

## Grapes

**Week of July 12-15:** With almost an inch July 13-14, the rain perked up thirsty vines. The extended period of wetness and warm temperatures will start up some downy mildew on the canopy. Susceptibility of berries to BR, PM and DM is rapidly declining; remember however that black rot infections can take 4-6 weeks to manifest on fruit. With veraison not far away, time to ponder control of cluster rots particularly if the weather pattern turns wet. Note that the article below discusses Botrytis only. Unfortunately, cluster rots can involve organisms other than Botrytis. In recent years, we have verified the presence of bitter rot in our Chardonnay, misidentified as phomopsis for years. In our disease management trials, we have verified what grape pathologists such as Wayne Wilcox (Cornell) and Turner Sutton (NC State) have found in formal trials - Pristine and Captan help control bitter rot. The topic of other-than-botrytis rot organisms is worthy of more discussion. Potato leafhoppers are low to moderate while Japanese beetle populations have escalated in some blocks. Time also to scout hot spots for grape berry moth, particularly with veraison and the potential for establishment of cluster rot organisms. Final thought – get your bird netting ready, particularly for early ripening varieties. Thirsty birds have already been pecking at clusters for about 2 weeks in the research vineyard. (AW)

**Botrytis Control:** A botrycide at veraison is the single most effective timing in humid climates such as eastern North America. The fungus sometimes gets a "foothold" in the cluster earlier in the season (latent infection of cluster debris), but serious losses are the result of rapid spread as the berries become highly susceptible after veraison. A quick review of the viable options:

- 1) Rovral. Resistance developed in many regions after intensive use in the 80's. The good news is that resistant Botrytis strains are weaker than their sensitive counterparts, so their numbers decline from one year to the next provided that you stop spraying Rovral and allow the sensitive strains to take over. Once the resistant strains have declined sufficiently, it may be possible to make one application per year without running into further trouble. Bottom line: Rovral should not be the workhorse of your program. However, if you've been giving it a rest, it may be a useful tool in a rotational program when used on a limited basis. Note that Rovral is one material where the use of an adjuvant improves control. Stylet Oil (assuming proximity to sulfur sprays is not an issue) is a good choice.
- 2) Vanguard. A consistent performer in our Botrytis control trials. Vanguard is absorbed into the berries, so it's rainfast and has limited postinfection activity. There doesn't seem to be any data showing improved performance by adding an adjuvant, and we saw no such benefit in the one year where we tested this product with and without a nonionic surfactant. Vanguard is highly prone to resistance development, so its use should be strictly minimized. The label allows a maximum of two applications per season, but keep it to a single spray each year unless you really get into a bind.
- 3) Scala. Same chemistry and mode of action as Vanguard, the two have performed similarly in a limited number of head-to-head tests. Same resistance concerns, consequently, there is no benefit in "rotating" between the two in terms of resistance management.
- 4) Elevate. This product is unrelated to any other on the market. Wilcox's results with it have been good to very good, and over the last few years it's been equivalent to Vanguard. Elevate is retained within the waxy cuticle of the berries, so it is rainfast within a few hours after its application (lab studies show 50% retention within 3 hr and 75% retention within 24 hr). It is strictly a protectant fungicide, without postinfection activity. It does not appear to be as prone to resistance development as Vanguard, but there is a resistance risk. The label allows a maximum of three applications per season, but European guidelines recommend just one, in rotation with unrelated materials.
- 5) Flint. Provides very good to excellent control at 3 oz/A, versus 1.5 to 2 oz for PM. Limit strobie use to a maximum of two applications per season, so if you're already there, this is not an option.
- 6) Pristine. Has provided good control at a rate of 12.5 oz/A in limited testing, and excellent control at 19 oz/A. Both the strobie and non-strobie component of this "combination product" have activity against Botrytis, so there is some resistance-management benefit to using it. Still not a preferred option if you've already used it or another strobie product twice earlier in the season.
- 7) Oxidate. In years past, growers have tried Oxidate in an effort to clean up/dry out Botrytis. Oxidate is formulated to stay on the outside of the waxy cuticle covering leaves and berries rather than enter them. In 06 trials on Chardonnay in the research vineyard, it did indeed burn out Botrytis sporulation on the outside of berries. However, since the fungus extends into the flesh of the berry, new sporulation reappeared within a week or so and infections progressed (this was in the absence of botrycides). Use of Oxidate in combination with or in addition to botrycides may be a better strategy but it is still unclear if the addition of Oxidate will enhance control. If possible, leave treated and untreated to gauge efficacy.

Final word: Cultural practices (canopy management, leaf pulling, moderate use of nitrogen) are critical components of Botrytis control programs. Botrycides will be minimally effective if cultural practices are not timely and well executed.

(WFW & AW)

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**Week of July 19-22:** Continued high temperatures have made vineyard work a challenge. Area vineyards look remarkably good, a testament to the skills of vineyard managers and their crews. Thunderstorms on July 21 were accompanied by a swath of hail. Periodic thunderstorms are predicted for the next few days.

In the research vineyard, the hybrid Marquette is blazing through veraison. As of 7-21, we also saw berries turning in Pinot Noir, Pinot Gris and Zweigelt.

**Summer Disease Control:** Berry susceptibility to new infections of black rot, downy and powdery mildew is practically non-existent. With veraison starting in early varieties, disease control is now focused on cluster rot as well as control of DM and PM on the canopy. Timely hedging of the canopy is one of the best control strategies for downy mildew as it allows leaves to dry out more quickly. Keeping downy mildew completely out of your vineyard is difficult. In the latter part of summer, warm temps accompanied by frequent morning dew help to fuel infections. A few spots do not reflect failed management, rather it reflects how challenging disease control can be. Treatment options are listed below. Downy mildew control requires a combination of canopy management, rotation of products and vigilance. Bird netting, esp over the row netting that leads to shoot crowding in the top of the canopy, complicates downy mildew control by reducing air flow and spray coverage.

- Mancozeb - A 66 days to harvest restriction on mancozeb products means that time of harvest must be considered. This may not be an option for earlier varieties. A protectant only.
- Ridomil Gold/Copper is still an option (42 day PHI). Ridomil is very effective, also resistance prone though if used prudently (not applied repeatedly to raging infections), the development of resistance is much less of a risk. Ridomil has both protectant and postinfection ability.
- Copper is a good protectant and can be tank mixed with sulfur. Copper can cause phyto, even with a spray lime safener, if drying conditions are poor.
- Phosphonate products have been widely used and effective. Many however have felt that they don't hold up under pressure. This slippage is a possible symptom of early resistance. However, with big canopies and possible compromises in coverage, don't rush to judgment on this topic. These can be tank mixed with sulfur. There have been a few reports of phyto from PA-sulfur tank mixes.
- Captan is a good protectant but does not offer post infection control. Should we get into extended wet conditions, captan has the advantage of providing good activity against most of the common non-Botrytis cluster rots that can occur under those conditions. Note that most labels have 48-72 hr REI's, down from 96 hrs.
- Ziram is another labeled protectant that offers DM control, although it is not as effective as captan.
- Revus is newly registered in 2009, reflecting a unique class of fungicides on grapes. It is absorbed into leaves and provides at least some post-infection activity. It did well in trials at LIHREC as well as in Wilcox's trials. It is not a miracle product however and the same warnings about resistance apply to Revus – don't apply to raging infections and rotate with different chemistry products.
- Strobilurins - Tanos is not technically a strobie but according to Wilcox has the same mode of action as Abound and Pristine. Thus it is not a suitable rotational partner for these materials. Also the Tanos label requires that it be tank mixed with a protectant fungicide. As a group, these products have provided decent control of DM but there have been failures under heavy disease pressure. In more southerly regions, resistance has been documented by researchers. (AW & WFW)