Disease Outlook into July
A favorable environment is one of the components of the disease triangle with the others being a susceptible host and a pathogen. The forecast through July 7 is for above average temperatures and below average precipitation. These hot dry conditions are coming after a period when many areas of the state received some rainfall. Rainfall coupled with cooler conditions has resulted in some pathogen problems. I have come across Black rot and powdery mildew this week when scouting. Additionally, grower contacts this week have also brought both Black rot and powdery mildew up in conversations as established threats.

Powdery mildew
If active sporulating colonies of powdery mildew are present an option is to apply a potassium bicarbonate fungicide. When applying a potassium bicarbonate fungicide be sure to get good spray coverage especially on the clusters. The potassium bicarbonate fungicides do not provide protection to new infections and therefore a protectant fungicide should also be applied. There are a lot of powdery mildew protectant fungicides, these can be found in the 2018 Midwest Fruit Pest Management Guide. On grape cultivars that are not sulfur-sensitive, sulfur is an option.

When scouting for powdery mildew be sure to look within the canopy and also on developing grape clusters. Often, powdery mildew will infect developing grape berries and grape leaves will remain free of infection.

Powdery mildew can be a problem throughout the growing season. However if the problem is appearing on berries now, there is good scientific evidence that the initial infections likely occurred at bloom or the period shortly following bloom. I cannot stress enough that the most critical times to control pathogens is the period of pre-bloom to 4 to 5 weeks post-bloom. During these periods of grape growth and development is when the best fungicides that your budget allows should be applied. I would be remiss to also mention that another critical period of management is when the grapevines are at ½-inch shoots. More on that another time.
High temperatures over the next 14-days will severely arrest the development of powdery mildew. Temperatures over 90ºF arrest powdery mildew development. However, if powdery mildew is currently sporulating within your grape clusters do not depend on the temperatures alone to provide control. Evening low temperatures over the next 14-days are predicted in the 60 to 80ºF range which are ideal for powdery mildew growth and development.

**Black Rot**
The intermittent rain showers over the past 10-days have provided for extended wetting periods which have resulted in infection periods for Black rot. Black rot only needs 6 to 7 hours of continuous tissue wetness for infection when temperatures are between 70 to 80ºF. Berries are most susceptible to black rot infections the first few weeks after bloom. The period from immediate pre-bloom to 6-weeks post bloom is when protecting the crop with fungicides is critical. Berries will develop age-related resistance to black rot. Berries attain resistance to black rot 6 to 7 weeks after bloom. Although the berries do develop a degree of resistance to black rot infection, the berries remain susceptible to infection up to veraison.

Black rot control requires both cultural and chemical management. Cultural control begins during dormant pruning by removing rachises and mummy berries. Mummy berries are typically the primary inoculum source. Canopy management practices that promote air circulation and expose the fruit to sunlight also aid black rot management. Clusters exposed sunlight reduce the period of time the berries remain wet. Which in turn helps reduce the potential for infection since black rot needs both moist/wet tissue for a period of time for infection to occur. This time period is dependent on both the moist/wet period and temperature. In warm moist climates, chemical management practices are needed to prevent black rot infections. Ideally, these chemical management practices should begin at ½-inch shoots and continue through 6-weeks post-bloom. Although berries develop a level of resistance to black rot at 6 weeks post-bloom, chemical management of black rot needs to continue through veraison if favorable environmental conditions persist for black rot infections.
Know the difference between Potassium bicarbonate and Phosphorous acid fungicides

- Potassium bicarbonate fungicides (examples include; Kaligreen and Milstop) have activity only on powdery mildew and are often applied when sporulating colonies are found, but Potassium bicarbonate fungicides do not protect the tissue from new infections of powdery mildew whereas

- Phosphorous acid fungicides (Examples include; Phostrol, Prophyt and Reliant) have activity on downy mildew. Often Phosphorous acid fungicides are used after an infection period occurred or when active infections of downy mildew are found. If applied as a curative use the higher labelled rate

Which means identifying the target pest

- If symptomology alone does not help you identify if the problem is downy or powdery mildew then look at the sporulating structure using a 20X hand lens

  - Powdery mildew appear as small little barrels all stacked on top of each other. Scientifically the barrels are conidia and the structure the conidia are attached to is a conidiophore

  - Downy mildew appear as branched trees with round globes attached to the branches. Scientifically the globes are sporangia and the branched tree structure is a sporangiophore
Introduction to Winemaking Workshop

The Grape and Wine Institute at the University of Missouri will be putting on a one-day Introduction to Winemaking for winemakers looking to cover some essential skills for making quality wine. If you’re feeling a little rusty in the lab or winery, this is a great refresher course as well. Topics during the day will include:

- Understanding and determining fruit ripeness for specific wine styles
- Designing a vinification plan with a focus on sparkling wine
- Overview of winery equipment and proper sanitation
- Fundamentals of in-house lab analysis, with hands-on practice
- Interpreting lab results

**When:** The class will be on August 8th, 2018 and will start at 10am with registration at 9:30am.

**Where:** Room 245 Eckles Hall, University of Missouri, Columbia, MO

**Cost:** $80 which includes lunch, please send check to Kwasniewski lab at Eckles room 135, payable to University of Missouri

Limited space is available, so reserve now to ensure you can take advantage of this opportunity. Email missourigwi@gmail.com to register or for more information.
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

Cumulative Growing Degree Days for the Seven Grape Growing Regions of Missouri from April 1 to 25 June, 2018.

<table>
<thead>
<tr>
<th>Region</th>
<th>Location by County</th>
<th>Growing Degree Days $^1$</th>
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$^1$Growing degree days at base 50 from April 1 to June 25, 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.