Downy Mildew Management

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Downy mildew is often difficult to manage because it requires specific weather conditions to become a serious threat, and because it can develop into an epidemic very quickly in favorable weather. While fruit become immune to infection within 4 weeks after bloom, vines remain vulnerable to defoliation throughout the season. Premature loss of leaves can jeopardize yield and increase the danger of winter injury.

Downy Mildew Basics

- The downy mildew (DM) pathogen, Plasmopara viticola, is a fungus-like organism that overwinters in the soil of the vineyard as resting spores (oospores) produced from infections in last year’s fallen leaves.
- Overwintering infections may become active in the spring as soon as the 5th or 6th leaves emerge (about 10-inch shoot length). Oospores germinate to produce sporangia (fruiting bodies) during rainy periods at temperatures of 52° F or higher.
- Primary infections occur when sporangia are blown or splashed onto shoots, leaves, or developing clusters. Sporangia release “swimming” spores (zoospores) onto wet tissue. Zoospores migrate to stomata and may cause infection within a few hours.
- Secondary cycles of infection begin when these primary infections produce sporangia, visible as cottony white fibers on the undersides of infected leaves and on clusters. These sporangia may be blown long distances.
- Rapid secondary spread requires warm, humid nights (65–77° F, >95% RH) followed by cloudy weather and frequent showers. Under ideal conditions, each new infection can develop and produce spores in 4 to 5 days. Disease levels can escalate quickly from minimal to devastating.

Managing Downy Mildew

- DM epidemics are driven by moisture in the air and soil, and on the vine. Improving soil drainage and air circulation and speeding up vine drying will help to prevent primary DM infections and slow secondary spread if infections do appear.

- Prevention of primary infections is key. Begin protectant fungicide sprays when shoots are 6–10 inches long in wet springs (especially after warm, wet winters) and in vineyards where DM was a (Continued on page 2)
problem in the previous year. Otherwise, add a protectant no later than the pre-bloom spray.
- Mancozeb, copper, and captan offer good protection against DM when applied at 7–14-day intervals.
- Strobilurin-resistant strains of DM have been found in Maryland, so do not rely on Abound or Pristine alone for protection.

- **After bloom, scout regularly for DM on leaves, shoots, and clusters.** Infected clusters may fail to set fruit or turn brown, shrivel, and become covered with white, cottony spores. Early leaf symptoms are reddish or yellow “oil spots” on the upper sides that soon produce white, cottony spores on the undersides. Late lesions turn brown, and severely infected leaves may drop.

- **If no DM is present in your vineyard,** continue protectant sprays through the 1st cover spray (2nd post-bloom spray) to fully protect fruit, then adjust your cover sprays according to the weather. Berries become immune to direct infection about 2 weeks after bloom but may be infected via the rachis for about 2 more weeks.
  - Captan, copper, and phosphites (Phostrol, ProPhyt, Topaz) are options after you reach the seasonal limit or 66-day PHI for mancozeb. Phosphites should be applied every 7 days for the best protective activity and rotated with other materials so they do not lose effectiveness.

- **If you see symptoms of DM,** apply a fungicide with post-infection and anti-sporulant activity as well as protective activity **as soon as possible.**
  - Ridomil Gold is now available only as a premix with mancozeb (66-day PHI) or copper (42-day PHI). It is very effective on serious outbreaks but highly resistance prone—and expensive. Make no more than (preferably 1) application per season, and rotate to another DM fungicide between applications.
  - Phosphites (0-day PHI) offer good post-infection and anti-sporulant activity, especially on “oil spot” lesions that are not yet sporulating. As noted, they must be applied weekly for good protection and rotated with other DM materials.

- **Two vegetable DM fungicides** with new chemistries have recently been labeled for grape DM, and trials are underway to determine their efficacy. Revus (mandipropamid) is a Group 40 fungicide from Syngenta with a 14-day PHI, and Presidio (flucopicolide) is a Group 43 fungicide from Valent with a 21-day PHI. Both are reported to have protective and at least limited curative activity. These new materials may be useful in later-season DM management.

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