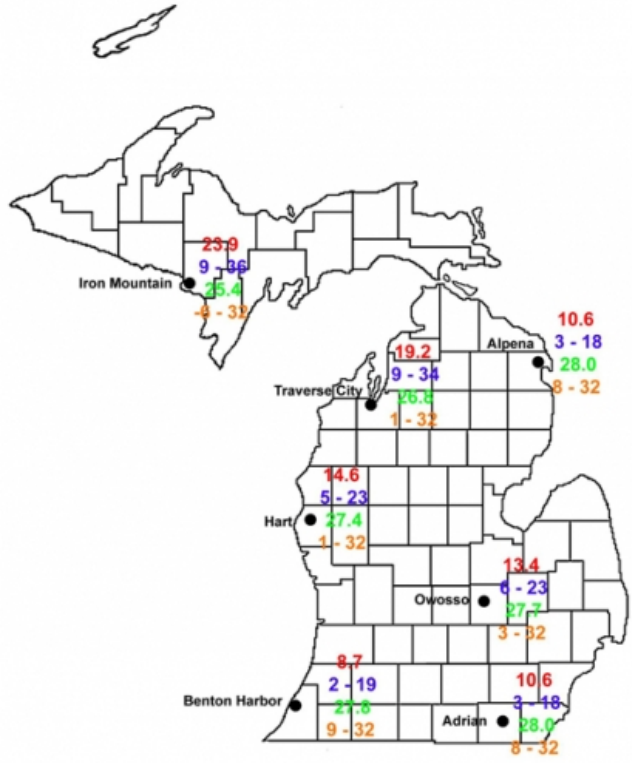

Figure 3. Numbers of daily April-June freeze events (32ºF or lower) at selected locations in Michigan, 1941-2011. The top number (red) is the average number of individual freeze events during the three-month period, the second- number (blue) is the range of total freeze events in a given season, the third number (green) is the average minimum temperature (ºF) for all freeze events, and the fourth number (orange) is the range of minimum temperatures (ºF) for all freeze events during the period of record.

Potential positive outcomes

It is also worth noting that there is some minor reduction of frost and freeze risk in years with very warm Marches. When only the top 10 warmest Marches were considered, there is an approximate reduction of 10 to 20 percent in the frequency of subsequent freeze events. This is very likely associated with the persistence of the upper air pattern that led to the abnormally warm March weather into April or longer. Finally, there may also be some positive impacts of the unusual weather. Warm temperatures will accelerate soil evaporation rates and may allow some early fieldwork opportunities, but this will depend greatly on upcoming rainfall frequency and intensity (the forecasts generally call for wetter than normal weather). Similarly, depending on weather conditions later this year – especially rainfall patterns – there is at least the possibility that seasonal yields of some crops (e.g., forages) could be higher due to a potentially longer than normal growing season.

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Many materials available for pear psylla management

With high temperatures expected this week, Michigan pear producers should start managing for psylla by applying a dormant oil application with or without insecticide.

Published March 15, 2012, MSU-E News - Fruit

Mike Haas and Larry Gut, Michigan State University Extension, Department of Entomology

Pear psylla. Photo credit: J. Dykinga, USDA-ARS.

Michigan pear producers know that management of pear psylla presents a challenge each season. Psylla become active early and numbers can quickly grow to unacceptable levels. Also, the ability of this pest to rapidly develop insecticide resistance makes it especially important to carefully consider each material included in a management plan. A dormant oil application is a good start to a program that alternates materials with different modes of action (MOA) as needed throughout the remainder of the season. Given the temperatures expected this week, it would be a good time to start managing for psylla by applying a dormant oil application with or without insecticide.

Table 1 contains a list of products that are labeled for psylla control in Michigan pear orchards. Listed for each table entry are the MOA group number as assigned by the Insecticide Resistance Action Committee, common name, trade name and insecticide class.

Materials that share the same MOA group number have the same mode of action even if the number is followed by a different letter. For example, carbaryl has an MOA classification of 1A and diazinon of 1B. The number 1 indicates that both materials share the same MOA, in this case they are both cholinesterase inhibitors. The letter after the number represents the chemical sub-group. Notice that the last six table entries have no MOA classification and can be applied whenever appropriate for that material.

A sound resistance management program relies on treating successive generations of psylla with materials from different MOA groups. Read the label directions for complete information regarding application rates, timing, combination with adjuvants and precautionary statements regarding effects on natural enemies and bees. Do not underestimate the power of natural enemies in the management of pear psylla. An orchard of Bartlett pears at the Trevor Nichols Research Center in Fennville, Mich., unmanaged for psylla, has had no sign of psylla for the last several years.

Check the current "Michigan Fruit Management Guide" (E-154) for information on the effectiveness of many of the control options listed in the table.

Table 1. Insecticides labeled for pear psylla control in Michigan

MOA Group*	Common name	Trade name	Insecticide class
1A	carbaryl	Sevin	carbamate
1B	azinphosmethyl	Azinphos-methyl,	organophosphate
1B	chlorpyrifos	Chlorpyrifos, Govern, Lorsban, Nufos, Warhawk, Whirlwind, Yuma	organophosphate
1B	diazinon	Diazinon	organophosphate
1B	dimethoate	Dimate	organophosphate
1B	methidathion	Supracide	organophosphate
2A	endosulfan	Endosulfan, Thionex	organochloride
3	deltamethrin	Battalion, Delta Gold, Decis	pyrethroid
3	esfenvalerate	Asana XL, Adjourn	pyrethroid
3	fenpropathrin	Danitol	pyrethroid
3	gamma-cyhalothrin	Proaxis	pyrethroid
3	lambda-cyhalothrin	Silencer, Warrior	pyrethroid
3	permethrin	Ambush, Arctic, Pounce, Perm-Up, Permethrin	pyrethroid
3	zeta-cypermethrin	Mustang Max	pyrethroid
3	pyrethrins	Pyganic	pyrethrin
3, 27A	pyrethrin + piperonyl butoxide	Evergreen	pyrethrin
4A	acetamiprid	Assail	neonicotinoid
4A	clothianidin	Clutch	neonicotinoid
4A	imidacloprid	Couraze, Pasada, Provado, Impulse, Nuprid, Prey	neonicotinoid
4A	thiacloprid	Calypso	neonicotinoid
4A	thiamethoxam	Actara	neonicitinoid
5	spinetoram	Delegate	spinosyn
6	abamectin	Abacus, Abba, Agri-Mek, Epi-Mek, Reaper, Zoro	antibiotic
6	emamectin benzoate	Proclaim	avermectin
7C	pyriproxifen	Esteem	insect growth regulator
15	diflubenzuron	Dimilin	benzoylurea

16	buprofezin	Centaur	insect growth regulator
18B	azadirachtin	Aza-Direct, Ecozin, Neemix	botanical
21	fenpyroximate	FujiMite, Portal	phenoxypyrazole
21	pyridaben	Nexter	pyridazinone
	sulfur	Golden-Dew, Kumulus DF, Micro Sulf, Microthiol Disperss, Sulfur-DF	
	horticultural oil	horticultural oil	
	calcium polysulfides	Rex Lime Sulfur Solution, Sulforix	
	kaolin clay	Surround	particle film
	oil, paraffinic	Citrus oil, JMS Stylet-oil	
	potassium salts of fatty acids	M-Pede	

* mode of action classification

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://news.msue.msu.edu/news/category/fruit

This issue and past issues of the weekly FruitNet report are posted on our website at:
http://agbioresearch.msu.edu/nwmihort/faxnet.htm

ACTUAL AND PREDICTED DEGREE-DAY ACCUMULATIONS SINCE MARCH 1, 2012

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

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March 20, 2012

IPM TREE FRUIT KICKOFF TO BE HELD APRIL 10

Erin Lizotte, IPM Educator

Please plan to join us for the annual *Tree Fruit Kickoff* to be held on **April 10** at the Northwest Michigan Horticultural Research Station in Traverse City Michigan from 5-7 pm. We will review label and management changes for the 2012 season that affect apple and cherry growers. This meeting is free and no registration is required. Pesticide Recertification Credits and Certified Crop Advisor Credits will be available. For more information contact Erin Lizotte at taylo548@msu.edu or (231)946-1510.

HYDRATING NEW BARE ROOT TREES FOR PLANTING
Michigan fruit growers could benefit from soaking their trees before planting for at least 24 hours, allowing plants to hydrate to twice their weight and providing 30 days of water.
Published March 16, 2012, MSU-E News - Fruit
Philip Schwallier and Amy Irish-Brown, Michigan State University Extension

In the summer of 2011, the IFTA summer tour was held in the UK, Belgium, and Holland. While visiting the nurseries and growers they explained their research of methods used to prepare trees for planting. All methods were centered on the importance of hydrating bare root trees prior to planting.

Here in Michigan and other places as well, growers store trees bare root with periodic watering by sprinkling typically from a garden hose. Then prior to planting, the trees are thoroughly wetted again by sprinkling or by a dip in a water tank and taken to the field to be planted. However, the Europeans indicate that trees get a better start by soaking the trees roots in water for 24 to 48 hours prior to planting. This soaking will hydrate plants to twice their weight and will provide 30 days of water in the new planting, thus greatly reducing the stress associated with the drying of soil around the roots shortly after planting.

The Europeans report trees hydrated by a good, pre-plant soaking will also give the trees a 30 day head start over trees handled in the traditional fashion. European growers report that they will take the whole bundle of trees down to a creek and completely submerge the trees in water (although only the roots need to be submerged) for at least 24 hours. This method of a 24-hour soak could be of great benefit to Michigan fruit growers.

This article was published on MSU Extension News. For more information from MSU Extension, visit http://news.msue.msu.edu. To contact an expert in your area, visit http://expert.msue.msu.edu, or call 888-MSUE4MI (888-678-3464).

AN EARLY-SEASON COPPER APPLICATION WILL HELP AVOID FEELING "THE BLUES" ABOUT DISEASES
Learn the benefits and cautions of using copper for disease control on apples early in the season.
Published March 19, 2012, MSU-E News - Fruit
George W. Sundin, Michigan State University Extension, Department of Plant Pathology

The use of copper for disease control on apples has always been viewed from two directions as the very positive disease-control benefits of coppers are counterbalanced with the risk of phytotoxicity to trees, most notably through russeting of apple fruit. Two major apple pathogens, the fire blight pathogen Erwinia amylovora and the apple scab pathogen Venturia inaequalis, are highly sensitive to copper, and we have no reason to believe that copper is a material that is at risk for resistance development in either of these pathogens. Thus, the potential benefit in using copper early for disease control is high. The only limitation is application timing as coppers applied after 0.25- to 0.5-inch green tip could result in phytotoxicity including fruit russeting.

Effective fire blight management practices should include efforts to reduce the primary disease inoculum
Primary inoculum refers to the bacteria that cause the initial infections in a growing season. After colonization of flower stigmas, bacterial populations in orchards can skyrocket, and blossom blight infections can occur with significant losses sure to follow. Therefore, limiting primary infection by starting control practices early is a critical first step in a season-long control program.

The predominant location of overwintering bacterial inoculum for fire blight is in cankers. These cankers are initiated from shoot blight infections occurring in the previous season and represent internal populations of the pathogen. As temperatures warm up in a growing season, cankers begin to ooze bacteria that can then be transmitted to and colonize flowers. Fire blight infections leading to blossom blight are initiated during bloom. Bacterial colonization and infection of open flowers lowers yield and initiates internal, systemic infections of trees that can lead to rootstock blight and death of younger trees planted on susceptible rootstocks. The occurrence of shoot blight (wilting and dieback of actively growing shoots) is also typically higher in orchards where blossom infections have occurred.

Besides pruning and removal of fire blight cankers during the winter, the best method for reducing initial inoculum populations of plant pathogenic bacteria in orchards is to use an early application of copper to cover trees with a "blanket" of copper. This tactic should be reserved for orchard blocks where fire blight has occurred in one of the previous two years, or blocks of highly-susceptible cultivars adjacent to blocks with recent fire blight. Entire trees should be sprayed, not just alternate rows. High rates of copper can be used (about 2.0 metallic copper per acre), with timings immediately prior to the trees breaking dormancy or up to about 0.5-inch green tip. Be sure that the correct rate of copper is used and that sprayers are properly calibrated.

The goal of this management practice is to have copper available to protect the plant tissue from bacterial colonization over time as the tissue develops. Thus, the copper being applied to trees at 0.5-inch green tip will actually be needed during or immediately prior to bloom, when cankers traditionally are oozing. Because the copper must be sprayed much earlier in the season than the dates of its targeted effectiveness, this management strategy can be defeated by rain amounts of 2 to 3 inches between green tip and bloom that wash the copper residues off trees.
In theory, any formulation of copper should be effective in disease control (copper sulfate, cupric hydroxide, copper oxychloride, etc.) in that each delivers what is needed for disease control, namely, free copper ions. These copper ions are taken up by cells and cause toxicity by non-selectively denaturing proteins in cells. Dr. David Rosenberger of Cornell University recently published an excellent article on copper formulations. In the first full paragraph on page 8 of this issue, Rosenberger gives a thorough review of the advantages of more finely-ground copper formulations as compared to coarser-ground coppers for this delayed dormant application for fire blight control.

An early copper application can also serve as a first apple scab spray
You can double-dip in disease prevention with this early-season copper application as copper compounds, although not quite as effective as Captan or EBDCs for apple scab control, can play a role in scab management as the first spray of the season at 0.25- to 0.5-inch green tip. Copper, at 2 lbs. metallic equivalent per acre, represents a separate mode of action that is not at risk of resistance development.
The green tip timing is absolutely critical for apple scab management. Although the amount of tissue available for infection is small and the scab spore load is typically small at this early timing, any infection that occurs early will result in severe consequences later in the primary scab season. This is because lesions initiated at green tip will be producing secondary spores (conidia) at a timing between pink and petal fall that coincides with what is typically the period of highest primary spore concentration from overwintering leaves. Thus, early infections can be a killer because they compound the spore load in an orchard, which can lead to significant fruit infection. It is true there is not a lot of green tissue present in orchards at green tip. But, be certain that spores of the scab fungus can find that tissue; for any spores released at this timing, that is their primary function. And once they land on that susceptible tissue, infection, producing a lesion and conidia becomes the primary function.

Finally, beware of phytotoxicity!

Copper phytotoxicity can occur on apples, with the predominant copper problem on apples being increased fruit russeting. Although phytotoxicity is a potential problem, if used wisely, copper bactericides applied early will effectively begin the 2012 disease management season and lower primary fire blight disease inoculum and control early apple scab.

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FREEZE DAMAGE DEPENDS ON TREE FRUIT STAGE OF DEVELOPMENT
Damage from freezes depends on the development stage of the fruit crop. These tables allow you to quickly asses the risk for your tree fruit crops
Published March 16, 2012, MSU-E News - Fruit
Mark Longstroth, Michigan State University Extension

During the winter, fruit trees can withstand very cold temperatures. As fruit trees develop in the spring and buds start to swell, they lose the ability to withstand cold winter temperatures. The young, actively growing tissues will be damaged or killed by warmer and warmer temperatures. Swollen fruit buds can often withstand temperatures in the teens without any damage. As the buds open, temperatures in the low 20s can cause harm, but leave other buds undamaged.

Early in development there is often a wide range between the temperatures that cause little damage and those that cause severe damage. As bloom nears, temperatures in the upper 20s can cause considerable harm to an early blooming species or variety and leave other fruit crops unaffected or with only slight damage. Near bloom, the range between slight and severe damage is very small. The stage of bud development determines how susceptible any given fruit crop is when

freezes occur.

I have posted two tables for the critical temperatures of tree fruit during development. Tree Fruit Critical Temperatures is a table of common tree fruit with bud stage names and the critical temperature ranges that will cause between 10 and 90 percent injury to the flower buds, all on one page. Picture Table of Fruit Freeze Damage Thresholds includes the same information and includes pictures. This table is three pages long.
Unfortunately, spring freezes are almost a certainty. Fruit growers need to constantly assess the stage of development of their crops and the susceptibility to freeze injury. During this unusual spell of warm weather, fruit trees will develop quickly and the critical temperature will rise from the teens to the 20s, to levels just **below freezing at bloom time.**

Growers will want to review Jeff Andresen's article on "Monitoring for the risk of frost and freezing temperatures." Given the unusual warm weather this March, we will be posting a lot of weather and freeze related articles at MSU Extension News.
This article was published on MSU Extension News. For more information from MSU Extension, visit http://news.msue.msu.edu. To contact an expert in your area, visit http://expert.msue.msu.edu, or call 888-MSUE4MI (888-678-3464).

USING SPRINKLERS TO PROTECT PLANTS FROM SPRING FREEZES
Irrigation sprinklers can be used to protect plants from freezing when the expected lows are just below freezing. Irrigation when the low is below the temperature you can protect to will result in severe damage.
Published March 19, 2012, MSU-E News - Fruit
Mark Longstroth, Michigan State University Extension

Many Michigan blueberry and strawberry growers use sprinkler systems to protect their crops spring freezes. The system is also used by some apple and grape growers. Sprinklers are very effective under certain circumstances, but can actually increase injury if used at the wrong time. Sprinklers used for irrigation do not protect below 23-24°F. If the system fails due to cold or wind, the blueberries will get much colder than in areas where you are not sprinkling.

When you use sprinklers to prevent freezing injury, you are using the energy that water releases when it freezes, and changes from a liquid to a solid, to keep the temperature in the ice right at the freezing point – 32°F. As long as you keep the ice **wet**, the ice temperature will stay at 32°F. If the ice dries out and water starts to evaporate from the ice, the ice will get colder than the air temperature as it evaporates.

Protection with sprinklers

If you understand that you need to keep the ice wet, and when your system will fail to keep the ice wet, you will understand how to use your sprinklers to prevent freeze injury. The freeze protection from sprinkler systems is limited by the irrigation rate. Most sprinkler systems in Michigan are designed to provide about 0.12 to 0.15 inches of water per hour. This volume protects plants to about 22°F with no wind or 24 to 25°F with a light wind. More water is needed to protect at lower temperatures and higher wind speeds (see Table 1).

Table 1. Irrigation rate (inches/hour) needed to protect fruit buds under different wind and temperature conditions (U of Florida Ext. Circ. 287)

	Wind speed (mph)		
Temp (°F)	**0-1**	**2-4**	**5-8**
27	0.10	0.10	0.10
26	0.10	0.10	0.14
24	0.10	0.16	0.30
22	0.12	0.24	0.50
20	0.16	0.30	0.60
18	0.20	0.40	0.70
15	0.26	0.50	0.90

Most irrigation systems cannot easily be changed to deliver more water and protect to lower temperatures. Increasing the operating pressure is not advisable because the volume is not increased substantially (you need to increase the pressure four times to double the output). Higher pressure can break lines and reduces the uniformity of application. Larger nozzles can be installed in some systems, but only if the capacity of the system, mainlines, well and pump can handle the added volume. For example, 9/64-inch nozzles that deliver 0.12 inches water per hour require 60 gallons per minute per acre of blueberries. Switching to 5/32-inch nozzles would deliver 0.15 inches per hour but requires 68 gallons per minute per acre. Irrigation systems are not designed to apply enough volume to protect from temperatures in the low 20s and teens.

Overhead sprinklers are often used to protect blueberries from freezes at bloom time. Photo credit: Brookside Farms.

Critical temperatures

Growers should only use sprinklers to protect a crop from freezing, when the temperature range for protecting the crop is relatively narrow, from 24 to 32°F. This narrow temperature range is the range that we can protect. If the temperature gets a little colder than predicted, we could cause more damage than if we had not turned on the system. Once we turn on the system, we need to keep it on until the temperatures are above freezing or you will cause a lot of damage as the temperature of the ice goes down colder than outside the irrigated area.
It is because of this narrow margin of error that I recommend that growers only try to protect when the temperature range that will cause damage is well inside the range that we can protect to with an irrigation system.
Do not use sprinklers if you think they might work. If it gets colder than you can protect, you will cause more damage, not reduce damage. I would not turn on the system if the temperature were forecast to fall below 24°F. If windy conditions (more than 10 mph) were forecast, I would not turn on the system at all.

When to turn on the system

Once you decide you are going to turn on the system, you need to decide when to turn it on. At the beginning of the irrigation cycle, the air temperature will fall in the field. This is because the water is evaporating (absorbing heat from the air) and cooling the air. The dryer the air, the greater the temperature fall when you start to irrigate. How dry the air is dictates when you turn the system on. This can be calculated from the dew point, which is measured with a wet bulb thermometer or a sling psychrometer.

Table 2. Starting temperature for overhead sprinkler freeze protection based on the dew point of the air

Dew point	Start irrigation at:
26°F	34°F
25 to 24	35
23 to 22	36
21 to 20	37
19 to 17	38
16 to 15	39

Once you start the system, it is necessary to keep it running until the ice starts to melt on its own. If your system fails and the ice dries out, evaporation from the ice will be an effective refrigeration system that can significantly reduce your crop. As long as water drips from the ice the system is working. If the ice is clear, this indicates the system is working properly and the water is freezing uniformly.

When can I stop irrigating?

Generally, you will need to irrigate until after the sun comes up and begins to warm the ground. Stop irrigating when the ice is melting and temperatures are above freezing and rising. Ice breaking free from branches indicates water is forming under the ice and it is likely safe to quit. Normally this is when temperatures are above freezing and rising. Beware of sudden dips in the temperature soon after sunrise.

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Four Steps to Building or Rebuilding Good Credit Webinar

Participate in the upcoming financial education webinar. Update your knowledge and/or promote it in your communities. The PowerPoint presentation and handouts will be available for your use after the program.
Thursday - March 22, 12:30 p.m. to 1:30 p.m. EDT
Learn a four step process that can be used to build good credit. Register at: http://bit.ly/rWkuhx

WEBSITES OF INTEREST

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60 Hour Forecast
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ACTUAL AND PREDICTED DEGREE-DAY
ACCUMULATIONS SINCE MARCH 1, 2012

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

Last Revised: 3-20-12

Northern Michigan FruitNet 2012
Special Alert
NW Michigan Horticultural Research Center

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

March 21, 2012

SNOW-DAMAGED TREE UPDATE
We have received feedback on March 20th that USDA-Farm Service Agency **has designated** 8 counties (Alcona, Alpena, Antrim, Benzie, Grand Traverse, Leelanau, Manistee, and Montmorency) as natural disaster areas, allowing eligible farmers to qualify for emergency loss loans. Farmers with losses in the 13 contiguous counties will also qualify for this program. Emergency (EM) loan applications will be received through **November 15, 2012** **for physical losses only**. If growers have questions, please call Nikki Rothwell at 231-946-1510.

USE FUNGICIDES FOR APPLE SCAB PROTECTION PRIOR TO ANTICIPATED EARLY INFECTION PERIODS

George Sundin, Dept of Plant Pathology, MSU
Nikki Rothwell, NWMHRC

The sustained heat in Michigan right now is unprecedented and has caught many growers by surprise in terms of how fast apples are developing. With rains predicted for Friday March 23 and for next week, *it is critical that scab-susceptible cultivars are protected from this anticipated early scab infection event*.

In the early season of 2010 (which still wasn't as early as we are now), the scab fungus was a little behind apple trees in development because we had an extended period of snow cover leading into the season that kept the fungus present in overwintering leaves cold. The lack of snow cover this "spring" of 2012 and lack of really cold temperatures during the winter suggests that the scab fungus is ready to go now.

Protecting trees at green tip is an essential first step to preventing an apple scab epidemic. We will likely have a high spore load out there for this upcoming first scab infection period. Although there is not a huge amount of green tissue present, scab infections at green tip can have severe economic consequences. The reason is because scab lesions that are initiated around green tip will usually produce conidia between pink and petal fall, the traditional timing when primary ascospores are in highest numbers. Hence, it will be extremely difficult to control scab under such high inoculum pressure and with the rapid tree growth at the later timings where rapid tree growth results in more unprotected tissue between fungicide applications.

The best fungicides available for scab control at this time of this early season are the broad-spectrum protectants: Captan and the EBDCs. It is likely too late for copper (see previous article). Also, it is too hot for the anilinopyrimidines (Scala and Vangard) that have better efficacy at cooler temperatures (low 60s and below). A tank mix of Captan (3 lb/A Captan 50W) and EBDC (3 lb) is an excellent scab control combination. This combination takes advantage of the efficacy of both materials and the superior retention and redistribution of the EBDCs. Be careful with Captan however, as use of Captan with oils or with some foliar fertilizers can lead to phytotoxicity.

We are hearing a lot of concern (fully warranted) about the prospect of a crop for 2012. We can't predict the weather ….. but controlling scab early is critical. If we let scab take hold early, and we have a crop, the fungus will get the crop later. Scab is one factor we *can* control in this early season – let's do it!

Early Apple Scab Applications—Vital for Season-long Control
N.L. Rothwell and E.M. Lizotte, NWMHRC

Despite that the calendar says 21 March, Michigan has had record high temperatures that make it feel like July. These temperatures have caused tree development to move along extremely quickly, and apple tree development is of utmost concern for growers with the forecasted rain in the coming days. Apples are between ¼-½" green in the region, and at this time, a copper application for scab control is likely too late for most orchards in the region. We recommend that high rates of copper can be applied just prior to the trees breaking dormancy or up to about 0.5-inch green tip. Depending on the orchard location, many blocks are beyond that stage of development. Additionally, tree growth is so rapid, and we have seen trees 'jump' from one developmental stage to the next in 24H. Growers should be hesitant to apply a copper application even if their current development stage is within recommendation parameters because of this day and nighttime heat, trees could move beyond that stage within a short amount of time.
At this time, growers should move away from copper to minimize the risk of fruit russet and apply a tank mix of a half rate of Captan (3lb Captan 50) and half rate of EBDC (half of the full rate: 3lb). We are recommending that both products be used in this application because the apple scab fungus has been exposed to these high temperatures with the lack of snow cover and are rapidly maturing. We predict that this rainfall will result in a high level of spore discharge, and growers

should be sure to be covered up going into this rain event to prevent the fungus from infecting green tissue. If a scab infection begins now, so early into the year, growers may be challenged to keep fruit clean later in the season. EBDCs (Dithane, Penncozeb, Manzate, Polyram) and Captan fungicides are referred to as "contact" or protectant fungicides and will provide a surface barrier on leaves and to kill the overwintering spores and provides five to seven days of protectant activity. Combinations of Dithane, Penncozeb, or Manzate with Captan are especially effective because they combine the retention properties of Mancozeb with the redistribution properties of Captan. Growers should remember that Captan is not compatible with oil.

Weather and Crop Protection Meeting Cancelled

Due to the weather and the onset of the early season, we are cancelling the Weather and Crop Protection meeting on **Friday, March 23rd.** We are sorry for the inconvenience, but we hope that growers can use this time to get a jump on the season.

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March 22, 2012

Dear FruitNet Subscribers:

Yesterday it was decided to cancel the Weather Workshop to be held March 23 due to the weather and growers busy schedules; however, the guest speakers decided this afternoon to still travel north and have an informal roundtable discussion tomorrow from **9:00-11:00**. Topics they may address include "What are the effects of sunlight, temperature, and humidity on crop management practices? What pathogens actually do poorly under rainy conditions? Are fast or slow drying conditions best for a particular agrochemical and why? If the discussion fits in your busy schedule, feel free to come on over to the NW Station.

MANAGING ORCHARD NUTRITION DURING THE EARLY SPRING
Eric Hanson, MSU Department of Horticulture
Amy Irish-Brown, MSU Extension Educator
Bill Shane, MSU Extension Educator

Early spring growth this year raises several questions about nutrient management in orchards. First, when should spring nitrogen (N) fertilizers be applied? Typically, N is applied either in a single application as growth begins in the spring, or a split application where half is applied when growth begins and half is applied in June after the crops size is known. The second half of the split can be reduced or skipped if cropping is low due to poor return bloom or set, or frost damage. Split applications will be very useful this spring because we are heading into a prolonged period of high risk of frost damage. Apply 30-50% of your typical seasonal rate in the next few weeks, then wait a month or so until the risk of frost is diminished. If the crop level is good, consider applying the rest of your N.

A second question is whether nutrition can improve the frost tolerance of fruit trees. There are no hard and fast recommendations, but there are some interesting observations. Foliar sprays of urea may enhance frost tolerance. Some work in Israel indicated that peach branches sprayed with low biuret urea (10 % w/v) three days before freezes sustained less injury to flowers than non-sprayed branches. Foliar urea sprays (2 %) also reduced freeze injury to avocado leaves. These plants were not deficient in N, so urea did not seem to correct an inherent N shortage. How urea promoted cold tolerance is not clear. We could not find any other instances where spring sprays of N or other nutrients enhanced the tolerance of temperate fruit crops to frost.

A related but different effect was observed in New York studies in the 1990's. Pre-bloom sprays of boron, zinc, and urea were applied to Empire and McIntosh apple trees that were injured by mid-winter cold. These nutrient sprays often increase cropping, and the authors thought sprays may have supplied needed nutrients to the flowers that were not able to obtain enough naturally due to cold injury. These treatments helped cold injured trees rather than protected trees from cold injury. Whether sprays applied prior to spring frost injury would result in similar effects is an open question. Growers interested in testing foliar nutrient sprays should make sure they leave appropriate untreated check trees so they learn from their efforts.

In summary, be conservative in N rates this spring, as the risk of losing fruit to spring freezes is high. You can always apply more N, but you can't take away what is already down. Spring nutrient treatments are unlikely to affect frost tolerance if trees have been adequately fertilized to this point. Apogee growth regulator treatments can be used post bloom to tame apple and pear trees with excess vigor, but this is an expensive option.

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March 27, 2012

GROWING DEGREE DAY ACCUMULATIONS through March 26th at the NWMHRC

Year	2012	2011	2010	2009	2008	2007	22 yr. Avg.
GDD42	270	16	68	45	10	68	33.1
GDD50	158	2	15	11	0	2	9.5

Growth Stages at NWMHRS (3/26/12, 9:00 a.m.)

Apple: Red Delicious – Early tight cluster
Gala – Early tight cluster
Yellow Delicious – ½" green
Pear: Bartlett: Green cluster
Sweet Cherry: Hedelfingen: White bud
Napoleon: First bloom
Gold: Early white bud
Tart Cherry: Bud burst
Balaton: Late bud burst
Apricot: Early petal fall
Grapes: 30% scale crack

Weather and Crop Report

The unseasonably warm temperatures have pushed the northwest region of Michigan ahead of our five-year average by 5 to 5 ½ weeks. We had seven days of daytime temperatures in the mid-70s to the mid-80s, and nighttime temperatures remained high in the 60s and 70s last week. These warm conditions were followed by a rain event on Thursday night and into Friday, 23 March where the region received ~0.4" of rain. Many growers were out spraying to cover for apple scab prior to this rain event.

Over the weekend, temperatures fell, and overnight temperatures on Monday were nerve-wracking as the thermometers read as low as 23.1F. These cold temperatures lasted the duration of the evening (6+ hours) and were coupled with high to moderate winds. As our fruit crops are all at different stages across the region, we are examining fruit buds for damage at this time. At the NWMRHC, we have observed little damage in sweet cherries, and we have variable damage reports for tart cherries depending on the stage of development. Thankfully, temperatures did not fall as low as the forecast predicted for Monday, March 26th into the 27th—temperatures hovered around 30-31F, well above the low 20s that were forecasted. At this time, we have accumulated 269.7GDD base 42 and 157.7GDD base 50. These degree day accumulations are typical in the first week of May.

Growers are extremely busy due to the early season. They are trying to finish up their pruning for the season and are pushing brush to be able to get sprayers into blocks. Northwest Michigan had a wet heavy snow storm on the weekend of 3 March, and many growers are cleaning up the damage in Montmorency orchards; estimated losses are from 10-20%.

Pest Report

Cherry
As we head into bloom in sweet cherry, growers are considering the pros and cons of treating for **American brown rot** with cool temperatures and the risk of crop damage from the overnight cold temperatures. Rovral is recommended for the spring, blossom-blight brown rot application to help limit the number of sterol inhibitor (SI) sprays used in a season in order to better manage against resistance development. Even though Indar has a 24(c) label for the 2012 season, the seasonal limit is still 48oz, and if the season is warm and wet, growers may be challenged to control ABR with the limited amount of Indar. Rovral is an excellent material for ABR blossom blight and cannot be used past petal fall, so these early spring timings are optimal. Regardless of the crop load, growers should plan to manage for cherry leaf spot and powdery mildew as green tissue emerges and becomes vulnerable. **Adult green fruit worm** moths were caught in the **American plum**

borer traps, growers typically target green fruit worm larvae control at shucksplit; eggs and larvae will develop more slowly with the cool temperatures. The unusual weather patterns we are experiencing this year make comprehensive scouting even more critical.

Apple
Friday and Saturday's rain triggered an **apple scab** infection with many growers going into the event with green tissue covered. With the upcoming rains in the forecast, many area growers will likely be applying sprays ahead of the wetting event. During the 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 controlled *at all* by this class of fungicides. Furthermore, increasing the rate of a strobilurin will not increase effectiveness – this is an all or nothing type of resistance. EBDCs tank mixed with captan is the recommended scab application at this time during the season. EBDCs and Captan are both excellent scab protectants, and provide five to six days of protectant activity when used at full rates. Growers should remember that spray intervals should be tighter when relying on these materials. Regardless of crop load, growers should carefully consider their scab management program as inoculum can build quickly over a season and make control difficult in subsequent seasons. An average of 4 **oriental fruit moth** were also trapped at the Station.

HOW TO ASSESS BUD DAMAGE ON YOUR FARM
Erin Lizotte, NWMHRC

With the recent weather many growers are rightfully concerned about the crop. Growers can survey for damage in their own orchards by collecting and dissecting blossom buds. For each ten acre block growers should cut and collect 30 branches. Be sure to collect branches from the lower, middle and upper canopy as well as from trees on the edge and interior of blocks to ensure a good representation of the variability in the orchard. If the block is located on a slope, make sure to collect samples from all elevations. Open all the buds on each branch, and inspect the pistils inside. If the pistil is black, the flower has been killed and will not produce a cherry (see picture below). Keep track of how many buds you check and how many are dead—this will give you a ratio or percentage of dead buds.

Flower bud with three dead flowers showing brown pistil, one lower flower is viable.

USING COVER CROPS TO DECREASE IRRIGATION COSTS
Traditionally cover crops were added to a farms rotation for soil building and erosion control. With the ever increasing cost of production and demand for higher crop productivity more attention is being given to value added qualities of cover crops.
Published March 27, 2012, MSU-E News - Fruit
Christina Curell, Michigan State University Extension

Irrigation is a costly practice many farms use out of necessity. The demand for higher yielding acres has made irrigation inevitable. The cost in some cases has put a strain on the profitability of farms. If used in rotation, cover crops can offset some of those costs.

A typical irrigation system pumps 400-1200 gallons per minute at 0.25 inches per hour, five gallons per minute per acre of irrigation. The cost of irrigation annually varies depending on many factors ranging from $15,000-$50,000, according to Lyndon Kelley, Michigan State University and Purdue University Extension educator. System efficiency and environmental factors can decrease or increase irrigation costs. Cover crops especially ones that produce large amounts of biomass can increase soil organic matter. Soil organic matter acts like a sponge by absorbing and holding water. So the question is, how much water holding capacity can we rely on by increasing soil organic matter?

The United States of Agriculture, Natural Resources Conservation Service estimates that on average bare soil can hold 1.7 inches of water. Fields that has a continuous cover, such as a pasture situation, on average has a water holding capacity of 4.2-4.5 inches. If we could raise our soil organic matter by 1%, we have the potential of raising our water holding capacity by 1 acre inch according to Jim Hooreman, Ohio State University Extension water quality and cover crop educator. That equates to 27,154 gallons of water that plants can use that is stored in soil. Hooreman also states that every pound of soil organic matter holds 18-20 pounds of water. If we were to pencil out the economics, that would be $12.00 which could add up to real savings in the fall.

For more information on cover crops and how to integrate them into your rotation contact Paul Gross or Christina Curell. For information about irrigation, contact Lyndon Kelley, Lyndon Kelley or Christina Curell. For questions in regards to irrigation costs, you can visit Lyndon Kelley's website.

This article was published on MSU Extension News. For more information from MSU Extension, visit http://news.msue.msu.edu. To contact an expert in your area, visit http://expert.msue.msu.edu, or call 888-MSUE4MI (888-678-3464).

Tax planning for 2012 more important than ever
By Dennis Stein, Michigan State University Extension
Mar. 19, 2012
Tax planning is one of the most important management tasks a farm can undertake because a good plan can help a farm avoid swings in farm income.

Major changes could take place in some of the tax options that farms use to manage their farm business taxes.

One of the first items farms need to be aware of is the scheduled decrease in the Section 179 — Direct Expense option

which, over the past few years, has been a major part of farm tax management.

In 2011 the individual farm Section 179 deduction was $500,000. For 2012, the deduction is $139,000, which is a major decrease.
Additionally in 2011, farms were able to take a 100 percent bonus depreciation deduction on all qualified new capital purchases which will be reduced to 50 percent for 2012. These two changes may have a huge impact on a farm's tax planning options unless congress takes action to change these reductions.

Tax planning is one of the most important management tasks a farm can undertake because a good plan can help a farm avoid swings in farm income.

The last two year's tax planning options are now set at much lower levels for 2012. This will require farm managers to implement a tax management plan for the entire year.

A farm should develop an estimated cash-flow budget for the year and an estimate of the expected profit as the basis for this year's tax plan. The cash-flow plan can also be the basis for the developing the farm's marketing strategies for the remainder of the 2011 crop in inventory and the template to determine commodity target prices for the sale of 2012 production.

Taking time to monitor your farm's financial situation can provide valuable information and allow the farm to reduce some of its continued risks.
Putting together an annual budget can help with management of the monthly cash flow needs and help project when additional funds will be needed.

Having an estimate of cash needs can put some incentives in your farm's marketing plan which is another important part of the farm management system.

Many farms put together annual budgets for their lender to help them see how the farm will be able to generate income necessary to service debt payments.

You can find a variety of information and user-friendly commodity cost of production templates at Dennis Stein's web page. These templates can be downloaded as tools in helping with the budget building and tax management plan.
We have seen in the past when farms have a good financial plan they are in a better position to take advantage of opportunities. If a farm can link a good financial plan with marketing and tax management they are moving toward improved risk management and peace of mind."

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