Bitter rot and Sour rot

The two diseases discussed below have one thing in common, both Sour rot and Bitter rot can infect grape berries in which the skin has been compromised. That is their only commonality.

Bitter rot

Over the past couple of years, the incidence of Bitter rot appears to be increasing at least by visual observation. In many cases, Bitter rot seems to appear in Vignoles and often it is overlooked because in most years the predominant rot in Vignoles is Sour rot. Unlike Sour rot, Bitter rot can infect berries very early in their development.

The causal agent resulting in Bitter rot is *Greenaria uvicola*. Infection can take place during an extended period during the growing season. Specifically, this period is from bloom to harvest. Infections that occur at bloom results in *G. uvicola* entering a latent period. In essence, *G. uvicola* simply rests without causing disease until the grape berry begins to increase soluble solids later in the growing season. Unlike Sour rot, *G. uvicola* does not require the fruit skin to be damaged or wounded in order to cause infection. However, if the fruit skin is compromised, *G. uvicola* will infect wounded berries if spores are present.

Infection by *G. uvicola* is dependent on two environmental factors. Optimum conditions for fruit infections take place when temperatures are between 72-76°F and 6 to 12 hours of wetness. Longer periods of wetness have been shown to decrease infections. These temperature ranges have been readily apparent during the last few days as our morning low temperatures. Couple those temperatures with areas in the state that have experienced evening rainfall/thunderstorms and that is a recipe the bitter rot infection.

Managing bitter rot requires protective fungicide applications. The period of management is from bloom to harvest with protectant fungicides applied every 10-14 days. Fungicides are not the only management tool and fungicides should be combined with canopy management and sanitation. Canopy management which results in increased air flow such as shoot combing, leaf pulling or the removal basal shoots will reduce the period of wetness of the berries. These canopy management techniques will also allow greater penetration into the canopy and clusters of protectant fungicides. There is also a great difference in susceptibility of grape species to bitter rot.
Whereas bitter rot infects *Vitis vinifera*, *V. labrusca*, and *V. rotundifolia*. Many of the hybrid grape cultivars are fairly resistant to infection by bitter rot. Of the hybrid cultivars that have been evaluated, Norton, Chardonel and Chambourcin are all very resistant to bitter rot infection. This does not mean that these cultivars will never experience bitter rot. There is evidence in the literature that some bitter rot isolates are more virulent than others. A case in point was in 2015, when I evaluated a Norton vineyard experiencing bitter rot (Figure 1).

**Sour rot**

It is not too early to start thinking about Sour rot management. To manage Sour rot, you need to manage the whole complex of organisms involved in the disease. The organisms involved are yeast, acetic acid bacteria and fruit flies. Fruit flies play an essential role in the sour rot complex.

A typical management program of sour rot has been to apply Oxidate tank mixed with an insecticide. Oxidate is surface sterilant with the active ingredient being peroxyacetic acid and hydrogen peroxide. Hydrogen peroxide has activity on bacteria, viruses and fungal organisms. The Oxidate therefore controls the yeast and acetic acid bacteria. The insecticide added to the tank mix controls the fruit flies. The common insecticide put into practice to control the fruit flies has been Mustang Max. Do not overuse Mustang Max as fruit flies in New York state have developed resistance to Mustang Max as well as cross-resistance to a number of other insecticides. Rotate insecticides with different IRAC codes (see page 87 and page 93 of the 2019-2020 Midwest Fruit Pest Management Guide).

Take Home. If you are growing tight-clustered grape cultivars or grape cultivars that are susceptible to Sour rot (Figure 1), then consider monitoring the following:

- Monitor the soluble solids (º Brix) and when 15 º 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 º brix is attained.
- Monitor the weather especially as 15 º 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, *Drosophila melanogaster* is the major player and not spotted wing drosphilia. Fruit flies can be monitored using commercial traps.

Figure 1. Norton grapes with Bitter rot in 2015. Notice the red discolored berry which is a classic symptom of Bitter rot in red berried cultivars and the berry that has fruiting structures (Acervuli) of Bitter rot. Photo credit: D. Volenberg.

Figure 2. Vidal blanc with classic Sour rot symptoms on September 26, 2019. See text for management recommendations. Photo credit: D. Volenberg.
The best control of Sour rot is the application of an antimicrobial plus an insecticide starting when the first symptoms appear. This is followed by a second application of an antimicrobial and an insecticide. This recommendation is a change from past recommendations and is based on the research of M.S. graduate student Patrick Kenney. Please take a look at his Symposium presentation entitled “Implicating early fruit fly life stages in sour rot and spray timing applications”.

Also let me bring to your attention that there is another surface sterilant on the market labelled for grapes besides Oxidate 2.0. The product is Sporequell 5.6% by Miller Chemical. Sporequell has the following active ingredients: Peroxyacetic acid 5.6% and Hydrogen peroxide 26.5%. Oxidate 2.0 has the following active ingredients: Peroxyacetic acid 2.0% and Hydrogen dioxide 27.1%. The higher percentage Peroxyacetic acid in Sporequell will reduce cost per acre by almost 66% based on the rate of Oxidate applied. Please read and follow label directions.

A number of factors have to be considered in the management of Sour rot. Remember that environmental conditions such as rainfall that cause berries to swell and crack as the berries approach harvest maturity will likely result in sour rot. Any conditions that cause the berry skin to crack such as hail, birds, racoons, turkeys, powdery mildew, and grape berry moth larvae will likely result in sour rot. Reducing factors that result in compromised berries will also reduce sour rot. Implementing management practices that maintain berry integrity (bird netting) and speed cluster dry-down (leaf removal) will also reduce the incidence of Sour rot.

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**Announcement**

The **Grape Exchange** on the Grape and Wine Institutes Web Page will begin to take listings on Monday, August 3, 2020.

Please submit your listing to Karissa King at kingkari@missouri.edu. Please submit the following information: varietal, tons, and contact information

The **Grape and Wine Institute** is also initiating an **Equipment Exchange** that includes equipment in the vineyard and winery. These items can also be submitted to Karissa King as above. Please submit the following information: equipment type, and contact information.
ISU/UMN Joint Research and Winemaking Webinar Series:

Cellar Sanitation
Prior to the beginning of the grape harvest season, it is necessary to clean and sanitize the winery cellar to maintain wine quality, production consistency, and the long-term winery reputation. Cory Marx (UC Davis) and Luke Holcombe (Scott Laboratories) will present this topic during the first 1-hour webinar on August 4, 2020 at 3PM Central.

Proper & Practical Use of SO2
In the second 1-hour webinar the importance of sulfur dioxide, and good SO2 management in the winery, will be presented and discussed by Dr. Gavin Sacks (Cornell University) and Katie Cook (Scott Laboratories) on August 18, 2020 at 3PM Central.
These two free webinars are co-organized by Dr. Aude Watrelot, Assistant Professor of Enology at Iowa State University and Drew Horton, Enology Specialist at the University of Minnesota’s Grape Breeding & Enology Project.

Two 1-hour webinars scheduled as follows:

- **August 4th 2020: Winery Cleaning and Sanitizing**
  - 20-minute presentation of the practical aspects of cleaning and sanitizing in a winery by Luke Holcombe from Scott laboratories.
  - 20-minute presentation of a recent work carried out at UC Davis by Cory Marx under the supervision of Dr. Anita Oberholster. This presentation will focus on a method for optimizing the use of chemical agents for cleaning and sanitation.
  - 15-minute *Questions and Answers* moderated by Dr. Aude Watrelot and Drew Horton.

  To register:  
  [https://iastate.webex.com/iastate/onstage/g.php?MTID=ef1fa65a9a75d6bcacb28617892594c91](https://iastate.webex.com/iastate/onstage/g.php?MTID=ef1fa65a9a75d6bcacb28617892594c91)

- **August 18th 2020: Practical Management of Sulfur Dioxide**
  - 20-minute presentation on the definition of sulfur dioxide, the forms of sulfites, differences between free, bound and total SO2, the importance of SO2 in winemaking and a new method to measure SO2 by Dr. Gavin Sacks from Cornell university.
  - 20-minute presentation on the practical aspects of the management of sulfur dioxide in a winery by Katie Cook from Scott laboratories.
  - 15-minute *Questions and Answers* moderated by Dr. Aude Watrelot and Drew Horton.

  To register:  
  [https://iastate.webex.com/iastate/onstage/g.php?MTID=e98abcc780dd31e367335e36914084d1e](https://iastate.webex.com/iastate/onstage/g.php?MTID=e98abcc780dd31e367335e36914084d1e)

For further details or any questions, check out the Wine Industry Events in Dr. Watrelot’s website [https://faculty.sites.iastate.edu/watrelot/](https://faculty.sites.iastate.edu/watrelot/) or contact us at watrelot@iastate.edu and dhorton@umn.edu
Was your vineyard damaged by frost freeze events in April and May 2020.

If so take this survey to help inform the Missouri Wine and Grape Board.

Survey Link

Dear Missouri Winery owner:

A number of vineyards in Missouri were negatively impacted by frost/freeze events that occurred in April and May, 2020. As the Viticulture Extension Specialist for the University of Missouri Grape and Wine Institute, I am surveying wineries to quantify the impact of the frost/freeze events on sourcing grapes in 2020. Results of the survey will help the Missouri Wine and Grape Board determine if a declaration should be moved forward within state government allowing Missouri wineries the opportunity to source grapes or juice from outside of Missouri. The survey is completely confidential and your responses will not identify you. The survey will only take a couple of minutes to complete. Thanks for your time and support of the Missouri grape and wine industry.

Dicamba Cancellation Order: What Does it Mean for Grape Growers?

- Potential for dicamba drift incidents extended through July 31, 2020

Prior to the court ruling on June 3, 2020 the cut off date in most all Missouri counties for applying dicamba containing herbicides was July 15. That cut off date has now been extended to July 31, 2020 for three dicamba containing herbicides Engenia, FeXapan and XtendiMax that were purchased prior to June 3, 2020

- Pay close attention to your grape crops over the next 3-weeks for potential off target herbicide drift from dicamba containing herbicides

- Report any herbicide drift incidents to the Missouri Department of Agriculture

- Learn more here
To determine the number of growing degree days accumulated in your area since April 1. Use this tool.

Weather Outlook for Weekend
- Above normal air temperatures
- Heat index 95 to 105°F

July 20-25
- Excessive heat and humidity
- Above normal precipitation

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 573-473-0374 (mobile) or volenbergd@missouri.edu

### Cumulative Growing Degree Days (base 50) for the Seven Grape Growing Regions of Missouri from April 1 to July 11, 2020.

<table>
<thead>
<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 July 11, 2020. Data compiled from Useful and Useable at https://mrcc.illinois.edu/U2U/gdd/. Click on link below to determine growing degree days in your area.