Pre-harvest grape disease management reminders

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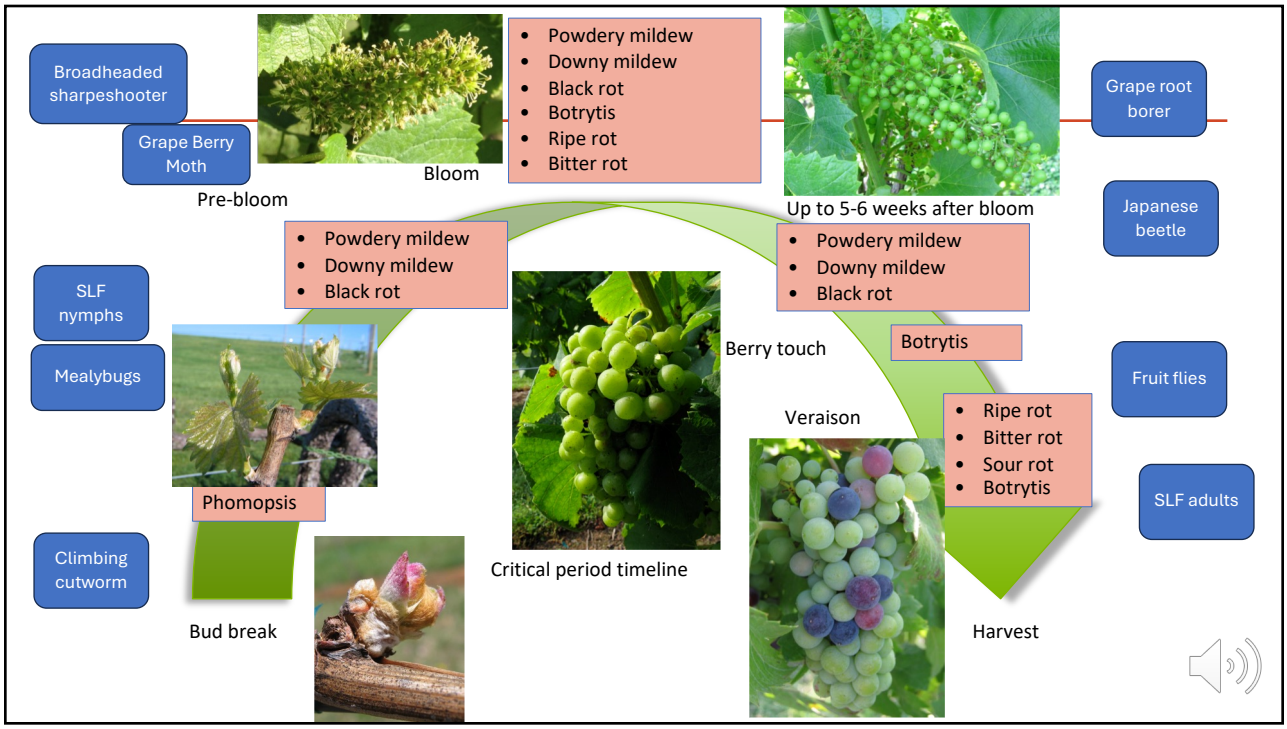

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Downy Mildew

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Downy mildew

- **Canopy management**
- After a critical time, Leaves are still susceptible to the infection.
  - Late summer infections: Watch out for humid nights

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Downy Mildew
Timing: all season
Clusters are susceptible from bloom to 4-6 wks after bloom

Preventative fungicide application

Good: ~~Mancozeb, ziram (Dithane, Penncozeb, Gavel, etc. Group M3),~~ Ranman (Group 21- 30-day PHI), captan (Group M4), copper (Group M1)

Good, but…: Revus/Forum (Group 40 – resistance spreading quickly), Zampro (Group **40** + 45),

Mixed: Lifeguard (defense activator) and Zonix (blocks spores) - please use them with a caution (can be a good rotation or tank mix partner)

Bad: Any QoI (Group 11) fungicides (e.g., Aboud, Pristine, etc.)

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Downy Mildew
Timing: all season
Clusters are susceptible from bloom to 4-6 wks after bloom

Kick-back fungicide application (<u>after the rain, not after you see downy!</u>)

Good: Phosphonate (Prophyt, Phostrol, etc. Group P07 (used to be 33)), Ridomil products (Group 4): Both have the potential fungicide resistance risk

Poor: Tanos (Group 11 + 27) note: we did not find a good result with Tanos in VA), Tanos need a mixing partner

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Downy mildew: after an outbreak

Stick with copper, mancozeb, or captan

Spraying other materials will increase the risk of fungicide resistance.

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Downy mildew: Biopesticides?

My student, Jonathan Ames, is currently evaluating several materials.

So far, Zonix seems to be OK: i.e., it can suppress downy mildew to some extent.

- Zonix can be a good mixing partner or a material for a low-pressure situation (the coverage could be critical).
- A runner-up was Stargus

A very weak material was Lifegard, but not good enough to recommend…

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Botrytis management

Timing: At bloom, bunch closure (the last opportunity to deliver fungicides inside of the cluster), and at veraison (spore availability)

Canopy management is critical because the outbreak is often associated with a long wetness event.

Injury management (***Grape Berry Moth***, Birds, PM) is also important

Caps remaining on clusters ***can*** host the pathogen

It won't be the major source of inoculum, but make sure to have good coverage!

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Botrytis Management
Preventative fungicide options

Fair to Good: Group 2: iprodione (Rovral/Meteor – resistance = low/mod risk),

Good, but…: Group 7 (SDHI): ~~boscalid (Endura),~~ Luna Experience, Kenja, Miravis Prime (– resistance = high)

Good: Group 9: cyprodinil (Vanguard, Inspire super, Switch- resistance = mod)

Good: Group 12: cyprodinil + fludioxinil (Switch – resistance = mod)

Good: Group 17: fenhexamid (Elevate – resistance = unknown)

Fair: Group 19: polyoxins (Oso, Ph-D – resistance = mod)

Fair: Group M4: captan – fair activity, but it will be a good mixing partner!

Fair: Group M1: copper (the same comment as above)

Bad: QoI fungicides, Pristine (7 + 11), Topsin-M

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Ripe rot

Caused by *Colletotrichum* species.
We found the average of 2.7 species per vineyard in our previous survey.
They vary in the level of susceptibility against fungicides.
We tested 10 modes of action, but **none** produced satisfying results consistently.

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Ripe rot application timing: at bloom, veraison, plus you may need one or two more, if you have susceptible cultivars with a history of outbreak…

- All materials shown here are “fair” in efficacy by itself
- MIX captan (M4) with
  - Rovral (2) or Switch (9 + 12) or Howler (not as good as Switch)
  - Copper is not as effective as mancozeb (66-day PHI) or captan
- In 2022-23 trial, Mancozeb or Aprovia Top (42-day PHI) applied at bloom, then Howler plus captan or Switch plus captan applied at veraison and on provided good controls.
  - Another successful treatment was Switch plus Howler applied three times

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Sour rot management

Timing: ~ 15 Brix

Current recommendation is **TWO** applications of an insecticide (to control fruit flies, e.g., Mustang MAXX) plus a fungicide [Oxidate (NC) or Switch (9 + 12), or Oso (19), or Howler (NC)], 7 to 10 days apart

Do not use Mustang Maxx more than twice a season!

Captan did not work in our trials

Ph-D (19), which has a higher concentration of polyoxin, probably works better.

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Alternative to Mustang MAXX

Spotted-wing drosophila	Entrust 2SC	4.0-8.0 fl oz	Spotted-wing drosophila is more important in some varieties than others; growers should incorporate block history. Berries become most vulnerable at about 15 degrees Brix. It is critical to rotate among differing modes of action in order to delay the development of resistance. PyGanic has a short residual life which limits its efficacy. Surround, Entrust and PyGanic are organic alternatives. Be watchful for flare-ups of secondary pests (mealybugs, spider mites) following application of pyrethroids. When available, flowable (F) formulations pose less risk of phytotoxicity that emulsifiable (EC; oil-based) formulations. Avoid using captan and oil-based pesticides within 14 days of each other. Removing foliage from the fruit zone will reduce habitat suitability for SWD. For more information on SWD, visit www.virginiafruit.ento.vt.edu/SWD.html.
	Delegate 25WG	3.0-5.0 oz	
	Malathion 8F	1.88 pt	
	Malathion 5EC	3.0 pt	
	Mustang Maxx 0.8EC	4.0 fl oz	
	Tombstone 2EC	2.4-3.2 fl oz	
	PyGanic 1.4EC	64.0 fl oz	
	Surround WP	25.0-50.0 lb	
	Sevin XLR Plus	1.0-2.0 qt	

We also tested Entrust 2SC and AzaGard, which provided a moderate reduction.
Please check the IRAC code and ROTATE!

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Bitter rot

- Timing: after veraison
- Materials: captan (M4) or a QoI fungicide (Abound, Flint, Pristine, Intuity, etc., FRAC = 11)
  - Copper (M1) seems to be not effective

Photo courtesy of Mike Ellis (OSU)
Note the characteristic concentric rings of black fruiting bodies

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Please refer to my blog for more information and resources

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Fungicide resistance? Send samples to Anton!

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