**Subject:** Re: New England Grape Notes, Vol. 6, No. 9
**From:** Sonia Schloemann <sgs@umext.umass.edu>
**Date:** 8/19/11 3:47 PM
**To:** Sonia Schloemann <sgs@umext.umass.edu>

# *New England Grape Notes*

August 19, 2011, Vol. 6, No. 9

UMass Extension

**Phenology**: pre-harvest; concerns now - Grape Berry Moth, Mites, Mildews, bunch rot diseases
See http://fruit.cfans.umn.edu/grape/IPM/appendixa.htm for good chart on growth stages

## Hail Damage

*Tom Zabadal, Michigan State*

Hail damage to grapevines can range from occasional tears in leaf blades to defoliation. Shoots and petioles become scarred. Petioles may remain attached to shoots while leaf blades are shredded from the vine. Damage to berries on exposed clusters during light to moderate hail will be associated with torn leaf blades. Severe defoliation from hail during early to midseason will typically cause a new canopy to develop from lateral shoots. Fruit maturity will be greatly retarded after severe defoliation. During early stages of berry development, berries will be scarred or will die without onset of fruit rot. Hail during or after veraison will promote fruit rot.

*Hail damage showing tears in leaves and scarring of shoots as well as damaged berries. This late-season injury resulted in deterioration of damaged berries by fruit rot.*
*Photos: T. Zabadal*

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**Crop Management:**

## Crop Development Sampling

Joseph Fiola, University of Maryland

It is critical to properly monitor and assess the fruit characteristics and maturity to make the appropriate management, harvesting, and winemaking decisions to produce the best quality grapes and wine possible. The first step to assess ripeness and quality is to take a proper sample that best represents the actual ripeness stage of the variety in that vineyard. The best way to achieve this is to collect a sample that is random, unbiased, and representative.

- **Pointers to collect a good sample:**
  - Avoid edge rows and first two vines in row;
  - Collect samples from both sides of vine;
  - For each row, estimate the proportion of shaded clusters and sample accordingly;
  - Only one berry per plant should be sampled;
  - Collect berries from top, middle, and bottom of cluster and all sides of clusters;

  - Maximum sample area should be < 2A.
  - The most consistent sampling is when the same person does the sampling each time.
- **Remember**, about 90% of the variation in berry sampling is believed to come from variation in the position of the cluster and degree of fruit exposure.
- **The greater the number of berries in the sample, the more representative the sample will be.**
  - To be within +/- 1.0 °Brix, you need 2 samples of 100 berries;
  - To achieve +/- 0.5 °Brix, 5 samples of 100 berries are required.
  - If you are cluster sampling, 10 clusters are needed to be with +/- 1.0 °Brix of actual.
  - Depending on stage of ripeness, blocks are sampled every second to third week and more intensively as harvest approaches.
  - pH, titratable acidity, and Brix are the common "objective" measurements practiced.

(**Source**: *Maryland Timely Viticulture, Mid-season Crop Management fact sheets*)

For another discussion about determining grape maturity and fruit sampling, see: http://www.oardc.ohio-state.edu/grapeweb/images/OGEN_31_August_2010_(18).pdf.

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**Insect Management:**

**Managing Late Season Grape Berry Moth**

*Rufus Isaacs, Michigan State Univ.*

With this hot summer, berry moth development is moving along quite rapidly. Recent observations of grape clusters have revealed increasing levels of infestation by grape berry moth larvae, and this reflects infestation by the second generation that layed eggs during mid-late July. The grape berry moth degree day model is also predicting the start of egglaying by the third generation (1,620 GDD) of this pest this week for many regions of southwest Michigan. This is almost two weeks earlier than during 2009, but with this warm season, the start of the third generation at this timing just in advance of veraison suggests that moth phenology is tracking vine development quite closely. Overall, berry moth pressure is higher than last year, and management of this pest during the next month before harvest is critical to ensure that fruit infestation by insects and the associated diseases are not a problem facing growers, processors and wineries. With many Niagara vineyards being harvested after Concords, plantings of this variety will also require more attention than is typical.

Scouting is critical at this time of the season to identify vineyards that require protection from grape berry moth through the rest of the season. Growers with vineyard blocks that have a history of infestation by this pest should take the time to walk through those blocks and assess the level of infestation before deciding whether a spray is required. In vineyards with very low infestation or where early-season frost damage removed most of the crop, the time and expense of a pesticide application is not warranted at this time of the season. Insecticide applications should be limited to vineyard borders where berry moth pressure is highest, to blocks where infestation is developing and a crop will be harvested. With regular vineyard scouting, growers can continue to monitor this pest and make decisions on whether pest populations warrant insecticide control as we go through August and into September.

Maintaining control of grape berry moth requires a combination of good timing, high insecticide activity and excellent cluster coverage. This update will cover each of these issues.

**Timing**

The late summer generation of grape berry moth typically starts laying eggs in the period just before veraison with increasing egglaying through August and into September. This late-season generation can lead to infestation of harvested clusters and can expose clusters to fruit rots, making it important to reduce injury from this generation. Using crop growth stages provides some adjustment for variation between the seasons, but we also now have the degree day model at www.enviroweather.msu.edu to help

refine these timings and ensure optimal timings for control sprays. The model is predicting the start of third generation grape berry moth this week in southwest Michigan. With fewer degree days up north, this point in the insect's development is expected to be reached by the middle to end of next week. This is the predicted start of the third generation egglaying, a timing that is appropriate for growth regulator insecticides such as Intrepid. Growers planning to use a broad-spectrum insecticide should wait for 100-200 growing degree days before applying insecticide to ensure that applications target eggs as they hatch, and so the residual doesn't decline before egglaying peaks. Follow-up application may be needed to maintain control in areas with very high pressure.

In 2010, our degree day accumulations are so far ahead of normal that there is potential for some late-season activity of grape berry moth (a partial fourth generation). The risk of this is lessened by the insect population naturally being triggered by shorter day lengths to enter diapause, where the larvae develop to a pupa, but do not emerge again as adults. Instead, they prepare for the cold winter months and drop to the vineyard floor. During very warm years, some of these larvae may use the warm conditions to bypass the diapause and attempt a fourth generation. We will continue monitoring this pest through August and September to determine whether a fourth generation is possible.

**Insecticide activity**
When selecting an insecticide, there are many options for berry moth control. Some of these are selective for this pest, while others will also provide control of leafhoppers, Japanese beetles and other insects that can occur at the same time. For details of registered pesticide options, consult MSU Extension publication E-154.

The selective insecticide Intrepid has shown good effectiveness against berry moth in small plot and vineyard-scale trials, and we have tested it in the mid-season timings in July and August at the 12 oz rate and at 8 oz/acre. Although this is more expensive than many standard insecticides, the product lasts a long time (two to three weeks depending on the rate) and is resistant to wash-off. This helps make it an effective tool to use against the high pressure of egglaying by berry moth seen late in the season, when maintaining control would otherwise require multiple sprays. This works on the molting system of the moth larvae and therefore allows biological control to remain active. However, because it is selective, Intrepid will not control leafhoppers or beetles. It also has a 30-day PHI, so many growers have been using this in their programs a month or more before harvest to protect clusters while they get ready for the harvest activities. Use of Intrepid has also reduced the number of infested berries and the number of diseased berries in samples taken at harvest. Intrepid is quite stable under hot conditions and resistant to wash-off once sprayed providing good residual control.

There are many broad-spectrum insecticides available for berry moth control, including a number of pyrethroids that provide inexpensive control and that have broad insect activity. These provide effective control of moths, eggs, and larvae of grape berry moths. They have relatively short residual control in the hotter summer weather when growers might be spraying for the third generation of grape berry moths. In our trials with Danitol, Baythroid, and Capture, the lower rates of these products declined in activity against grape berry moth after nine days. If using a pyrethroid to control grape berry moth along with Japanese beetle in the hot sunny conditions of August, using the full rate will provide the best residual control, but no more than 10-14 days control should be expected. Despite the temptation to look only at the price per acre when making decisions, be sure to rotate this class with other chemical classes to avoid resistance developing. This means that growers should rotate out of this group of insecticides (Baythroid, Danitol, Capture, Mustang Max, or any generic pyrethroids) and use an alternative chemical class the next time an insecticide is used. Sevin or Imidan (buffered to pH 6) are both in different chemical classes. Be aware that Imidan now has a 14 day re-entry interval in grapes. There are also many effective reduced-risk insecticide options. These include Intrepid that was mentioned earlier, and also Altacor and Belt that have high activity on moth larvae. Altacor has also demonstrated activity on Japanese beetles in recent trials this summer, reducing feeding damage to leaves, and it provides control of grape berry moths with a 3-4 oz rate with a 14-day pre-harvest interval. Assail is a neonicotinoid insecticide that has moderate activity on grape berry moth and will also provide control of leafhoppers and Japanese beetles.

**Coverage**
Getting cluster coverage with your spray material is essential for berry moth control. This is important for getting full activity from broad-spectrum insecticides and even more important if applying any of the newer chemistries that must be eaten to be effective. As the canopy becomes denser after bloom, increase the water volume and slow down to ensure the pesticide has a chance to contact the pest. Juice grape canopies have many layers of leaves during the late summer, making it hard to penetrate to the clusters, but this is essential if the insecticide is to work against grape berry moth. If the spray doesn't hit the cluster, a significant investment of time and money is being wasted. Spraying every row is another important component of ensuring that your clusters are well covered.

To illustrate this, our research in a mature Niagara vineyard found that an airblast sprayer operated at 20 gallons of water per acre gave only half the control of grape berry moths in August compared with one running at 50 GPA. We have also seen that vineyards treated using alternate row spraying at 20-30 gallons of water per acre have poor control of berry moth, likely due to the spray material not reaching both sides of the clusters.

One way to test your coverage is to spray water or SURROUND WP kaolin clay through the sprayer in a test run. Immediately after spraying (with water) or after the spray has dried (for the kaolin), lift the canopy of the sprayed and adjacent rows to see where the material hits the cluster. If there are untreated berries, these are sites where a berry moth larva could avoid the treatment and survive. These results emphasize the need to calibrate your sprayer and adjust through the season to ensure it is getting good cluster coverage, because it can make a big difference for control.
(**Source**: Michigan Fruit Crop Advisory Team Alert, Aug. 4, 2010)

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**Disease Management:**

**Preharvest Disease Management**
Anne Demarcy, formerly of Univ of Maryland

Many Maryland vineyards are approaching or already within 30 days of the anticipated harvest date for early wine grape varieties. During this window, growers face the challenge of managing several fungal diseases, including powdery mildew (PM), downy mildew (DM), Botrytis bunch rot, and other late-season bunch rots, without using fungicides that could impair wine quality. Maryland growers may refer to Extension Fact Sheet 848, Guidelines for Developing an Effective Fungicide Spray Program for Wine Grapes in Maryland for specific management recommendations.

**General Guidelines**

- Avoid applying fungicides containing sulfur, copper, and captan within 30-45 days of your anticipated harvest date. Sulfur and copper residues impart off-tastes to wine, and captan residues may delay fermentation.
- In managing PM and DM, your objective should be to maintain a functional canopy for long enough to fully ripen your grapes.
    - On white varieties, you may be able to stop spraying for PM and DM before harvest and tolerate some foliar mildew without harming fruit.
    - On red varieties that need to hang on the vine to mature, you may need to apply fungicides until quite late in the season to preserve the canopy.
- Be vigilant in scouting for late-season bunch rots, which often appear suddenly and close to fruit maturity, weeks after black rot and Phomopsis fruit rot.

**Powdery Mildew**

- Protect fruit until they reach 8° Brix, when they become immune to PM infection. Thereafter, protect the canopy as long as needed for ripening fruit.

- **Late PM** fungicides that will not affect wine quality include Quintec, Endura or Pristine (boscalid component), stylet oil, and the potassium salts (Armicarb, Kaligreen, Nutrol).
- The sterol-inhibiting (SI) fungicides (Nova/Rally, Elite, Procure) may still be useful where PM has not lost sensitivity to SIs.
    - **If you have active PM**, use only stylet oil or a potassium salt product. Use stylet oil once, and only on severe infections. Do not apply oil within 14 days of either sulfur or captan.

**Downy Mildew**

- For **late DM**, use a phosphorous acid product (phosphite) such as Phostrol, ProPhyt, Topaz, etc. Because of strobilurin-resistant DM strains, Pristine alone may no longer be effective on DM in Maryland vineyards.

**Botrytis Bunch Rot**

- Preharvest can be a critical time for Botrytis control on bunch rot-prone varieties, especially in wet seasons. Latent infections that occurred at bloom become active again, and berries become increasingly susceptible to infection after veraison. (See Joe Fiola's Timely Viticulture on Botrytis).
- Effective fungicides include Vangard/Scala, Elevate, Pristine (at the 18.5-23 oz/ac rate) and Endura (at the 8 oz/ac rate).

**Late-Season Bunch Rots**

- Watch for late-season rots as fruit ripen, especially if there has been hail, bird damage, insect feeding, or PM on fruit. The fungi that cause ripe rot, bitter rot, and Macrophoma rot, can enter intact berries, however.
    - Be careful not to injure ripening fruit while spraying or mowing.
    - Control insects that feed on fruit as part of an IPM program.
- If **ripe rot, bitter rot**, or **Macrophoma rot** appear during the preharvest window, protect healthy fruit with a strobilurin fungicide (Pristine or Abound).
- Sour rot is caused by a complex of fungi, bacteria, and insects that can gain entry only to wounded fruit. Because of the bacterial component, fungicides are not effective against sour rot.

(***Source**: Maryland Timely Viticulture, Pre-Harvest fact sheets)*

**Late Season Pest Management And Fermentation**
*Alice Wise and Wayne Wilcox, Cornell University*

All pesticides have a days to harvest restriction, also called a preharvest interval (PHI). If a product is labeled 14 days PHI, this means it cannot be used within 14 days of harvest. From a winemaking standpoint, one of the primary concerns about late season sprays is that potential residues may inhibit fermentation. Some winemakers consider this an issue, especially with sulfur, others discount it. Some enologists demand a particular interval (ranging from weeks to months) between the last sulfur spray and harvest. However, most vineyards on LI have reached the point in the season where fruit is no longer susceptible to new PM infections. Consequently, regardless of materials being used, most growers have turned off the nozzles in the cluster zone and are focusing on keeping the canopy clean.

Nevertheless, sulfur is often demonized by winemakers as the reason for stuck fermentations. A late application of sulfur, particularly if no rain occurs between the spray and harvest, may lead to H2S and/or slow fermentations. Because of industry concerns, this is an area of research being addressed by Cornell. In early August, Cornell enologist Dr. Gavin Sacks distributed a sulfur testing kit to attendees of the enology strategic planning meeting. Test results should shed some light on this issue. While sulfur use in the vineyard must be evaluated, other potential must problems such as must nutrition and winemaking strategies should not be overlooked. (Growers who would like a sulfur test kit can contact

Dr. Sacks at <gls9@cornell.edu>.)

Other potential end of season powdery mildew sprays include potassium bicarbonate (Kaligreen, Armicarb, Milstop), monopotassium phosphate (Nutrol), hydrogen peroxide (Oxidate), the biological products Serenade and Sonata and JMS Stylet Oil. The first two groups contain potassium, though there is no evidence that they raise must pH. It would be prudent, however, to avoid a heavy application shortly before harvest. No issues come to mind with hydrogen peroxide, it breaks down rapidly after application (thus no forward protection).

JMS Stylet Oil, 0 days PHI, is actually a very good late season PM spray. It will knock back European red mite as well. Several researchers have found that oil can depress Brix (sugar) accumulation. In a trial at LIHREC several years ago, two end of season app's did depress Brix slightly. While we did not evaluate single app's, a single end of season application will likely not have a profound impact. As for fermentation, research conducted in California a few years ago indicated that Stylet Oil had no effect on fermentation. Read and understand the label thoroughly concerning compatibility of oil with other materials.

Primary choices for downy mildew control are copper, phosphorous acid products, Revus, Presidio and Tanos. Copper can also be inhibitory to yeast and bacteria (i.e. ML) though only with very high residual copper concentrations, not likely if used prudently in the vineyard. Phosphorous acid products (0 days PHI) will keep infections in check but coverage must be excellent. PA products will not control a well established DM infection. For the last three products, be sure to check preharvest intervals and avoid use on raging infections due to resistance concerns.

Finally, for DM and PM, there's the synthetic materials such as the strobilurins and sterol inhibitors. Again, resistance is a major issue if these products are used on existing infections. To minimize this possibility, either avoid use or rotate with other materials that are not prone to resistance. From a fermentation standpoint, there appear to be no issues with either group of materials.

There are no known issues with botrycides such as Elevate, Vangard and Scala and fermentation. In general botrycides are inactive against most fungi that are not closely related to Botrytis (yeasts are not closely related). If near harvest and time/labor is available, snip out the worst of the infections at the minimum. Another option would be one or more sprays of Oxidate, which leaves no residue as it dissipates soon after application. In a 2006 trial in the research vineyard Chardonnay clone 4 (big clustered), repeated applications of Oxidate burned out Botrytis sporulation; however, since the infection penetrated the flesh, sporulation reappeared within a week. Though this is pure speculation, perhaps knocking back sporulation would hinder spread.

Bottom line – make pest management choices carefully at this time of year. It is complicated if disease exists or a major rain looms or if trying to maintain a canopy into November.
(Source: Long Island Fruit & Vegetable Update, No. 23, August 18, 2011)

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**Weather data**: (Source: UMass Landscape IPM Message #21, Aug. 19, 2011)

| Region/Location | 2011 Growing Degree Days (base 50° from March 1, 2011) | | 2010 Growing Degree Days (base 50° from March 1, 2010) |
|---|---|---|---|
| | 2-week gain | total accumulation for 2011 | total accumulation at comparable 2010 dates |
| Cape Cod | 265 | 1,926 | 2,221 |
| Southeast MA | 285 | 1,890 | 2,227 |
| East MA | 310 | 2,109 | 2,404 |

| | | | |
|---|---|---|---|
| **Metro West MA** | 298 | 2,029 | *2,245* |
| **Central MA** | --- | 1,911 | --- |
| **Pioneer Valley MA** | 285 | 1,982 | *2,209* |
| **Berkshires MA** | 253 | 1,641 | *2,044* |

**Additional Weather Data is available form the following sites**:

UMass Cold Spring Orchard (Belchertown MA), Tougas Family Farm (Northboro MA), and Clarkdale Fruit Farm (Deerfield MA) at http://www.umass.edu/fruitadvisor/hrcweather/index.html

University of Vermont Weather Data from several sites around the state at http://pss.uvm.edu/grape/2010DDAccumulationGrape.html

New Hampshire Growing Degree Days at http://extension.unh.edu/Agric/GDDays/GDDays.htm

Connecticut Disease Risk Model Results at http://www.hort.uconn.edu/ipm/

Network for Environment and Weather Applications program run by the Cornell IPM team at http://newa.cornell.edu/.

*This message is compiled by Sonia Schloemann from information collected by:*
*Arthur Tuttle and students from the University of Massachusetts*
*and Frank Ferandino from the University of Connecticut. We are very grateful for the collaboration with UConn.*
We also acknowledge the excellent resources of Michigan State University, Cornell Cooperative Extension of Suffolk County, and the University of Vermont Cold Climate Viticulture Program. See the links below for additional seasonal reports:
**University of Vermont's Cold Climate Grape Growers' Newsletter**
**UConn Grape IPM Scouting Report**

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Sonia Schloemann <sgs@umext.umass.edu>
UMass Extension Fruit Specialist
Plant, Soil, Insect Sciences
UMass Center for Agriculture