Downy Mildew Active Colonies

In early July I observed a few incidences of active Downy mildew colonies on a wide assortment of cultivars. It is very important to manage downy mildew especially when active sporulating colonies are found. Only a couple active colonies on a couple of leaves should raise your level of concern. Downy mildew can spread very quickly through a vineyard, especially during warm, wet, humid conditions.

Active sporulating colonies can be managed with phosphorous acid type fungicides. These products will essentially “burn out” active colonies and thereby reduce further sporulation. However, the phosphorous acid products will not provide extended preventative management of downy mildew. Therefore other fungicide products must be applied to provide extended downy mildew management.

If downy mildew is present consider a phosphorous acid fungicide and applying a preventative or systemic fungicide that has activity against downy mildew. There are number of products available (see page 95-96 of the Midwest Fruit Pest Management Guide 2017).

Black rot

I have observed very little black rot in the vineyards so far this season. However some growers have reported problems. In these instances, black rot seems to be taking hold because the main cover sprays have been Captan. Captan does have activity against black rot but the activity is marginal. The grape berry’s need to be protected from potential infection periods until 4 to 6 weeks have passed after bloom. The range in time is dependent on the cultivar as some cultivars develop age related resistance to disease faster than others. The point being, from the period of immediate pre-bloom through 4 to 6-weeks after flowering the grape berry’s need to be protected.
A number of infection periods have occurred over the past 3 to 4 weeks in most areas of the state. Infection periods are those times when leaf wetness and temperatures are ideal for infection to occur. Ideal conditions for black rot are temperatures in the high 70’s and low 80’s and plant tissue moisture. Leaf wetness can occur from rainfall events or dew. Often during periods when rainfall is limited or non-existent, growers sometimes extend the duration between cover sprays. These management decisions must also consider periods when dew is heavy especially when dew is present during an extended cloudy period.

Take home message. Keep your clusters protected from black rot during the period of immediate pre-bloom to 5 to 6 –weeks after bloom. Use fungicides that have activity on Black rot. Often when black rot symptoms appear on berry’s the infection occurred sometime weeks prior. Black rot infections can remain (latent) invisible for extended periods.

Japanese Beetles

Although Japanese beetles only have one generation per year, the emergence of adult beetles from the soil occurs over an extended period. The first beetles often appear in late May to early June. Adult beetles release pheromones that result in beetles congregating and similarly damaged plants release chemicals which attract the adult beetles. Both the extended adult emergence, congregation pheromone and plant defense chemicals all result in a continuous migration of Japanese beetles to susceptible plants. Therefore your only defense is to control Japanese beetles.

If the population of Japanese beetles builds quickly then your best control options are Danitol or Mustang Max. Both of these products will knock down the pest quickly. Mustang Max being a pyrethroid has the tendency to provide some extended repellency. Sevin XLR will also provide good control of Japanese beetles. However, during wet conditions your better off to apply an EC formulation such as Mustang Max that will have extended knockdown compared to Sevin.
Sour rot

It is not too early to start thinking about Sour rot management. For those of you that attended the Show Me Grape and Wine Conference, Megan Hall from Cornell University provided an abundance of research on the Sour rot complex (Presentation). From her research, the best control of the Sour rot complex was attained by managing both microbes and the fruit flies. The research results clearly demonstrated that fruit flies play an essential role in the Sour rot complex. The damage from Sour rot was best managed by applying Fracture or Oxidate plus an insecticide at the onset on Sour rot symptoms.

Fracture fungicide according to the FMC website is a polypeptide derived from germinating sweet lupine plants. The end result is a biological fungicide that derives its name from fracturing fungal cell walls resulting in cell destruction. According to Wayne Wilcox from Cornell University, Fracture has provided some good control of Botrytis and has provided activity against Sour rot. Wayne has not observed good activity against powdery mildew, although Fracture is labeled for powdery mildew control. Further, Wayne notes that Fracture is pricey. Wayne also notes that Fracture’s mode of action should result in no activity on bacteria. Remember Acetobacter and Gluconobacter bacteria are responsible for converting ethanol to acetic acid.

Oxidate has provided anecdotal Sour rot control in New York trials according to Wayne. Similar to Fracture, Oxidate is also expensive. Oxidate is a surface sterilant.

Take Home. If you are growing tight-clustered grape cultivars that are susceptible to Sour rot, then consider monitoring the following:
- Monitor the soluble solids (° Brix) and when 15 ° Brix is obtained this is often when Sour rot will begin to make an appearance. Pay attention and monitor clusters closely for Sour rot symptoms when 13 ° brix is attained.
- Monitor the weather especially as 15 ° Brix is approaching. If wet rainy periods occur this is often the time that Sour rot will start in the vineyard.
- Monitor fruit fly populations in the vineyard. Currently it appears that the common fruit fly, Drosphilia melanogaster is the major player and not spotted wing drosophil. Fruit flies can be monitored using commercial traps.

The best control of Sour rot is the application of an antimicrobial plus an insecticide starting at 15 °Brix. However if costs preclude this application, then consider controlling fruit flies with Mustang Max.

There still are a lot of questions to be addressed in managing Sour rot. Sour rot is a complex disease composed of bacteria, yeast, and fruit flies. Wet conditions also play a role. As well as damaged fruit. Implementing management practices that maintain berry integrity (bird netting) and speed cluster dry-down (leaf removal) will also reduce the incidence of Sour rot.
Herbicide Drift and Dicamba Stop Sale

On July 13, 2017 the Missouri Department of Agriculture issued a statewide Stop Sale, Use or removal order of Engenia herbicide, Xtendimax with VaporGrip Technology and Fexapan Plus VaporGrip Technology. Additionally a number of other herbicides containing the active ingredient dicamba that have agricultural uses are also impacted by the order. The order does not impact dicamba containing herbicides for lawn or garden.

The Missouri Department of Agriculture has established a website with more information in regards to the order. The website also has a link to report pesticide drift damage.

Pesticide Drift Complaints

- FY2016 - 97 (27 complaints are allegedly Dicamba-related)
- FY2017 (July 1, 2016 - June 27, 2017) - 325 (212 complaints are allegedly Dicamba related)
- January 1 to July 12, 2017 - 218 (161 complaints are allegedly Dicamba related)

Be aware that there are many other growth regulator herbicides that can cause serious injury to grapes that are not impacted by this order. These include the Picolinic Acids and include picloram, clopyralid, and triclopyr. Herbicides containing these chemicals are often found in herbicides applied on pastures or right-of-ways. Similarly, 2,4-D is often used on lawns and pastures.

Although herbicide drift from dicamba containing products may be reduced or eliminated for this cropping year, there is still potential for herbicide drift to occur in vineyards from many other growth-regulating herbicides as well as other herbicides. Be vigilant and continue monitoring.
Grape Virus Vineyard Survey—Update

Observations
Over the past two weeks 350 samples have been collected which comprise 5,600 individual grape leaves. In addition, almost 50 soil samples have been collected that are being analyzed for the presence of nematodes. Over the course of the sampling we have observed symptomology of a couple of viruses, tomato ringspot virus in Vidal blanc, and grapevine clearing virus in Chardonnay, Valin muscat and others. We anticipate having results available from the survey near the end of the year. Thanks to vineyards that have participated in the survey.

Shot berries are representative symptoms of Tomato ringspot virus (A) and chlorotic veins are representative of symptoms of grapevine vein clearing virus (B). Photo credit: D. Volenberg.

Background of grape viruses in Missouri
Past research by others has determined that a variety of grape viruses are present in Missouri. Grape leafroll associated virus has been found in Norton, St, Vincent, Seyval blanc, Vidal blanc, Vignoles, and Catawba. Two leafroll variants GLRaV-2 and GLRaV-3 but GLRaV-1 has not been confirmed in Missouri. Mealybugs are the vector of GLRaV-3 whereas soft scales are the vector of GLRaV-1. Grapevine fleck virus has also been confirmed in Vignoles, Vidal blanc and Norton. Two Nepoviruses, Tomato ringspot virus and Arabis mosaic virus that are vectored by the nematode Xiphinema americanum have also been confirmed. More recently (2011), Grapevine vein clearing virus was reported. In 2016, Red Blotch was confirmed present in Missouri. Although a number of viruses have been confirmed, the industry has no information on how prevalent these viruses are within a vineyard, a cultivar, or geographic location.

Impact
Prior to implementing any pest management strategy the causal agent(s) need to be identified. Most hybrid grapevines infected with viruses do not display apparent symptomology to the naked eye. Therefore the only way to be sure vines are infected with a virus is to test the vines. If viruses are determined to be present then management strategies could involve using nematode resistant rootstocks in the case of Nepoviruses, controlling mealybug or soft scale in the case of specific leafroll viruses, and if planting a vineyard block to use virus free plants.
Cumulative Growing Degree Days for the Seven Grape Growing Regions of Missouri from April 1 to July 10, 2017.

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<th>Region</th>
<th>Location by County</th>
<th>Growing Degree Days¹</th>
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¹Growing degree days at base 50 from April 1 to July 10, 2017. Data compiled from Useful and Useable at https://mygeohub.org/groups/u2u/tools. Click on link below to determine growing degree days in your area.

To determine the number of growing degree days accumulated in your area since April 1, click this link Search for GDD at your location using this tool.

Please scout your vineyards on a regularly scheduled basis in an effort to manage problem pests. This report contains information on scouting reports from specific locations and may not reflect pest problems in your vineyard. If you would like more information on IPM in grapes, please contact Dean Volenberg at 573-882-0476 or volenbergd@missouri.edu