

*Welcome to VCE Virtual
Vineyard Meetings, 2024*

*Every first Thursday of the
month at 1 PM!*

VT VIRGINIA AGRICULTURAL EXPERIMENT STATION
ALSON H. SMITH JR. AGRICULTURAL
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Agenda

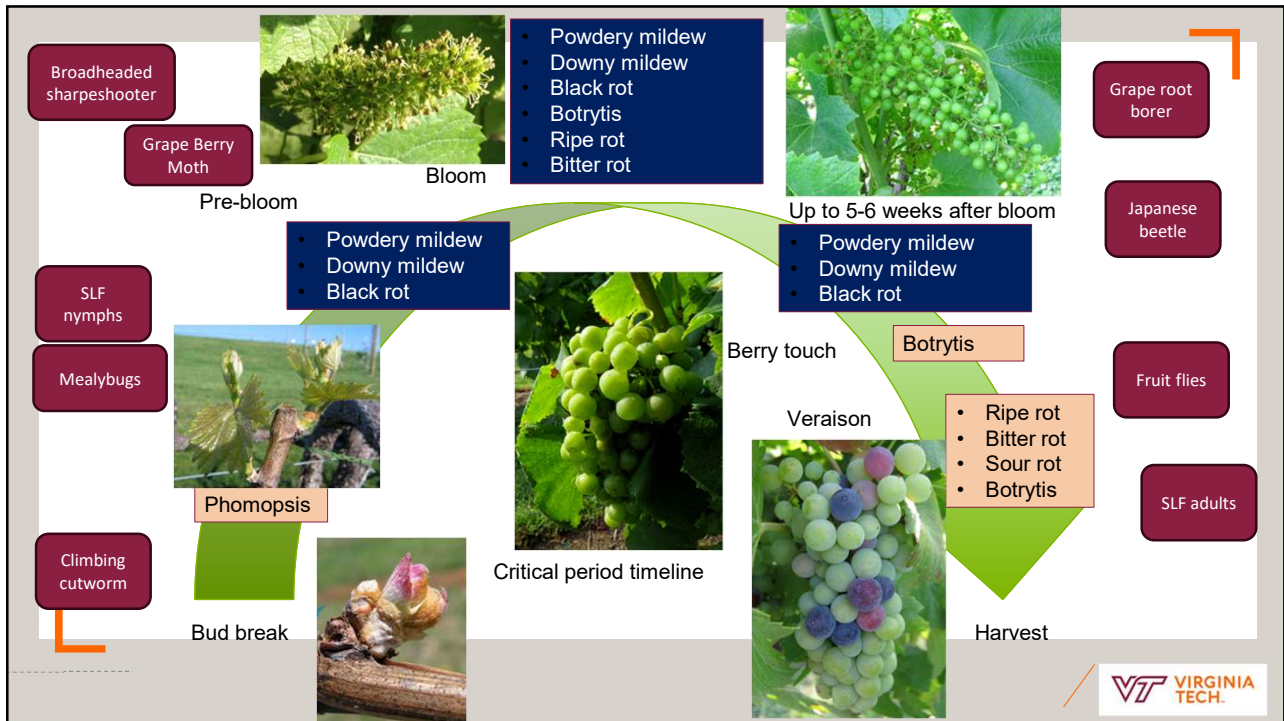
- Grape Disease Management Updates (Mizuho Nita)
- Viticulture Updates (Drew Harner)

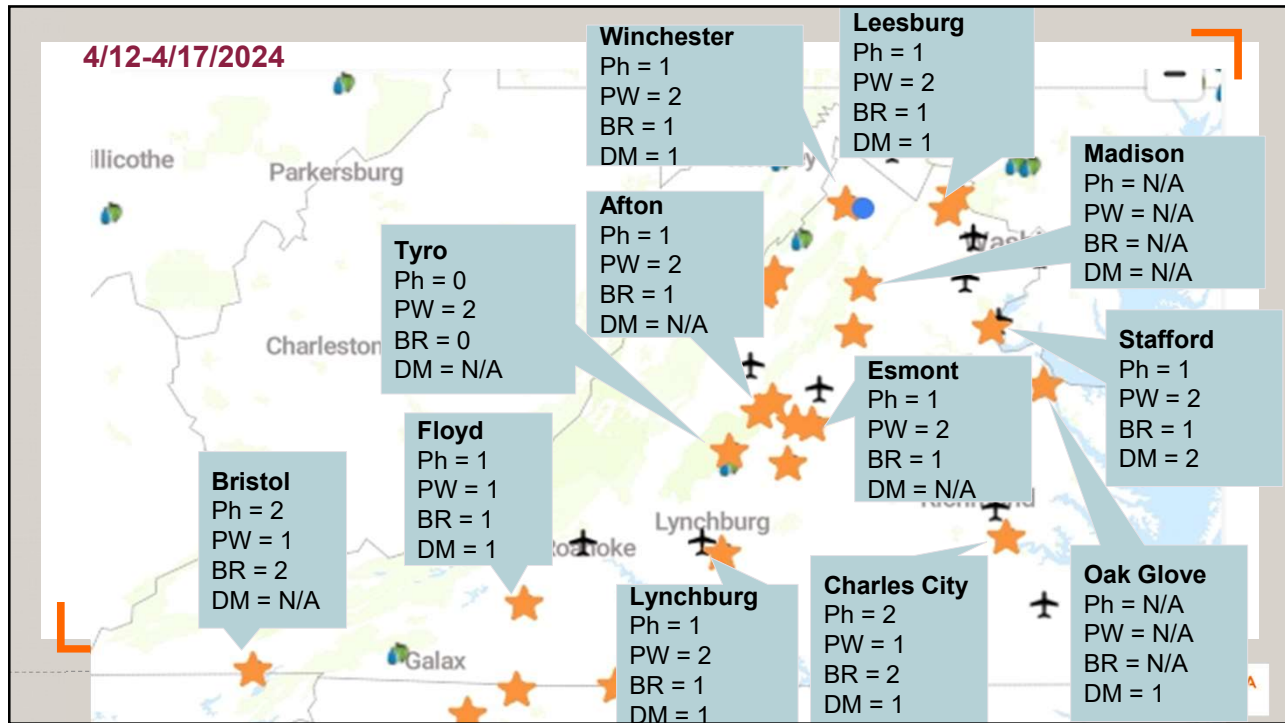
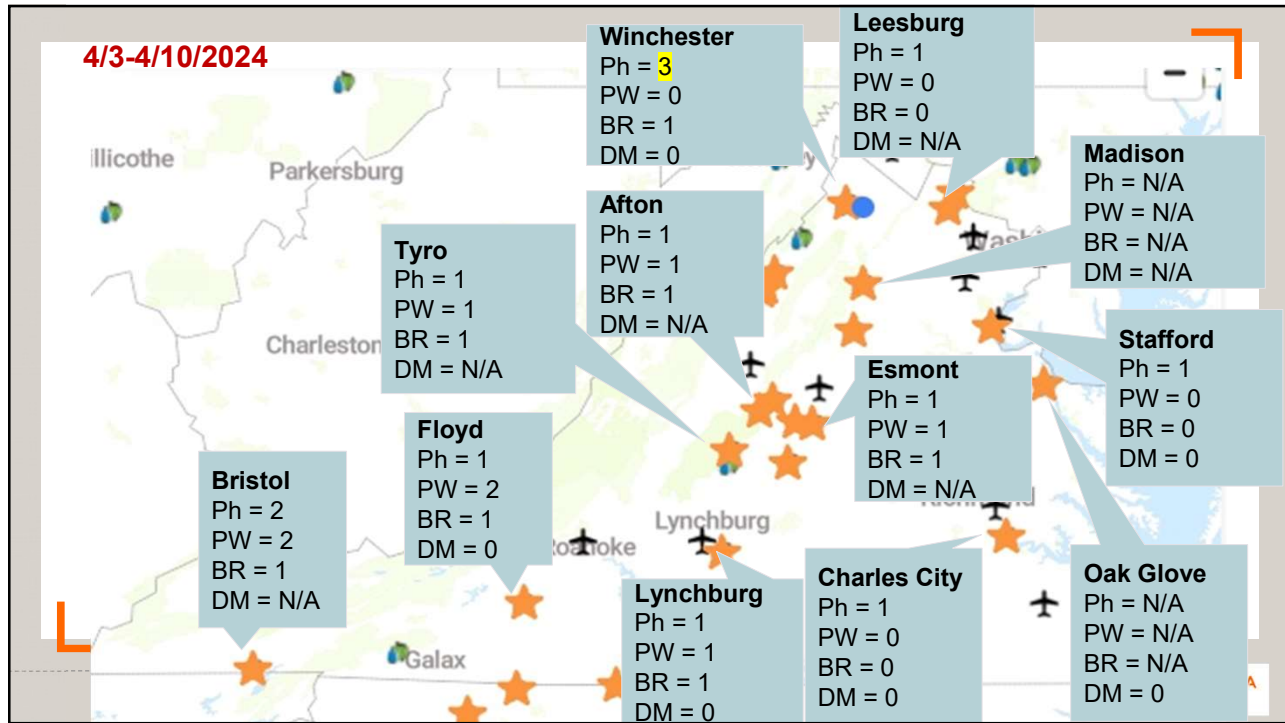
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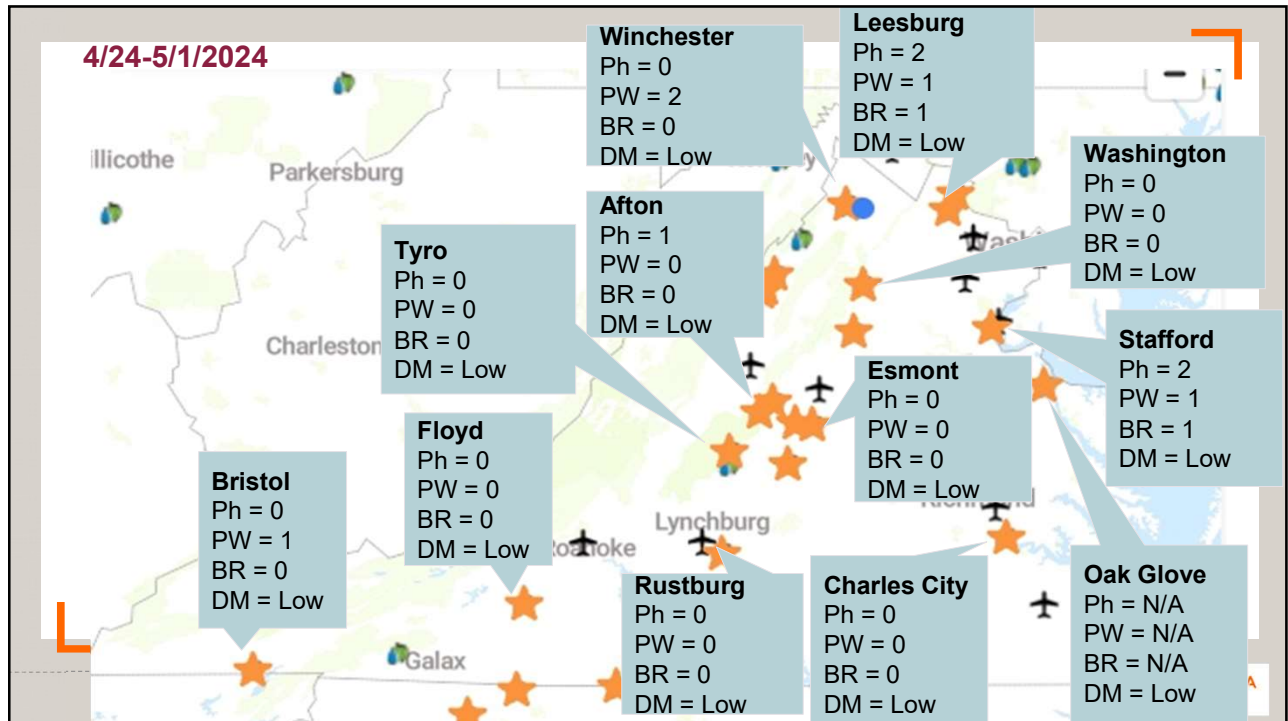
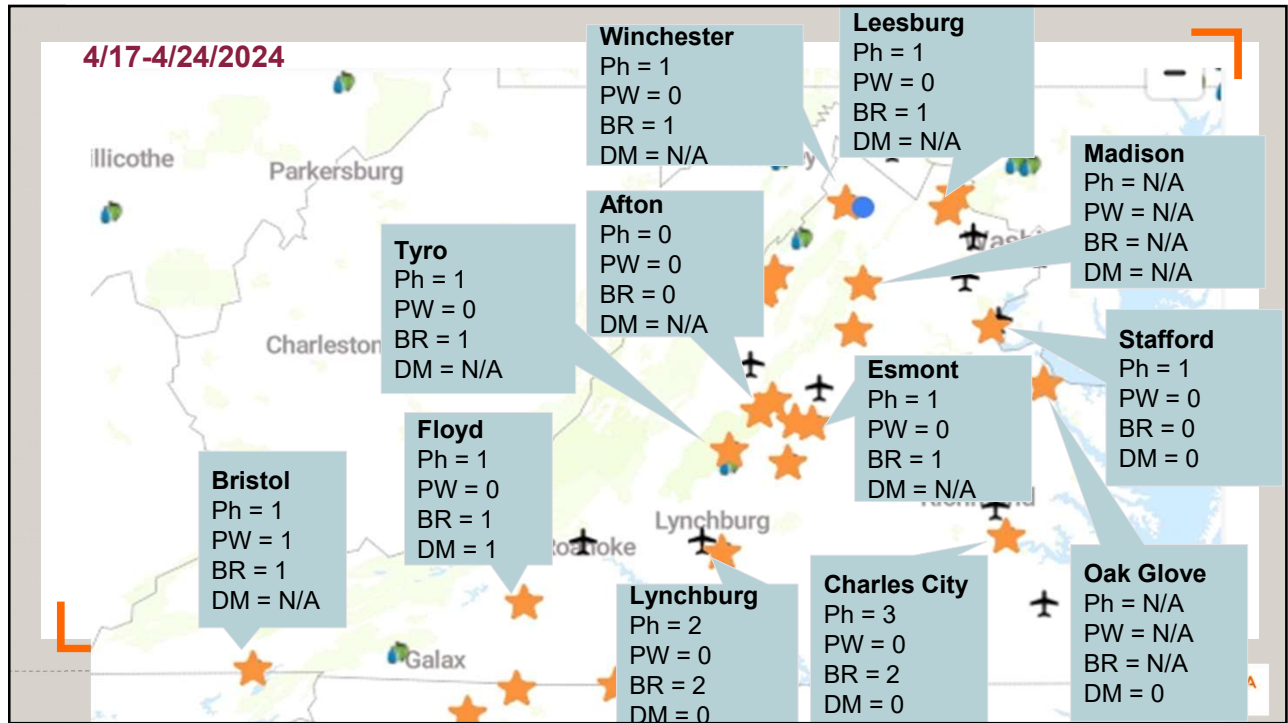


Pre-bloom and Bloom Time Disease Management Reminders

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







Powdery mildew



Powdery Mildew Management

- Canopy management for
 - Good air circulation
 - Good light penetration
- Timing for chemical management is pre-bloom to harvest
 - However, the risk of infection is low when the temperature hits 90F or higher, so, if you keep the vines clean until mid-July or so, you may not need to worry about powdery mildew.
- Young berries infected by the powdery mildew pathogen tend to crack open later, thus, early season PM management will be important for Botrytis, sour rot, and fruit fly management too!!



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:** Qol (group 11) or Topsin-M most likely not going to be help

Powdery Mildew "after outbreak" fungicide options

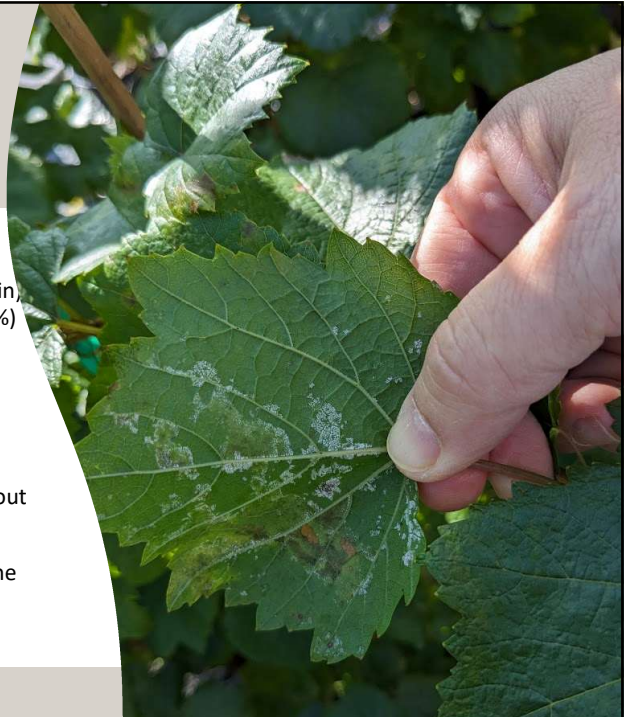
- Stylet Oil (Group M) [early season, some varieties may show phytotoxicity when applied on premature fruits]
 - Efficacy = Good
 - **DO NOT mix oil with sulfur or captan!!!**
 - **Cannot spray within two weeks of each other**
 - You may be able to spray a certain oil product then sulfur after one week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

Downy Mildew



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



Downy Mildew

Timing: all season

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

- **Preventative fungicide application**
 - **Good:** Mancozeb, ziram (Group 3, Dithane, Penncozeb, Gavel, etc.), Ranman (Group 21), 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., Aboud, Pristine, etc.)



Downy Mildew

Timing: all season

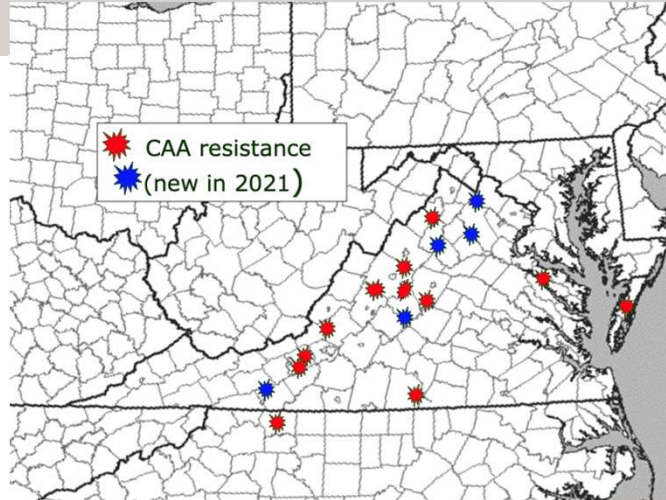
Clusters are susceptible from bloom to 4-6 wks after bloom

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



Group 40 (Revus, Forum, and part of Zampro)

- Dr Anton Baudoin's lab at VA Tech has been tracking resistance isolate against dimethomorph (the a.i of Revus), and results are not promising...
- If you suspect that Revus is not working for you, it is probably better not purchase in the future.
- If you have some, my recommendation is to use it early in the season as **protectant** and **mix** with captan, mancozeb, or copper.




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Black Rot

- It is a fungal disease caused by *Guignardia bidweillii*.
- The fungus tends to be active in relatively higher temperature ranges, and it takes about 7-8 hours to complete infection = good air circulation helps!!
- It can infect leaves and berries, berry infection can cause serious damage






Black rot management

- Canopy Management
 - It takes at least seven hours for the pathogen to cause disease.
- At bloom to ~ six weeks after bloom is the critical period
 - Berries become resistant after that.
- Mancozeb plus DMI, SDHI, or even QoI

Black rot

Timing: pre-bloom to 4-6 wks after bloom
Clusters are susceptible from bloom to 4-5 wks after bloom

- Preventative fungicide options
 - **Good:** Mancozeb, SDHI (Pristine, Luna Experience, Aprovia, Kenja, Miravis Prime, etc. Group 7)
 - **Good, but...:** Sterol-inhibitors (Rally, Mettle, Rhyme, Luna Experience, Top Guard EQ, etc., **Group 3**), Strobilurins (QoI, Pristine, Abound, Flint, Intuity, Group 11):
There may be resistance issue with group 3 fungicides...
 - **Poor or not working:** Captan and copper



Black rot kick-back fungicide options

- Myclobutanil (Rally) is known to have a good kick-back activity against black rot fungus. It has an efficacy up to 6 days after infection.
- Azoxystrobin (Abound) does have some curative activity against black rot fungus; however, the efficacy is not as good as that of myclobutanil.
- **Note: Rally is group 3 and Abound is group 11...**

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



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

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.



Ripe rot management



Timing: flowers, veraison, and late season



OK materials: mancozeb, captan, Switch, Iprodione (Rovral), Aprovia, Howler?



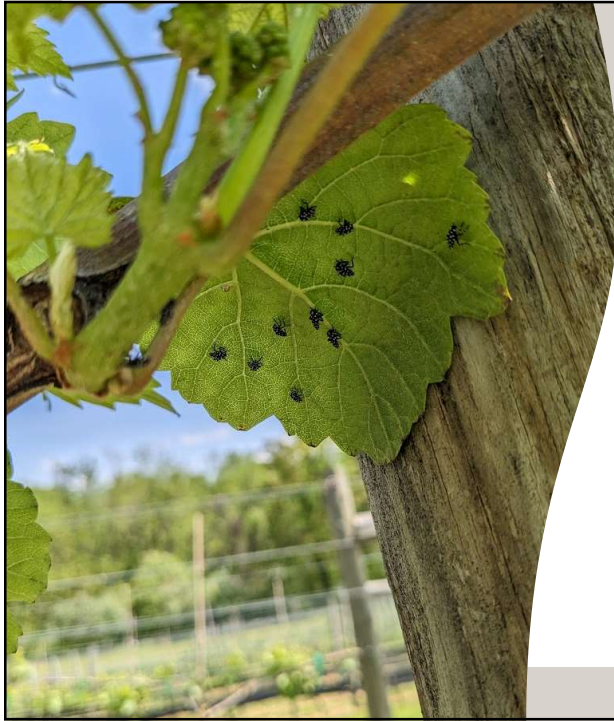
Mix two of them and keep eyes on the PHI!



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





SLF management

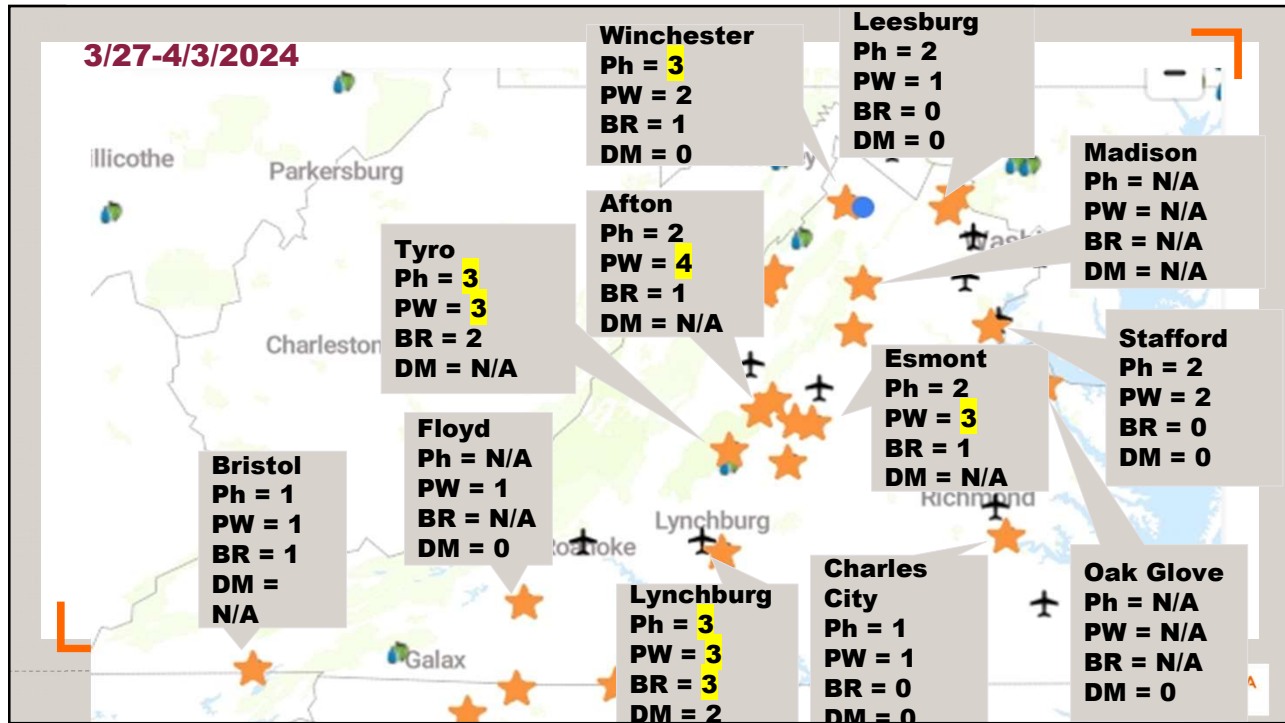
- Do not panic! We have a list of effective materials.
- For vineyards, wait until they move into leaves and shoots (~ mid-May in our areas).
- One spray should be good for the rest of the season until they migrate into vineyards from the outside.
- You can select materials to hit more than one species.
 - E.g., May spray to deal with mealybugs and SLF





Grapevine leafroll disease

- Caused by several species of grapevine leafroll-associated viruses.
- Vecteded by mealybugs and scale insects.
- Timing: early spring (2-3 weeks after bud break) and bloom






Pierce's Disease

A Broad-headed sharpshooter.
bugguide.net

- Vector Management is the key
- Soil application of Admire Pro (or similar) or Scorpion (or similar)
- Timing... mid-May?, then ~ 30-day after the first application
- Foliar application does not work as well as the soil application.





Crown gall

- Become obvious in May-June
- You may see red-color leaves

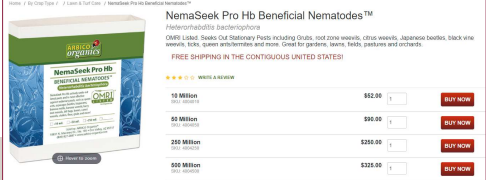


Grapevine yellows

Most noticeable symptom is abortion of flowers


Grape root borer




- Pheromone-based mating disruption (Isomate GRB)
- Pheromone bucket traps
- Nematodes (two species of *Heterorhabditis bacteriophora*)
- Lorsban (only for this year)




NemaSeek Pro Hb Beneficial Nematodes™
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OMG! Label: Breaks Out Stationary Pests including Grubs, root zone weevils, citrus weevils, Japanese beetles, black vine weevils, ticks, saproxyphagous and more. Great for grapes, trees, fields, pastures and orchards.
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Grape root borer




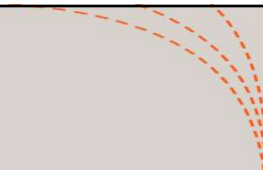


Grape Berry Moth

- It becomes more prevalent after bloom (2nd and 3rd generation, ~800 and 1,600 growing degree days after wild grape bloom).
- Webbing on young clusters is a good cue for an insecticide application.

Webbing and damaged flower parts in blooming grape. Photo by





▪ **Any questions?**