Growers should apply a series of protectant fungicide sprays to new shoots to protect them from several diseases, beginning shortly after bud break. Maryland growers may refer to Extension Fact Sheet 848, Guidelines for Developing an Effective Fungicide Spray Program for Wine Grapes in Maryland for specific management recommendations.

½- to 1-inch Shoots

- **Phomopsis cane and leaf spot** is usually the earliest disease threat. Spores can germinate as soon as temperatures are above freezing, so include protection in your first shoot spray. Cool, rainy weather favors sporulation and shoot and leaf infection.

- **Powdery mildew (PM).** In Maryland, the ascospores that cause primary infections on shoots and rachises may be present as soon as bud break, so include a PM fungicide in your first shoot spray. Rain events trigger ascospore released from over-wintering structures, and temperatures above 59° F, high humidity, and overcast skies favor infection. Protecting new growth from primary infections on shoots and rachises is the key to preventing later fruit infections.

- **Black rot (BR).** You may want to include BR protection in the first spray in warmer parts of the state, particularly in wet weather and in vineyards that had high levels of disease last year. Leaf infections may occur at temperatures as low as 50° F if leaves remain wet for 24 hours or longer. The warmer the temperature, the shorter the leaf wetness period needed for infection.

3- to 5-inch Shoots

- Continue protection for Phomopsis and PM. Begin protection for BR if you didn’t do so at the first shoot spray. Preventing leaf lesions reduces BR inoculum for fruit infections.

- Make your second shoot spray 7–10 days after the first spray. Use a 7-day interval if you are applying sulfur for PM, if 2 or more inches of rain have fallen since the first spray, or if shoots are growing rapidly. Fungicides must be re-applied as new growth occurs, as they do not move systemically to protect it.

- If rain is predicted between 7 and 10 days after the first spray, make the second spray before the rain. To be effective, protectant fungicides must be on the shoots and leaves before spores arrive. Some will wash off, but typically 75-80% sticks to plants.
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6- to 10-inch Shoots

- Continue protection for Phomopsis, PM, and BR. Make your third spray 7–10 days after the second spray. See the note on intervals under the previous spray.

- If you are using a fungicide that is at high or medium risk of resistance development, remember to rotate to a fungicide with a different mode of action after each spray. Limit total applications of these fungicides to no more than 2 per season. See Table 2 of Fact Sheet 848 for more information on fungicide classes and resistance risks.

- Protection against downy mildew (DM) may be warranted in warm, wet years once 5 or 6 leaves have emerged on the shoot, though generally no earlier than mid-May. If you are using mancozeb or captan for Phomopsis and BR, they will protect shoots against DM as well.

- Bear in mind that Pristine resistance has been detected for DM, so if you are seeing poor efficacy, consider that you might have resistance.

12- to 17-inch Shoots

- If you have been spraying at 10-day intervals and your vines are approaching bloom, make sure you include DM protection in this spray. Add a fungicide for Botrytis blight for Botrytis-prone varieties or if the weather is consistently wet.

- If you have been spraying at 7-day intervals, make one more shoot spray for Phomopsis, PM, and BR. Make sure to include DM protection in this spray.

- If you have been using paraffinic oil (JMS Stylet-Oil or Pure-Spray) for PM, switch to another fungicide after the last shoot spray. Later in the season, oil can slow growth and retard fruit ripening.

- Remember to increase spray volume as the canopy fills out to ensure thorough coverage.

For more information, contact Dr. Casandra Swett at clswett@umd.edu or Dr. Joseph A. Fiola at jfiola@umd.edu.

Thanks to Anne DeMarsay, Ph.D., (former University of Maryland Extension Specialist in Fruit Pathology) for the original version of this TimelyVit.