

# Update on Muscadine Diseases, Insects and Weeds –

Bill Cline, 16Jun21

Entomology and Plant Pathology

North Carolina State University



# MUSCADINE DISEASES

# Muscadines are Tough!

- Resistant to Pierce's Disease (*Xylella fastidiosa*) that kills many bunch grape types
- Often not sprayed for disease control when grown for wine production
- Muscadines in backyard plantings are usually not sprayed
- Sour rot rarely seen
- Muscadines are resistant to many fungal pathogens:
  - No Downy Mildew, Bunch Grape Anthracnose or Botrytis gray mold
  - Resistant to Phomopsis
  - Physically tough, thick-skinned
  - Sulfur can be used to control Powdery Mildew

# Disease Concerns

- Mostly worried about FUNGAL PATHOGENS causing fruit rots, leaf spots, dead arm
- Bacteria -- Resistant to Pierce's disease, (and to Crown gall ?)
- Viruses, nematodes -- not a problem (?)
- Abiotic/Cultural – Poor site selection, wet soils, lack of adequate drainage




# Control Methods

- **Resistance** -- muscadines, especially dark cultivars, are good at fighting disease
- **Cultural/Sanitation** – canopy and vineyard floor management to improve air flow
- **Pruning** -- removes infected plant parts
- **Fungicides** – must use before disease appears in the field



# What is your fungicide spray strategy?

- Option #1 -- Do nothing – Sometimes this works!
- Option #2 -- Organic only – Sulfur or other organic products to minimize risk of a powdery mildew “wipe out”
- Option #3 -- Minimal fungicide use – Early-season sprays are the most effective
- Option #4 -- Full-season sprays – May be needed for maximum yields or for susceptible cultivars, ESPECIALLY fresh market



# Basic spray concepts for using fungicides in the vineyard

- Apply fungicides BEFORE disease is visible
- Treat repeatedly (every 10-14 days) to provide continuous coverage for emerging shoots and flowers/fruit
- Coverage is critical – use enough water per acre (varies with different sprayer types)

# Leaf and fruit diseases of muscadine grape

- Mostly caused by fungi
- Spores are microscopic
- Spread by wind, splashing rain, or insects
- Most spores require moisture to germinate and infect





A microscopic image showing a dense population of bitter rot spores. A human hair is visible, heavily coated with the spores. The spores are small, oval-shaped, and have a distinct outer layer. They are scattered throughout the field of view, with a high concentration on the hair. The background is a light, yellowish-green color.

**Bitter rot spores  
from muscadine  
grape**

Human  
hair

Spores

Fungal pathogens overwinter in old, infected plant parts, releasing spores that infect new emerging shoots in the spring





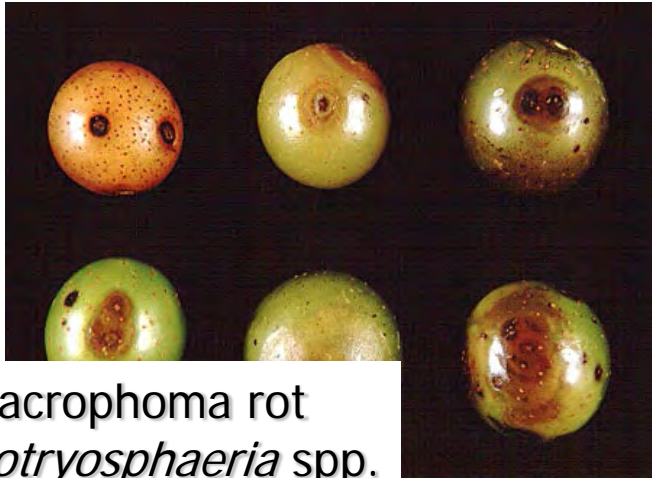




# **MUSCADINE FRUIT AND LEAF DISEASES**

## **SIGNS & SYMPTOMS**

# Fruit Rots



Macrophoma rot  
*Botryosphaeria* spp.



Ripe rot  
*Colletotrichum* spp.



Bitter Rot  
*Greeneria uvicola*



Sooty mold  
*Peltaster fructicola*



# Leaf Diseases



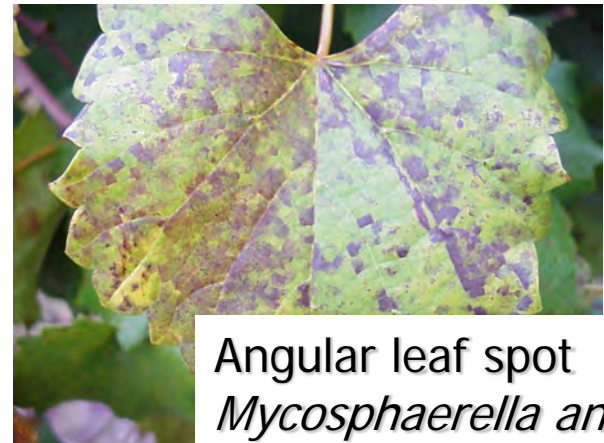
Bitter Rot  
*Greeneria uvicola*



Pierce's Disease  
*Xylella fastidiosa*



Black rot  
*Guignardia bidwellii*



Angular leaf spot  
*Mycosphaerella angulata*

# 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



# “Standard” Fungicide Recommendations for NC

- Mancozeb early (66 d PHI)
- Alternate or tank mix myclobutanil (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**





# MUSCADINE INSECTS



# Insect pests on muscadine

- Dr. Hannah Burrack is the entomology specialist covering muscadines at NCSU
- Although a number of insects feed on various parts of grape vines the grape root borer does the greatest long term damage
- Occasional leaf- and fruit-feeding insects are controlled on an as-needed basis

# Insect pests on muscadine (continued)

- Thrips generally do not require control, and if present in large numbers are usually transient on muscadines
- Fire ant control where needed can be accomplished with bait materials (Extinguish, Esteem)

# Adult Female Grape Root Borer







Aerial roots = stress indicator  
Possible GRB injury to roots



# Grape Root Borer Control Options

- Mounding – August 1 in NC, must remove mounds in Nov-Dec.
- Lorsban (chlorpyrifos) 4.5 pts/100 gal, apply 2 qts solution/vine, 35 day PHI
- Mating disruption – Isomate GRB – use 100 ties per acre (every other vine)



Japanese beetles cause obvious damage but vines survive and productivity is not usually diminished





Aphids (black) and predators (white), the waxy white insects are larvae of a lady beetle species





# **WEED CONTROL IN MUSCADINES**



# Weed Control (Example)

- On established vines, may need preemergence application in Spring. Can use flumioxazin (Chateau) 60 d PHI, or other preem. products
- Grow tubes protect 1-2 yr old vines
- Directed/shielded glufosinate (generic) 14 d PHI
- Mow aisles as needed
- Hand-removal of grapevine suckers
- Wayne Mitchem is our resource person for weed control questions

Gramoxone injury can occur on 2-yr-old trunks when multiple suckers are burned off



# Gramoxone injury on Noble <2 yrs old







# 2021 Southeast Regional Muscadine Grape Integrated Management Guide

## Commodity Editor

Bill Cline (North Carolina State University)

## Section Editors

Pathology: Bill Cline (North Carolina State University), Phil Brannen (University of Georgia), Rebecca Melanson (Mississippi State University) and Mary Helen Ferguson Louisiana State University  
Entomology: Brett Blauw (University of Georgia), Frank Hale (University of Tennessee), Hannah Burrack (North Carolina State University) and Aaron Cato (University of Arkansas)  
Weed Science: Wayne Mitchem (North Carolina State University)  
Vertebrate Management: David Lockwood (University of Tennessee) and Michael T. Mengak (University of Georgia)  
Pesticide Stewardship and Safety: Ash Sial (University of Georgia)

## Senior Editors

Phil Brannen (University of Georgia)  
Bill Cline (North Carolina State University)

Recommendations are based on information from the manufacturer's label and performance data from research and extension field tests. Because environmental conditions and grower application methods vary widely, suggested use does not imply that performance of the pesticide will always conform to the safety and pest control standards indicated by experimental data.

This publication is intended for use only as a guide. Specific rates and application methods are on the pesticide label, and these are subject to change at any time. Always refer to and read the pesticide label before making any application! The pesticide label supersedes any information contained in this guide, and it is the legal document referenced for application standards.