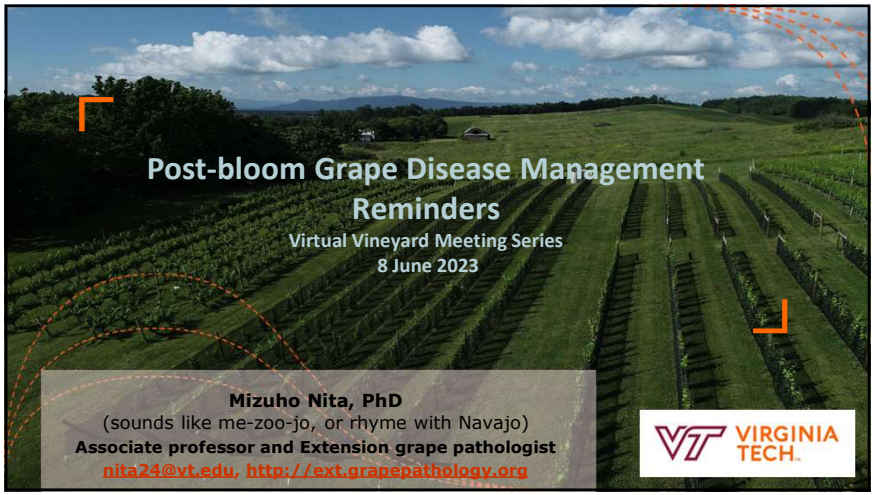

VCE Virtual Viticulture Meeting Series
8 June 2023
Viticulture Updates (Tremain Hatch)
Pathology Updates (Mizuho Nita)
Please type in questions to the chat box.
VIRGINIA TECH


Post-bloom Grape Disease Management Reminders
Virtual Vineyard Meeting Series
8 June 2023
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(sounds like me-zoo-jo, or rhyme with Navajo)
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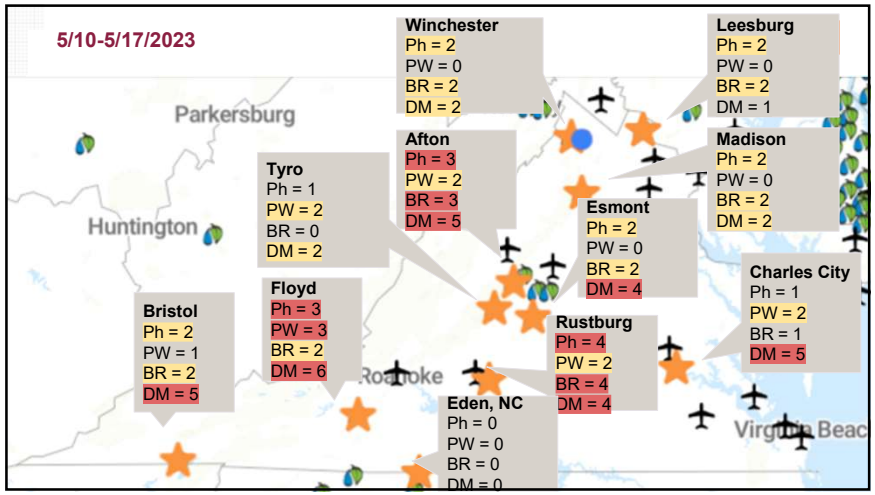
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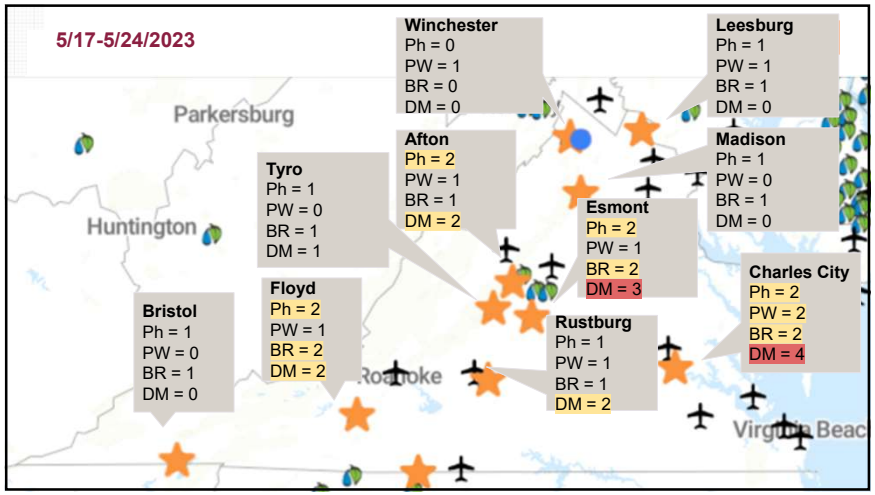
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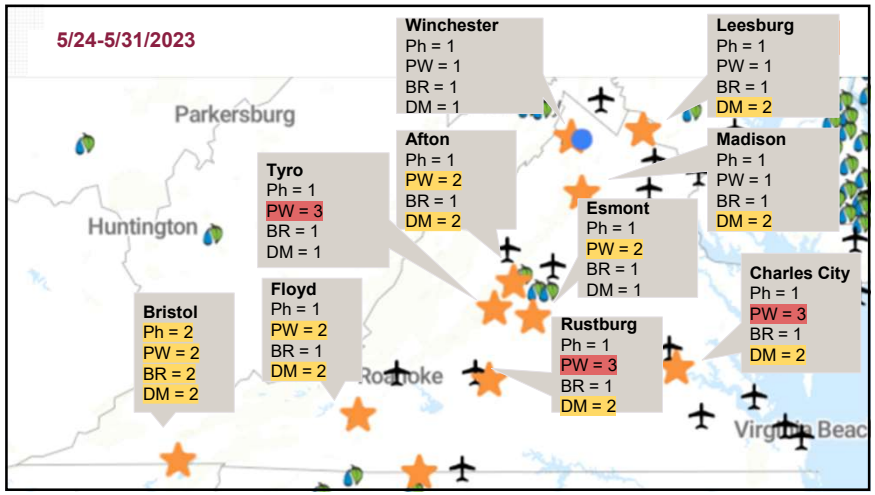

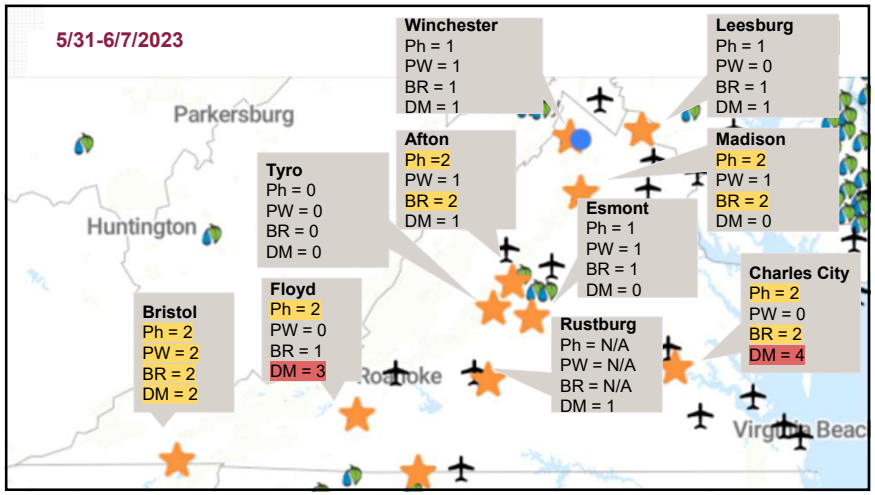

Updates from the Sentinel Vineyard Core Group (We focus on Chardonnay and Cab Franc)

- Majority of areas passed bloom, many are in fruit-set to BB-size (1 to 2 weeks ahead of "typical" year)
- Some reported a lots of caps remained on the flowers
  - More on that later
- A slight concern on drought condition
- No pest or disease issues reported

Other

- Some reported a bit longer bloom duration
  - The lack of colder winter?
- When we examined leaves under microscope, we noticed early development of powdery mildew on younger leaves.

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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

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 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), captan (M4) or a fixed copper (M1) with
  - a QoI (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 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

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

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)], 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.

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

- **Good:** Sulfur (Group M2), Vivando (50 (used to be U8)), SDHI (Pristine, Endura, Luna Experience, Kenja, Aprovia, Miravis Prime, etc. Group 7),
- **Good, but…:** DMI (Sterol-inhibitor, Rally, Mettle, Rhyme, Top Guard EQ (3+11), etc., Group 3), 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

Downy Mildew

- It can infect leaves and berries, berry infection can cause serious damage
- Heavy leaf infection can cause defoliation

Oily spot appearance on the upper surface

Picture on the center: Organic grape production guide: OSU, Ellis and Nita 2004

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), captan (Group M4), copper (Group M1)
  - **Good, but…: Revus/Forum (Group 40 – resistance spreading quickly)**, Zampro (Group 40 + 45),
  - **Don't know:** Lifeguard and Zonix (defense activators) - inconsistent reports, 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 (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

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Tank-mix to reduce fungicide resistance development risk

Mix one of them with other material with "number-only" FRAC group (e.g., 3, 7, etc.)

- Black rot: mancozeb (M3), ziram (M3)
- Downy mildew: mancozeb (M3), copper (M1), captan (M4), ziram (M3), phosphite (P07 - please do not overuse!)
- Powdery mildew: sulfur (M2) [some growers use stylet oil, but the oil cannot be used with sulfur or captan - make sure to have at least two weeks in between sprays!]

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Tank-mix to reduce fungicide resistance development risk

- Botrytis: captan (M2) or copper (M1) (both are poor-to-fair materials for Botrytis, but I think they are good mixing partners)
- Ripe rot and bitter rot: mancozeb (M3), captan (M4), or copper (M1) (copper products do not list ripe rot as a target, but provided moderate reduction in some of our trials)

Limit the use of "number-only" FRAC group to twice a season

Fungicide resistance? Send samples to Anton!

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