News you can use

Disease management
Powdery mildew and downy mildew are active in Michigan vineyards. Monitor vineyards for infections and protect fruit clusters with effective fungicides. Add protectant fungicides in the tank-mix if fungicide resistance suspected.

Insect management
Japanese beetle emergence is starting. Potato leafhoppers, rose chafer, and grape berry moth are still active.

Growing degree days
Please notice that we are now reporting a 5-year average for GDD. This average is for 2005 through 2009. We report GDD for key growing regions; go to the MSU Enviroweather website to find more information for these stations and other regions.

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<th>Location</th>
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<th>GDD 2010</th>
<th>GDD 2009</th>
<th>5-yr Avg*</th>
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*5-yr Avg = 2005 to 2009
See enviroweather.msu.edu for more information.
Temperatures have been erratic over the past week, and warmer weather is in the forecast for the days ahead. The region has been receiving some much needed rainfall, with 2.8” of rain on 12 June and 0.61” on 15 June here at the NW research station. The overall June rainfall total is 4.48”. Conditions have been cloudy and humid causing concerns about disease control.

We continue to monitor for grape berry moth activity, with no adult moths detected this week. According to the model, as of 17 June we have accumulated 341 DD47 if wild grape bloom (biofix) occurred on 26 May in your vineyard. The first treatment window for sites with significant pressure should be targeted at 810 DD47 after biofix. Potato leafhopper continued to be trapped this week (Fig. 1) at relatively low levels, with the first nymphs being spotted this week on the underside of leaves. Refer to last week’s report for more information on potato leafhopper management. Growers should remain vigilant for the tell-tale signs of leafhopper damage. Potato leafhoppers can be very destructive on hybrid or vinifera varieties that are sensitive to the saliva they inject while feeding.

Growers with lecanium scale concerns are approaching a treatment window when controls will target the crawler stage. During the crawler stage, the insects are once again susceptible to insecticides after emerging from the protective waxy shell formed by females this spring. The rule of thumb is that vigorous and healthy trees and plants can tolerate some scale infestation, and natural enemies usually regulate scale populations and prevent outbreaks of these pests. However, if high populations of Lecanium scale are found, control programs should be considered. Most scale insecticides are targeted at the approaching crawler stage which can be identified by placing double-sided sticky tape near to scales on infested shoots, and checking with a hand lens until you see tiny dots (the young crawlers) on it. Crawlers resemble tan colored footballs, and unless they are in high numbers, they are difficult to see without a hand lens. We have not observed any crawlers in our traps yet, but have received report of the first crawlers emerging on Leelanau Peninsula. Growers should wait until they observe significant crawler activity (approximately 80% emergence) before applying an insecticide. Refer to last week’s report for more information on scale.

Rose chafer populations have increased this week with significant damage to young trees and vines being observed at some sites (Fig. 3). Rose chafers are in the family Scarabaeidae, and their larvae resemble the characteristic C-shaped white grub. These larvae overwinter deep in the soil, and in spring, they move up to feed on grass roots just below the soil surface. Adults emerge from the soil in late May to June,
and male beetles are attracted to females and congregate on plants to mate and feed (Fig. 4). Rose chafers are often more problematic in vineyards and orchards that are adjacent to grassy areas, particularly those with sandy soils. Adults are tan, long-legged beetles, and this life stage is the most damaging because they feed on tree fruit and grape vine foliage. This feeding can be particularly damaging in young trees and vines. The good news is that mating and egg-laying last only about two weeks, and the average life span of the adult is three weeks. Rose chafers management can be questionable in orchard or vineyard systems both because the insects are only present for a short time and because they can re-infest an area quickly after an insecticide application. The feeding damage and/or population size of this pest may not warrant an insecticide, particularly on older trees or vines with ample leaves present at this time of the year. Many insecticides will knock down the beetle population effectively, but most are only rated as fair or good because of the beetles’ mobility and potential to re-infest a site. There are many options for control, and growers should consult the E-154 Michigan Fruit Management Guide for specific insecticides.

Still no sign of mildews or disease symptoms as of yet, but growers should remember that we are entering the critical management period for powdery mildew from bloom through 3-4 weeks post bloom.

-E.L.
We continue to see some minor pests during vineyard scouting, especially in those vineyards that haven’t received any insecticide sprays. We’re also seeing quite a few natural enemies while scouting, including syrphid flies, lacewings, and multi-colored Asian ladybeetles (pests at harvest, beneficial during the season). These are good to see in a vineyard since they’ll be eating pest insects.

**Rose Chafer.** Only a few straggler rose chafers were found this week and none were found feeding on clusters. They should be out of the picture for the rest of the season.

**Grape Cane Girdler.** We’ve been finding scattered evidence of grape cane girdler damage in some of the vineyards we scout for this newsletter (Fig. 6). This small black beetle makes holes near the end of the grape shoot that cause the shoot to break off. The picture shows an adult beetle we found on a damaged shoot yesterday. This minor pest usually isn’t of economic concern in mature vineyards that receive a regular insecticide program. However, in young vineyards and/or vineyards that receive minimal insecticide sprays you may see populations build higher than normal. For example, at the Trevor Nichols Station in Fennville we have some damage on some of our unsprayed potted vines, but no damage in any of our mature vineyards that receive insecticide sprays.

**Potato Leafhopper.** Last week we found a lot of potato leafhopper nymphs on leaves at the Allegan Chardonnay site. After an insecticide spray was applied this past week, we didn’t find any PLH in the vineyard. Now is a good time to look for nymphs, assuming you haven’t already sprayed for them, because the majority of the nymphs are quite large (large for a leafhopper nymph, that is) and are a bright green/yellow color (Fig. 7). Also keep an eye out for yellowing on the leaf edges and cupping of the entire leaf, as these are both signs that the PLH are causing damage to the vines.

**Grape Berry Moth.** We found grape berry moth larvae in clusters at three of the four sites we scout for this report. Larvae infesting primary clusters are beginning to burrow inside the small berries, while larvae on secondary clusters are still webbing together the berries (see Figs. 8 and 9). The larvae we’re finding have developed quite rapidly in the last week and will probably continue on to pupation during the next 7-10 days.

In frost-damaged vineyards that aren’t being harvesting this year, there is little point in spraying insecticide to control the GBM larvae in the clusters right now. You can skip the insecticide spray for this generation and still...
achieve control in anticipation of next year by targeting the second and third generations.

If you are keeping track of growing degree days (GDD) with the grape berry moth model, we are well on our way to the 810 GDD that is the predicted start of second generation egg-laying. Sites in southwest Michigan are approaching or have just passed 500 GDD (see table). If the warm weather continues we could reach 810 GDD in another two weeks.

Japanese Beetles. While we didn't find any Japanese beetles at the four scouting sites, we did find an adult beetle on an Aurore leaf at TNRC in Fennville (Fig. 10). We should see just a trickle of adults emerging this coming week followed by a much larger number emerging the week after next.

Phomopsis. Phomopsis infections on cluster rachises are becoming more noticeable as the clusters continue to grow. Vineyards that have been receiving reduced spray programs have more infections on the rachises than those that have received their usual program. Now that bloom is mostly over you can better judge what kind of crop you have in your vineyards. If you do have vineyard blocks that are harvestable you need to keep them protected. This is especially true given how much wet weather we've been having.

Black Rot. We found quite a few black rot spots on leaves at the Van Buren Concord site. Clusters will be vulnerable to infection for a few weeks yet. The black rot model on the Enviroweather web site shows that there have been six wetting events in the Lawton area since May 20. In previous years at this time there were seven (2009), four (2008), and two (2007) infection events, indicating that this year is at the high end of black rot infection events.

Downy Mildew. We found one downy mildew leaf spot at the Van Buren Concord site this week. This is earlier than we normally see leaf spots showing up and should be a warning to keep a close eye on your susceptible varieties for leaf spots. To scout for downy mildew walk through your vineyard looking for yellow spots on the leaves. When you do find a spot turn the leaf over and look for white fuzz directly underneath the yellow spot. This is the sporulation of the fungus and is the key to identifying the disease. Low-level paraquat injury on the leaves will frequently look very similar to downy mildew but lacks the white sporulation on the underside of the leaf.

Growth Stages. Primary clusters at the Van Buren and Berrien Concord sites are well past bloom while secondary clusters are just wrapping up bloom right now. The Berrien Vignoles site is past bloom (Fig. 11) and will probably progress rapidly towards bunch closure over the next couple of weeks. Clusters at the Allegan Chardonnay site have just finished up with bloom.
Protect grape clusters from all major grape diseases at this time

Powdery mildew and downy mildew
This past week, we observed the first active downy mildew and powdery mildew infections in unsprayed grapevines in Lansing, Fennville, and Ontario, Canada. Sporulating downy mildew lesions were seen on leaves and tendrils of Chardonnay, on leaves and clusters of Chancellor, and on leaves of wild grapes (Vitis riparia). On Niagara vines, sporulating lesions were found on leaves close to the ground, which are subject to splashing soil which contains germinating oospores. Last year, we first observed downy mildew in Chancellor in Fennville during the first week of June. It is safe to assume that these pathogens will continue to be active during the warm, humid weather that is forecast for the coming weeks. Growers are therefore strongly advised to protect flower and fruit clusters from infection using effective fungicides as soon as possible if the vines are not already protected. Also, continue to monitor vineyards for signs of infection. At this stage, the young clusters are highly susceptible to all major diseases, including downy mildew, powdery mildew, black rot and Phomopsis. Black rot and Phomopsis lesions have been seen for several weeks and indicate that the pathogens are active. The risk of infection is especially high if we have multiple or big rain events, like we’ve had recently, and moderate to warm temperatures during this time. Prolonged wet conditions during bloom can also allow Botrytis to get a foothold in the clusters of susceptible varieties by promoting growth on senescing flower parts.

If active infections are found, use fungicides with post-infection activity at the highest labeled rate. For downy mildew, Ridomil Gold MZ or Ridomil Gold Copper are the strongest fungicides, followed by phosphorous acid fungicides like Phostrol and ProPhyt. Strobilurin fungicides have limited post-infection activity and should preferentially be used in a preventative mode. New(er) fungicides for downy mildew control are: Presidio, Revus and Revus Top (don’t apply Revus Top to Concord or Noiret vines due to phytotoxicity concerns), Gavel (contains mancozeb), Forum, and Tanos. While some of these new fungicides have post-infection (curative) activity, they are best applied on a preventative basis. They are excellent for integration into a fungicide resistance management program as they represent new and different chemistries.

It will be especially critical to protect clusters of susceptible varieties from powdery mildew at this time. Sterol inhibitor (e.g., Elite, Rally) and strobilurin (e.g., Abound, Flint) fungicides have the ability to cure early infections but will not eliminate already established colonies. JMS Stylet Oil and potassium bicarbonate fungicides (Kaligreen, Armicarb, MilStop) can be used to eradicate visible powdery mildew colonies. Make sure that coverage is thorough (use sufficient spray volume), as only those colonies contacted by the fungicide will be killed. Since strobilurin-resistant powdery mildew isolates have been found in Michigan vineyards (mostly MSU experimental vineyards and wine grape vineyards with a history of strobilurin use) and we have circumstantial evidence for sterol inhibitor resistance, we recommend adding a protectant fungicide like Sulfur or Ziram to the tankmix when using either type of fungicide. Sulfur is the most cost-effective option for non-sulfur sensitive grape cultivars. Over the past two years, we have noticed that Ziram as a tank-mix partner did improve control of powdery mildew in a spray program. Also, alternate with fungicides with different modes of action, for example Quintec, Endura, Serenade, Sonata, Regalia. Revus Top is a new fungicide for powdery and downy mildew and black rot control in grapes. However, the ingredient that is active against powdery mildew is difenoconazole which belongs to the sterol inhibitor class. This fungicide may be phytotoxic on Concord grapes, so do not use on Concords.

Protect clusters for at least 4 to 5 weeks after bloom, keeping in mind that due to spring frost injury there are clusters of different ages in many vineyards. Make sure to continue protecting the youngest clusters. As the berries develop, they become naturally resistant to black rot, downy mildew, and powdery mildew and the need for protection diminishes after the susceptible period ends. This happens quite rapidly for downy mildew (2-3 weeks after bloom), whereas for powdery mildew it is about 4 weeks after bloom. Concord grapes become resistant to black rot 4-5 weeks after bloom, but some wine grape varieties may remain susceptible to black rot for up to 8 weeks postbloom. However, be aware that the cluster stem (rachis) and berry stems can remain susceptible longer than the berries in most cases. The only disease to which berries remain susceptible throughout their development is Phomopsis, but the risk of infection diminishes...
after bunch closure because inoculum levels drop off then. Botrytis is just the opposite in that berries actually become more susceptible as they get closer to harvest, especially in tight-clustered varieties. In general, aim to protect the clusters from the major diseases from immediate pre-bloom until 4-5 weeks after bloom.

**Black rot**

Small black rot lesions have been seen on grape leaves in various locations. Temperatures in the high 70's and low 80's are perfect for black rot. At these temperatures, only 6-7 hours of wetness are needed for infection. Black rot is a tricky disease because infections can remain latent (invisible) for a long period of time, so you won't know that you have the disease until it is too late to do anything about it. However, one can scout for the small, round leaf spots – a lot of black rot leaf lesions indicate high disease pressure from ascospore inoculum and also contribute to fruit infections. In a field with a history of black rot, old fruit cluster remnants left hanging in the trellis are major contributors to infection. Fruit infections can take place anytime from bloom onwards, but only become apparent sometime between bunch closure and veraison. The period from immediate pre-bloom through early fruit development is crucial to protect grapes against black rot infection.

The approach to black rot control now focuses primarily on protecting the clusters from infection. EBDC sprays applied earlier in the season for Phomopsis will also control black rot leaf infections, and therefore no sprays are recommended specifically for black rot on the foliage early in the season. In five years of trials in New York, good black rot control was achieved with one immediate pre-bloom and 1 to 2 post-bloom fungicide sprays. A second post-bloom application is strongly advised if black rot has been a problem in the vineyard the previous year, and should be considered prudent if wet weather is anticipated. During three years of fungicide trials in a ‘Concord’ vineyard in Fennville, MI, just two post-bloom applications of SI fungicides (Nova, Elite) have provided very good control under high black rot pressure.

Phomopsis Cane and leaf lesions have been showing up in high numbers in susceptible varieties. Each rainfall event will lead to spore dispersal and can also lead to successful infection if the tissue remains wet for a sufficient amount of time. The optimum temperature for infection is 59-68°F, at which time about 6-10 hours of wetness are needed for infection. The longer the tissue stays wet, the more severe the symptoms will be. At this time we should be concerned with preventing Phomopsis infection of the rachis and fruit, especially in mechanically pruned vineyards and vineyards with a history of the disease. Rachis infections are most closely correlated with yield losses due to berry drop at harvest in Niagara vines, whereas fruit infections are more of a problem in wine grapes.

If at this time you find a lot of lesions on the leaves and canes, infection pressure will be high for the fruit also. It is not too late to apply fungicides for cluster protection from Phomopsis. The best fungicide options for control of Phomopsis during and after bloom are Abound, Sovran, Flint, or Pristine (do not use Pristine on Concord grapes). Phosphorous acid fungicides such as ProPhyt and Phostrol are also good and cost-effective alternatives. These are systemic and will likely provide some kick-back activity. In trials done in Michigan, ProPhyt provided very good control of Phomopsis when sprayed on a 14-day schedule. Tighten the schedule and increase the rate if disease pressure is high. Ziram is a moderate to good protectant against Phomopsis and can be a tank-mix partner with any of the phosphorous acid fungicides. EBDC fungicides and Captan are good protectants but cannot be applied after bloom has started in grapes grown for the National Grape Cooperative. EBDC’s have a 66-day pre-harvest interval.

Sterol-inhibitor fungicides (e.g., Nova and Elite) continue to provide outstanding control of black rot, and provide several days of post-infection activity. Currently there are various “generic” tebuconazole products on the market, e.g., Orius and Tebuzol that may be more cost-effective. When using SI fungicides on a post-infection schedule, use the highest label rates, because post-infection activity is strongly rate-dependent, particularly when extended “kickback” activity is required. The strobilurin fungicides (Abound, Flint, Sovran, Pristine) and Revus Top are also excellent protectants but provide only limited post-infection activity. Flint, Pristine, and Revus Top should not be used on Concord grapes because of potential phytotoxicity.
**Great Lakes Wine & Brew Fest**
June 26-27
Michigan International Speedway

**2010 NW Wine Grape IPM Updates**
More information: Erin Lizotte, 231-946-1510.
July 9
3-5PM
2Lads Winery, OMP
Speakers: Paul Jenkins and Paolo Sabbatini

August 6
3-5PM
Ligon Farm, OMP
Speaker: Paolo Sabbatini

September 3
3-5PM
L. Mawby
Speaker: Rufus Isaacs

**2010 NWMHRS Annual Open House**
More information: Nikki Rothwell, 231-946-1510.
August 19
3-5PM
NWMHRS

**2010 SW Juice Grape Grower Meetings**
More information: Mark Longstroth 269-330-2790 or Diane Brown-Rytlewski 269-944-4126 X4012.
June 23
6-8PM
SWMREC
Speakers: Annemiek Schilder & Rufus Isaacs

August 17
1:30-3:30PM
Location TBA
Speakers: Annemiek Schilder & Rufus Isaacs

**2010 SW Wine Grape grower meetings**
August 4
12PM
Location TBD

**2010 SW Viticulture Field Day**
July 29
9AM-5PM
SWMREC
Please note this event is on a Thursday this year.

**ASEV-Eastern Section Conference**
More information: 
http://www.nysaes.cornell.edu/fst/asev/index.php
July 13-15, pre-conference tour July 12
Geneva, New York
Hobart and William Smith Colleges

**2010 Enology Education Workshops**
August 16
9AM-4PM
Location: SW Michigan Winery TBD

August 18
9AM-4PM
Location: NW Michigan Winery TBD

Keynote speakers for both events: Dr. Nichola Hall (CA) and Dan Wampfler (WA).