Disease Management after Fruit Set

Grape berries are at a phenological stage where they are susceptible to a number of fungal pathogens. The berries will not become resistant to several of the more common fungal pathogens until 5 to 6 weeks post bloom. The period from immediate pre-bloom through 5 to 6 weeks post bloom is the most critical time to protect the crop from pathogens.

Fungicides or fungicide tank mixes should target phomopsis, black rot, downy mildew, powdery mildew and anthracnose. These are the five major diseases of concern. I would not expect Botrytis infections to be of concern especially with the high temperatures Missouri has been experiencing. One caveat, if botrytis was a problem for you last season it may be a problem this season. If your grapevines got through flowering in warm dry conditions then botrytis likely will not be an issue. However, pay attention to tight clustered cultivars such as Vignoles around cluster-close. A fungicide applied at bloom and cluster-close often will eliminate primary botrytis infections.

Remember to avoid repeat applications of the same fungicide and fungicides from the same chemical class. The two classes of fungicides of main concern are the strobilurins (Frac Code 11) and sterol inhibitors (Frac Code 3). Many of the labels of both strobilurins and sterol-inhibitors limits the number of applications during the growing season. For example, the Rally label states that only 2 sequential applications of Rally or Rally and another product containing the same active ingredient as Rally or another Sterol inhibitor can be applied.

Continue being vigilant in your scouting and protecting your crop until the grape berries are 5 to 6 weeks post-bloom. After that period the berries develop age-related resistance to many of the common pathogens. However, green tissues such as leaves, shoots, tendrils remain susceptible to most of the common pathogens throughout the growing season. Please pay attention to sequential applications of fungicide products with same mode of action to delay or prevent the selection of fungicide resistant pathogens.
Japanese Beetles

It is that time of year again to start thinking about management options for Japanese Beetles. Often Japanese Beetles appear on or near Father’s Day weekend. This year Father’s Day is June 17. Another tool that will help you pinpoint when the Japanese Beetles are appearing is to visit the Integrated Pest Management website at the University of Missouri. On the front page simply move your cursor over the regions to see what pests have been reported by MU Regional Extension Specialists. Of course, scouting your vineyards is also a good option to determine exactly the pest pressure at your vineyard locations. As you plan your management strategies remember a few simple priorities.

- Apply management strategies to grape cultivars more prone to Japanese beetle feeding preference. *Vitis labrusca* are least susceptible, followed by hybrids and then *V. vinifera*
- Apply management to Japanese beetle susceptible young establishing grapevines prior to established grapevines
- Monitor the vineyards; Japanese beetles often will be at higher population densities in border rows than within the interior of the vineyard
- Monitor for other insect pests that may be present during the period of Japanese beetle feeding. For example, Grape berry moth and Grape rootworm. Incidence of multiple target pests will warrant the use of a broad spectrum insecticide
- Rainfall can reduce the effectiveness of insecticides. Mustang Max will provide better rainfastness than Sevin which can be attributed to Mustang Max being less water soluble and more lipophilic than Sevin (Hulbert et al. 2012)
- Pyrethroid insecticides (Mustang Max) provide instant knockdown of Japanese beetles and pyrethroid insecticides may also provide a repelling effect in treated fields
- Adult Japanese beetles emerge in large numbers from moist soil compared to dry droughty soils
- Vineyard rows bordering grass areas (mowed areas or pastures) often have greater population densities of Japanese beetles than vineyard border rows adjacent to wooded areas or row cropped agricultural fields

See page 88 of *2018 Midwest Fruit Pest Management Guide* for insecticides that control Japanese beetles
Grapevine Water Stress

Dry weather continues. The daily accumulated evapotranspiration (ET) for the period of May 1 through June 4 is almost double the amount of rainfall received in Columbia, MO (Figure 1). This means that plants are transpiring more water and the water used by plants is not being replaced by rainfall. In essence, the soil is drying out and moisture is likely to become limiting. On average, the month of May is the wettest month for Missouri with average rainfall being near 5-inches. June is often the second wettest month with the average rainfall also averaging near 5-inches. The absence of rainfall should suggest that growers should be taking the time to evaluate their irrigation systems. There are areas around the state that have received adequate rainfall and there are other areas that are approaching drought status. The northwestern and northern half of the state are abnormally dry to severe drought status. To see US drought status click on the United States Drought Monitor.

Temperatures are forecast to be in the 90 degree F range over the next 5 to 7 days further increasing ET.

Water use by bearing grapevines depends on the phenological stage of development. The grapevines are at the stage of development where the greatest percentage of water is required, that being fruit set to veraison. The need for water will continue in advancing stages of development from veraison to harvest. Approximately, 70% of the water required by a grapevine is from fruit set to harvest.

Remember grapevines can grow under very dry soil conditions with little water. In some areas of eastern Washington, red wine grapes are grown with 12-inches of water. The important thing to remember is that grapevines need water at specific times to produce quality grapes. Visual signs that grapevines are under water stress is when the shoot tips are longer than the tendrils. Grapevine shoots that are actively growing without water stress will have long tendrils that extend well past the shoot tip.

Establishing vineyards

Unlike bearing grapevines, establishing grapevines have a shallow developing root system. The young vines have not developed deep penetrating roots and are therefore more prone to water stress. It is important that young vines have adequate soil moisture to grow and develop. Root growth is dependent on the supply of adequate soil moisture. Grapevines that struggle to establish due to low soil moisture conditions will also be susceptible to cold winter survival.
Chambourcin die-back in 2018

Over the last couple of weeks I have been contacted by a few grape growers that have observed late bud emergence, cordon death, or whole-vine death of Chambourcin grapevines. I have had the opportunity to visit a couple Chambourcin vineyards that have been experiencing damage. Additionally, I have visited a Crimson Cabernet vineyard that is also having similar issues as described above for Chambourcin.

Observations
At one of Chambourcin vineyards about 5 to 7% of the vines were damaged. Most of the damaged vines were suckering around the crown of the grapevine. Many of the trunks as well as cordons had were split (Figure 1). Crown gall was found on nearly all damaged vines (Figure 2).

At the second Chambourcin vineyard approximately 15% of the vines were damaged. Again basal suckering was occurring on the damaged vines. Crown gall was found on damaged vines but not on all vines observed. All damaged vines were infected with grape scale. The scale eggs were observed by stripping basal bark on the lower portions of the trunk.

In the Crimson Cabernet vineyard approximately 25% of the vines were damaged. Similar to Chambourcin, the trunks and cordons were split. Again in most of the damaged vines observed, crown gall was present.

Why the damage occurred
I speculate that crown gall likely took hold after an extreme cold period that started around December 23, 2017 and continued through approximately January 4, 2018. The cold temperatures may have caused some vascular system damage and the healing process of the vine set crown gall in motion. Vine damage from cold events often occur when there are major swings in temperature from above freezing to well below zero degrees fahrenheit. Although there is some anecdotal evidence that crown gall is more prevalent in heavy soils, this does not hold-up in all cases.

A couple of thoughts
Regardless of why the damage occurred, the solution is to start the process of retraining a new basal sucker upwards to establish a new trunk. This will involve cutting the trunk off below the galled area for vines that are on their own roots. If damaged vines are going to be removed and replaced, replacement vines should be sourced that are free of crown gall.
Herbicide Drift

Over the next three weeks many of the soybean acres in Missouri will likely be sprayed with a post-emergent herbicide(s). Most of the dicamba tolerant soybean will be sprayed with a tank mix of glyphosate (Roundup) and Engenia, Xtendimax, or Fexapan which contain dicamba. Grapes are highly sensitive to synthetic auxin herbicides that includes dicamba.

The cutoff dates for the use of Engenia, Xtendimax, and Fexapan in dicamba tolerant soybeans and cotton is:

- June 10, 2018 in Dunklin, Premiscot, New Madrid, Stoddard, Scott, Mississippi, Butler, Ripley, Bollinger, and Cape Girardeau counties.
- July 15, 2018 in all remaining Missouri counties.

For more information on Dicamba use and restrictions see MDA

If you experience herbicide drift damage to your vineyard or other sensitive plants and want to know what to do. Please read the article, Herbicide Drift: What to do?
Cumulative Growing Degree Days for the Seven Grape Growing Regions of Missouri from April 1 to 4 June, 2018.

<table>
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<tr>
<th>Region</th>
<th>Location by County</th>
<th>Growing Degree Days¹</th>
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<td>Western</td>
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¹Growing degree days at base 50 from April 1 to June 4, 2018. 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. Use 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