News you can use

Disease management
Continue to monitor for foliar and fruit diseases. Continue checking susceptible varieties against downy and powdery mildew.

Insect management
Continue to scout inside canopies for grape berry moth and leafhoppers. Protect clusters from berry moth in high pressure sites.

Pre-harvest enology workshop
Our next enology workshop is on August 16th (Fennville) and August 18th (Suttons Bay). Registration is limited to 50 people at each location. Go here for online registration. Registration deadline is August 12th. More information: Paul Jenkins, jenki132@msu.edu

Seminar announcement
Dr. Keren Bindon, of the Australian Wine research Institute, will present a seminar on “Tannin from the grape to the wine: New insights on a compex system.” Monday, August 9th, 12:00PM A279 Plant & Soil Science Building MSU Campus

SW winegrape grower meeting today. August 4th at 12PM, Karma Vista in Coloma.

GROWING DEGREE DAYS

<table>
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<th>Base 50 from April 1</th>
<th>2010</th>
<th>2009</th>
<th>5-yr Avg*</th>
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*5-yr Avg = 2005 to 2009
See enviroweather.msu.edu for more information.
It has been hot and muggy over the past couple of days. We have accumulated 2400 GDD base 42 and 1538 base 50, still well ahead of the 20-year average. We received 0.18” of rain on 31 July and 0.02” on 1 August at the NWMHRS. Vines have really shot up over the past weeks and hedging and leaf pulling is underway in many vineyards. Growers are concerned about sun scald, but are weighing the risks and benefits of pulling leaves, such as ensuring proper fungicide coverage on clusters where rot is a concern and foliage is precluding delivery.

We continue to monitor for grape berry moth (GBM) activity and although there was no significant adult trap catch this season, larval webbing and feeding remain visible in clusters. At this point in the season it is easy to spot fruit with active larvae as discoloration of the green berries occurs (Fig. 1), simply peel back the skin to confirm the larvae of grape berry moth inside the fruit (Fig. 2). Currently the model is predicting that egg laying will begin this Sunday, however as we are seeing small larvae feeding we know that the time for treatment is now, particularly as berries expand and clusters close. We typically would like to time treatment earlier and it is still unclear why the model appears to be predicting egg laying so late.

This year’s hot temperatures and rare weather patterns could be a likely cause of the model’s error. If you are seeing active larvae in your vineyard broad spectrum larvacides should be applied immediately, growers should not wait to manage based on the model. There are a number of effective berry moth materials, refer to the E-154 Fruit Management Guide and the June 25 Newsletter for more information.

Beetle feeding damage was observed on foliage, though the culprit was not identified. We have also received report of false Japanese beetle being spotted. False Japanese beetles have a head and thorax that is a dull, metallic green and its wings are brown; these insects are also narrower (more like the shape of a Rose chafer) than the round-looking Japanese beetle. Japanese beetle are a more substantial insect with flashier and more distinct colors and patterns, none have been reported in the northwest yet this season. Potato leafhopper adults continue to be trapped at moderate levels, but no nymph or adult activity was observed on vines this week and few growers report the need for management.

Downey mildew has been seen in area vineyards (Figs. 3 & 4), including those under conventional management programs. We typically see a minimal amount of downy mildew in northwest Michigan, but the humidity this season may be a contributing factor. It is important to keep in mind that the list of GRAPE&WINE August 4, 2010

REGIONAL SCOUTING REPORTS

NORTHWEST

Erin Lizotte, IPM/IFP District Educator
NW Michigan Horticultural Research Station

Fig 1. Grape berry moth infested berry seen on 2 August; Photo: E. Lizotte.

Fig 2. Grape berry moth larva seen on 2 August; Photo: E. Lizotte.

Fig 3. Downy mildew leaf infection (top side), 2 August; Photo: E. Lizotte.

Fig 4. Downy mildew leaf infection (bottom side), 2 August; Photo: E. Lizotte.

REGIONAL SCOUTING REPORTS

GRAPE&WINE August 4, 2010

Figure 1: Grape berry moth infested berry seen on 2 August; Photo: E. Lizotte.

Figure 2: Grape berry moth larva seen on 2 August; Photo: E. Lizotte.

Figure 3: Downy mildew leaf infection (top side), 2 August; Photo: E. Lizotte.

Figure 4: Downy mildew leaf infection (bottom side), 2 August; Photo: E. Lizotte.
fungicides effective against both downy and powdery mildew is short, so even if growers applied fungicides for powdery mildew it may necessary to treat for downy separately. Powdery mildew has been slow to arrive this season but is beginning to show up around the region. It is likely that significant powdery mildew infections will be visible at this time, although we have received no reports of severe infections thus far. Botrytis has also been spotted, not surprising given the persistent wetting events as of late. We typically time botrytis treatments for veraison, but if you have botrytis infections on green fruit management should not be delayed. Symptoms of leafroll virus are also visible on area vines. Leaves on vines infected with leafroll virus become yellow or reddish purple as the season progresses (Fig. 5); the main veins remain green. By late summer, the leaves start rolling downward and at harvest fruit clusters are small, poorly colored, and low in sugar. The disease does not kill the vine but is chronic and is spread primarily via infected nursery stock and the grape mealybug. Within-field spread by mealybug is very slow.

-E.L.
Southwest
Steve Van Timmeren, Research Technician
Trevor Nichols Research Complex

Grape Berry Moth. Three of the four sites scouted for this newsletter have now reached the 1620 GDD point, the time when the next generation of grape berry moth egg-laying is predicted to start. Egg-laying should continue for at least a few weeks, so you should make sure your clusters are covered, especially if you haven’t sprayed yet for GBM this year.

Recent scouting has shown a steady increase in berry infestations as the 2nd generation of GBM has progressed. The percent of infested clusters at the Berrien Vignoles are well above the 6-year average for this time of year (Fig. 9). This is in contrast to last year, which was significantly lower than the multi-year average. Grape berry moth pressure hasn’t been at this high of level at the Berrien Vignoles site since 2005.

What all this means is that you shouldn’t let last year’s lower levels of infestation lull you into complacency. This year is shaping up to be a higher pressure year than average so making sure your vineyards remain protected is crucial.

If you have frost-damaged vineyards that you haven’t been applying insecticides to, you probably have a reasonably high level of GBM in the berries at this point. If you decide not to apply any insecticides for this generation of GBM you should remember that most of the GBM will overwinter in the vineyard and will result in much higher pressure next spring.

Japanese Beetles. Japanese beetles were lower at the Berrien Concord and Vignoles sites where insecticide applications were made. Populations at the Allegan Chardonnay site are beginning to increase again and may or may not reach levels requiring a spray. Once we get to the latter half of August almost all of the beetles that move into your vineyards will be ones that are immigrating from elsewhere and not freshly emerged beetles. Continue to watch your young vines closely, as they have a higher risk for defoliation.

Black Rot. Almost all Black rot berries found are now at the mummy stage (Fig. 11) or have fallen off the clusters. If you have a lot of infected berries, such as in minimally-managed frost damaged vineyards, remember that the disease pressure is going to be higher next year.

Powdery Mildew. Powdery mildew is noticeable at both the Van Buren and Berrien Concord sites, but only on scattered clusters deep within the canopy.

Downy Mildew. Downy mildew still has only shown up at the Van Buren Concord site in very low amounts. The infections that are visible appear to be naturally dying out at this point. However, if you have susceptible varieties, especially those receiving few sprays due to frost damage, you should be watching closely. Although our scouting has not revealed high levels of downy mildew infections, the MSU Small Fruit Pathology lab indicates that downy mildew is out there this year. Scout your vineyards to know your risk.

Growing degree days (base 47) from biofix date

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<th>Site</th>
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<td>1606</td>
<td>1761</td>
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<td>1598</td>
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<tr>
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<td>May 26</td>
<td>1340</td>
<td>1538</td>
<td>1689</td>
<td>1880</td>
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</table>

Fig 9. Average percent of clusters infested with GBM (average of four locations in the vineyard: 2 border and 2 interior) at the Berrien Vignoles location.

Fig 10. Later instar GBM larva. Your pennies are safe, GBM only feeds on grapes. Photo: S. Van Timmeren.
Botrytis. While no new Botrytis infections are showing up at the Allegan Chardonnay site, the ones that are present continue to spread to adjacent berries. If you have vineyards that get a lot of Botrytis applying a protectant spray at veraison is crucial to achieving control.

Grapevine Decline aka “Measles”. Last year we found a few vines showing “measles” on the grapes at one of our Concord sites (Figs. 12 & 13). Most of the vines had at least one whole arm of the vine infected with the disease. Upon revisiting these infected vines this year every infected arm had died off this year. If you’re noticing some vines dying in your vineyard now is the time to pay attention to something such as grapevine decline. When you see any clusters with the purplish-grey flecks in the berries you should flag those vines and watch them over the coming seasons.

Growth Stages. Clusters at the Berrien Vignoles site are just starting to soften up a bit as we approach veraison. Clusters at the other three sites (Van Buren and Berrien Concord, Allegan Chardonnay) are still at the green fruit stage.

-S.V.
Controlling Botrytis bunch rot in grapes

Early symptoms of Botrytis bunch rot (gray mold), caused by the fungus *Botrytis cinerea*, have been showing up in grape clusters in some locations. However, in some cases, it was associated with grape berry moth infestation. The entry point and tunnels created by the larva also allow entry of Botrytis into the berry. So check the affected berries and look for the tell-tale entry hole and webbing. You may see a larva upon opening up the frass and berries. However, frequent precipitation and high humidity do enhance Botrytis and growers should be prepared, particularly if it rains heavily in the weeks before harvest. Tight-clustered varieties, such as Pinot noir, Pinot Gris, Vignoles, etc. are most seriously affected. Botrytis bunch rot may be confused with sour rot, which is caused by bacteria and yeasts. The main difference is that clusters with sour rot smell distinctly like vinegar and do not support the gray sporulation typical of Botrytis.

**Botrytis biology.** *Botrytis cinerea* is a “weak” pathogen that primarily attacks highly succulent, dead, injured, or senescent tissues such as wilting blossom parts and ripening fruit. The fungus thrives in high humidity and still air (optimum temperature: 59-77°F). Grape berries are most susceptible to infection after veraison. However, if Botrytis spores are available and wet conditions prevail, berries can become infected anytime after bloom. Infection occurs through scars left by the fallen caps or by contact with sporulating floral debris. Infections often remain latent (dormant) until the fruit ripens or may not progress at all. However, the few that do activate can lead to rapid disease spread within the cluster as berries become highly susceptible upon ripening. Controlling infections at bloom provides no benefit if post-veraison weather is dry and doesn’t support further disease development, but can pay significant dividends if the weather turns wet before harvest. In most years, fungicide applications at veraison and pre-harvest are more beneficial than earlier applications.

**Factors that favor the disease.** Factors that cause latent infections to activate are poorly understood, although high humidity and tissues with elevated nitrogen levels appear to promote this process. Cluster compactness also has a pronounced effect on disease development, due largely to rapid berry-to-berry spread. In addition, berries in tight clusters often crack due to pressure within the cluster, providing moisture and nutrients for growth as well as an entry point for the fungus. Insect or other injury, e.g., grape berry moth holes, can also lead to Botrytis as well as sour rot infection. Research in New York has shown that late powdery mildew infections (barely visible with the naked eye) of the berries can also predispose them to rots.

**Control options.** Promoting good air circulation by canopy management and leaf pulling is an important cultural option for managing Botrytis bunch rot. Avoid excessive leaf pulling, as berries may suffer from sun scald when suddenly exposed to sunlight and high temperatures. Sun scalding is usually restricted to the sides of the berries exposed to the sun and will appear like browning and collapsing (flattening) of the affected berry surface. Sun-scalded berries tend to dry up rather than rot. There are some products available that apparently reduce sunscalding (Purshade and Surround (kaolin clay)), but they have not been tested in Michigan as far as I know. There are currently some excellent fungicides available for control of Botrytis bunch rot.

- **Elevate** (hydroxyanilides; locally systemic; 0-day PHI): good to excellent preventive and limited post-infection activity.
- **Vanguard** (anilinopyrimidines; systemic, 7-day PHI): good to excellent preventive and post-infection activity.
- **Scala** (anilinopyrimidines; systemic; 7-day PHI): good to excellent preventive and post-infection activity.
- **Endura** (carboxamides; systemic, 14-day PHI): good to excellent preventive and post-infection activity. Use at 8-oz rate for Botrytis control.
- **Rovral** (dicarboximides; locally systemic; 7-day PHI): moderate to good preventive activity; activity is improved by addition of oil or non-ionic spray adjuvant. Some vineyards may have resistant strains if Rovral was used a lot in the past.
- **Pristine** (strobilurins: systemic, 14-day PHI): good preventive and post-infection activity but only at the high rate (18.5-23 oz/acre).
- **Topsin M** (benzimidazoles; systemic, 14-day PHI): moderate preventive and post-infection activity.
- **Serenade** (biological control agent; protectant; 0-day PHI): fair to moderate preventive activity. Organic formulation can be used in organic vineyards.
Principles of vine canopy management: accelerating ripening

After the miserably cool 2009 season, 2010 looks like a fantastic year! Seasonal Growing Degree Accumulation (GDD) is following the pattern of the 2007 season, which was a great vintage for grape growers and winemakers (Fig. 16).

Heat accumulation in our appellation areas are above average right now, with the South West portion of the state having an higher accumulation (+300 GDD) than the North West; but both locations are higher than 2007 (+120 GDD in the SW and +90 GDD in the NW). This looks great for our 2010 vintage. However, we had more rain than usual (see table in Fig. 16). 13.9 and 12.4 inches of rain in the SW and NW during this first part of the growing season, respectively; a relatively high amount that tends to exacerbate vine vigor. For this reason timely vine canopy management is pivotal this year in ripening the fruit with several viticulture strategies available to produce high quality fruit.

Canopy management is a term used to describe the modification of a grapevine’s natural canopy growth. It is directly related to row and vine spacing, rootstock choice, training and pruning practices, irrigation, fertilization, and summer activities (shoot hedging, shoot thinning, and leaf removal). Grapevine canopies are determined by the training system (single-canopy system, divided canopy system) and can be described by several physiological parameters: height, width, exposed leaf surface area, number of leaf layers, and shoot density (the number of shoots per unit length of canopy). In general, dense grapevine canopies can create an unfavorable microclimate, evidenced by temperature, humidity, wind speed, and amount of sunlight. In Michigan a
classical shoot positioning trellis (VSP) with 20-35 buds in red varieties and 35-45 buds in white varieties left at winter pruning, will produce an optimal shoot density of 3-5 shoots per foot of canopy (Fig. 17).

Grapevine leaves absorb approximately 90 percent of incident sunlight, and use it for photosynthesis (sugar production). The exterior leaves of the canopy absorb large amounts of sunlight but transmit very little to the leaves deeper within the canopy. Shaded leaves are using more carbohydrates (for cellular respiration) than they produce through photosynthesis. Unfortunately, shade also reduces the fruitfulness of developing buds (at the base of the growing shoots). Thus, yields from vines with dense canopies can be significantly lower the following year, than those from vines having a good shoot distribution along the cordon. In a vine with a uniform and equilibrated shoot density, clusters receive ample sunlight. Fully exposed fruit can be heated by solar radiation to a temperature 10-20 degrees F higher than that of the surrounding air. That warming is very useful in cool climate regions in reducing fruit acidity and accelerating sugar accumulation.

Richard Smart is a pioneer in research on vine canopy characteristics and their impact on fruit and wine quality. He formalized a series of principles for understanding canopy management, which are always useful to remember.

Principle 1: Vines should be spaced and trained to maximize the amount of leaf area exposed to sunlight and to facilitate a rapid development of canopy leaf area in the spring. Vineyard productivity increases when the percentage of available sunlight intercepted by vine leaves (rather than by the vineyard floor) increases. Canopies need to be trained vertically to tall, thin walls of foliage. Rapid leaf area development is promoted by retaining a relatively large number of short shoots on each vine, as opposed to a relatively few long shoots. In Michigan, this principle involves a lot of attention to spur spacing, position and renewals. For VSP vines 20-40 buds per vine is suggested (in relation to the variety, or for Pendelbogen - cane pruned - 15-25 buds per vine) and removing of clusters from week shoots that are less than 10 inches long after fruit set is essential. Also, cordon sucker and removal of non-count shoots, to avoid canopy congestion is important before the end of June.

Principle 2: Rows and canopies should not be so closely spaced that one canopy shades the renewal region of adjacent canopies. The ratio of canopy height to alley width should not exceed 1 to 1. The renewal zone (the current season's fruit zone) should be under the light to favor bud development.

Principle 3: Canopy shade has to be avoided, especially in the fruit and renewal zone. Leaves and fruit should be exposed to as uniform a microclimate as possible. Canopy shade can significantly reduce fruit and wine quality. The negative effects of shade on fruit composition include elevated levels of potassium, pH, and titratable acidity, reduced pigmentation, reduced concentrations of phenolic and soluble solids. Shade retards the development of varietal character and imparts vegetal characters to the fruit and wine. This means that in Michigan we should perform leaf pulling when the berries are no bigger than pea size and our cluster thinning by veraison to fine tune the wine crop level (and green drop post-veraison). Leaf removal from the area around fruit clusters is fundamental in cool climate viticulture. Leaves are removed between fruit set and veraison; early leaf removal must be repeated to keep fruit clusters open, however, post-veraison leaf pulling can result in sunburn. Generally, only 3-4 leaves per shoot are removed.

Principle 4: Shoot growth and fruit development should be balanced to avoid either too much or too little leaf area in relation to the weight of fruit. Excessively vigorous vines produce large shoots “bull-canies” (relatively large in diameter, with long internodes, large leaves, and a tendency to develop several lateral shoots), resulting in dense canopies. Insufficient vigor typically results in stunted shoots that have insufficient leaf area to ripen the crop. Balanced *vinifera* vines have a ratio of crop weight to cane pruning weight of 10-12. Summer pruning is one of the tools to achieve the principles described by Dr Smart and one of the most important to overcome ripening challenges in our cool climate.

References

2010 NW Wine Grape IPM Updates
More information: Erin Lizotte, 231-946-1510.
August 6
3-5PM
Ligon Farm, Traverse City (OMP)
Speaker: Paolo Sabbatini

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

2010 NWMHRS Annual Open House
More information: Nikki Rothwell, 231-946-1510.
August 19
NWMHRS, Traverse City

2010 TNRC Field Day
September 28
1-4PM
TNRC, Fennville
Speakers: Rufus Isaacs, Annemiek Schilder, John Wise, Larry Gut, Mark Whalon, George Sundin.

2010 SW Juice Grape Grower Meetings
More information: Mark Longstroth
269-330-2790 or Diane Brown-Rytlewski
269-944-4126 X4012.
August 17
1:30-3:30PM
Lemon Creek Winery, Berrien Springs
Speakers: Annemiek Schilder & Rufus Isaacs

2010 SW Wine Grape grower meetings
More information: Diane Brown-Rytlewski
269-944-4126 X4012.
August 4
12PM
Karma Vista Winery, Coloma

2010 Pre-harvest Enology Education Workshops
Keynote speaker: Dr. Nichola Hall of Scott Labs.
Online registration here.
August 16 - SW Michigan
9AM-4PM
Fenn Valley Vineyards, Fennville

August 18 - NW Michigan
9AM-4PM
L. Mawby, Suttons Bay

2010 Great Lakes Fruit, Vegetable, & Farm Market Expo
More information: Mark Longstroth, 269-330-2790 or Diane Brown-Rytlewski
269-944-4126 X4012.
December 7-9
DeVos Place Convention Center, Grand Rapids
Grape sessions are being planned.

2011 SW Hort Days
February 9-10 (Tentative)
Lake Michigan College, Benton Harbor

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