

Timely Viticulture

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"Timely Vit" is designed to give those in the Maryland grape industry a timely reminder on procedures or topics they should be considering in the vineyard.

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Disease Management - Botrytis

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Botrytis is a major disease threat as harvest approaches. *Botrytis cinerea* is a fungus that affects many plant species, especially wine grapes, where it is commonly known as *Botrytis* bunch rot or gray mold.

Botrytis basics

- Grape flowers are considered the "gateway" for *Botrytis* infections, but the pathogen can also find its way to infect the clusters later in the season from bunch closing to harvest.
 - Infections experienced at bloom (through senescing blossom parts) remain latent (dormant) until some of them resume activity and rot the berries as they begin to ripen.
 - The majority of latent infections may remain inactive through harvest, and the fruit stays healthy.
 - Factors such as high humidity and physical damage (due to high-speed winds, insect, bird, or diffuse colonization of powdery mildew, etc.) during the pre-harvest period may promote activation.
 - Infections occurring closer to harvest do not undergo the latent period, and can readily cause symptoms on berries.
- Leaf and woody tissue infections are limited, and typically do not serve as inoculum for secondary infections. Thus, disease management should focus on clusters.
- Optimal conditions for spread are extended moisture and relatively cool temperatures.
- Leaf removal is a very important cultural/management practice that opens up the canopy to airflow, which reduces the canopy humidity and improves fungicide spray coverage.
- Serious *Botrytis* losses result from spread during the post-veraison/pre-harvest period, after berries begin ripening and become highly susceptible to rot by the fungus.
- Varieties with tight/compact clusters have greater susceptibility due to increased berry-to-berry spread. Reducing cluster compactness has been shown to reduce infections.
- Pre-harvest spread may be increased with high N content of berries (high soil N and or foliar urea applications). Be more diligent with your *Botrytis* scouting and management if you apply post-veraison N.

Botrytis management program

- Bloom sprays are targeted to limit the establishment of latent infections. These are especially critical during seasons with extended wet weather during the bloom period.
- Veraison sprays are targeted to limit the establishment of new primary infections and prevent berry to berry spread.
- A post-veraison (2-3 weeks pre-harvest) application may be critical to prevent spread especially under wet/humid conditions.

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Bloom

Pre-Harvest

Fungicides

Botrytis can be managed with fungicides, however, the pathogen has tremendous ability to develop fungicide resistance. It is thus important to select fungicides that have no or fewer resistance issues and closely follow guidelines for fungicide resistance management. Below is a list of single-site fungicides commonly used, grouped by frequency of resistance detected in local populations.

- High frequency of resistance (frequency of resistant isolates > 40%)
 - The strobies (FRAC 11) only have suppression activity against *Botrytis* in general. It is not advisable to use this group for *Botrytis* control regardless of resistance.
 - Vangard (FRAC 9). The product has high volatility and its use during summer is less effective.
 - Scala (FRAC 9—the same chemical family as Vanguard).
 - T-methyl (FRAC 1) and other products in this group.
- Medium frequency of resistance (15 to 40%)
 - Elevate (FRAC 17) has only protective activity but is quite rain fast.
 - Rovral (FRAC 2). Other products in this group include Iprodione 4L, Nevado, and Meteor.
 - Endura and Pristine (FRAC 7). Unlike other chemical groups, the fungicides within FRAC 7 lack complete cross-resistance, meaning that fungal isolates resistant to Endura or Pristine are not necessarily resistant to other FRAC 7 fungicides.
- Low frequency of resistance (<15%)
 - Switch or Miravis Prime (a.i. fludioxonil, FRAC 12).
 - Luna Experience and Luna Sensation (a.i. fluopyram, FRAC 7).
 - Kenja and Fervent (a.i. isofetamid, FRAC 7).

Please remember that all the single-site fungicides listed above are very prone to resistance development, so do not use the same fungicide group more than twice a season. For a complete list of active ingredients and products registered for Botrytis and other disease management, please refer to MyIPM app (download for free from App Store or Google Play)

Recommendations for resistance management:

- Avoid using fungicides to which resistance in *Botrytis* is widespread. Based on our findings, FRAC 7 (newer ones) and FRAC 12 have much fewer resistance issues than other groups.
- Base resistance management on multi-site fungicides such as Captan that do not select for resistance.
- Use single-site fungicides only when disease pressure is high, and tank-mix with Captan to insure disease control efficacy due to potential resistance issues.
- **The key to managing resistance issues is spraying less single-site fungicides. When weather conditions are less favorable (no extended moisture) for disease infection, consider extending spray intervals. The best fungicides are not as good as good weather!**

For more information, contact Dr. Mengjun Hu at mjhu@umd.edu or Dr. Joseph A. Fiola at jfiola@umd.edu.

Additional resources for Botrytis and general grape disease management.

Virginia Tech Grape Pest Management: https://www.pubs.ext.vt.edu/content/dam/pubs_ext_vt_edu/456/456-017/ENTO-337C.pdf

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