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July 3, 2012

GROWING DEGREE DAY ACCUMULATIONS through July 2nd at the NWMHRC

Year	2012	2011	2010	2009	2008	2007	22 yr. Avg.
GDD42	1798	1261	1634	1248	1272	1602	1380.4
GDD50	1119	732	964	697	728	916	817.6

Growth Stages at NWMHRC (July 2, 1:00 p.m.)

Apple: Red Delicious – 42 mm fruit

Gala – 42 mm fruit

Yellow Delicious – 44 mm fruit

Pear: Bartlett: 32 mm fruit

Tart Cherry : 22 mm fruit

Balaton: 22 mm fruit

Grapes: Buck shot berries

Weather Report

Recent temperatures in northwest Michigan have been on the high side for the region, particularly in late June. We recorded daytime temperatures from Wednesday through Sunday in the mid-80s and overnight temperatures in the mid-60s. On Monday, temperatures reached into the nineties and are expected to do so throughout the week. Thus far this season, we have accumulated 1798 GDD base 42 and 1119 GDD base 50. These accumulations are higher than our averages: 1380 GDD base 42 and 817.6 GDD base 50. Thunderstorms rolled through the region early on Tuesday (July 3) morning, and the NWMHRS received 0.37" of rainfall. This rain was welcomed due to the dry conditions, but we are still waiting to see if the precipitation caused cracking in ripening sweet cherries.

Crop Report

Sweet cherry harvest has begun across the region. Growers are concentrating on removing briners at this time, and canners are expected to come off over the weekend and into next week. Quality of fruit is variable as some growers have reported cracking and **American brown rot** (ABR) has invaded those cracks. **Bacterial canker** on fruit has also been problematic with the cool wet spring, and those fruits are also susceptible to ABR. Birds have been an issue in area orchards, and there are reports of major flocks of seagulls, crows, and cedar waxwings in sweet cherry blocks. The tart cherry crop is extremely small, but a few growers are anticipating shaking isolated orchards or areas within orchards; however, we will actually harvest a minute portion of a typical yield for northwest Michigan. The apple crop continues to look good, and some growers are reported 40% of a normal crop. Apples are sizing well, and growers are finding more apples in the orchards than originally estimated—most likely because apples are more visible with size. Red raspberry harvest has begun in early varieties.

Pest Report

Cherry

Cherry leaf spot (CLS) is not hard to find in any orchard, and some orchards have better CLS control than others—we are in the process of trying to understand the different levels of control. We are seeing a second wave of CLS on new growth in regional orchards, and there are many questions about efficacy of our fungicides at this time. There are many inconsistencies with control and use of particular products, and we will need to evaluate different orchard situations to determine the causes of reduced control this season. Dr. George Sundin was here on Friday (June 29), and we are working diligently to uncover why we are seeing discrepancies and lack of control in blocks with seemingly good timing and coverage. We welcome input as we tackle this difficult issue.

Again, we encourage growers to continue to scout the orchard as a CLS infection in early July can result in early defoliation, and set trees up for damage as we head into winter. We are recommending that growers use full covers if their CLS infection is high or if they have already lost lots of leaves this season. Again, a reminder to growers that we still have a long season to go as it is only early July, and we need to keep the new foliage covered as we head into July and August.

Powdery mildew is evident in most tart cherry orchards, and once the white mycelium is on the leaf, control options will only further protect new foliage; we do not have any products that will eradicate powdery mildew.

As we are now harvesting sweet cherries across the region, **American brown rot** is the disease to watch. This Monday's rain event followed by temperatures into the 90s will be the perfect conditions for the ABR pathogen's growth. We also have fruit in orchards with old bacterial canker infections, cracks as a result of past rain (and potentially the Monday rain), and lots of bird pecks; these fruits are all very susceptible to ABR and should be protected or harvested as soon as possible. Growers should be cognizant of PHIs at this time, but if ABR is detected, they should move to an every row spray regime for fungicide applications, particularly if the trees are large. Growers should also slow down the tractor speed to obtain adequate coverage. Efforts should be made to apply fungicide applications with ample water to ensure that the entire tree is properly covered. Controlling obliquebanded leafroller (OBLR) is also of utmost importance as we approach harvest as these larvae web cherry clusters together and prevent fungicide penetration inside the cluster. If growers know that they have had a problem in the past with OBLR and did not control them at the overwintering generation timing, they will decidedly need to apply an insecticide for the summer generation as these insects could ultimately impact ABR control at or near harvest. The SIs remain the optimal choice for ABR control, and Indar has routinely provided the best control of that class of chemistries.

Obliquebanded leaf roller (OBLR) trap counts are up this week with an average of 28 moths per trap. Scouts have reported trap counts into the 60s in sweet cherry blocks at this time. These insects are mating, and females are laying eggs at this time. Depending on when certain blocks of sweet (and tart) cherries will be harvested, OBLR larvae could be present at the time of harvest. In the past three years, this insect has become a contaminant pest in tanks of harvested fruit. To ensure these insects are not in the tank at harvest, growers will need to apply an effective material that specifically targets Lepidoptera. Additionally, growers will need to be aware of the pre-harvest intervals (PHIs) as they approach the harvest window. We have three new Lepidopteran materials that work well against OBLR: Delegate (7D PHI), Belt (7D PHI), and Altacor (10D PHI), and all three materials provide excellent control of OBLR. Bts, such as Entrust, will work against OBLR but should not be used at this time as they are slower acting than the other materials and we need a fast kill if the block will be harvested in the next week. Sevin and the pyrethroids have a three-day PHI, but older data tell us that these chemistries will not be effective due to cross resistance with the OP's.

We have also caught **cherry fruit flies** (CFF) again this week, and we expect more emergence with the recent rains. Growers should be applying an insecticide to control CFF as we head into the harvest season to prevent larvae in the fruit at harvest. As each CFF population is unique to individual farms, growers should be monitoring for these insects with a yellow sticky trap baited with ammonium acetate. Neonicotinoids, such as Provado or the generics, are rated as good against CFF, but only last for ~7 days in the orchard. In a few blocks, we have seen sap beetle numbers on the rise when neonicotinoids are used—growers should keep an eye out for **sap beetles** and make insecticide decisions for CFF based on sap beetle infestation. If the harvest window is stretched, Provado or the generics will need to be re-applied to reduce the potential for fruit infestation. Organophosphates (Guthion and Imidan) last longer but Guthion's PHI is 15D and Imidan's PHI is 7D. Imidan cannot be used in sweet cherry.

Again, **sap beetles** have been found in ripening sweet cherries. These insects overwinter as adults in protected places such as decaying vegetation, debris or fruit buried in the ground. In the spring, adults come out of hibernation and mate. Egg-laying begins in May and June, and females lay near decomposing plant material. Larvae develop in food material in contact with the soil, and full-grown larvae leave their food when mature, wander through the soil and molt into the pupal stage. Adults emerge in June and July, and there is usually only one generation per year. Growers should be on the lookout for sap beetles in fruit that is ripening or damaged as they are attracted to ripe or overly ripe fruit. Control of these insects will likely be difficult as the adult beetles burrow into fruit to feed. Additionally, we are at or approaching harvest, so growers will need to pay special attention to the PHI's of the materials. Pyrethroids have good knockdown and short PHI's, Sevin and malathion also have 3-day PHI's. Danitol has been reported to be effective against sap beetles by area scouts.

We caught an average of 24 **lesser peachtree borers** this week and an average of 9 **peachtree borers**. **American plum borer** second flight has started again, and we caught an average of 7 moths in the traps this week. Borers still need to be controlled even if there is no fruit in a block.

Apple

At this time, Enviroweather is not predicting a scab infection because the wetting period is ongoing. But based on the temperatures and precipitation, it is highly probable but we will not know if the infection was medium or heavy until the wetting event is over. If growers were not able to control scab in this primary season, they need to keep fruit protected from this pathogen as we move through the season. Growers should also note that strobilurin resistance has been confirmed in all major apple growing regions of the state and the mutation confers complete resistance—fungicides containing strobilurin will not work against apple scab and increasing the rate of a strobilurin is not an effective option. **Powdery mildew** (PM) is evident in area orchards, and other areas of the state are reporting severe PM infections. Once the white mycelium is on the leaf, control options will only further protect new foliage; we do not have any products that will eradicate powdery mildew.

Unfortunately, **fireblight** strikes are evident in all blocks across the region. We hypothesize that these infections were the result of tag bloom or the long lasting bloom in apples coupled with the right weather conditions. We are currently testing for streptomycin resistance in the fireblight bacteria in all counties in northwest Michigan.

Codling moth (CM) trap counts are still on the low side here at the NWMHRC, and we suspect that is due to the few apples we have on the station property. However, scouts are reporting very high trap counts in commercial blocks in northwest Michigan. We recommend that growers be monitoring for this pest in their own orchards as there is variability in the pest population from block to block; the degree day accumulation is HIGHLY dependent on the biofix date (the first date of sustained codling moth trap catch) for each apple block. Growers should track the progress on their farms using the Enviroweather codling moth model and on-farm trap catch data.

Obliquebanded leafroller numbers remain constant in apple, and again this week, we caught an average of 15 moths per trap. The summer generation larvae will begin showing up in regional orchards in the coming weeks, and fruit should remain protected from these hatching larvae. OBLR will feed on the developing fruit, and many fruits are large enough to remain on the tree despite this feeding, but the fruit will not be marketable. Unlike cherry, this pest in apple feed on the fruit, which makes control paramount for the remainder of the season.

MANAGING SPOTTED WING DROSOPHILIA UPDATE

Trapping, fruit sampling and fruit protection methods can help manage spotted wing Drosophila.

Posted on **July 2, 2012, MSU-E**, by **Rufus Isaacs**, Keith Mason, Steve Van Timmeren, and John Wise, Michigan State University Extension, Department of Entomology

Many berry growers are aware that we have seen an earlier arrival of [spotted wing Drosophila](#) (SWD) during this scorching summer. As of July 2, 2012, these detections have been in Berrien, Van Buren, Allegan, Ottawa and Muskegon counties. Detections in these counties likely reflect the higher density of our monitoring traps in this region of the state, and we advise growers of susceptible fruit in all Michigan counties to initiate active monitoring for this pest. SWD have been trapped in raspberry, strawberry, blackberry and blueberry plantings. This update provides information on monitoring, fruit sampling and fruit protection to help growers meet quality standards for their crops.

The first detections of SWD have been getting earlier in the past three years: Sept 23 in 2010, then July 3 in 2011 and May 29 this year (2012). The earlier activity here in Michigan and elsewhere may reflect better survival through the recent, mild winter. This is the second season that growers have needed to manage for this pest during the harvest season, but with detections coming a month earlier, there is more of the harvest period that overlaps with this pest's activity.

There are some important insights into this pest that we have learned in the past few years of research, and some new results that can help growers optimize their management for this pest. Much of this information is posted at the [MSU IPM Spotted Wing Drosophila website](#) and berry growers can check for more details at the [management guides](#) posted there.

SWD trapping update

For the second year in a row, the traps baited with a yeast-sugar mix (1 Tbsp. active dry yeast: 4 Tbsp. sugar: 12 oz water) are outperforming those with apple cider vinegar, by a long way. This pattern is being seen in both raspberry and blueberry fields. For example, from 73 traps of each of these two baits deployed across four blueberry farms, we have trapped 390 SWD in the yeast-baited traps this season so far, but only seven in the apple cider vinegar baited traps. Most of these SWD have been trapped in the liquid, so this is drained across a mesh surface before sorting to look for SWD flies. At least 80 percent of the SWD found in these traps have been females, which do not have the distinctive wing spots that males possess. To identify the females, you must look for the long, dark ovipositor and this will take a microscope or 30x hand lens. For more on identification of SWD, we have developed a [pictorial guide](#) posted at our [SWD website](#).



Yeast-baited traps are catching more SWD than those baited with apple cider vinegar.

Whichever bait is used in the traps should be checked and changed weekly at a minimum. We have found declining activity of both apple cider vinegar and the yeast mix baits after one week. The attractive radius of a trap for SWD is also expected to be quite small, so different fields that might be ripening at different times should each be monitored if growers want to know when SWD activity starts in each field.

Sampling for SWD in berries

Sampling for SWD in berries can help inform management decisions by providing indication of infestation and an assessment of how well a spray program is working. Now that berries are ripening, weekly samples can be taken to look for the number of SWD larvae. These are small (2 to 4 mm long) and require a boil test or salt solution test to detect them. To do the boil test, simply cover a sample of berries with water just to the top of the fruit then boil them in a microwave for a minute. Pour the sample through a 0.25-inch hardware cloth onto a tray, mash the berries with the back of a spoon and look for the larvae in the liquid in the tray. Alternatively, berries can be collected and placed in a Ziploc bag, mixed with a salt solution (quarter cup salt per quart of water = a cup per gallon) and left to sit for 30 minutes or more. These can then be assessed for larvae. Watch a [video of the salt bag method](#).

SWD control

Summer and fall ripening berries must be protected from first color until harvest if SWD is active in your farm. The most effective SWD materials are the organophosphates Imidan and malathion; the synthetic pyrethroids Asana, Brigade, Bifenture, Danitol and Mustang Max; the carbamate Lannate; and the spinosad insecticides Entrust and Delegate. Neonicotinoid insecticides such as Actara, Assail or Provado are not effective against SWD and should not be used for this pest.

Due to the zero tolerance for fruit infestation in the food industry and the increasing captures of SWD being detected in monitoring traps, if ripe fruit are present and SWD is active in your immediate area, we recommend fruit protection at this time. Maintaining fruit protection will require reapplication based on the product used previously and its expected longevity, the weather conditions and the harvest schedule. Refer to the table below for guidance on residue effectiveness in blueberries **under dry, normal conditions**.

Insecticides for SWD control in blueberries

Class	Trade name	Active ingredient	PHI (days)	Days of activity#
Organophosphate	Malathion*	malathion*	1*	5-7*
	Imidan	phosmet	3	7
Pyrethroid**	Mustang Max	zeta-cypermethrin	1	7

	Danitol	fenpropathrin	3	7
	Asana	esfenvalerate	14	7
	Brigade/Bifenture	bifenthrin	1	7
	Hero	bifenthrin+zeta cypermethrin	1	7
Carbamate	Lannate	methomyl	3	3-5
Spinosyn	Delegate	spinetoram	3	7
	Entrust (organic)	spinosad	3	3-5
Pyrethrum	Pyganic (organic)	pyrethrum	0.5	2-3

*** The new label for Malathion 8F allows only 1.25 pints per acre and this rate has not been tested in efficacy trials. A maximum of three applications are allowed per season. Also, check the label for your specific Malathion formulation for the correct PHI. Most are one day, but some may allow 0.5 day PHI.**

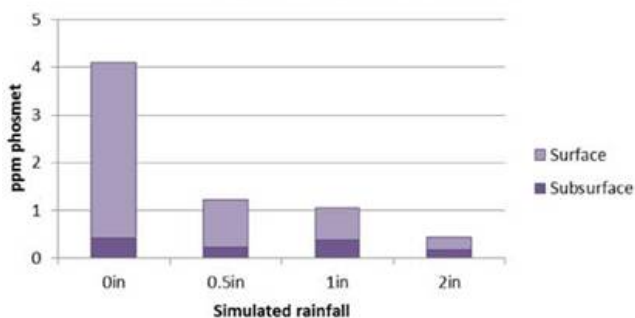
**** Residual control will be reduced during hot sunny weather.**

Estimated residual activity from experience with other insect pests in Michigan and from SWD studies in Oregon.

However, this summer is far from normal. Hot, sunny weather and rain can both reduce the longevity of pesticides, so it is important to consider how the current or future environmental conditions will affect spray intervals. With the continued 90 degree Fahrenheit heat we are experiencing, the residual control of pyrethroids is expected to be shortened, whereas the organophosphates are less susceptible to this effect.

Relative rainfastness of Imidan and Mustang Max residues on blueberries

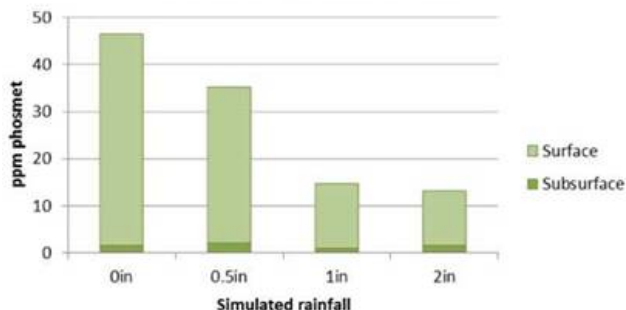
Imidan - Fruit Residues



Although we have had too little rain this summer, it is also worth reviewing recent studies on the wash-off potential for pyrethroid and organophosphate (OP) insecticides on blueberries. This varies according to tissue type (fruit or leaf) and the amount of simulated rainfall applied to the fruit. OPs formulated as wettable powders are highly susceptible to wash-off following precipitation, with residue losses on fruit up to 75 percent following 0.5 inch of rainfall, and similar losses on leaf tissue after 1 inch of rain. Synthetic pyrethroids, like Mustang Max, adhere well to the waxy surfaces of blueberries. Although less persistent than OPs, they

tend to be more resistant to wash-off with residue losses on fruit up to 60 percent following 2 inches of rainfall, but relatively little negative impact on fruit and leaves when rainfall levels are less. A rainfall decision chart has been developed in the E-154 [Michigan Fruit Management Guide](#) published for 2012 by [MSU Extension](#).

Imidan - Leaf Residues



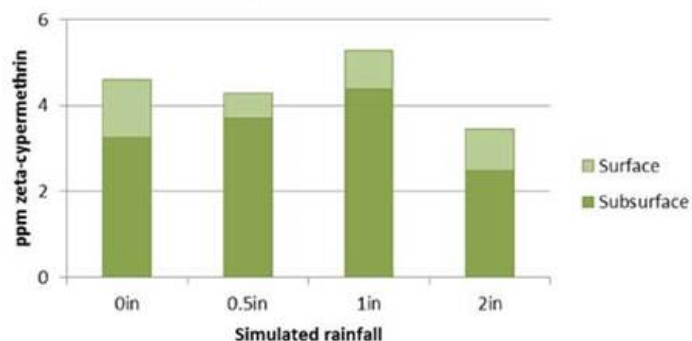
Overall, the pattern is for greater rainfastness of pyrethroid insecticides and greater "sun-fastness" of organophosphate insecticides. This information can help guide selection of sprays to protect fruit based on the predicted weather conditions.

Related MSU Extension News article: [Spotted wing Drosophila: Training is essential for management and control](#)

[Drs. Isaacs' and Wise's work is funded in part by MSU's AgBioResearch.](#)

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

Mustang Max - Leaf residues



SPOTTED WING DROSOPHILA NUMBERS BUILDING RAPIDLY IN SW MICHIGAN

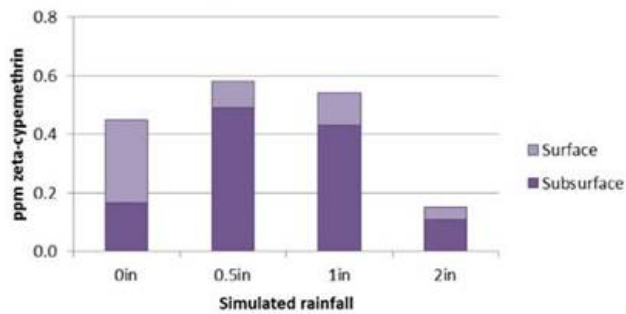
[An unpleasant surprise is building for Michigan small fruit growers as spotted wing Drosophila trap counts are increasing.](#)

Posted on **July 1, 2012, MSU-E**, by **Mark Longstroth**, Michigan State University Extension

I have received a couple of phone calls and texts indicating that people who are trapping for [spotted wing Drosophila](#) are catching increased numbers and at new sites. [MSU Department of Entomology's Rufus Isaacs'](#) crew is finding females in yeast baited traps in most of their trapping locations in Van Buren and Berrien counties. These

flies are already being caught in increasing numbers in Allegan and Ottawa counties. This indicates to me that this pest is

Mustang Max - Fruit Residues



generation time is two to three weeks. This pest has the ability to emerge and infest all the ripen fruit in a field in a few weeks.

For more information, see the [Blueberry Insect Scouting Report for June 18-24, 2012](#).

See the [MSU IPM Spotted Wing Drosophila](#) page for more information. [Recommendations for control in Michigan blueberries](#) was one of the handouts at the preharvest blueberry meetings in Van Buren and Ottawa counties.

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

BEND BRANCHES NOW TO ENCOURAGE FLOWER BUD INITIATION IN HIGH DENSITY APPLE ORCHARDS

The window of opportunity to influence flowering and reproductive capability for the 2013 season of branches in apples is upon us.

Posted on **June 26, 2012**, **MSU-E News**, by **Ron Perry**, and Phil Schwallier, Michigan State University Extension, Department of Horticulture

From the longest day of the year (June 22) to July 15-20, bending of new branches below the horizontal can begin the slow process of changing the tenor of branches from maintaining a vigorous, vegetative state, to slowing growth down and changing the buds to becoming more fruitful.



Goldrush apple branches bent using UV light-resistant rubber bands (end of season)

I first learned of this interesting management tool in the 1980s from Jeff DeCoster who was a long-time fruit advisor in Belgium where he helped growers in developing high density apple orchards on dwarfing rootstocks. At that time, he demonstrated the use of modified weighted clothes pins and even cement pieces clung to nails shaped as hooks to hold to branches. He used to say that the bending process during this time of year in our latitude mimicked hanging fruit, which resulted in the same outcome. The physiological process is not clearly understood, but appears to be associated with the changing of hormones along with an accumulation of carbohydrates in branches that are subtended.



Jonagold in second season showing weight of fruit subtending branches

During this period, buds begin to develop in the leaf axils in what is known as flower bud initiation (for acronym-loving folks, "FBI") and continues to develop through the rest of summer, fall and the final flower bud development stage where flower primordia are fully developed. This occurs in the latter part of winter preceding spring and bloom. This is why a heavy crop for many varieties, such as the antique varieties and Goldrush, are so

severely impacted by the current season crop. A heavy crop that taxes the plant of carbohydrates and hormones during summer negatively impacts FBI. The result is alternate bearing. Other stresses can have a similar impact during this period such as drought, severe pest infestation, etc.

The process of bending branches is a must for growers who are training young trees in the high density systems such as the Super Slender Spindle, Tall Spindle and Vertical Axe. The closer the trees are planted, the more severe the bend in the angle of the branches. In the Vertical Axe, the practice is imposed only on the branches above shoulder height. The reasoning in this latter system is that trees are spaced further apart and allowed to develop larger canopies. Several research projects over many years have shown that there is a direct relationship between branch angle and branch vigor. Branches that are more vertical will remain vegetative longer in its life. Branches that are bent below the horizontal and even upside down are slowed dramatically and many buds become reproductive along with formation of more spurs. Apples growing on dwarfing rootstocks respond positively to this process.

Bending branches below horizontal on young, developing Honeycrisp using rubber bands

In our shortened crop year in Michigan in 2012, many growers understandably feel the need to adjust and reduce resources in managing orchards. Some are spraying plant growth inhibitors such as Apogee to slow growth, which, depending on the variety, can be very effective. Unfortunately, while Apogee may slow branch growth development much like subtending branches, it has for most varieties only a weak positive affect FBI.



We have used the UV light-resistant rubber bands for years with good effectiveness without the worry or bother with girdling. The negative is the time it takes to subtend branches and, in many cases, growers have to use two bands – looped within itself to make it long enough to fully extend the branch downwards (expand the hypotenuse on the triangle). Last year, we began using floral wire (18 inches in length) to do the job and found that the 20 gauge wire was best. Ends of the pieces can easily be formed as hooks to catch branches and leaders. Setting these is quick compared to bands, but realize that they must be moved later in the season to avoid branch injury (girdling). The benefit is that the same wire can be moved higher in the canopy after affecting young, succulent branches. After two to three weeks, lignin sets in the branch near the bend and is permanently influenced.

How many branches do growers need to do on a typical young tree? As many as they have time for (typically at least five to seven). Short branches (less than 6 inches) do not need to be bent.

After trees begin fruiting in years two and three and following branch bending, the grower has changed the tree so that it has become more reproductive and calm. The practice can be suspended after about years five to six.

Dr. Perry's work is funded in part by [MSU's AgBioResearch](http://www.msue.msu.edu).

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

PREDICTED 2012 APPLE HARVEST DATES

Phillip Schwallier, District Horticulture Educator

Amy Irish-Brown, District ICM Educator

Clarksville Horticultural Experimentation Station

We have the least confidence in our predicted harvest dates for 2012 more than any other year of previous predictions. The winter was warm and the spring early with full bloom being as much as 5 weeks ahead on normal in the south and 4 weeks ahead on normal in the north. Numerous nights of frost and freeze events killed primary bloom (bloom born of 2 year wood and older) and most of any secondary bloom (bloom born of 1 year old wood) in most of the state, particularly the south half to the state. Some areas however had apples survive these adverse conditions. Frost and freeze events moved in around the bloom period for most of the state and thus most primary bloom were killed. These cold conditions stretched out the bloom period over 2 to 3 weeks. The predicted harvest dates are based on primary full bloom dates and not secondary bloom dates. Fruit of secondary bloom will mature up to 7 days after these dates.

2012 predicted harvest dates (Table 1) are between 14 and 30 days ahead of normal. These predicted harvest dates are for the center or peak harvest of these varieties for CA storage. Since these predicted harvest dates are based on primary bloom, growers with bloom that survived the frost may mature this early, however, most frost surviving fruit is from bloom at least a week later than these dates. Thus, the predicted dates have been adjusted by 7 days later and listed in Table 3 (adjusted 2012 predicted date).

Gala is notorious for ripening early when late summer temperatures are above normal. Light crops will mature a few days earlier. Other varieties are less prone to hot temperatures advancing fall maturity. Still other varieties ripen when cold temperatures occur near harvest time.

The normal harvest dates for other varieties are listed in Table 3 for the Grand Rapids area. This year's 2012 predicted dates and adjusted predicted dates are a rough estimate based on the McIntosh, Jonathan and Red Delicious predicted dates. Other areas of the state should adjust non-predicted varieties based on their own history. Using a 30 days before harvest 2012 predicted harvest date to time applications of ReTain should be adjusted a few days later for fruit from secondary bloom and heavy crop-loads. Light crop-loads, hot summer weather, and fruit from primary bloom should be adjusted earlier.

Table 1. 2012 predicted peak harvest dates

Full bloom date				Predicted harvest date			
Station	McIntosh	Jons	Reds	McIntosh	Jons	Reds	Observer
SWMREC	3/31	4/2	4/3	8/9	8/28	9/4	Shane
Deerfield	4/12	4/15	4/15	8/19	9/13	9/19	Tritten
Romeo	4/17	4/19	4/20	8/23	9/15	9/21	Tritten
Peach Ridge	4/11	4/14	4/15	8/20	9/11	9/20	Schwallier
Hart	4/15	4/18	4/19	8/23	9/18	9/23	Schwallier
NWMHRS	4/25	4/30	5/1	8/30	9/20	9/27	Rothwell

Table 2. 2012 predicted peak harvest dates compared to normal and last year

Days ahead of normal				Days ahead of last year		
Station	McIntosh	Jons	Reds	McIntosh	Jons	Reds
SWMREC	29	24	24	34	29	28
Deerfield	20	8	13	27	16	16
Romeo	21	10	12	25	17	17

Peach Ridge	25	15	14	27	18	16
Ludington	26	15	21	28	16	17
NWMHRS	23	16	20	25	20	19

Table 3. Normal peak harvest dates for varieties for the Grand Rapids area.

Variety	Normal date	2012 predicted date	Adjusted 2012 predicted date
Paulared	8/24	7/29	8/5
Gingergold	8/26	7/31	8/7
Gala	9/10	8/15	8/22
McIntosh	9/15	8/20	8/27
Honeycrisp	9/18	8/23	8/30
Empire	9/22	8/27	9/3
Jonathan	9/28	9/11	9/18
Jonagold	9/28	9/11	9/18
Golden Delicious	10/2	9/15	9/22
Red Delicious	10/5	9/20	9/27
Idared	10/10	9/25	10/2
Rome	10/15	9/30	10/7
Fuji	10/25	10/10	10/17
Braeburn	10/25	10/10	10/17
Goldrush	11/1	10/17	10/24

MID-SEASON GRAPE BERRY MOTH MANAGEMENT FOR 2012

Growers managing vineyards for the 2012 harvest should now consider protecting berries from grape berry moth. The MSU Enviro-weather grape berry moth model can assist with timing of control measures.

Posted on **June 26, 2012, MSU-E News**, by **Rufus Isaacs**, Michigan State University Extension, Department of Entomology

The [MSU Enviro-weather grape berry moth model](#) is predicting the start of the second generation egg laying this week in southwest Michigan. This is based on 810 growing degree days accumulated since the date of wild grape bloom, which was in mid- to late May across the region.

Growers who are managing their vineyards for harvest in 2012 should now consider protecting berries from grape berry moth in vineyards, as the second generation of this pest can infest berries and lead to later cracking and splitting of fruit as the berries start to swell.

If you recorded the date of wild grape bloom, that can now be used to predict the start of second generation egg laying at your location using the [MSU Enviro-weather grape berry moth degree day model](#). To access the model, go to www.enviroweather.msu.edu, pick a station closest to you, select "Fruit" at the top and then select "Grape Berry Moth" under the Grape folder, located on the left-hand side of the screen (see image below).



MSU Enviro-weather grape berry moth model, located on the Fruit section under the Grape folder.

This season provides a good example of why a degree day model might help growers time applications better than a calendar approach. In 2010 the model was predicting the start of this generation in southwest Michigan at 810 degree days on July 14, and we are over two weeks earlier using the model this year.

The predicted start of egg laying is the optimal timing for application of insecticides that are active on eggs and young larvae, such as Intrepid, Altacor and Belt. For these products, excellent cluster coverage is essential, but once it is on the clusters, long residual control of grape berry moth (two to three weeks) and rainfastness are achieved. For products that are broad-spectrum that are best timed for egg hatch, applications should be delayed to be timed 100 degree days after 810, i.e., at 910 degree days from wild grape bloom. For the locations in far southwest Michigan, this is expected to be closer to Independence Day (July 4).

The [MSU Enviro-weather grape berry moth model](#) is a tool to assist with timing of control measures. It is not designed to replace regular vineyard scouting, which can show the exact date of wild grape bloom at your farm. Growers should also be checking

clusters for the level of infestation by grape berry moth through the season, to provide indications of whether it is worth

the expense of a pesticide application.

In our recent research trials, spray programs that timed applications for berry moth control based on the degree day model outperformed those that used a calendar approach. This was the case for broad spectrum insecticides, and even better control was achieved when we tested degree-day timed sprays using some of the new insecticides that are highly active and long-lasting for berry moth control. For example, a program using Intrepid at 8 oz/acre applied at 810 degree days followed by Altacor at 3 oz/acre applied at 1,620 degree days provided similar or slightly better control than a Sevin and Imidan program in the mid- and late season timings. Altacor also has activity against Japanese beetles, making it a useful tool for mid-season control when both pests are present. Belt has a similar mode of action to Altacor and is less expensive, but it is more selective and does not provide the Japanese beetle control. Other pest insects may be important in your vineyards, but if you are focusing on berry moth control, degree day-timed applications of long-lasting and active insecticides applied with excellent coverage provides an effective program to reduce pressure from this pest.

Finally, a word of early warning for growers with vineyards that will be harvested this year. The exceptionally early and warm weather this summer is setting up conditions that will favor a fourth generation of grape berry moth in the late part of the summer. If 1,620 degree days falls before early August (and it looks like it will), this means that the eggs laid around that time will be primed to develop through all the way to moths, rather than stopping at the pupa stage for overwintering. After the recent experience during hot summers (think 2010), we are better able to predict this and will provide some updated warnings as that time of the season approaches.

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

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PLANT, VITICULTURE, AND LANDSCAPE COURSES ENROLLMENT OPEN THROUGH MSU THIS FALL

[Off-campus courses in Applied Plant Science and Viticulture through MSU are available at northwest and southwest Michigan community college locations this fall.](#)

Posted on **June 25, 2012, MSU-E News**, by **Joanne Davidhizar**, Michigan State University Extension, Michigan State University Product Center

[Michigan State University Institute of Agricultural Technology](#) will conduct off-campus as part of the popular certificate program in Applied Plant Science and Viticulture at northwest and southwest Michigan community college locations this fall. The [Institute of Agricultural Technology at MSU](#) (MSU IAT) has been conducting practical plant, animal and technology certificate courses on its East Lansing campus for more than 100 years. Commercial horticulture programs relating to fruit, vegetable, greenhouse production, and ornamentals are attracting students to Lake Michigan College in Benton Harbor, and Northwestern Michigan College in Traverse City. In addition to local access to MSU academic programs serving agriculture, the community college collaboration enables students to obtain an Associate's Degree through supplemental coursework. MSU classes begin Aug. 29, 2012.

Michigan State University Institute of Agricultural Technology off-campus coordinators guide prospective students through the application process, creation of a course of study, and student internship. Act now since MSU IAT application deadlines and procedures differ from those of community colleges.

All MSU IAT courses are taught by Michigan State University approved faculty and staff and credits earned are fully transferable to on-campus bachelor's degree programs.

On-line Viticulture Enology Science Technology Alliance (VESTA) courses operate through a separate registration system and may be found at the [VESTA website](#). The registration deadline is Aug. 15, 2012.

To learn more about VESTA and off-campus MSU IAT Applied Plant Science certificate programs and admission requirements, visit the [MSU IAT website](#), or call 517-355-0190. Lake Michigan College-based Coordinator, Stacey Rocklin, may be reached at 269-927-8100 X 8772 rocklin@msu.edu, and Northern Michigan College-based Coordinator, Andy Norman at 231-995-1719, normanl@msu.edu.

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LOW-INTEREST LOAN PROGRAM OFFERS RELIEF TO MICHIGAN'S FRUIT INDUSTRY

[A new bill creates a partnership between growers, processors, private lenders and the state to support Michigan's fruit industries after this spring's unprecedented loss to fruit crops.](#)

Posted on **June 27, 2012, MSU-E News**, by **Terry McLean**, Michigan State University Extension

What started out with an [amazingly warm stretch of weather in March](#) resulted in significant damage to Michigan's tree and vine fruit crops. Freeze events that occurred in April after the warmest March ever recorded for Michigan caused losses of 80 to 95 percent to Michigan apple, cherry, peach and other tree fruit crops. Blueberries, asparagus and wine grapes suffered 20 to 50 percent damage. For apples, blueberries, grapes, peaches, sweet cherries, tart cherries and asparagus, the estimated loss is 58 percent of the 2006-2010 average, a loss of \$209.8 million.

As a measure of the impact on Michigan's economy, the output of goods and services in Michigan will be expected to decline by about \$503 million compared to 2006-2010 as a result of these crop losses.

House Bill 5717 was introduced on **May 31, 2012** and will provide for a low interest loan program for growers, processors and agribusinesses affected by the freeze events this spring. This bill creates a partnership between growers and processors, private lenders and the state to support our fruit industry following this unprecedented crop loss disaster. This is designed to be a privately administered and funded loan program, to help protect and maintain the infrastructure supporting our unique fruit growing areas in Michigan.

This program utilizes a low interest loan where growers and processors or handlers pay a one percent interest rate; lenders evaluate and take the credit risk, and are compensated partially for their administration costs. The state augments the process by paying lenders a loan origination fee totaling five percent of the original loan amount, paid out over five years.

Because these loans are privately administered, using private funds, the administration costs on behalf of the state are minimized and private loans will not pose a risk of losses to the state. A Federal disaster request has been submitted by Governor Snyder to the United States Department of Agriculture (USDA), but Federal programs can be unpredictable and will not come soon enough to help growers and processors with little or no cash flow this growing season. For a maximum \$15 million investment in natural disaster relief to fruit growers through a low interest loan, the State of Michigan is supporting more than \$500 million in annual economic activity. According to [Derek Bajema](#), legislative liaison of the Michigan Department of Agriculture and Rural Development, the bill will be signed on June 26 and appropriation will follow in the fall.

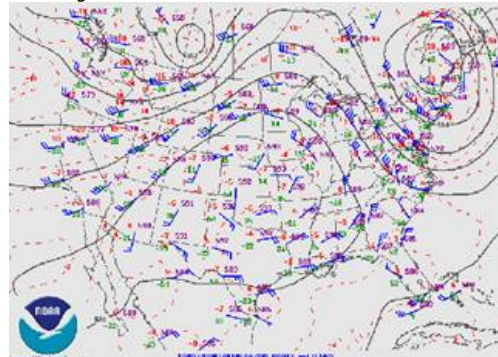
This article was published by [MSU Extension](#). For more information, visit <http://www.msue.msu.edu>. To contact an expert in your area, visit <http://expert.msue.msu.edu>, or call 888-MSUE4MI (888-678-3464).

DRYNESS, DROUGHT INTENSIFY OVER MICHIGAN

No current signs of a break in recent weather patterns means continued warmer and drier than normal weather during the upcoming week.

Posted on **June 28, 2012, MSU-E News**, by **Jeff Andresen**, Michigan State University Extension, Department of Geography

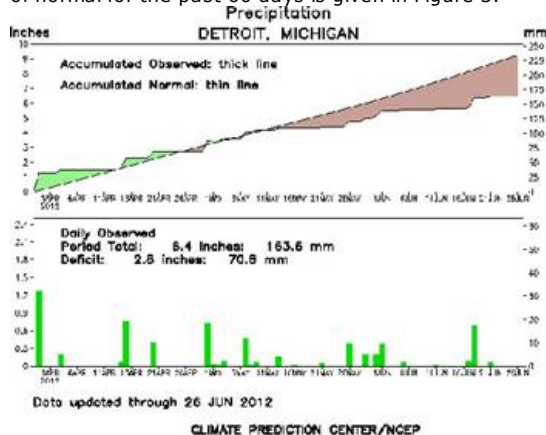
Hot, dry weather covered large portions of the Midwest including Michigan during the past week, resulting in a large, upper air ridge of high pressure across the center of North America (Figure 1). The unusually dry conditions have led to rapidly draining soil moisture reserves and water stress in many unirrigated crops.



[Click here for larger view.](#)

Figure 1. Air flow between 18,000 and 19,000 feet above sea level, June 27, 2012, 8 a.m. EDT. Wind speed and direction are expressed in arrow/vector form at observing sites in blue (direction of arrow indicates direction, length of arrow depicts velocity). Solid, black lines depict general pressure pattern and air flow. The upper air ridging feature is the upside down "U-shaped" pattern over the Midwest region. Figure courtesy of [National Weather Service Storm Prediction Center](#).

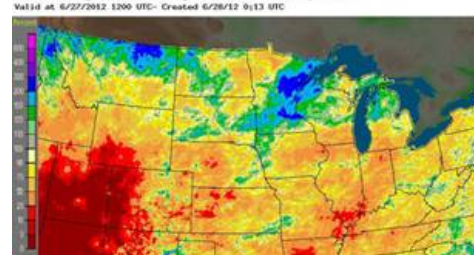
The general upper air pattern responsible has persisted in one form or another across the region since early May. Current rainfall deficits in southern sections of the state are generally in the range of 2 to 5 inches below normal (Figure 2). Normal rainfall for the same time frame ranges from a little more than 5 inches in extreme northeastern sections of the state to more than 7 inches in the south. Rainfall expressed as percentage of normal for the past 60 days is given in Figure 3.



[Click here for larger view.](#)

Figure 2. Daily precipitation totals (bottom) and accumulated precipitation totals (top) at Detroit, March 28 to June 26, 2012. In the top figure, accumulated precipitation surpluses are depicted in green and deficits in brown. Figure courtesy of [National Weather Service Hydrometeorological Prediction Center](#).

[Click here for larger view.](#)



[Click here for larger view.](#)

Figure 3. Accumulated rainfall expressed as percent of normal from April 28 to June 27,

2012. Figure courtesy of [National Weather Service Hydrometeorological Prediction Center](#).

As Figure 3 indicates, Michigan is along the northeastern periphery of a much larger area of abnormally dry conditions stretching across eastern and central sections of the Corn Belt to the lower Mississippi River Valley and westward to the Rockies, where it is a major contributing factor to the extreme fire danger conditions currently being experienced there. In sections of the Ohio Valley, the dryness is as intense as recorded in 1988, the last major, region-wide drought. In contrast, rainfall across northern sections of the Great Lakes and Great Plains regions (including northern Michigan) has been much heavier and more frequent, with some areas reporting more than 200 percent of normal values. Looking ahead, there are currently no signs of a break in the recent pattern. The upper air ridging across central sections of the country is generally expected to persist during the upcoming week, with continued warmer and drier than normal weather a strong bet. With the passage of at least two weak frontal boundaries, there is a chance for some widely scattered showers and thunderstorms (generally 0.25 to 0.50 inches or less) late Saturday and Sunday (June 30-July 1), and again by the middle of next week. But unfortunately, areal coverage of any precipitation will be very limited and most areas will remain dry. Daytime temperatures will generally range from the low and mid-80s north to low 90s south through the upcoming weekend with lows in the 60s to low 70s. Daily reference potential evapotranspiration rates (the amount of evapotranspiration of an unshaded, well-watered, 4-inch grass-covered surface) will generally range from 0.20 to 0.28

inches per day.

Further ahead, medium range forecast guidance is suggesting more of the same pattern during the next one to two weeks, with warmer temperatures forecast across large sections of the central United States including Michigan. Both of the latest [Climate Prediction Center](#) 6-to-10-day and 8-to-14-day outlooks (covering July 3-7 and 5-11) call for above normal mean temperatures and near to below normal precipitation totals. One exception is far northwestern sections of the state, where above normal precipitation totals are possible during the next 6 to 10 days. This pattern highlights the importance of the exact location of the upper air ridge axis during the next couple of weeks. If it remains further east across the Mississippi Valley, warmer and drier than normal is almost guaranteed in Michigan. If it sets up further west across the High Plains or Rockies, Michigan would be more under the influence of northwesterly winds aloft, with relatively cooler temperatures and more frequent chances for precipitation (similar to northern Michigan during the past couple of weeks).

The most recent suite of Climate Prediction Center long lead outlooks for the month of July and the three-month July through September period have been adjusted and now call for increased odds of warmer and drier than normal weather across areas of the central Corn Belt region extending northeastward into southern and western sections of Michigan. These outlooks and changes relative to previous forecasts are based largely on recent medium range forecast guidance and on the climatological tendency of warm season dryness to persist in central sections of the country after large areas have already become abnormally dry (as is the case this year).

Dr. Andreson's work is funded in part by [MSUs AgBioResearch](#).

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HOW WARM AND DRY IS IT, REALLY ?

Use MSU's Enviro-weather tools to quickly compare seasonal heat (degree-day) and moisture (precipitation) accumulations with previous and "normal" years.

Posted on **June 28, 2012, MSU-E News** by **Beth Bishop**, MSU Enviro-weather

Though we can't change the weather, we still want to know where we stand. How does this year's weather compare with previous years? Is it hotter than normal? Is it drier than normal? Is the growing season more advanced than it was this time last year? These questions and more can be quickly answered by using [Enviro-weather's](#) online tools.

We can use a measure of accumulated heat ("degree-days" or "growing degree-days") to answer the questions "are we warmer than normal?" and "is the growing season more advanced?" Temperature drives the growth of most living things (everything except the warm-blooded mammals and birds), and that includes crops, diseases and pests. That is why, in warmer years like 2012, the season comes earlier and crops grow faster and mature quicker. Flowers that usually bloom the first of July may flower in mid-June. The opposite occurs in cooler years, crop growth is delayed and so is pest development. Degree-day accumulation mirrors development of crops and pests.

To see an overview of seasonal degree-day accumulation (base 50) across Michigan, [Enviro-weather](#) provides a "[current degree day maps](#)" tool that is accessible from any station or commodity page (Photo 1).

Degree-day tools

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

Photo 1. Enviro-weather degree-day tools.

This menu can be found on any station or commodity page.

Clicking on the "[current degree day maps](#)" link will show you the current degree-day map that lists the degree-day accumulations (base 50) throughout Michigan. You can choose to change the dates on the pull-down menus above the map and view accumulated degree-days past dates.

If you scroll down from the current degree-day map you will see two more

maps that depict how far ahead or behind "normal" the season is in terms of heat (degree-days). For example, through June 26, 2012, most of Michigan is one to two weeks ahead of "normal" and parts are more than two weeks ahead (Photo 2).

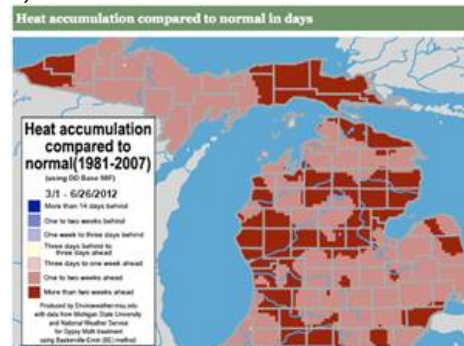


Photo 2. Map of Michigan showing heat accumulation (degree-days base 50)

for March 1 through June 26, 2012, compared with "normal." Number of days

and weeks ahead of or behind normal is shown.

In contrast, on June 26, 2011, the growing season was progressing normally in most of Michigan; some areas in northern Michigan were behind normal (Photo 3).



Photo 3. Map of Michigan showing heat accumulation (degree-days base 50)

for March 1 through June 26, 2011, compared with

"normal." Number of days

and weeks ahead of or behind normal is shown.

Enviro-weather users can choose to view these maps for any date from

2008 to present.

If you'd like to see more details and precipitation information, Enviro-weather has additional tools available. To see a listing

of degree-day accumulations over the past five years at one of the Enviro-weather station locations, select "[Degree-day comparisons: last 5 years at this station](#)" (Photo 1). A table will display the accumulated degree-days from March 1 through the present date for the current year and the previous five years. The "average" or normal for those past five years is also displayed. Photo 4 shows this table for Emmett, Mich.

Historical Degree Day Summary (Numerical Integration method) from 3/1/2012 to 6/27/2012 (Report last 5 years)

YEAR	Degree Days Base 42°F	Degree Days Base 45°F	Degree Days Base 50°F
2007	1555	1322	979
2008	1369	1149	826
2009	1270	1040	715
2010	1682	1428	1052
2011	1343	1130	820
2012	1741	1474	1073

Photo 4. Degree-day accumulations March 1 through June 26 for 2007 through 2012 at the Emmett, Mich., Enviro-weather station.

Similarly, to see a comparison of accumulated rainfall for the past five years, select "[Rainfall comparisons last five years at this station](#)" (Photo 5). This tool is available from any station or commodity page on Enviro-weather.

Weather observations and summaries

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

Photo 5. List of weather

observations and summaries on Enviro-weather. This menu can be found on all station and commodity pages.

Clicking on this option will display a table listing total rainfall to date for the current growing season (both total inches of rain and number of hours with rain) and for the same time period the previous five years. Here, for example, is a table for Emmett, Mich., that shows total rainfall in inches and number of hours with rain for March 1 through June 27 of each year from 2007 to 2012 (Photo 6).

Historical Rainfall Summary from 3/1/2012 to 6/27/2012 (Report last 5 years)

YEAR	Rainfall total (in.)	Hours with rainfall
2007	8.33	156
2008	8.14	229
2009	15.68	249
2010	10.99	205
2011	17.66	276
2012	6.91	144
Average of 5 years, not including current year	12.16	223

Photo 6. Rainfall totals March 1 through June 26 for 2007 through 2012 at the Emmett, Mich., Enviro-weather station.

I've used these Enviro-weather tools to put together a table comparing the degree-day (base 50) accumulations from March 1 through June 26 for 2007 through 2012, plus the "average" degree-day for that time period over the past five years, for four different locations in Michigan. Included are degree-days from the [Commerce Township Enviro-weather station](#) (southeast Michigan), [Clarksville Enviro-weather station](#) (west central Michigan), [Traverse City Enviro-weather station](#) (northwest Michigan) and the [Escanaba Enviro-weather station](#) (Upper Peninsula) (Table 1).

Table 1. Degree-day accumulations (50) from March 1 through June 26 for 2007-2012 at four Enviro-weather stations

	Commerce Township	Clarksville	Traverse City	Escanaba
	<i>Southeast MI</i>	<i>West Central MI</i>	<i>Northwest MI</i>	<i>Upper Peninsula MI</i>
2007	1011	1040	940	691
2008	842	817	669	503
2009	815	788	651	477
2010	1068	1036	919	718
2011	843	814	654	489
2012	1073	1090	1002	704
<i>Average (2007 through 2011)</i>	916	899	766	575

This table shows clearly the variation in degree-day accumulations from year-to-year. It also shows that, although 2012 is the warmest of the past six years (so far) in all locations except for Escanaba, we've experienced some pretty warm springs during the past five years (for example, 2007 and 2010). Also note that how *much* warmer than normal we are depends a lot on location.

I also put together a table of rainfall totals over the past six years for the same four locations using Enviro-weather (Table 2). Please note that these numbers reflect rainfall totals **at the station**. Since rainfall amounts can vary widely in a small geographical area, these numbers may not be reflective of the rainfall totals throughout the area. Nevertheless, the table shows we are drier than normal for many locations in south Michigan and wetter than normal for many locations in the north.

Table 2. Total rainfall (inches) from March 1 through June 26 for 2007-2012 at four Enviro-weather stations.

	Commerce Township	Clarksville	Traverse City	Escanaba
		<i>West Central</i>		<i>Upper Peninsula</i>
Total Rainfall				

(inches)	Southeast MI	MI	Northwest MI	MI
2007	9.9	10.6	6.4	4.8
2008	10.1	10.7	10.4	5.8
2009	14.5	14.3	6.8	8.8
2010	16.5	13.0	11.0	10.0
2011	16.4	15.0	11.1	13.0
2012	8.0	9.4	12.6	9.3
<i>Average (2007 through 2011)</i>	12.9	12.7	9.1	8.5

We hope you are using these and other [Enviro-weather](#) tools and applications and that you find them useful. If you have questions, comments or suggestions, please contact [Beth Bishop](#), Enviro-weather coordinator, at 517 432-6520. If you'd like to contribute to Enviro-weather, please visit the [MSU gift cart](#).

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WEBSITES OF INTEREST

[CIAB Weekly Harvest Report Week 2](#)

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

Last Revised: 7-3-12

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Agricultural & Regional Viticulture Agent

July 10, 2012

GROWING DEGREE DAY ACCUMULATIONS through July 9th at the NWMHRC

Year	2012	2011	2010	2009	2008	2007	22 yr. Avg.
GDD42	2036	1465	1876	1395	1458	1816	1567.9
GDD50	1301	880	1150	788	858	1053	949.0

Growth Stages at NWMHRC (July 9, 1:00 p.m.)

Apple: Red Delicious – 42 mm fruit

Gala – 42 mm fruit

Yellow Delicious – 44 mm fruit

Pear: Bartlett: 32 mm fruit

Tart Cherry : 22 mm fruit

Balaton: 22 mm fruit

Grapes: Buck shot berries

Weather Report

Daytime temperatures have returned to a more 'normal' range in northwest Michigan; we have been in the high 70s and low 80s, and those temperatures are predicted to continue throughout the week into the weekend. Little rainfall is in the forecast. Thus far this season, we have accumulated 2036 GDD base 42 and 1301 GDD base 50. These accumulations are higher than our averages: 1568 GDD base 42 and 949 GDD base 50. We received some rainfall over the weekend, but overall accumulations were low—the NWMHRC received less than ¼" of rain. With little rainfall in the past two weeks, conditions are becoming drier and soil moisture is dropping. However, compared to other fruit growing regions in the state, our soil moisture levels are not as low at this time.

Crop Report

Sweet cherry harvest is already winding down this season. Because of the small crop, growers have moved through the blocks very quickly, and most growers have completed sweet cherry harvest. Quality of fruit was variable as some growers have reported cracking and American brown rot (ABR). Growers also competed for cherry harvest with the birds; with the small crop, bird predation has been particularly problematic in area orchards, and few orchards did not have flocks of seagulls, crows, and cedar waxwings in them at some time during the harvest period. Tart cherry harvest has begun for those growers that will harvest—the overall number of blocks that will be shaken is very small. The apple crop continues to look good and are sizing well. We have had no reports of hail in the past two weeks, and growers on good apple sites are optimistic about the crop. Red raspberry harvest has begun in early varieties.

Pest Report

Cherry

Cherry leaf spot (CLS) is not hard to find in any orchard, and some orchards have better CLS control than others—we are in the process of trying to understand the different levels of control. We are seeing a second wave of CLS on new growth in regional orchards, and there are many questions about efficacy of our fungicides at this time. There are many inconsistencies with control and use of particular products, and we will need to evaluate different orchard situations to determine the causes of reduced control this season. Again, we encourage growers to continue to scout the orchard as a CLS infection in early July can result in early defoliation, and set trees up for damage as we head into winter. We are recommending that growers use full covers if their CLS infection is high or if they have already lost lots of leaves this season. Again, a reminder to growers that we still have a long season to go as it is only the second week of July, and we need to keep the new foliage covered as we head into July and August.

Powdery mildew is evident in most tart cherry orchards, and once the white mycelium is on the leaf, control options will only further protect new foliage; we do not have any products that will eradicate powdery mildew.

As we are now harvesting sweet cherries across the region, **American brown rot** is the disease to watch. Growers should be cognizant of PHIs at this time, but if ABR is detected, they should move to an every row spray regime for fungicide applications, particularly if the trees are large. The SIs remain the optimal choice for ABR control, and Indar has routinely provided the best control of that class of chemistries.

Obliquebanded leaf roller (OBLR) trap counts continue to remain relatively high in regional blocks with an average of 20 moths per trap. These insects are mating, and females are laying eggs at this time. We anticipate larvae to be present in trees now; however, we have been scouting for larvae for the duration of the season and we still cannot find them in regional blocks. We will continue to look for larvae and will keep growers posted as the season progresses. Perhaps we will be fortunate this year, and no OBLR larvae will be found in area orchards. Depending on when certain blocks of tart cherries will be harvested, OBLR larvae could be present at the time of harvest. In the past three years, this insect has become a contaminant pest in tanks of harvested fruit. To ensure these insects are not in the tank at harvest, growers will need to apply an effective material that specifically targets Lepidoptera. Additionally, growers will need to be aware of the pre-harvest intervals (PHIs) as they approach the harvest window. We have three new Lepidopteran materials that work well against OBLR: Delegate (7D PHI), Belt (7D PHI), and Altacor (10D PHI), and all three materials provide excellent control of OBLR. Bts, such as Entrust, will work against OBLR but should not be used at this time as they are slower acting than the other materials and we need a fast kill if the block will be harvested in the next week. Sevin and the pyrethroids have a three-day PHI, but older data tell us that these chemistries will not be effective due to cross resistance with the OP's.

We have also caught **cherry fruit flies** (CFF) again this week. Growers should be applying an insecticide to control CFF as we head into the harvest season to prevent larvae in the fruit at harvest. However, if a block does not have fruit, growers can eliminate a CFF spray at this time. These insects lay eggs in fruit, and if there is no fruit, no insecticides are needed. Growers should keep in mind that even if there are few fruits per tree, the females will seek out these fruits and lay eggs. With no CFF-targeted insecticide sprays, the result of this situation could be an increase in CFF populations in 2013. Growers should also be aware that CFF populations are unique to individual farms, and growers should be monitoring for these insects with a yellow sticky trap baited with ammonium acetate. Neonicotinoids, such as Provado or the generics, are rated as good against CFF, but only last for ~7 days in the orchard. In a few blocks, we have seen sap beetle numbers on the rise when neonicotinoids are used—growers should keep an eye out for sap beetles and make insecticide decisions for CFF based on sap beetle infestation. If the harvest window is stretched, Provado or the generics will need to be re-applied to reduce the potential for fruit infestation. Organophosphates (Guthion and Imidan) last longer but Guthion's PHI is 15D and Imidan's PHI is 7D. Imidan cannot be used in sweet cherry.

Sap beetles have been found in ripening sweet cherries, but we have had no reports of these insects in tart cherry at this time. However, these insects can infest tart cherry and can be found in fruit that is ripening or damaged as they are attracted to ripe or overly ripe fruit. As we are at or approaching harvest, growers will need to pay special attention to the PHI's of the materials. Pyrethroids have good knockdown and short PHI's, Sevin and malation also have 3-day PHI's. Danitol has been reported to be effective against sap beetles by area scouts.

We caught an average of 17 lesser **peachtree borers** this week and an average of 15 **peachtree borers**. **American plum borer** second flight has begun last week, and we caught an average of 11 moths in the traps this week. Borers still need to be controlled even if there is no fruit in a block.

Apple

Apple scab has been reported as low throughout the state, and we have observed little scab in area orchards here in the northwest. The apple scab model on Enviroweather predicted a light scab infection on 8 July. The dry conditions will minimize the need for scab control in the coming week. Growers that were not able to control scab in this primary season need to keep fruit protected from this pathogen as we move through the season. Growers should also note that strobilurin resistance has been confirmed in all major apple growing regions of the state and the mutation confers complete resistance—fungicides containing strobilurin will not work against apple scab and increasing the rate of a strobilurin is not an effective option. **Powdery mildew** (PM) is evident in area orchards, and other areas of the state are reporting severe PM infections. Once the white mycelium is on the leaf, control options will only further protect new foliage; we do not have any products that will eradicate powdery mildew.

Fireblight is showing up at a slower rate than last week, but we can still observe strikes in area orchards. We hypothesize that these infections were the result of tag bloom or the long lasting bloom in apples coupled with the right weather conditions. Growers should keep an eye on weather as trauma events can spread the bacteria in orchards where strikes are evident. However, at this time, the forecast is not predicting rainfall or thunderstorms.

Codling moth (CM) trap counts are still high throughout the region. Growers that have a crop of apples need to be monitoring this pest diligently as they are internal feeders and will infest marketable fruit. With fewer apples in area orchards, CM will be competing to lay eggs in the reduced number of fruit that is available; therefore, growers need to be sure that fruit is covered at all times to minimize the risk of CM infestation. Again, we emphasize that growers monitor for this pest in their own orchards as there is variability in the pest population from block to block; the degree day accumulation is HIGHLY dependent on the biofix date (the first date of sustained codling moth trap catch) for each apple block. Growers should track the progress on their farms using the Enviroweather codling moth model and on-farm trap catch data.

Obliquebanded leafroller numbers have declined in apple, and we caught an average of 6 moths per trap this week. The summer generation larvae will begin showing up in regional orchards in the coming weeks, and fruit should remain protected from these hatching larvae. Unlike cherry, this pest in apple feed on the fruit, which makes control paramount for the remainder of the season. There are materials that will control both CM and OBLR in apple, and the use of these combination sprays will minimize costs for control of both of these pests. **Oriental fruit moth** (OFM) catch is higher this week than we typically see here in northwest Michigan, where we caught 24 moths per trap. This insect has also been reported across the state in higher numbers, and in blocks of apples where growers have eliminated insecticide sprays, OFM has been observed causing flagging in terminals.

Wine Grapes

Fruit set in NW Michigan looks very good for most cultivars. Some sites are rapidly approaching berry touch.

In general, foliage condition looks great throughout the region. Rose chafer populations were very high this year, but new shoot and leaf growth has now hidden their damage. In some vineyards the rose chafers reduced the crop to a small degree by direct feeding on clusters before bloom. **Japanese beetles** should appear very soon. In most NW Michigan sites Japanese beetles are not numerous enough to be much of a concern. Vineyard sites with a history of infestations should scout frequently for Japanese beetle until the general population levels for this pest this year are known. **Potato leafhopper** numbers appear to have moderated, and recent shoot and leaf growth do not show as much injury. As usual,

we have had very little success trapping **grape berry moths** in pheromone traps in NW Michigan. Thus far, cluster infestation levels have been very low and hard to detect in most areas. The adults of Pandora, Achemon and **hog sphinx moths** still flying, and larvae should be present in vineyards. These are insignificant in mature vineyards, but a very significant threat to young vines that can't afford to give up a lot of foliage to the voracious appetites of the larvae.

Powdery mildew remains at very low levels in the area. Untreated vines of very susceptible cultivars are still free of infection at the Northwest Michigan Horticultural Research Center. Berries have reached the developmental period where they are temporarily not susceptible to infection.

Important Meeting Notice

The "Sprayer Rodeo" on July 13 at has been changed to a different location. It is now going to be held at the vineyard managed by Jerry Stanek, 9120 South Center Highway, Traverse City (about 1.5 miles north of the intersection of Center Highway and Crain Hill Road).

Saskatoons

Harvest has been completed through most of the area. The biggest concern for the rest of the season is maintaining foliage health to assure maturation of wood and buds. **Entomosporium leafspot** and **rust disease** are the problems to watch for now.

BACTERIAL CANKER, ICE NUCLEATION, FROST INJURY, AND BLOSSOM BLAST

George W. Sundin, Plant Pathology
Nikki Rothwell, NWMHRC

The blossom blast symptom of bacterial canker is caused by frost injury that is induced by the ability of the Pseudomonas pathogen to induce ice formation in flowers.

Bacterial canker is a serious disease of sweet cherry in the midwestern and eastern United States caused by the bacterial pathogen *Pseudomonas syringae* pv. *syringae* (PSS). Canker infections are initiated during bloom and are associated with frost injury or extended periods of cool, wet weather. PSS bacteria overwinter in symptomless dormant sweet cherry buds and grow and quickly colonize flowers as they emerge from the bud. In a typical winter, about 30-40% of the buds are colonized by the bacteria which rapidly leads to 100% colonization of flower clusters in the spring.

Surveys of sweet cherry orchards throughout Michigan conducted by the Sundin lab during 2006-2008 indicated that every flower cluster sampled contained populations of PSS. The size of these populations ranged from 50 to over 50,000 PSS cells *per individual flower*. These ubiquitous PSS populations play an important role in influencing frost injury through a process termed ice nucleation (see below), and the subsequent frost injury can kill flowers and possibly result in further infection of woody tissue.

Ice nucleation is a trait whereby PSS cells can catalyze ice formation at temperatures only slightly below freezing. Pure water can supercool significantly below 32°F without freezing. However, the presence of ice-nucleation active PSS cells enables ice to form at temperatures of approximately 28°F or below. Once ice is formed, it rapidly propagates through sensitive tissue such as flowers causing wounds that facilitate bacterial entry into the tissue. The severity of frost damage plays a critical role in the occurrence of subsequent wood invasion and canker formation.

The frequency of PSS cells that can act as an ice nucleus and initiate ice formation at any one particular moment is dependent upon temperature. At 28°F, only one in 1,000,000 PSS cells freeze. At 27°F, one in 10,000 cells freeze, and at 25°F and below, one in 10 cells freeze. The typical sweet cherry flower in Michigan harbors 50 to 50,000 PSS cells, so at 28°F, there are not enough cells present to induce ice formation (would need 1,000,000 cells at this temperature). However, at 27°F, up to five ice nuclei could be present (with a possible population of 50,000 cells and ice nucleation frequency of 1 in 10,000 cells). It only takes one PSS ice nucleus to initiate ice formation that would spread rapidly through a flower cluster.

The PSS populations tend to increase rapidly during bloom periods that are cool and wet, and the bacteria can be further spread by wind and rain. In a "normal" season with few frost events, temperatures may not fall below 28-30°F, and few ice nucleation events will occur because the frequency is low (1 in 1,000,000 PSS cells), and that large of a population is not present on flowers. Therefore, the blossom blast symptom of bacterial canker is not common. However, very early development of sweet cherry trees in 2012 resulted in trees that were vulnerable to multiple freeze events during bloom. With the low temperatures observed in 2012 (22°F or lower on multiple nights), almost all PSS cells became ice nucleation active, and the result was extensive frost injury and severe blossom blast. This situation resulted in the bacteria taking out entire flower clusters and even all of the clusters on each tree.

After the occurrence of blossom blast, the further progression of bacterial canker can follow two paths: (1) no further invasion of the PSS pathogen into woody tissues, and trees begin recovery and produce new growth; or (2) invasion of PSS into woody tissues below infected spurs, canker formation, possible girdling and killing of branches. Assessment of affected sweet cherry trees in northern Michigan over the last few weeks suggests that the canker pathogen is following the first path in most trees; in short, we are not observing significant numbers of new cankers forming in branches.

These observations are good news as new canker formation in branches could have killed a significant number of trees from this event. PSS inoculum in trees is reduced during the summer months as the bacterial cells are inhibited by temperatures above the mid-80s°F and dry conditions. The pathogen will become re-activated by cooler temperatures in the fall, and wind and rain will disseminate cells to leaf scars during leaf drop. The bacteria colonize the leaf scars and migrate to dormant buds where they will overwinter.

MANAGEMENT OF BACTERIAL CANKER – WHAT OPTIONS ARE THERE?

George W. Sundin, Plant Pathology
Nikki Rothwell, NWMHRS

While highly effective management strategies for bacterial canker are not available, the best tactics include using copper to reduce PSS populations during bloom in advance of frosts and correctly-timed pruning.

The accompanying article described aspects of the biology of the bacterial canker pathogen *Pseudomonas syringae* pv. *syringae* (PSS) that contribute to blossom blast symptoms which took out huge percentages of sweet cherry flower clusters in Michigan in 2012. Besides blossom blast, there are many other symptoms of bacterial canker including fruit spots, leaf

spots and shothole on leaves, dead buds, and branch and trunk cankers in some cases with associated gummosis (Fig. 1). This article will focus on the management of the bacterial canker disease.

Management of bacterial canker is difficult due to the lack of availability of a highly-effective bactericide, the lack of disease resistance in most sweet cherry hosts, and the ability of the pathogen to colonize and move systemically in the trees under optimal conditions.

Copper use. Because of the association between PSS population in flowers, frost injury, and the occurrence of blossom blast, reducing PSS cells during bloom is a top priority. Reducing cell numbers on flowers prior to a predicted freeze event of temperatures at or above 27-28°F will significantly lower the risk of blossom blast. The only available bactericide for this purpose is copper. To avoid issues with phytotoxicity, copper rates used are 25-35% of the dormant rate or about 0.5 to 0.7 pounds of metallic copper per acre and can be used up to the white bud or popcorn stage. One downside of copper use is that the control of the disease is short-lived. In field experiments we performed at the Northwest Michigan Horticultural Research Station, either copper hydroxide or copper sulfate applied at white bud kept PSS populations steady or reduced them slightly on flowers over the next four days after treatment as flowers opened on the tree. Within two days, the PSS populations then increased back to levels on unsprayed trees. We also found that temperature plays a critical role: if the temperatures fall to 26°F or below, copper will not effectively reduce PSS populations low enough to prevent ice nucleation and frost injury to flowers.

Copper can also be applied in early spring before trees break dormancy. At this timing, copper can be used at higher rates, up to 2 pounds of metallic copper per acre with 6-9 pounds of hydrated lime per acre. One or two applications at one-week intervals can be applied before green tissue is visible. The idea of the dormant applications is for the copper to cover buds and existing cankers and persist on this tissue for a period of weeks. This copper can be solubilized and available as the PSS bacteria emerge from buds or cankers. However, if trees receive 2-3" of rainfall, the copper will be washed off.

Copper can also be applied in the fall during leaf drop. When leaves are falling, temperatures are typically cooler, and these periods can also be windy and rainy. During this time of year, the PSS pathogen becomes active again in orchards and is disseminated to leaf scars. Following colonization of leaf scars, the PSS bacteria will migrate systemically to dormant buds. Leaf scars are only susceptible to infection for a period of about 1-2 days after the leaf defoliates. Copper applications (1.2 to 2 pounds metallic copper per acre) timed at about 25-35% leaf drop can be somewhat effective in preventing leaf scar application and reducing existing PSS populations in orchards. The overall utility of this fall application is not clear because the pathogen is adept at growing and spreading during the spring. Thus, a hypothetical reduction of dormant bud colonization from 40% to around 10% may not yield a reduction in disease incidence the following season.

Finally, the efficacy of copper in reducing PSS is also impacted by copper resistance present in about 25% of the PSS population in Michigan. These resistant bacteria will not be controlled by copper used at any field rate.

Host disease tolerance. Most of the sweet cherry cultivars grown in Michigan are susceptible or highly susceptible to bacterial canker. The only cultivar with an observable level of tolerance is Gold.

Correct pruning timings. Timing of sweet cherry pruning can have an important impact on the subsequent occurrence of bacterial canker. Pruning should never be done during or immediately prior to wet weather. Pruning wounds are vulnerable to infection by PSS, and the wounds allow the bacterium ready access to internal tissues of the tree. Summer pruning is also better than spring pruning from a disease management standpoint because the PSS pathogen becomes inactive following extended periods of warm temperatures in the mid-80's°F and higher and is also inactive during extended warm, dry periods. There is an additional possibility that the tree is physiologically better able to withstand PSS infection during summer months. This research is currently underway at the NWMHRS. Besides pruning for horticultural purposes, all visible cankers should be pruned out of the tree.

Research done at Cornell University in New York led by Julie Carroll and Terence Robinson showed that leaving a branch stub during pruning was an effective method of reducing canker infection due to slow progression of the PSS pathogen in the stubs. Also, the pathogen only rarely progressed from stubs into older wood. The use of either copper bactericides or phosphorous acid sprays immediately after pruning had minimal to no effect on infection of the stubs. Pruning after harvest during dry conditions provided the best results in terms of little to no infection and the least amount of canker progression into stubs.

SUBSIDIZED REGISTRATION FEE FOR SPARKING WINE SYMPOSIUM

The Michigan Grape and Wine Industry Council was successful in obtaining some grant funds to subsidize the cost of the upcoming Sparkling Wine Symposium on **Thursday, July 19** at the NMC Hagerty Center in Traverse City. This symposium is part of the ASEV-ES annual meeting being held at the same location. The grant will subsidize a portion of the registration cost for up to 50 Michigan growers and winemakers. Here are the details:

1. The regular registration fee for the symposium is \$125.00. The MGWIC grant will subsidize \$75.00 of that cost, reducing the registration fee to \$50.00 per person.
2. The purpose of this grant is to encourage/enable/allow Michigan grape growers and winemakers the opportunity to attend this symposium. This subsidized registration fee is **ONLY** available to commercial Michigan grape growers and winemakers. Eligibility will be determined by the MGWIC if necessary.
3. Eligible industry members who have already registered and paid full price will be given a refund by the ASEV-ES.
4. Grants funds are limited, so only up to 50 registrants may take advantage of this subsidized registration fee. First come, first serve.
5. Due to the timeliness of this grant funding notification, the \$100 late fee for registering for the Sparkling Symposium will be waived. If you register for other events at the meeting, the \$100 late will be included since the original deadline was July 2.
6. You must register by Wednesday, July 11 by faxing the attached registration form to Nancy Long at 315-787-2443. Please mark "MGWIC" at the top of your registration form so it will be identified as a subsidized registration. Submission questions can be directed to Nancy at NPL1@cornell.edu.

Approximately 100 people have already signed up for this symposium, and we hope this new subsidy will encourage more industry members to attend. It has been 14 years since the ASEV-ES meeting has been in Michigan, and we are looking forward to an outstanding conference! The Sparkling Symposium is targeted to industry members, so whether you are

growing grapes for sparkling wines, making sparkling wines, having your wines custom made or just thinking about it - this symposium is designed for you. We have an international lineup of speakers, and Larry Mawby and David Munksgard will be doing an educational tasting as part of their presentation on making sparkling wines to meet your goals.

Hope to see you there - call me if you have any questions 517-648-5099.

EMERGENCY FARM LOANS AVAILABLE

USDA/FSA emergency farms loans are available in Antrim, Grand Traverse, Leelanau, Kalkaska, Charlevoix, Emmet, and Otsego Counties to all qualified farm operators as a result of losses caused by the following weather conditions:

<i>Disaster Description</i>	<i>Dates of Disaster</i>	<i>Final Date To Apply</i>
The effects of blizzards, excessive snow, excessive heat, excessive rain, high winds, hail, freeze, frost, tornadoes, flooding and lightning	January 1, 2012 to May 11, 2012	March 1, 2013

Emergency loan funds may be used to:

- Restore or replace essential property;
- Pay all or part of production costs associated with the disaster year;
- Pay essential family living expenses;
- Reorganize the farming operation; and
- Refinance certain debts.

All emergency loans must be fully collateralized. Producers can borrow up to 100 percent of actual production or physical losses, to a maximum amount of \$500,000. Loans for crop, livestock, and non-real estate losses are normally repaid within 1 to 7 years; depending on the loan purpose, repayment ability and collateral available as loan security. In special circumstances, terms of up to 20 years may be authorized. Loans for physical losses to real estate are normally repaid within 30 years. In certain circumstances, repayment may be made over a maximum of 40 years. The current annual interest rate for emergency loans is 3.75 percent.

For more information farm operators should contact their local FSA Farm Loan Program office or the Farm Loan Program office in the Traverse City USDA Service Center at 231-941-0951.

USDA DESIGNATES 72 COUNTIES NATURAL DISASTER AREAS

Effective June 29, 2012, the United States Department of Agriculture designated 72 Michigan counties as natural disaster areas.

The counties were designated as natural disaster areas for losses due to the combined effects of blizzards, excessive snow, excessive heat, excessive rain, high winds, hail, freeze, frost, tornadoes, flooding and lightning that occurred January 1, 2012 through May 11, 2012.

Counties in Northwest Michigan included in the designations are Antrim, Benzie, Grand Traverse, Leelanau, Emmet, Charlevoix, Kalkaska, Otsego, and Wexford counties.

The disaster designation makes available low interest (3.75%) loans to farm operators in the designated area. Farm operators who suffered a 30% loss in crop production caused by the weather conditions and meet other eligibility requirements may qualify for Emergency (EM) loan assistance from FSA.

If you have any questions please call your local FSA office in Bellaire (231) 533-6450, Traverse City (231) 941-0951, or Petoskey (231) 347-2133 or contact the Farm Loan Program staff headquartered in the Traverse City USDA Service Center (231) 941-0951.

The deadline for filing an EM loan application is **March 1, 2013.**

FACT SHEET

UNITED STATES DEPARTMENT OF AGRICULTURE FARM SERVICE AGENCY

June 2011

Emergency Loan Program

Overview

USDA's Farm Service Agency (FSA) provides emergency loans to help producers recover from production and physical losses due to drought, flooding, other natural disasters or quarantine.

Loan Uses

Emergency loan funds may be used to:

- Restore or replace essential property;
- Pay all or part of production costs associated with the disaster year;
- Pay essential family living expenses;
- Reorganize the farming operation and;
- Refinance certain debts.

Eligibility

Emergency loans may be made to farmers and ranchers who:

- Own or operate land located in a county declared by the President or designated by the Secretary of Agriculture as a primary disaster area or quarantine area. All counties contiguous to the declared, designated, or quarantined primary counties also are eligible for emergency loans. A disaster designation by the FSA administrator authorizes emergency loan assistance for physical losses only in the designated and contiguous counties;
- Are established family farm operators and have sufficient farming or ranching experience;
- Are citizens or permanent residents of the United States;
- Have suffered at least a 30 percent loss in crop production or a physical loss to livestock, livestock products, real estate or chattel property;
- Have an acceptable credit history;
- Are unable to receive credit from commercial sources;

- Can provide collateral to secure the loan and;
- Have repayment ability.

Loan Requirements

FSA loan requirements are different from those of other lenders. Some of the more significant differences are the following:

- Borrowers must keep acceptable farm records;
- Borrowers must operate in accordance with a farm plan they develop and agree to with local FSA staff and;
- Borrowers may be required to participate in a financial management training program and obtain crop insurance.

Collateral is Required

All emergency loans must be fully collateralized. The specific type of collateral may vary depending on the loan purpose, repayment ability and the individual circumstances of the applicant. If applicants cannot provide adequate collateral, their repayment ability may be considered as collateral to secure the loan. A first lien is required on property or products acquired, produced or refinanced with loan funds.

Loan Limit

Producers can borrow up to 100 percent of actual production or physical losses, to a maximum amount of \$500,000.

Loan Terms

Loans for crop, livestock, and non-real estate losses are normally repaid within one to seven years, depending on the loan purpose, repayment ability and collateral available as loan security. In special circumstances, terms of up to 20 years may be authorized. Loans for physical losses to real estate are normally repaid within 30 years. In certain circumstances, repayment may be made over a maximum of 40 years.

Interest Rate

The current annual interest rate for emergency loans is 3.75 percent.

Application Deadline

Applications for emergency loans must be received within eight months of the county's disaster or quarantine designation date.

Emergency Loan Program

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, political beliefs, genetic information, reprisal, or because all or part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotope, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of Discrimination, write to USDA, Assistant Secretary for Civil Rights, 1400 Independence Avenue, SW., Stop 9410, Washington, DC 20250-9410, or call toll-free at (866) 632-9992 (English) or (800) 877-8339 (TDD), or (866) 377-8642 (English Federal-relay), or, or (800) 845-6136 or. USDA is an equal opportunity provider and employer.

2012 HOPS FIELD DAY & TOUR

Registrations are filing up quickly for the **2012 Hops Field Day & Tour** in Northwest Michigan on **Friday, August 10 from 8 am - 4:30 pm**. The cost is \$75 per person and includes program, lunch and bus transportation. Details of the program and registration is available online at:

www.events.anr.msu.edu/hops2012

Registrations are only accepted online at this website via credit/debit card. For further information contact **Rob Sirrine** at sirrine@msu.edu or the Leelanau MSU Extension office at 231-256-9888 or msue45@msu.edu.

Pre-registration is required and space is limited to 18 more registrants on a first come first serve basis.

It's going to be another great tour! Register today!

WEBSITES OF INTEREST

[CIAB Weekly Harvest Report Week 3](#)

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

Last Revised: 7-10-12



Researcher Resources



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[Nikki Rothwell](#)

District Horticulturist

[Duke Elsner](#)

Agricultural & Regional Viticulture Agent

July 17, 2012

[Bill Klein](#)

Farm Mgr, NWMHRC

GROWING DEGREE DAY ACCUMULATIONS through July 16th at the NWMHRC

Year	2012	2011	2010	2009	2008	2007	22 yr. Avg.
GDD42	2274	1679	2099	1565	1658	1980	1761.1
GDD50	1483	1038	1317	902	1002	1221	1086.3

Growth Stages at NWMHRC (July 16, 2:00 p.m.)

Apple: Red Delicious – 49 mm fruit

Gala – 49 mm fruit

Yellow Delicious – 52 mm fruit

Pear: Bartlett: 41 mm fruit**Grapes:** Berry touch

Weather Report

The past week has been hot and dry, not unlike other fruit growing areas around the state. Daytime temperatures have been in the high 80s and low 90s, and nighttime temperatures have not fallen into the 50s since Wednesday last week. Conditions remain dry although the region had a touch of rainfall in some areas on Sunday morning. Little rainfall is in the forecast, although there is a chance of thunderstorms for many in the coming days. Thunder has been heard in the distance but no distinct rainfall has been recorded at the NWMHRC since 3 July. Thus far this season, we have accumulated 2274 GDD base 42 and 1483 GDD base 50. With little rainfall in the past two weeks, conditions are becoming drier and soil moisture is dropping.

Crop Report

Sweet cherry harvest finished mid-week last week, and tart cherry harvest is over for the season for the most part. There are some Balatons in the region that will be harvested but that crop was much shorter than originally estimated as well as other cherry crops. Because of the small crop, growers have moved through the blocks very quickly, and most growers were finished with cherry harvest within a week. The apple crop continues to look good and are sizing well. Red raspberry harvest is in full swing.

Pest Report

Cherry

Cherry leaf spot (CLS) is not hard to find in any orchard, and some orchards have better CLS control than others—we are in the process of trying to understand the different levels of control. We are also seeing a significant amount of phytotoxicity in tart cherry, and this situation is likely the result of applying a fair number of sprays in hot conditions. In some cases, this phytotoxicity is causing significant amounts of leaf drop. We will try to quantify this level of phytotoxicity, rainfall amounts, and temperatures this season.

We are at a point in the season when we are 'done' or almost done with harvest, even if many did not harvest this season. In a typical year, we would be applying a post-harvest CLS application. We are recommending that application for 2012, but because we are only in mid-July, we are recommending a second application of a post-harvest spray to keep leaves on until late August and into September. Conditions have been dry in recent weeks, which will help in keeping the levels of CLS down in orchards. However, because there is so much inoculum in the orchards, any wetting event will significantly increase the spread of this disease. Growers should keep a close eye on the leaf spot model on Enviroweather (www.enviroweather.msu.edu). Again, a reminder to growers that we still have a long season to go as it is only the second week of July, and we need to keep the new foliage covered as we head into August.

Powdery mildew is evident in most tart cherry orchards, and once the white mycelium is on the leaf, control options will only further protect new foliage; we do not have any products that will eradicate powdery mildew.

Obliquebanded leaf roller (OBLR) trap counts continue to remain relatively high in regional blocks with an average of 20 moths per trap. These insects are mating, and females are laying eggs at this time. We anticipate larvae to be present in trees at this time; however, again this week, we have been scouting for larvae and cannot find them in regional blocks. Based on our scouting results so far this year, we were fortunate, and no OBLR larvae were found in area orchards during

the harvest period.

We have also caught **cherry fruit flies** (CFF) again this week. As most growers are finished with harvest, the fruit that is remaining on the trees is vulnerable to CFF infestation. The larvae that will develop in the fruit will contribute to a large CFF population next season. Recent work has shown that a post-harvest CFF application within seven days of harvest will reduce the CFF population in subsequent years. As many growers did not harvest this year, there could be a larger amount of fruit left on trees that can be infested by CFF. If growers are going out with a post-harvest CLS spray, we recommend that growers add a lower priced neonicotinoid to the tank to help minimize next year's CFF population.

The unfortunate news of the week is that we found **spotted wing drosophila (SWD)** infesting tart cherries in the region. We have been trapping for adults since mid-May and have captured no adults in over 100 traps. However, we did find larvae in fruit, and when we reared them out, we identified them as SWD. Growers that have berry crops and/or vegetables (tomatoes, peppers, etc.) need to be on the lookout for this pest. Please refer to Dr. Isaac's article for more information: http://msue.anr.msu.edu/news/managing_spotted_wing_drosophila_update/

Apple

Apple scab has been reported as low throughout the state, and we have observed little scab in area orchards here in the northwest. The dry conditions will minimize the need for scab control in the coming week. Growers that were not able to control scab in this primary season need to keep fruit protected from this pathogen as we move through the season. Growers should also note that strobilurin resistance has been confirmed in all major apple growing regions of the state and the mutation confers complete resistance—fungicides containing strobilurin will not work against apple scab and increasing the rate of a strobilurin is not an effective option.

Codling moth (CM) trap counts were low at the NWMHRC this week, but still remain moderately high at grower sites. Growers that have a crop of apples need to be monitoring this pest diligently as they are internal feeders and will infest marketable fruit. With fewer apples in area orchards, CM will be competing to lay eggs in the reduced number of fruit that is available; therefore, growers need to be sure that fruit is covered at all times to minimize the risk of CM infestation. Again, we emphasize that growers monitor for this pest in their own orchards as there is variability in the pest population from block to block; the degree day accumulation is HIGHLY dependent on the biofix date (the first date of sustained codling moth trap catch) for each apple block. Growers should track the progress on their farms using the Enviroweather codling moth model and on-farm trap catch data.

Obliquebanded leafroller summer generation larvae should be showing up in regional orchards in the coming weeks, and fruit should remain protected from these hatching larvae. Unlike cherry, this pest in apple feed on the fruit, which makes control paramount for the remainder of the season. There are materials that will control both CM and OBLR in apple, and the use of these combination sprays will minimize costs for control of both of these pests.

Wine Grapes

Despite the lack of rainfall, shoot growth and berry development have progressed at a fast pace. Several sites have already had to top or side hedge their vineyards. Clusters have closed up, so sprayers need to be set up for maximum ability to get materials in place for disease and insect control.

Foliage condition is still very good. **Potato leafhoppers** are fairly numerous in some sites, but foliar injury and shortening of internodes does not seem to be very significant this year. **Japanese beetle** adults are now appearing, the numbers have been low thus far. Some defoliation from **sphinx moth caterpillars** is now apparent. It is very important to control these in first and second year plantings where they can significantly reduce vine growth. **Phylloxera leaf galls** are now starting to show on susceptible cultivars.

Powdery mildew is still virtually undetectable in the sites scouted for these reports. However, we are now moving into a very serious period when berries are susceptible again, the foliage is dense and spray penetration is becoming more difficult. Growers need to keep up with frequent scouting to detect infections and make appropriate treatments on a suitable schedule.

POST-HARVEST CHERRY LEAF SPOT APPLICATIONS

Nikki Rothwell, NWMHRC and George Sundin, MSU

Growers need to monitor weather conditions to determine if they will need more than one CLS post-harvest sprays. With the short cherry season behind us for 2012, growers have inquired about post-harvest management strategy for cherry leaf spot (CLS). In a typical year, we harvest tart cherries in mid-July to mid-August, and a post-harvest fungicide spray is applied within a week of harvest. The intent for this spray is to prevent early defoliation that can lead to reduction in tree winter hardiness, diminished fruit set the following year, and result in poor fruit quality in future seasons. These post-harvest applications are commonly sprayed mid- to late-August, which in most years is effective enough to prevent premature leaf loss in September. In the case of 2012, much of the tart cherry harvest was finished by early July, which leaves almost an extra month to manage for cherry leaf spot. The following guidelines should help growers when making their post-harvest cherry leaf spot management decisions.

First, all growers should have made the "typical" chlorothalonil application just after harvest. If the orchard was clean or fairly clean up until this point, this spray will keep the leaves protected until the first of August. Further fungicide applications will be warranted if conditions remain wet and warm. Long periods of warm, dry weather will keep the cherry leaf spot fungus in check.

Under cherry leaf spot-conducive conditions, a second post-harvest fungicide application in early August will further protect the leaves until mid-August, the traditional timing for the post-harvest spray. Again, if the orchards do not already show signs of cherry leaf spot, this second post-harvest application should protect foliage through to September, and because the cherry leaf spot fungus grows slowly, the pathogen will not have adequate time to move through its life cycle and result in premature defoliation. On the other hand, since most orchards are already showing signs of leaf drop at this time, a third fungicide application may be warranted at the end of August. Additionally, if conditions in August are wet and warm, even clean orchards may need another fungicide application. Because there are many formulations of chlorothalonil, growers should check the label for the maximum allowable limit for the season.

INCREASED POPULATIONS OF GRASSHOPPERS CAUSE PROBLEMS IN FRUIT CROPS

Dry conditions in some areas of Michigan have sparked grasshopper problems in fruit orchards.

Posted on **July 10, 2012, MSUE News** by **Bill Shane**, and John Wise, Michigan State University Extension, Department of Entomology

The dry conditions in some regions of Michigan have resulted in significant damage to young orchards by grasshoppers (Photo 1). Although not as bad as the major Minnesota invasion of the 1930s when grasshoppers reportedly chewed the paint on houses, in some newly planted peach and cherry orchards in southwest Michigan, young trees have been stripped of more than 50 percent of the leaf area (Photo 2). Under drought conditions, grasshoppers will move from brown, weedy fields to feed on green foliage and sometimes fruit of orchards. Mowing may also remove food sources and cause grasshoppers to invade nearby orchards.



Photo 1. Grasshoppers feeding on peach foliage can cause considerable damage in a few days.



Photo 2. Young tart cherry tree with severe leaf loss due to grasshopper feeding

Similar to Japanese beetles, heaviest infestations and damage by grasshoppers will be along orchard borders adjoining grassy fields. There may be a tendency to blame leaf feeding damage on Japanese beetles, the usual suspect. It can be tricky to verify that grasshoppers are, indeed, the culprits causing the damage because this insect is easily startled by movement.

Although Michigan has four major and many minor grasshopper species, control strategies are generally similar for them all. Grasshopper control options in orchards include a range of insecticides (Table 1).

Biological control options, such as those containing *Nosema locustae* spores, are relatively slow acting. Use

of insecticides to manage grasshoppers will be more difficult next to grassy areas with large insect populations that will reinvade the orchard being protected. Monitoring and possible reapplication may be needed. Hot conditions will shorten the residual effectiveness of pyrethroid insecticides. Be sure to check the insecticide label for restrictions on use, especially concerning minimum days between application and harvest.

Table 1. Details of insecticide options for grasshopper control in fruit crops

Compound trade name	Chemical class	Life-stage activity	Spray rates per acre*
Imidan	Organophosphate	Nymphs	1.3 lb
Malathion	Organophosphate	Nymphs	1 to 2 pt
Sevin XLR	Carbamate	Nymphs	1 to 2 pt
Asana	Pyrethroid	Nymphs	5.8 to 9.6 oz
Battalion	Pyrethroid	Nymphs	7.7 to 11.5 oz
Baythroid	Pyrethroid	Nymphs	2 to 2.8 oz
Danitol	Pyrethroid	Nymphs	10.6 to 21.3 oz
Mustang Max	Pyrethroid	Nymphs	3.2 to 4 oz
Warrior	Pyrethroid	Nymphs	2.5 to 3.8 oz
Pyganic***	Pyrethrin	Nymphs	16 to 32 oz
Azera***	Pyrethrin + Azadiractin	Nymphs	1 to 2 qt
Dimilin**	IGR	Nymphs	2 oz

* In most cases, the product's label does not specifically list grasshoppers under a fruit crop section, but the pest is labeled for control by the compound within another crop group.

** Registered for use in pears only (14-day PHI).

*** OMRI approved for certified organic production.

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

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

FREE, NO OBLIGATION, FORESTRY ASSISTANCE!

What:

Due to unprecedented weather conditions this year, the Leelanau Conservancy and Leelanau Conservation District are teaming up to provide forestry assistance to local fruit growers at **NO COST**. The Conservancy is underwriting the costs to enable the Conservation District to provide forestry technical assistance to local fruit growers.

Why:

Fruit growers have little or no fruit to harvest, and many are considering harvesting their woodlot to help get through this difficult year. Do you know the value of your timber and how to ensure that the harvest is part of a long term forest management system? This FREE SERVICE will help you get a handle on both. Don't undervalue your timber or allow a cut that could set your next harvest back decades!

How:

Call the Leelanau Conservation District NOW for a free forest inventory and evaluation at no obligation. This service will provide growers with an estimate of the amount of timber available for harvest and the approximate value of the timber that can be removed and still allow you to retain a quality in the woodlot that can be harvested again in 10 – 15 years. We will work with you to help you get the best value for your timber and to insure that your woodlot will have value in the foreseeable future.

To set up an appointment contact the Leelanau Conservation District at (231) 256-9783.



NEWS RELEASE

USDA Risk Management Agency Springfield Regional Office 3500 Wabash Avenue
Springfield, IL 62711 (217) 241-6600 rsoil@rma.usda.gov <http://www.rma.usda.gov/go/roil>

Release No. SRO-12-016

Contact: Brian Frieden (217) 241-6600

CROP INSURANCE REMINDERS FOR DROUGHT CONDITIONS

SPRINGFIELD, Ill. July 11, 2012 - The hot, dry weather has threatened much of the Midwest's crops, including corn and soybeans. Brian D. Frieden, Director of USDA's Risk Management Agency's Springfield Regional Office, offers reminders for producers who may have a loss on an insured crop.

If you have a potential crop loss, notify your crop insurance agent immediately. You are responsible for notifying your agent within 72 hours of discovering crop damage; continuing to care for the crop as you normally would and getting permission from the insurance company before destroying any of the crop.

Your crop insurance company can explain your options. If you don't plan to take your corn or soybean crop to harvest, talk to your insurance company before taking action. In many cases, it may be too early to accurately appraise the crop. Producers considering cutting their corn for silage, or tearing up a corn crop to plant soybeans should discuss this with their insurance company. For acreage not being harvested, the company can establish representative strips. These strips must be maintained and will be used to establish yield. Corn insured for silage is handled differently than corn insured as grain. Consult with your company before proceeding.

In times of loss, your crop insurance agent should be your first contact. The agent and insurance company know your policy and can help you through the claims process.

During the 2011 disasters, with fires, floods, hurricanes and drought, insurance companies were able to pay producers timely who were suffering from crop losses. Frieden is confident that producers will receive the same prompt response on claims filed this year.

HOUSEHOLD HAZARDOUS WASTE COLLECTON IN LEELANAU COUNTY

Attached is a [flyer on the household hazardous waste collections](#) in Leelanau County for **July 28** at the Government Center, and **September 22** at the Peshawbestown gas station site.

Reservations are needed – call 256-9812 for a reservation. Feel free to share this email and attachment.

FRUIT AND VEGETABLE INDUSTRY SCHOLARSHIPS AVAILABLE IN 2012

The Michigan State Horticultural Society and The Michigan Vegetable Council announce the availability of scholarships for students who intend to pursue careers in the Midwest fruit industry or vegetable industry, respectively. The awards are made available by these organizations, with the generous support of industry sponsors. In 2011, scholarship awards totaling \$13,000 were awarded with the support of Crop Production Services, Breckenridge Insurance, Nestle/Gerber Products Company, Michigan Apple Promoters, Valent USA, Wilbur-Ellis Company, MACMA Apple Division, Mike Pirrone Produce, Inc. and Agro Fresh, Inc. (SmartFresh™), as well as the support of the following industry publications: *Meister Publications (American Fruit Grower, American Vegetable Grower)*, *The Fruit Growers News*, and *The Vegetable Growers News*. The target amount per scholarship is \$1,000, but it could be more or less at the discretion of the selection committee. The award is not based on need or academic achievement; however, the selection committee may use these criteria to decide between two or more qualified applicants.

For more information, see the [Scholarship Announcement](#) and the [Scholarship Application](#).

WEBSITES OF INTEREST

[CIAB Weekly Harvest Report Week 4](#)

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

Last Revised: 7-18-12

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[Nikki Rothwell](#)

District Horticulturist

[Duke Elsner](#)

Agricultural & Regional Viticulture Agent

July 24, 2012

[Bill Klein](#)

Farm Mgr, NWMHRS

GROWING DEGREE DAY ACCUMULATIONS through July 23rd at the NWMHRC

Year	2012	2011	2010	2009	2008	2007	22 yr. Avg.
GDD42	2505	1940	2310	1718	1861	2158	1960.0
GDD50	1658	1243	1472	999	1149	1376	1229.4

Growth Stages at NWMHRC (July 23, 8:30 a.m.)

Apple: Red Delicious – 53 mm fruit

Gala – 52 mm fruit

Yellow Delicious – 57 mm fruit

Pear: Bartlett: 45 mm fruit**Grapes:** Green fruit

Weather Report

The past week has been hot and dry for the past two weeks. Daytime temperatures have been in the high 80s and the past two days hit the low 90s; nighttime temperatures have stayed steady in the mid-60s. Conditions remain dry throughout the region, and many growers are hoping for rain on the radar. A small amount of rain fell last week on 19 July at the NWMHRC where we recorded 0.15 inches of rain. Thus far this season, we have accumulated 2506 GDD base 42 and 1659 GDD base 50. Soil moisture is extremely low at this time.

Crop Report

All cherry harvest has finished now. Because of the small crop, growers have moved through the blocks very quickly, and most growers were finished with cherry harvest within a week. The apple crop continues to look good and are sizing well. Growers that have a good apple crop have done an excellent job of managing the fruit. Red raspberry harvest continues this week. Drought stress is evident on trees without irrigation, particularly in small trees.

Pest Report

Cherry

Cherry leaf spot (CLS) is still present in regional orchards, and we continue to remind growers that we are still pretty early in terms of the growing season to discontinue CLS applications. This dry weather has been helpful in minimizing the spread of CLS. We are still recommending potentially multiple post-harvest sprays to keep leaves on until late August and into September. With the predicted rainfall and the high levels of inoculum in the orchards, growers should be covered up prior to this rain event to protect the foliage into the fall.

All insect levels are low this week, except for **cherry fruit flies** (CFF) counts. As most growers are finished with harvest, the fruit that is remaining on the trees is vulnerable to CFF infestation. The larvae that will develop in the fruit will contribute to a large CFF population next season. Recent work has shown that a post-harvest CFF application within seven days of harvest will reduce the CFF population in subsequent years. As many growers did not harvest this year, there could be a larger amount of fruit left on trees that can be infested by CFF. If growers are going out with a post-harvest CLS spray, we recommend that growers add a lower priced neonicotinoid to the tank to help minimize next year's CFF population.

Again this week, **spotted wing drosophila** (SWD) larvae have been observed in sweet and tart cherries left on the trees. We have been trapping for adults since mid-May, and during this last week, we have captured some adult flies in some isolated traps. Based on some of the infestation in fruit, we thought adult trap counts would be higher at this time.

Apple

We have observed little **apple scab** in area orchards here in the northwest. The dry conditions have been helpful in keeping this disease at bay. Growers should also note that strobilurin resistance has been confirmed in all major apple growing regions of the state and the mutation confers complete resistance—fungicides containing strobilurin will not work against apple scab and increasing the rate of a strobilurin is not an effective option.

Codling moth (CM) trap counts remain low at the NWMHRC this week. Growers that have a crop of apples need to be monitoring this pest diligently as they are internal feeders and will infest marketable fruit. With fewer apples in area

orchards, CM will be competing to lay eggs in the reduced number of fruit that is available; therefore, growers need to be sure that fruit is covered at all times to minimize the risk of CM infestation. Again, we emphasize that growers monitor for this pest in their own orchards as there is variability in the pest population from block to block; the degree day accumulation is HIGHLY dependent on the biofix date (the first date of sustained codling moth trap catch) for each apple block. Growers should track the progress on their farms using the Enviroweather codling moth model and on-farm trap catch data.

Although we have been monitoring for this pest, **obliquebanded leafroller** summer generation larvae have been difficult to locate in regional orchards, but we remind growers that fruit should remain protected from larvae because these insects will feed on the fruit and result in unmarketable apples. There are materials that will control both CM and OBLR in apple, and the use of these combination sprays will minimize costs for control of both of these pests.

Apple maggot have been trapped in low numbers at the NWMHRC.

Wine Grapes

Continued warm and dry weather has been good for vineyards and berry development, even at sites without irrigation. Young vines without a well-developed root system may be getting into severe drought stress if they are not irrigated.

Potato leafhoppers are still fairly numerous, but not causing significant harm in most locations. **Japanese beetles** have remained at relatively low populations. **Whiteflies** have been found on some vinifera cultivars. This is a new situation for our area, so we have no indication of the significance of these pests in NW vineyards.

The large **sphinx moth** caterpillars of summer are now appearing in NW vineyards. There are three common species, the **Pandora Sphinx**, the **Achemon Sphinx**, and the **Hog Sphinx**. The adults of these fly over an extended period, from as early as late May in some years all the way through to August. The larvae that hatched from eggs deposited by the earliest adults are now getting fairly large - in the two to three inch range. At this size, they can consume leaves at a rapid pace, completely defoliating a shoot in only a couple of days. It is very important to control these in first and second year plantings where they can significantly reduce vine growth. In older vineyards their feeding injury does not typically have a significant impact on vine health or fruit quality, as the number of larvae is usually low and vines often have an excessive leaf canopy to begin with. The Achemon and Pandora sphinx larvae have several different color phases in their populations, with a base color ranging from bright green through pink, rose, orange and shades of brown. Despite these various colors, they are still very difficult to find amongst the foliage of a grapevine.

There have been a few reports of **powdery mildew** in the area, but many vineyards still appear to be quite clean of this disease. This situation can change rapidly now that we have dense leaf canopies and susceptible clusters. If a bit of rainy weather and high humidity comes along, powdery mildew could become a more serious issue.



Pandora Sphinx (green form)



Pandora Sphinx (orange form)



Hog Sphinx



Achemon Sphinx (brown form)

POST-HARVEST CONTROL OF CHERRY FRUIT FLY

Nikki Rothwell, NWMHRC

Larry Gut, Dept of Entomology, MSU

Although the cherry crop throughout the state was extremely low due to spring freeze events, cherry fruit flies are still able to infest the fruit remaining on the trees and that remaining fruit is vulnerable to CFF infestation. The larvae that will develop in the fruit will contribute to a large CFF population next season. Recent work has shown that a post-harvest CFF application within seven days of harvest will reduce the CFF population in subsequent years. As many growers did not harvest this year, there could be a larger amount of fruit left on trees that can be infested by CFF. If growers are going out with a post-harvest cherry leaf spot spray, we recommend that growers add a lower priced neonicotinoid to the tank to

help minimize next year's CFF population.

Data collected in Michigan in the past six years shows that cherry fruit fly (CFF) peak emergence occurs after harvest, and some managed orchards have resident populations of this pest. One study has shown larval infestation in managed orchards was low before harvest and increased immediately after harvest, contributing to increases in resident populations. This work established that the majority of CFF infesting commercial orchards originate from resident populations, rather than populations outside of the orchard; implications of these findings may result in increases in overall population size within orchards and make CFF control more difficult for growers. Additionally, larger populations can lead to increased periods of adult activity extending the management period. Fruit fly-infested fruit that remain on the tree after harvest represent a source for infestation the following season.

This pattern of increased CFF activity after harvest was detected over several years, and research has shown that a post-harvest application of imidacloprid (Provado, Prey, etc.) has the potential to reduce CFF populations in the following year (Gut, unpublished). Again, as many growers are already making a post-harvest CLS application, adding a 6oz rate of imidacloprid to the tank mix may be warranted in orchards. Post-harvest applications should be made within seven days of harvest or the estimated harvest date if harvest did not occur.

SPOTTED WING DROSOPHILA LARVAE IN CHERRY

Nikki Rothwell, NWMHRC

Growers with fruit remaining on the tree should look for the signs of SWD larvae. Although there is little fruit left hanging in sweet and tart cherry orchards, we have found many cherries to be infested with spotted wing drosophila (SWD) larvae in northwest Michigan. Obviously these fruits will not be harvested, but infested fruit in 2012 could lead to larger SWD populations the following season. We are not recommending that growers apply an insecticide specifically for SWD at this time, but we want to bring awareness about this new insect pest in cherry orchards. In early infestations, the hole in the fruit is extremely small--almost a pin hole size. Eventually, a dark circular pattern forms under the hole as the larvae begins to feed on the flesh of the fruit internally. Although we are still investigating these infestations, larger, more jagged holes become apparent as the larvae grow in size. We also believe that the SWD holes and larvae attract sap beetles, and some fruit have visible sap beetle feeding around the SWD hole. The following pictures will help growers determine if cherries are infested with SWD larvae.



Figure 1 Multiple SWD holes in tart cherry

Figure 2 Larger SWD hole in tart cherry

MI DEPT OF AGRICULTURE & RURAL DEVELOPMENT SEEKING PUBLIC INPUT ON AGRICULTURAL MANAGEMENT PRACTICES

The Michigan Commission of Agriculture and Rural Development and the Michigan Department of Agriculture and Rural Development (MDARD) today announced a public input meeting and review period has been scheduled for **August 22, 2012** in order to gather comments on the 2013 drafts of the state's **Generally Accepted Agricultural and Management Practices** (GAAMPs).

Public comment will be taken on all of the following GAAMPs. There are proposed changes in the GAAMPs for: Manure Management and Utilization, Site Selection and Odor Control for New and Expanding Livestock Production Facilities, the Care of Farm Animals, Irrigation Water Use, and Farm Markets. The GAAMPs regarding Nutrient Utilization, Cranberry Production, and Pesticide Utilization and Pest Control have no proposed changes for 2013.

The GAAMPs Public Input Meeting will be held at **10 a.m. on Wednesday, August 22, 2012**, in the Forum Conference Room at the State of Michigan Library and History Center located at 702 West Kalamazoo Street, Lansing, MI 48915.

Written comments may be submitted to MDARD's Environmental Stewardship Division, P.O. Box 30017, Lansing, MI 48909 and postmarked no later than **August 22, 2012**, or sent via e-mail to casteelh@michigan.gov <<mailto:casteelh@michigan.gov>> by 5 p.m. on August 22, 2012. MDARD will forward all comments received by the due date to the respective GAAMPs Task Force Chairpersons for consideration prior to final review and adoption.

The Michigan Right to Farm Act provides nuisance protection for farms and farm operations. In order to have this protection, the farm or farm operation must conform to GAAMPs, which are set by the Michigan Commission of Agriculture and Rural Development. These GAAMPs are reviewed annually by scientific committees of various experts, and revised and updated as necessary. Public comment is accepted and considered before final versions of the GAAMPs are approved.

For a copy of any of these GAAMPs, including the proposed revisions, please visit www.michigan.gov/gaamps <<http://www.michigan.gov/gaamps>>, or contact MDARD's Environmental Stewardship Division at (517) 373-9797, or toll free at (877) 632-1783.

PESTICIDE APPLICATOR CREDITS GRANTED FOR MAEAP VERIFICATION

Michigan farmers who have achieved verification in the Farmstead or Cropping Systems through the Michigan Agriculture Environmental Assurance Program (MAEAP) will be eligible for eight core pesticide applicator re-certification credits. Re-verified Cropping or Farmstead Systems, completed three or more years after the initial verification, will be eligible for four core pesticide applicator re-certification credits. The MAEAP verification pesticide applicator re-certification credits are available for Systems verified after January 1, 2012.

The verification credits are in addition to the pesticide applicator re-certification credits already available for completing environmental risk assessments with Farm *A* Syst and Crop*A*Syst. This recognition is based on the number of hours of pesticide-related technical support work completed by the farmer and the conservation district MAEAP technician after an environmental risk assessment in preparation for MAEAP System verification.

It was determined an average of 12 hours of pesticide related technical work is done to mitigate pesticide related environmental risks on the Farmstead System and 18 hours for the Cropping System.

Activities supported by technician activities in preparation for System verification include: developing an emergency farm plan; reporting extremely hazardous substances stored on the farm to the local emergency planning committee and the State; maintaining required setbacks for pesticide storages from wells and surface water; preparing environmentally sensitive field maps; identifying pesticide use restrictions for pesticides with groundwater or surface water use restrictions; assisting with pesticide inventory control; and proper disposal of unwanted or unusable pesticides. Most of these activities fall outside the scope of regulatory requirements but enhance environmental protection efforts.

Pesticide applicator re-certification credits are awarded to the owner/applicator of the MAEAP verified farm. The applicator must be currently certified and either own or lease the farming system.

Farmers with multiple cropping systems at one location must have all enterprises evaluated for environmental risks and verified to be eligible for Cropping System pesticide applicator re-certification credits. Farmers with multiple farming locations may receive credits for only one Farmstead System and one Cropping System.

For additional information on pesticide applicator re-certification credits and other producer incentives for MAEAP verification, farmers are encouraged to contact their MAEAP technician. MAEAP technicians are housed at local conservation district offices. To find your local office go to <http://macd.org>. For information about MAEAP, visit www.maeap.org. For the Grand Traverse Conservation District office, contact Garrett Coggon at 231-941-0960.

WEBSITES OF INTEREST

[CIAB Weekly Harvest Report Week 5](#)

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:

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Northern Michigan FruitNet 2012 Weekly Update NW Michigan Horticultural Research Center

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Farm Mgr, NWMHRS

July 31, 2012

Weather Report

The weather continues to be hot and dry, and we have received a little rainfall here in northwest Michigan, but it looks as though the amounts of rain were variable. For instance, we received almost $\frac{3}{4}$ " of rain at the NWMHRC but the East Leland weather station recorded less than 0.01" of rain. Daytime temperatures have been in the high 70s and low 80s, but we have not reached into the 90s since the prior week. The region could really use more rain to size apples but the lack of moisture has kept cherry leaf spot and apple scab infections at bay.

Crop Report

All cherry harvest has been completed, and raspberry harvest is wrapping up. The apple crop continues to look good but could use some rain to get some size to the fruit. There are few peaches throughout the region due to the spring weather, but peach harvest is underway and the quality is good.

Pest Report

Cherry

Cherry leaf spot (CLS) is still an issue for growers at this point in the season. This dry weather has been helpful in minimizing the spread of the disease that got an early jump on growers this season. We are recommending postharvest CLS applications, and growers should plan on keeping the trees covered through August, particularly when we have rain in the forecast and a potential wetting event. There is a lot of inoculum in the orchards, and moisture will certainly increase the spread of this disease. Growers should keep a close eye on the leaf spot model on [Enviroweather](http://www.enviroweather.msu.edu) (www.enviroweather.msu.edu).

We continue to catch **cherry fruit flies** (CFF). We remind growers that the fruit that remains on the trees is vulnerable to CFF infestation. The larvae that will develop in the fruit will contribute to a large CFF population next season. Recent work has shown that a post-harvest CFF application within seven days of harvest will reduce the CFF population in subsequent years. As many growers did not harvest this year, there could be a larger amount of fruit left on trees that can be infested by CFF. If growers are going out with a post-harvest CLS spray, we recommend that growers add a lower priced neonicotinoid to the tank to help minimize next year's CFF population.

We have observed **spotted wing drosophila (SWD)** infesting tart cherries in the region. Growers that have berry crops and/or vegetables (tomatoes, peppers, etc.) need to be on the lookout for this pest. Please refer to Dr. Isaac's article for more information: http://msue.anr.msu.edu/news/managing_spotted_wing_drosophila_update/

Apple

Apple scab has been reported as low throughout the state, and we have observed little scab in area orchards here in the northwest. The dry conditions will minimize the need for scab control in the coming week. Growers that were not able to control scab in this primary season need to keep fruit protected from this pathogen as we move through the season. Growers should also note that strobilurin resistance has been confirmed in all major apple growing regions of the state and the mutation confers complete resistance—fungicides containing strobilurin will not work against apple scab and increasing the rate of a strobilurin is not an effective option.

Codling moth (CM) trap counts are on the rise this week, and growers that have a crop of apples need to be monitoring as this pest will infest marketable fruit. With fewer apples in area orchards, CM will be competing to lay eggs in the reduced number of fruit that is available; therefore, growers need to be sure that fruit is covered at all times to minimize the risk of CM infestation. Again, we emphasize that growers monitor for this pest in their own orchards as there is variability in the pest population from block to block; the degree day accumulation is HIGHLY dependent on the biofix date (the first date of sustained codling moth trap catch) for each apple block. Growers should track the progress on their farms using the Enviroweather codling moth model and on-farm trap catch data.

Obliquebanded leafroller adult catch is low at the NWMHRC, but growers should also be trapping for this pest as they will also impact good marketable apples. There are materials that will control both CM and OBLR in apple, and the use of these combination sprays will minimize costs for control of both of these pests.

Wine Grapes

The recent rains have provided a bit of relief from drought conditions. We may see a response of rapid shoot growth. Some SW Michigan vineyards have started to show signs of veraison—we can't be very far behind!

The rains also provided for potential disease infection periods. Hard rains actually wash away powdery mildew spores, but the humid conditions following rains favors the progression of existing infections of this disease. It will be very important to scout carefully for powdery mildew on the shaded interior leaves and clusters. Downy mildew is not a common problem in our area, but it is important to be looking for this too now that we have been getting some rain.

Not much has changed on the insect front. **Sphinx moth** larvae should be getting large enough to detect more easily; keep these under control in young vineyards. Now that clusters are closed up from the sizing of berries, scouting for **grape berry moth** becomes more difficult. It is important to examine the interior of clusters thoroughly to find feeding sites.

IS LATE SEASON DISEASE CONTROL NEEDED IN GRAPES?

The warm, dry season has kept fungal diseases in grapes at bay. Continue vineyard and weather monitoring and be ready to take action if rainy weather returns.

Posted on **July 24, 2012, MSUE News**, by **Annemiek Schilder**, Michigan State University Extension, Department of Plant, Soil and Microbial Sciences

Considering the poor juice grape crop and extended warm, dry weather, the need for fungicide sprays during the rest of this season in juice grapes is minimal, but wine grapes are still at risk of foliar and fruit diseases. However, the weather conditions have definitely helped to keep fungal diseases at bay, for which we can be grateful. The main concern is if the weather changes and we will have to deal with lots of rain in the weeks before harvest, which would promote Botrytis bunch rot and sour rot. Below are some considerations which may help in making a spray decisions for the rest of the season.

Powdery mildew is showing up on leaves here and there on susceptible varieties and in unsprayed plots. This disease does not need a lot of moisture and can continue its development despite the drought. However, since there was not a lot of rain to get the disease started in the spring and early summer, and high radiation and heat can kill young colonies, powdery mildew pressure has been light this year. High temperatures that do not harm the plant can harm the fungus; spores and mildew colonies can be killed after extended durations of temperatures above 91 degrees Fahrenheit. The fungus is killed completely when air temperatures rise above 95 degrees Fahrenheit for 12 hours or more if colonies are directly exposed to UV light.

One thing to remember is that leaf temperatures are usually higher than air temperatures during the day. Protection against powdery mildew now is not necessary in Concord or Niagara, as many vineyards have excess foliage and little fruit. The vine can withstand a fair bit of disease anyway, especially with a reduced fruit load. At this point, most fruit clusters have developed resistance to powdery mildew infection, as berries are susceptible to powdery mildew infection for four to six weeks, with the time of highest susceptibility being from bloom to two to three weeks after bloom. Even wine grape growers can consider easing up on powdery mildew sprays and applying eradication sprays (i.e., with JMS Stylet Oil or bicarbonate salts) only if powdery mildew were to show up on the leaves between now and harvest. At this point, there is little risk of fruit infection unless there are berries out there that are still relatively young, which could be the case with uneven bloom after spring frost damage. An eradication spray is recommended anyway in late August and early September to knock back overwintering inoculum for next year.

Downy mildew symptoms were seen on wild grapes in mid-June but have not been seen in juice or wine grapes. The dry weather has kept this disease at bay. During hot, dry weather, downy mildew "goes on vacation." Were the weather to change, there could still be some downy mildew development; however, it is unlikely to be very damaging. In August and September, heavy dews can aid downy mildew development. Continued monitoring of the vines and weather is advised.

Black rot is showing up on the fruit in some vineyards where black rot was a problem last year and fungicide sprays may have been missed. Fruit symptoms include a sharply delineated brown area that expands quickly, finally shriveling up the fruit to hard, blue-black mummies. These symptoms are the result of infections that took place sometime between bloom and four to six weeks after bloom and have remained dormant until now. Any symptoms showing up now are an indication that you missed an infection period during which preventive or curative sprays should have been applied.

The susceptible period ranges from bloom to about five weeks after bloom in juice grapes and up to eight weeks after bloom in some wine grape cultivars, at which point the berries become naturally resistant to infection. Since there were so few rainfall events during which clusters would have been wetted for a sufficiently long period to get infection, it may be beneficial to look back at the [black rot Enviro-weather model](#) to see when infection periods occurred in relation to fungicide sprays. If black rot is showing up in wine grapes and there are still relatively young berries (stragglers), there might still be a chance of infection, potentially from already infected berries. With the high temperatures, six to seven hours of fruit wetness would be sufficient for infection.

Consult the [black rot Enviro-weather model](#) of a nearby weather station, and if an infection period has occurred, apply an SI fungicide (Elite, Rally, Orius, etc.) within 24 to 48 hours if possible. This fungicide spray will also aid in powdery mildew control.

Phomopsis lesions are present on canes, leaves, petioles and even some rachises to some extent in many vineyards, but levels are lower than in previous years. Fruit infections will become apparent a few weeks before harvest. During warm, dry years, there may be remaining spores that can still be released in July and August were rainy weather to prevail later in the season. In susceptible cultivars (e.g., Vignoles), it may be helpful to apply a broad-spectrum product (e.g., Pristine) to catch any late-season Phomopsis and other diseases. In wine grapes, there can be berry-to-berry spread by Phomopsis as harvest approaches as rotten berries remain attached more than in juice grapes. Therefore, later-season sprays for Phomopsis may still have benefits in wine grapes.

As we approach veraison, **Botrytis** becomes a concern in susceptible varieties, especially tight-clustered grapes. However, continued dry, warm weather will also keep Botrytis at bay; the concern is if the weather changes and cool, wet conditions prevail. If needed, good control can be achieved with the reduced-risk fungicides Vangard and Elevate. These fungicides can be alternated for fungicide resistance management. A spray at veraison and one to two weeks prior to harvest is recommended.

Rainy weather in the weeks before harvest will increase chances of **sour rot**. Work by MSU's [Paolo Sabbatini](#) has shown that berries can take up water rapidly through their skins, swell up and burst, leading to injuries that allow acetic acid bacteria and yeasts to enter the fruit and cause sour rot. For both Botrytis and sour rot management, it is not yet too late to pull leaves around fruit clusters, which will help to reduce disease pressure. However, be careful not to fully expose previously shaded clusters as strong radiation and high temperatures can cause severe scalding of berries.

With respect to **fungicide use** during hot, dry conditions, remember that in the absence of rain, high temperatures and solar radiation can still break down fungicides on the plant surface and, even though fungicide residues may still be visible, the active ingredient may have been reduced to non-effective levels. In addition, be careful with phosphites (Phostrol, ProPhyt) as leaf burning may occur when applied to drought – and heat-stressed vines and at high temperatures. Sulfur also should not be applied when temperatures are at or anticipated to be over 85 F. Remember that leaf temperatures can be substantially higher than air temperatures during the day.

The best times to apply systemic fungicides during this period is at night or in the early morning, especially when the soil is moist (i.e., after a rain event) and the cuticle is swelled up and permeable to fungicides. Avoid applying systemic fungicides during hot, dry conditions as they will not be taken up by the leaves and can be lost to evaporation and UV breakdown. Protectant fungicides, on the other hand, are OK to be applied during warm, dry conditions, as we want them to quickly dry onto and adhere to the leaves. If a tank-mix is applied, choose the conditions that favor uptake of the systemic component.

Additional information:

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

MICHIGAN DROUGHT UPDATE FOR JULY 25, 2012

The next week or two is forecasted to bring at least a temporary break to the drought conditions.

Posted on **July 25, 2012, MSU-E News**, by **Jeff Andresen**, and Aaron Pollyea, Michigan State University Extension, Department of Geography

Showers and thunderstorms moving around the northern periphery of the vast upper air ridge across the central United States brought much-needed rainfall to many sections of Michigan during the past several days, including the southwestern Lower Peninsula, which had been repeatedly missed by earlier precipitation. While the rainfall provided at least some temporary relief from moisture stress, more will be needed in the coming weeks given near peak crop-water use demands and extremely low soil moisture reserves.

As of July 17, the percentage of the state experiencing drought conditions or abnormal dryness as defined by the [U.S. Drought Monitor](#) had grown to 82 percent. There was also an expansion of the area of severe or worse drought conditions to 21 percent and the first appearance of "extreme" drought conditions in a narrow area of southern Lower Michigan along the Indiana border.

Latest forecast guidance suggests some changes in the next one to two weeks that should result in at least a temporary break in the drought conditions. During the next 48 to 72 hours (as of July 25, 2012), two weather systems are expected to bring significant rainfall to the state with widespread heavy rain possible in northern sections late Wednesday through Thursday morning (July 25-26). Additional scattered showers and thunderstorms are possible Thursday and during the day Friday (July 27). Fair, somewhat cooler and less humid weather is likely this weekend. After one more relatively hot day Thursday with highs in the 80s to mid-90s, daytime temperatures will generally fall back to a range from the mid- and upper 70s far north to the mid- to upper 80s south. Lows will be in the 60s.

In the medium range time frame, forecast guidance suggests that the axis of the upper air ridge across the central United States will shift westward and flatten somewhat, which should leave Michigan and the Great Lakes region under northwesterly flow aloft. This pattern would lead to somewhat cooler temperatures and more frequent chances for rain.

The latest [NOAA Climate Prediction Center](#) 6-10 day and 8-14 day outlooks (for July 30 to August 3 and August 1-7) both call for near to above normal mean temperatures and precipitation totals. New 30-day and three-month outlooks for the month of August and August through October period both call for warmer than normal temperatures to continue state and region wide for both periods, and for below normal precipitation totals across southern sections of the state. Precipitation totals across northern sections are forecast to remain in the "climatology" category, suggesting near equal odds of below, near and above normal totals. These outlooks are based primarily on continuity, with the widespread impacts of this year's drought (i.e., large areas of abnormally dry soils) likely to continue to influence weather patterns in the region through the late summer.

Additional information:

MSU Extension's [Drought Resources](#)

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

DROUGHT QUESTIONNAIRE

Public Insight Network is asking farmers for their thoughts on how climate change is affecting their farms and they are looking for input from growers in our region. Could you please take a minute to go to one of the online questionnaire websites given below to fill out the questionnaire.

It should not take you long to fill out the questionnaire: <http://www.publicinsightnetwork.org/form/073171bd39be>

Or you can fill it out on the Public Insight Network website from this article:

<http://www.pbs.org/newshour/rundown/2012/05/climate-change-on-the-farm.html>

Join us in Michigan August 17 & 18

OTFA Orchard Field Day - Hops Tour & Cider Tasting

Organic Orchard Management: Highlights and Lessons Learned from On-farm Research

Saturday, August 18th, 10:00 am -4:00 pm

**Garthe Farms, LLC
9691 East Seth Rd, Northport, MI**

Cost: Register by August 13th for the early bird rate of \$20 and \$10 for OTFA members. Registration the day of the event -- \$25 and \$15 for members.

Catered organic lunch provided

Celebrate and learn with us. Join us at Garthe Farms as we learn more about their organic orchard management practices with a focus on apples, pears, sweet and tart cherries, and on-farm research projects that Gene and Kathy are conducting in collaboration with Michigan State University researchers and other area growers. Highlights will include morning discussions on the challenges and opportunities associated with organic pest management, orchard tour, afternoon field walk sessions on orchard fertility, organic disease and insect management, and ways to integrate pastured hogs in the organic orchard.

Extend your stay—learn and celebrate some more!

Free Hops Tour: Friday, August 17, 2:00 - 4:00 pm, [NW Michigan Horticultural Research Center](#)

Free Cider Tasting: Friday, August 17, beginning 5:00 pm, at [Tandem Ciders](#)

We also invite you to join us the day before on Friday, August 17th for an afternoon tour of an organic hops variety trial being conducted at the nearby NW Michigan Horticultural Research Center. The tour will be led by Dr. Rob Serrine, Extension Educator and Specialist in Community Food Systems.

And

We'll wrap up the day to visit Nikki Rothwell, owner of Tandem Orchards for a cider tasting at her cidery, [Tandem Ciders](#) located in Sutton Bay just 11 miles from the Research Center.

To RSVP and for event details, directions, and suggested accommodations contact info@organictreefruit.org or call 608-257-6729.

You can also download a copy of the [event flyer](#) and [registration form](#)

Special thanks to event hosts, Gene and Kathy Garthe, to Matt Grieshop, Mark Whalon, with Michigan State University and Jim Laubuch, IPM Crop Scout, for sharing your expertise. Thank you also to Nikki Rothwell, Director of the NWMHRC, Tandem Orchards and Tandem Ciders and to Rob Serrine, Extension Educator for hosting the hops tour and for sharing your research expertise.

For more information on this and other OTFA events, visit our [website](#).

Safe travels and we hope to see you in Michigan later this summer!

WEBSITES OF INTEREST

[CIAB Weekly Harvest Report Week 6](#)

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/>

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