Muscadine Disease Update
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Pathogens spread by microscopic propagules (spores, bacteria, virus particles) that are too small to see

Image below: Hundreds of bitter rot spores compared in size with a single human hair

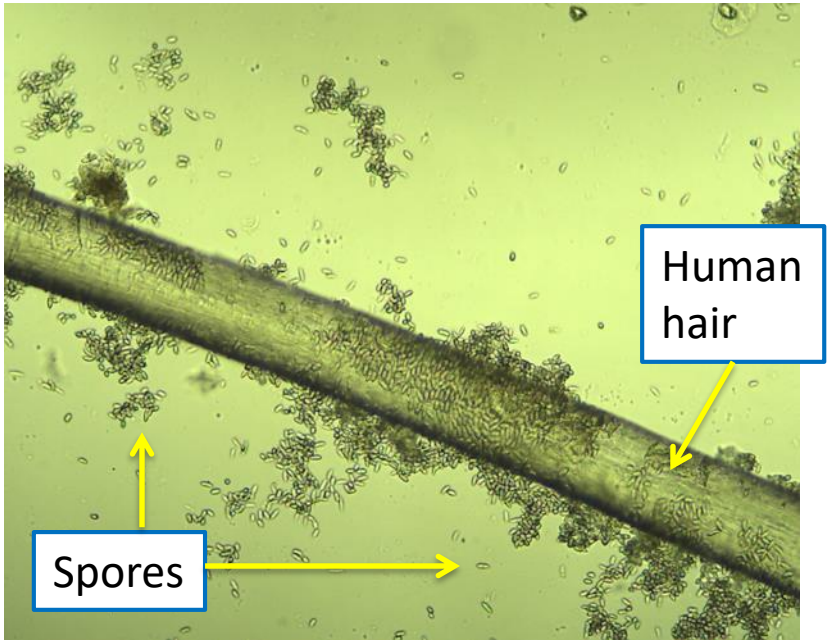
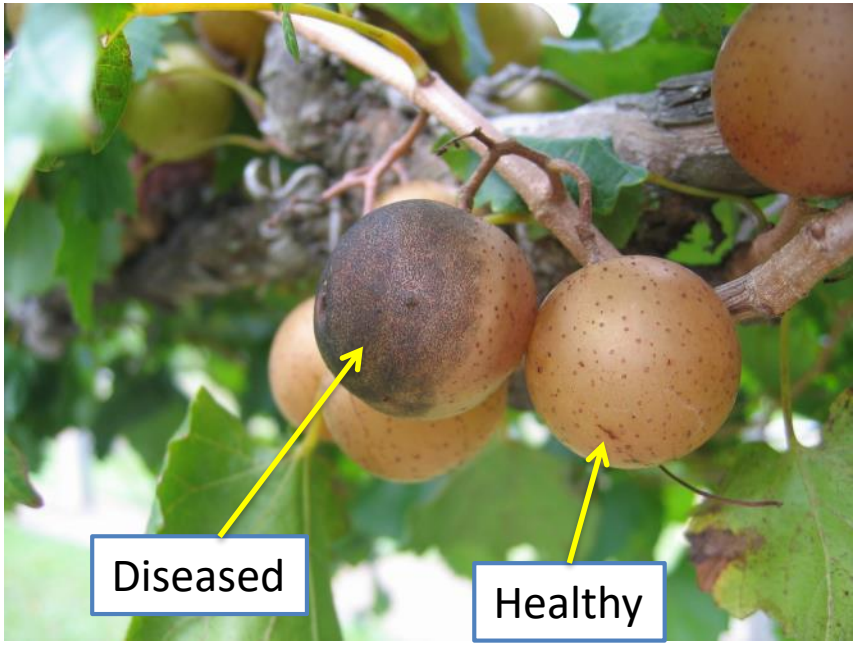


Image below: Masses of black spores produced on the surface of an infected grape



Bitter rot caused by the fungus *Greeneria uvicola*

Biotic or Abiotic?

Using Signs and Symptoms as a Guide

What to look for at this time of year

(late August, early September, beginning harvest, fungicide sprays mostly finished for the year)

SIGNS are the visible parts of the pathogenic organism – in this example, the pathogen is a fungus producing signs (mold and spores) on a stored orange

SYMPTOM -- Spray burn -- front vs back of the same cluster of blueberries

SYMPTOM – abiotic injury -- hail damage on strawberry and blueberry

Hail damage to green fruit


2,4-D herbicide injury

2,4-D on blueberry (and nearby oak)

Ripe Rot

- Fungus (*Colletotrichum* sp.)
- Spreads by splashing rain, insects
- Clustered in “hot spots” along the cordon
- Brown-colored rot with pink to orange spore masses

Powdery Mildew

- Fungus (*Uncinula necator*)
- Appears as faint white “powder” on young fruit
- Causes brown russeting on surface
- Affected fruit cannot ripen normally; may crack

Spray Timing – much simpler for muscadine (compared to Vinifera)

- Mid-May (Before disease is visible)
- Shoots 6-10 inches in length
- Flowers not yet open
- Continue every 2 wk until early August
- Early summer sprays provide more disease control than later sprays, because fungicides are mainly protectants
- Write it down

Fungicides

- Mancozeb early (66 d PHI)
- Alternate or tank mix myclobutanil (Nova, Rally) with Captan, apply every 2 wks from Mid-May through August
- Where ripe rot is a problem (shown), replace or supplement Captan with a strobilurin fungicide (such as Abound, Pristine or Flint)
- ALWAYS READ AND FOLLOW THE LABEL

Ripe rot

Nita, January 2016

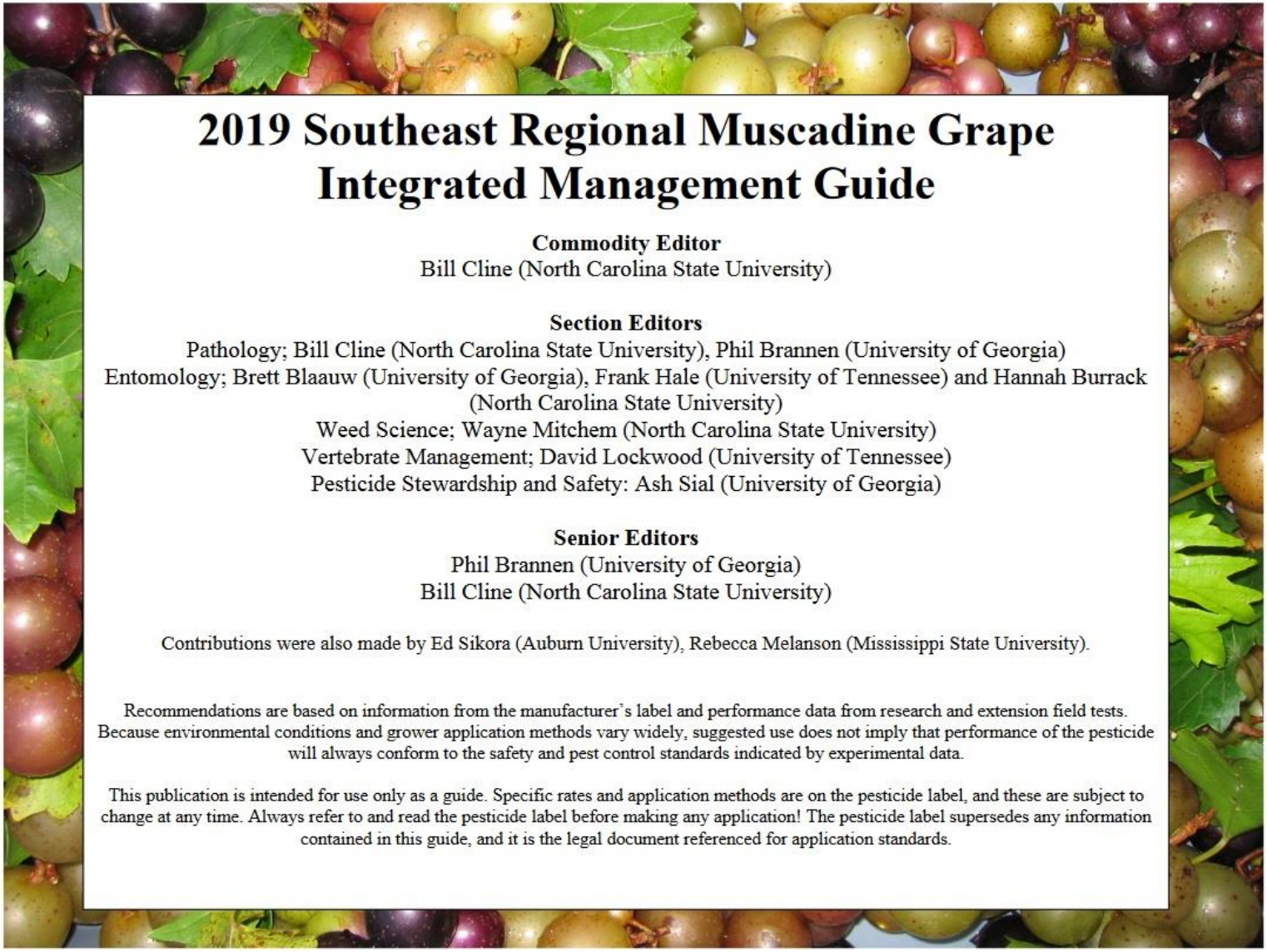
Summary cont.

Vinifera

- Modes of action used
  - M1 (copper) x 2 times
  - M2 (sulfur) x 11 times
  - M3 (mancozeb) x 7 times
  - M4 (captan) x 4 times
  - 2 (Rovral) x 2 time
  - 3 (Rally) x 2 times
  - 9 (Scala) x 1 times
  - 13 (Quintec) x 1 time (+1)
  - 33 (Phosphite, Phostrol) x 2 times (+ 2-3 times)

Muscadine

Mancozeb 1-2X
Captan 3-6X
Rally 3-6X



2019 Southeast Regional Muscadine Grape Integrated Management Guide

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Contributions were also made by Ed Sikora (Auburn University), Rebecca Melanson (Mississippi State University).

Pierce's Disease (PD) Caused by a plant pathogenic bacterium, *Xylella fastidiosa*

- Xylem vessels are clogged, resulting in drought-like symptoms
- Muscadines resistant, do not remove vines
- Bunch grape – remove symptomatic vines

Marginal leaf burn on 'Carlos'

"Orange Slime" on muscadine grapes occurs when bacteria and yeasts colonize leaking sap.

Common on pruning wounds

Shown here, a cold-damaged trunk with sap leaking from the injury.

2018 Nematode Survey (SRSFC Grant)

Occurrence and Distribution of Plant-parasitic Nematodes on Muscadine Grapes in Georgia and North Carolina

NCSU – Bill Cline, Benny Bloodworth
UGA – Ganpati Jagdale, Paul Severns, Phil Brannen

- **Are nematodes present in muscadines?**
- **What species?**
- **How do populations compare NC vs GA?**

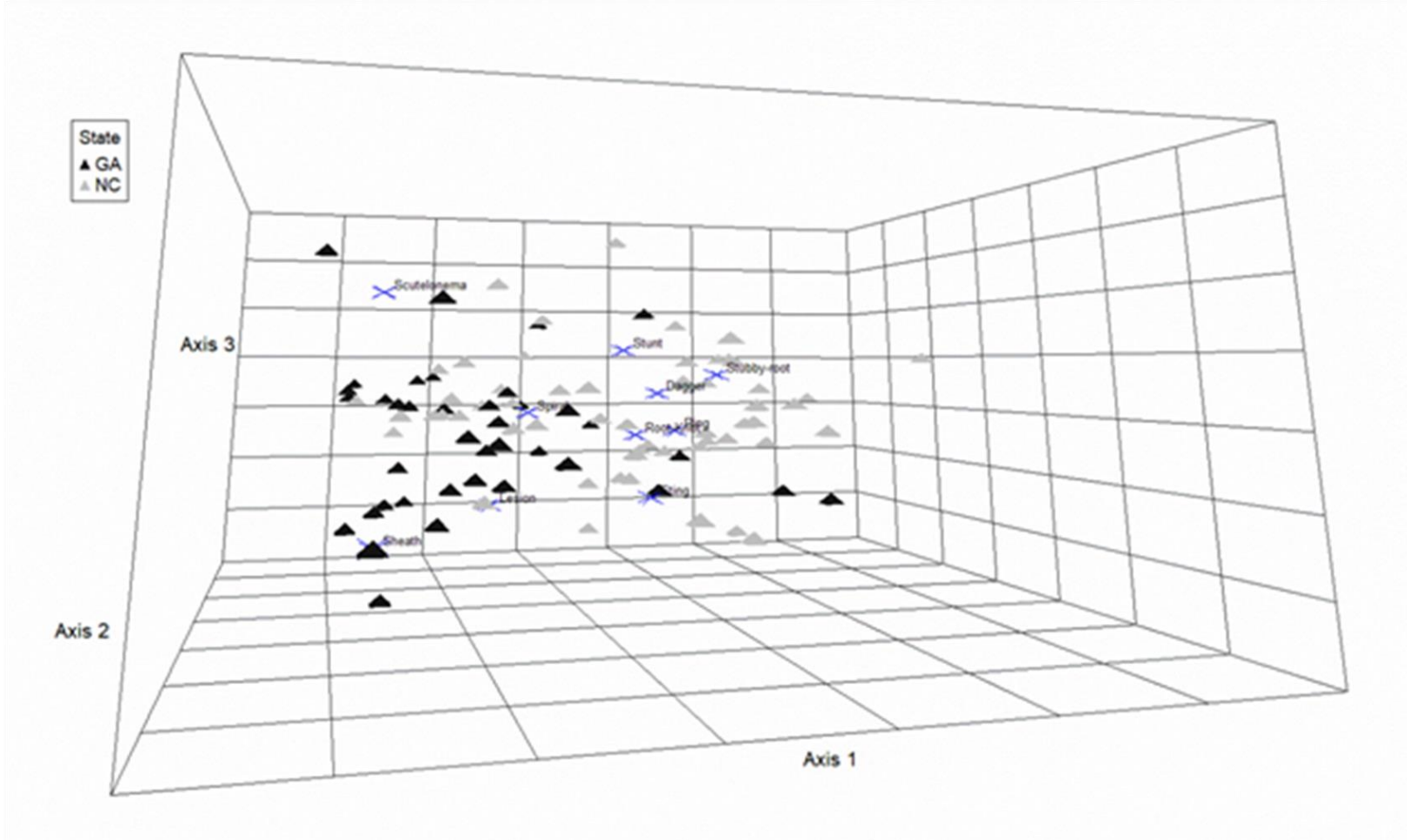
Photographs by Ganpat Jagdale

Survey of plant-parasitic nematodes in commercial vineyards in North Carolina, October 2018

Common name and species	Percent frequency[a]	Abundance[b]	Standard Deviation	Maximum density/ 100 cm^3 soil[c]
Dagger, *Xiphenema*	80	4	4	17
Lesion, *Pratylenchus*	13	2	1	4
Ring, *Mesocriconema*	76	93	139	844
Root-knot, *Meloidogyne*	13	2	1	5
Spiral, *Helichotylenchus*	89	22	32	190
Sting, *Belonolaimus*	9	1	1	1
Stubby-root, *Paratrichodorus*	18	2	2	10
Stunt, *Tylenchorhynchus*	40	9	11	66

Jagdale, et al. 2019. Occurrence and Distribution of Plant-parasitic Nematodes on Muscadine Grapes in Georgia and North Carolina (in press).

Multivariate analysis, GA vs NC



Jagdale, et al. 2019. Occurrence and Distribution of Plant-parasitic Nematodes on Muscadine Grapes in Georgia and North Carolina (in press).

Fungicide Testing is Needed on Muscadines – Many "grape" labeled products have not been evaluated in the field

- Efficacy
- Phytotoxicity
- Price
- Mode of Action
- Formulation
- Pre-harvest interval
- Re-entry interval
- Resistance management

- Aprovia
- Aprovia Top
- Miravis Prime
- Endura
- Switch
- Luna Experience
- Top Guard
- Kenja
- Tebuconazole
- Merivon
- Procure
- Inspire Super