**Grape berry moth trap catches decreased a bit this week. Egg-laying will probably begin in the next week or so, but control measures won't need to be applied until after bloom.**

**A couple of weeks ago we pointed out how grape flea beetle larvae could be mistaken for GBM larvae. The red-banded leafroller (RBLR) is another species that can be mistaken for GBM. We found one RBLR larva at the Berrien Concord site this past week (see picture above). The main difference is the fact that RBLR is a pale green color with a light head, while the GBM will be a darker yellow color (gradually changing to green and later purple) and will have a dark head. Also, given how early it is in the growing season any GBM we would find right now would be a lot smaller than this RBLR larva we found. RBLR are only an occasional pest in grapes and aren't really anything you need to worry about.**

**Biofix for the GBM model was set at the Van Buren Concord site last Thursday while biofix at the Allegan Chardonnay site will take place early this week sometime. Both Berrien sites have accumulated over 140 GDD since biofix at the end of May. Egg-laying for the second generation of grape berry moth is predicted to begin when we reach 810 GDD.**
Upcoming Evening Grape IPM Meetings To Put On Your Calendar:
**June 25:** Tim Sepalla farm, Lawton (6-8pm, free dinner, 1 RUP credit)
**July:** No evening meeting in July due to Viticulture Day on July 29
**August 13:** Lemon Creek Winery, Berrien Springs (6-8pm, free dinner, 1 RUP credit)

### Leafhoppers:

**A few potato leafhopper adults are being found, but no nymphs at this point.**

**One grape leafhopper nymphs was found on a leaf at the Berrien Concord site. Grape leafhopper nymphs are a pale yellow while potato leafhopper nymphs are a pale green (see pictures to the right). Also, PLH nymphs walk sideways while GLH nymphs walk forwards.**

Grape leafhopper nymph.  
Potato leafhopper nymph.

### Grape Plume Moth:

**Most of the grape plume moth larvae found last week were no longer present this week. Most of the wrapped leaves they were inhabiting are now empty, or have a plume moth pupa hanging from a leaf (see pictures below and to the right).**

Webbed leaves with no grape plume moth larva (left) and grape plume moth pupa on a Niagara leaf (right).

### Grape Blossom Midge:

**If you're looking at the clusters in your vineyards you may notice some flower buds that are enlarged and reddish in color. These buds are infested with the grape blossom midge, *Contarinia johnsoni*. This small fly lays its eggs in the developing flower bud; the larvae that hatch feed inside the buds, causing them to swell and turn red. These midges rarely cause economic damage since they only feed here and there on individual flower buds.**

Grape blossom midge infested buds (left) and midge larvae (above).

### Banded Grape Bug and *Lygocoris inconspicuous*:

**Lygocoris and banded grape bug nymphs appear to be running their course, as we only found a few nymphs on vines at the Van Buren Concord site. There were still some banded grape bug nymphs on wild grape vines adjacent to the vineyards, but not within the vineyards themselves.**

Banded grape bug nymph (left) and *Lygocoris nymph* (right).
** Phomopsis lesions on leaves decreased as new leaves continue to emerge on the shoots. Protecting your clusters before rain events is still important. Remember that extended rain events with temperatures in the 60s degrees F are the optimum conditions for Phomopsis infections.

** Phomopsis leaf spots at the Berrien Concord site.

** Phomopsis infections on leaves at the Berrien Concord site in 2009 and the previous three years.

Fungicide Update:

** Mettle 125 ME: a new fungicide for grapes**

Annemiek Schilder  
Plant Pathology

Mettle (no, not what your mother-in-law does) recently got registered for use in grapes. This product is manufactured by Isagro, Inc., and is formulated as a micro emulsion. The active ingredient is tetraconazole, which is a sterol inhibitor (triazole) fungicide. Since Mettle is in the same chemical class as Nova and Elite, it should not be tank-mixed with any of these products. For fungicide resistance management purposes, tank-mix or alternate Mettle with fungicides in a different chemical class.

Mettle is a systemic fungicide with protectant and curative activity. It is labeled for control of powdery mildew and black rot in grapes. The recommended application rate is 3-5 fluid ounces per acre on a 21-day schedule. A spray interval of 14 days is recommended when disease pressure is severe. When a post-infection application is used for black rot, it is recommended within 72 hours of an infection period. Mettle is absorbed quickly into the plant tissue and is rainfast within 2 hours of application. The pre-harvest interval (PHI) is 14 days and the restricted entry interval (REI) is 12 hours. Do not make more than two applications of Mettle 125 ME to grapes per year. The maximum amount of Mettle allowed per season is 10 fluid ounces and there must be at least 14 days between applications. Do not apply Mettle through any kind of irrigation system. Mettle is currently being evaluated for disease control efficacy in grapes in Michigan.
Downy mildew has gotten an early start this year due to the high levels of precipitation over the past two months. Beginning oil spots have been sighted on leaves of suckers of un sprayed “Chancellor” grapes. These leaves were near the ground, which is where the oospores overwinter. Systemically infected suckers that were partially necrotic with heavy sporulation on the undersides of down curled leaves were also seen. Suckers can get infected as they grow through the soil and come in contact with germinating oospores which overwinter in the soil. Often, infected suckers are covered with a layer of white spores and act as a disease source if not removed or killed by an herbicide. Leaves and clusters become infected by airborne sporangia which are released by germinating oospores on the ground and by newly produced sporangia on primary lesions.

Symptoms
Downy mildew is caused by the fungus \textit{Plasmopara viticola} and can seriously damage leaves and clusters of susceptible cultivars. Leaf infections may lead to premature defoliation, which can reduce winter hardiness and sugar accumulation in the fruit in severe cases. Cluster infections usually translate into direct losses, as the infected cluster stems and berries will become necrotic and fail to develop. First symptoms on the leaves may be light green or yellow spots that may have a greasy appearance (oil spots). On older leaves, lesions are smaller and more angular as they are delimited by leaf veins. White sporulation usually occurs on the underside of the leaf under moist conditions. This is in contrast to powdery mildew, where sporulation mostly occurs on the upper surface. Infected flower and fruit clusters also may be covered with a downy white growth.

Biology of the fungus
The fungus overwinters as thick-walled spores (oospores) in fallen infected leaves on the ground below the vine. As the leaves break down, the oospores are released into the soil where they can survive for a long time. Only oospores at or near the soil surface will germinate in the spring. Oospore germination is favored by moist soils and moderate temperatures (over 50ºF), and typically starts several weeks before bloom in this region. Oospores develop a second spore type (sporangia), which are splashed by rain or carried by wind to young leaf and shoot tissues. The sporangia release multiple zoospores (swimming spores) which need water (rain or dew) to infect the plant tissue. Under optimal conditions, the time from germination until penetration is less than 90 min. Lesions appear within 5-17 days after infection, depending on the temperature. Zoospores infect the plant exclusively through the stomates, which are mostly located on the underside of the leaf. Young tissues are particularly susceptible, but gain some degree of resistance as they age. Berries become less susceptible as they mature, but the rachis remains susceptible for a long time. The fungus will sporulate through the stomates of infected tissues under humid conditions (95-100% RH) at night. The optimal temperature for sporulation is 65-72ºF. Rain is the principal factor driving epidemics. Temperature plays a less important role by retarding or accelerating the development of the disease. The most serious epidemics occur when a wet winter is followed by a wet spring and a warm summer with cloudy days and intermittent rainstorms every 8-15 days. Since the generation time of the fungus can be as short as 4-5 days, this can lead to “explosive” disease development when the conditions are right.
Disease monitoring
Since downy mildew can spread rapidly under warm
conditions with frequent rain or dew, disease monitoring is
important. Scout several rows in various places in a
vineyard. Visually scan leaves and clusters, and look
particularly for symptoms on the lower leaves and shoots.
If you see yellow lesions, turn the leaf over to look for
white sporulation on the lower leaf surface. This would
confirm that it is downy mildew. Occasionally, low-level
paraquat herbicide injury may resemble downy mildew
lesions. However, no sporulation will be present on the
lower leaf surface in that case. Also, you’ll see typical
necrotic lesions associated with paraquat injury on the
same or nearby leaves. If you are still not sure, remove
several symptomatic leaves and place them in a plastic
bag with a moist paper towel and store at room
temperature (68-75 F). If it is downy mildew, white
sporulation should become visible on the underside of the

Control
Fungicide sprays for downy mildew at this time are recommended for susceptible varieties, particularly the variety
Chancellor, as flower clusters can be infected even before they open. Keeping the disease from defoliating vines may also
be important after harvest to allow the vines to build up maximum reserves for the winter. Following are some
characteristics of fungicides that may help you decide which ones are most appropriate:

1.) Broad-spectrum protectants such as Mancozeb, Captan, Ziram, and fixed coppers are effective when sprayed on a
preventative basis. Good coverage, especially on the undersides of leaves, is important. However, they tend wash off to
varying degrees during rain events, and copper my be phytotox to some grape varieties. Also, some juice grape
processors place restrictions on the use of mancozeb and captan. Mancozeb has a 66-day PHI, Ziram has a 21-day
PHI, Captan has a 0-day PHI, and coppers have a 24-h REI.

2.) The strobilurins generally provide better coverage and are more rainfast since they are locally systemic as well as
translaminar (protect top and bottom of leaf). However, they have a limited amount of kick-back activity (up to 24 h), so they
should be applied on a preventative basis. Strobilurins will also reduce sporulation in existing lesions, thus slowing the
epidemic. Abound provides the best protection against downy mildew. Sovran is good, and Flint provides marginal control.
Pristine (a new product) is very effective against downy mildew, but should not be used on Concord or Niagara vines due to
possible phytotoxic effects. The strobilurins have a 14-day PHI.

3.) Ridomil Gold MZ or Ridomil Gold Copper provides excellent control of downy mildew. It is a systemic material with
curative and eradicant activity (i.e., it will stop development of lesions before and after symptoms start to show). It has at
least 2-3 days of kick-back activity and up to 21 days forward action. Since it is truly systemic, it will move throughout the
plant and even protect vegetation formed after the treatment. Ridomil also stops or reduces sporulation in developing and
existing lesions. However, it has a 66-day PHI. Some juice grape processors also restrict the application of Ridomil Gold MZ
to the pre-bloom because of the mancozeb component. Ridomil Gold MZ contains 64% mancozeb. Sprayed at full label
rate (2.5 pounds/acre), you'd only be applying 1.6 pounds of mancozeb per acre.

4.) Phosphorous acid (phosphate or phosphonate) products, such as ProPhyt and Phostrol, are new products which work
similarly to Aliette. They are truly systemic and highly mobile within the plant. They have at least three days of kick-back
activity and about 7-10 days of forward action. These products do not eradicate active lesions, but it reduce further spore
production. Research in New York has shown good to excellent disease control on a 14-day schedule, except on highly
susceptible varieties, which may require more frequent sprays. Phosphate products are relatively inexpensive and have a
favorable toxicological profile and therefore have a 0-day pre-harvest interval. Some varieties may be vulnerable to burning
symptoms, so test out these products on a small scale first. ProPhyt and Phostrol have a 0-day PHI.

5.) New fungicides like Presidio, Tanos, and Revus are also labeled for downy mildew control and have worked well in
research trials.

If downy mildew has been found in your vineyard, don’t allow the disease to develop to epic proportions before taking
action. Use best materials now (Ridomil would be my choice given precipitation patterns of the last few weeks but
Abound, Pristine, or phosphorous acid products would also work well).
Current Growth Stages:

- Concord-Van Buren
- Chardonnay-Fennville (TNRC)
- Concord-Fennville (TNRC)
- Niagara-Fennville (TNRC)
- Aurore-Fennville (TNRC)
- Chardonnay-Fennville (TNRC)
- Vignoles-Berrien
- Chancellor-Fennville (TNRC)

As of June 4

As of June 8
This report is a summary of weekly scouting from winegrape and juicegrape vineyards in southwest Michigan. It should be used only as a general guide, because pests vary greatly in their abundance from site to site. Scouting your own vineyards is the best way to know whether pest problems are developing in your farm.

For more information on this project, contact Steve at (517) 242 1282

More information on Vineyard IPM is available online at: [www.grapes.msu.edu](http://www.grapes.msu.edu)

All photos: Steven Van Timmeren

**Growing Degree Days (Base 50)**

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**Previous Year GDDs on June 7 (March 1 Start):**

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[Click here for more Information on GDDs](#)
Be on the look out for these important pests of grape over the coming weeks in northwest Michigan!

PEST REPORT
We caught a couple more grape berry moths this week both on Old Mission and Leelanau Peninsula. Our first grape berry moths (two to be precise) were caught in a Leelanau vineyard last week. So far only one lone potato leafhopper has been caught on Old Mission. As rain arrives from the south we could observe potato leafhopper arriving in more significant numbers.

Grapes are finally moving along in the north with a great deal of variability in phenology--some vineyards have vines that have yet to break bud and others at greater than 8 inches of shoot growth.

GRAPE IPM UPDATES FOR 2009
Don't forget the 'First Friday' IPM Grape Updates! Each meeting will include pest and disease information as in previous years, but each session will also focus on an area of interest to our grape growers. All sessions will take place from 3:00-5:00pm and are often followed by conversation over wine and cheese. Our next session at Mawby's, will feature Dr. Rufus Issacs from the MSU Department Entomology discussing pest management strategies for grape growers. Call Erin at (231)946-1510 with any questions. Hope to see you there!

July 10: Larry Mawby's vineyard, S. Elm Valley Rd. - Dr. Rufus Isaacs will talk about insect pests of grape.

August 7: Location to be announced - Paul Jenkin (MSU Small Fruit Coordinator) will discuss winegrape sustainability.
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All photos: Steven Van Timmeren and Erin Lizotte