

Bunch closure and veraison Disease Management Reminders

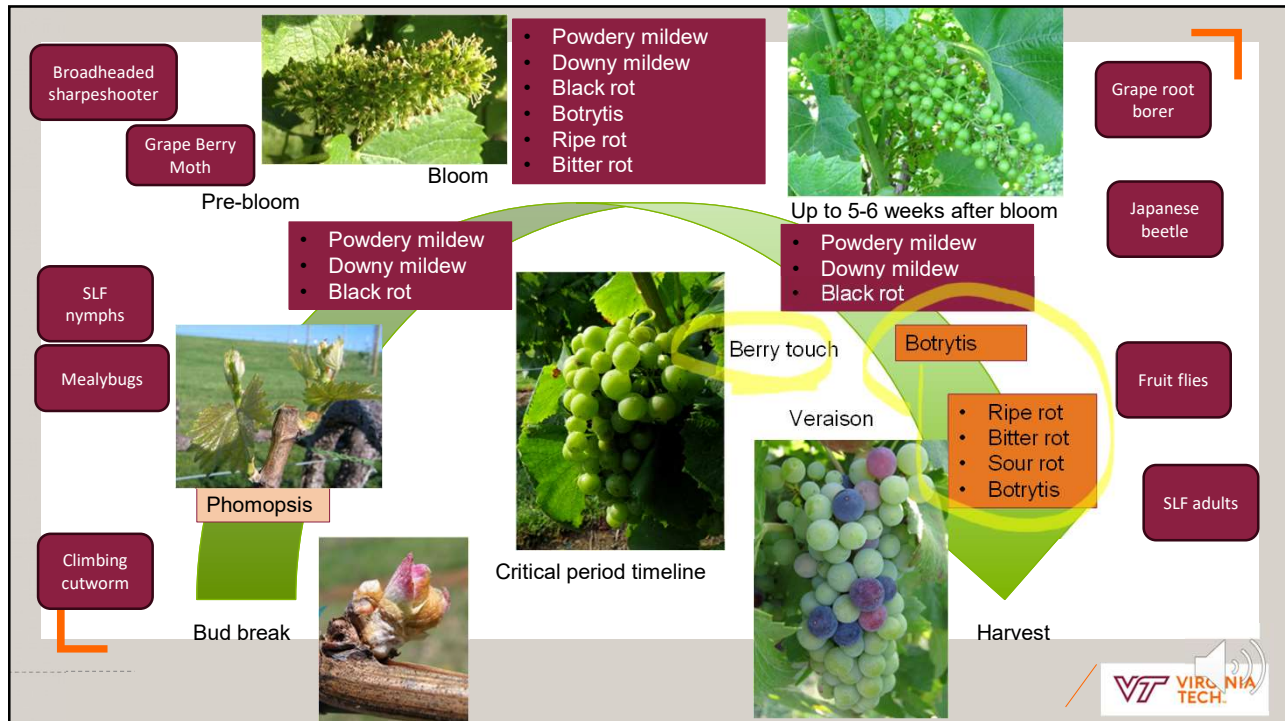


Mizuho Nita: Nita24@vt.edu
<https://ext.grapepathology.org>

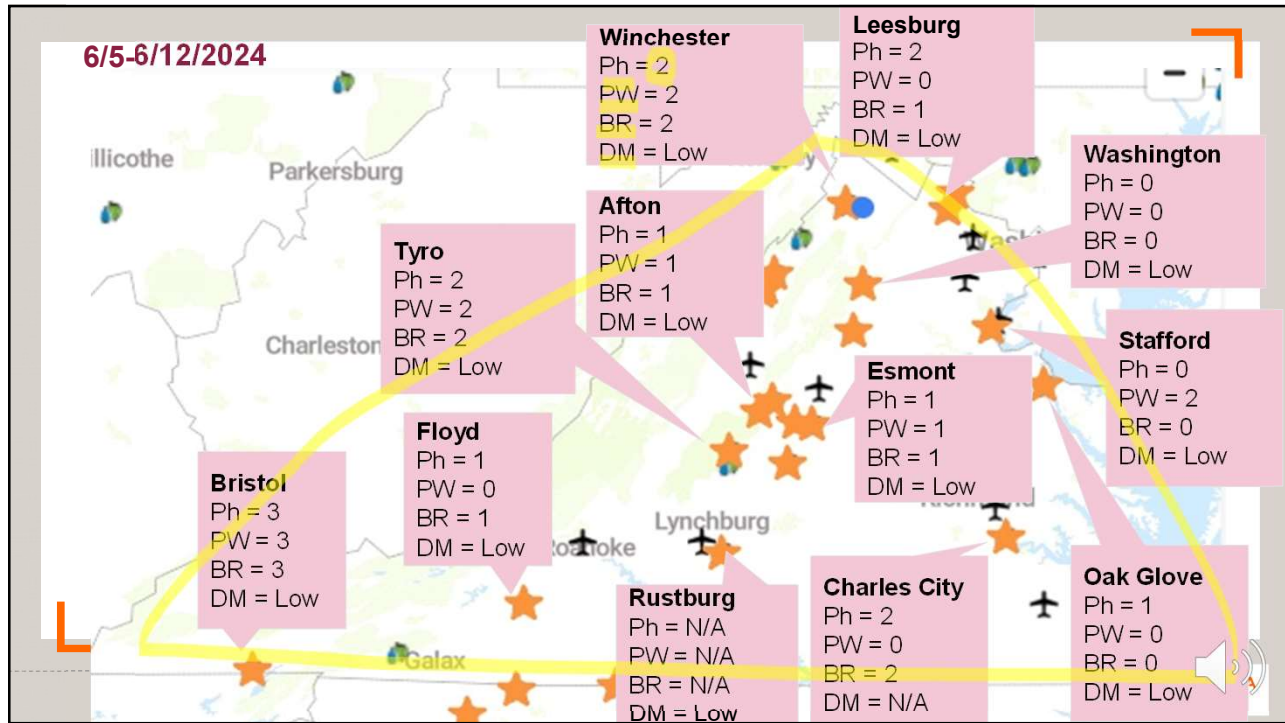




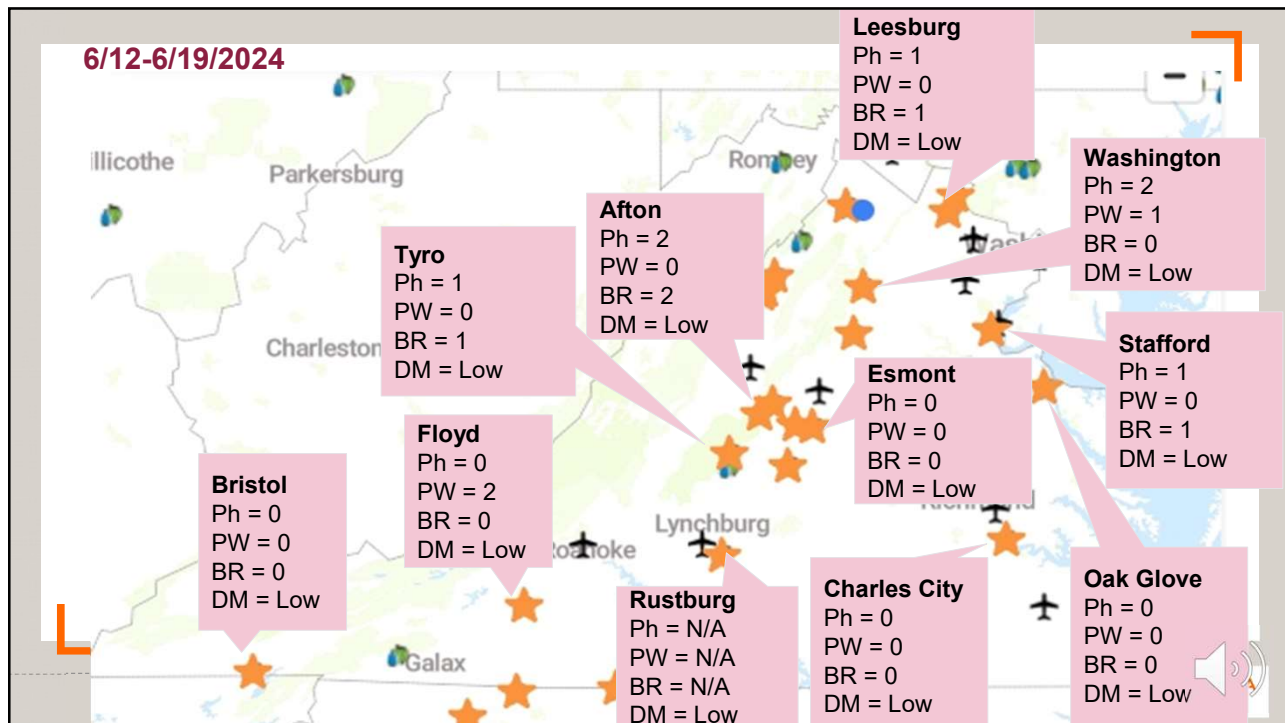
39



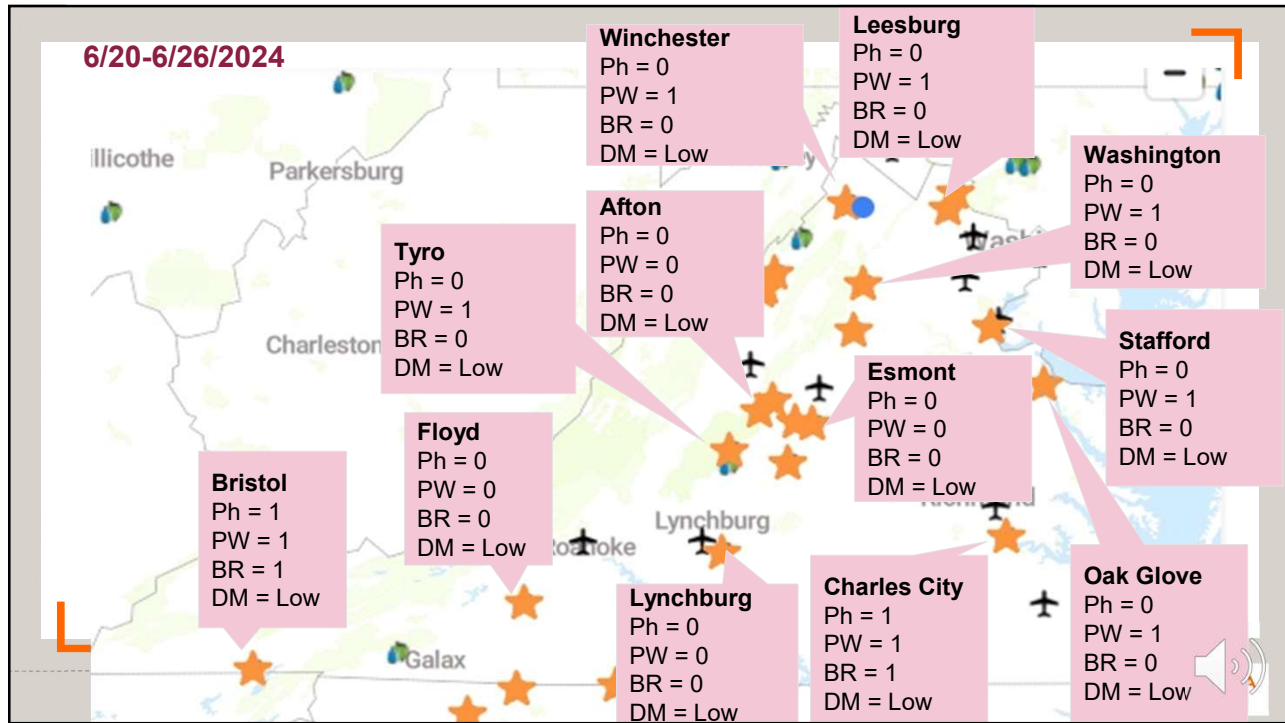
40



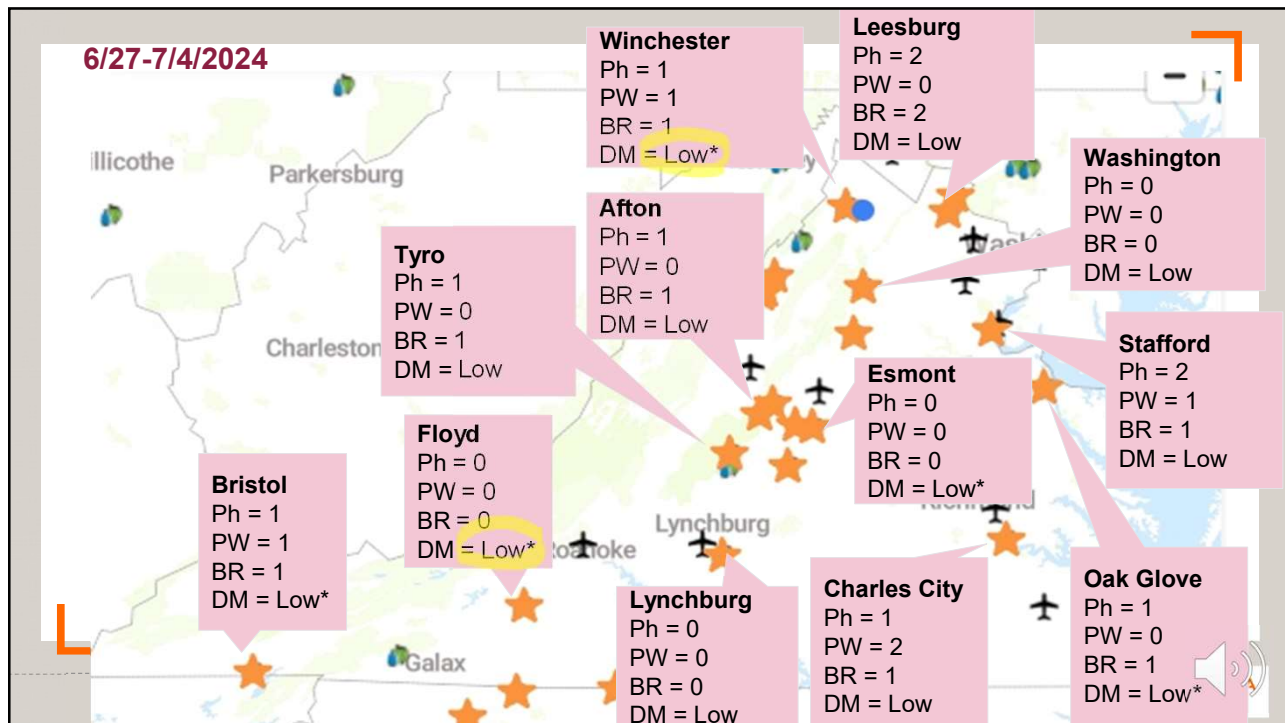
41



42



43



44





Powdery mildew



45

Powdery Mildew Management

- Canopy management for
 - Good air circulation
 - Good light penetration
- Outbreak? Sulfur, oil, or Potassium salt is good option
- Timing for chemical management is pre-bloom to harvest
- The risk of infection is low when the temperature hits 90F or higher
- Can we stretch our spray intervals?
 - 14-days for *V. vinifera*
 - Maybe longer for some hybrids, e.g., Chardonel, Vidal, Arandell

46

Powdery Mildew

Timing: pre-bloom to harvest

Pre-bloom application is critical esp. with under high pressure

Clusters are susceptible from bloom to 4-6 wks after bloom

- **Good:** Sulfur (Group M2), Vivando (50), SDHI (Group 7, Pristine, Endura, Luna Experience, Kenja, Aprovia, Miravis Prime, etc.),
- **Good, but...:** DMI (i.e., Sterol-inhibitor, Group 3, Rally, Mettle, Rhyme, Top Guard EQ (3+11), etc.), Quintec (Group 13, one case of resistant isolate found in VA)
- **Fair:** Fixed copper (Group M1), Torino (Group U6), etc.
 - DMI: there are evidence of chemical resistance in Europe, AND good evidence of resistance development among VA isolates
 - Torino works, but not as strong as others. Good mixing partner to sulfur to have an extra kick
- **Bad:** QoI (group 11) or Topsin-M most likely not going to be help



47

Powdery Mildew "after outbreak" fungicide options

- **Stylet Oil (Group M)** [early season, some varieties may show phytotoxicity when applied on premature fruits]
 - Efficacy = Good
 - **DO NOT mix oil with sulfur or captan!!!**
 - **Cannot spray within two weeks of each other**
 - You may be able to spray a certain oil product then sulfur after one week (try in a small area first!)
- **Potassium salt** products (Group M, Kaligreen, Milstop, etc.)
 - Efficacy = Good
 - Requires through coverage, and it is expensive!



48

Downy Mildew



50



Downy mildew

- **Canopy management**
- Pre-bloom: Consider not only infection event (=rain but also warm and humid nights (>60F and 80-90%) that promote spore production (2009, 2013, and 2018...))
 - Overwintering spores are active for 3 to 6 months
- After bloom: Critical time for the cluster runs about 4-6 weeks.
- **After critical time: Leaves are still susceptible to the infection.**
 - **Late summer infections**



51

Downy Mildew

Timing: all season

Clusters are susceptible from bloom to 4-6 wks after bloom

- **Preventative fungicide application**
 - **Good:** Mancozeb, ziram (Group M3, Dithane, Penncozeb, Gavel, etc.), 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),
 - **Don't know:** Lifeguard (defense activator) and Zonix (bio-control) - inconsistent reports; please use them with caution (can be a good rotation or tank mix partner)
 - **Bad:** Any QoI (Group 11) fungicides (e.g., Abound, Pristine, etc.)



53

Downy Mildew

Timing: all season

Clusters are susceptible from bloom to 4-6 wks after bloom


- **Kick-back fungicide application (after the rain, not after you see downy!)**
 - **Good:** Phosphonate (Prophyt, Phostrol, etc. Group P07 (used to be 33)), Ridomil products (Group 4) (Note, Ridomil products have relatively long PHI.)
 - **Poor:** Tanos (Group 11 + 27) note: we did not find a good result with Tanos in VA), Tanos need a mixing partner



54

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



61

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**



63

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.



64

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 mancozeb (M3) or captan (M4) with
 - a Qol (Pristine, Flint, Abound, FRAC = 11), Rovral (2), Switch (9 + 12), tebuconazole (3),
 - 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 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



68

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

70



70

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.



71



Alternative to Mustang MAXX

Spotted-wing Drosophila	Azera	1.0-2.0 p	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 than emulsifiable (EC; oil-based) formulations. Avoid using captan and oil-based pesticides within 14 days of each other. For more information on SWD, visit www.virginiafruit.ento.vt.edu/SWD.html .
	Entrust 2SC	OK material 0-8.0 fl oz	
	Baythroid XL 1EC	2.4-3.2 fl oz	
	Delegate 25WG	3.0-5.0 oz	
	Malathion 8F	1.88 pt	
	Malathion 5EC	3.0 pt	
	Mustang Maxx	4 fl oz	
	PyGanic 1.4EC	64.0 fl oz	
	Tombstone 25EC	2.4-3.2 fl oz	
	Surround WP	25.0-50.0 lb	
Sevin XLR Plus	1.0-2.0 qt		

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



72



Spotted Lanternfly (SLF) management

- Wait until you see them coming; the approach is similar to Japanese beetle management
- Edge treatment works
- Tree of heaven can be used as a trap plant



73



Thank you and see you next time!

- Any questions?
- I will post my slides to my blog.



86

