

## Spots, Rots and “Where did the grapes go?” – Identification and Control of Muscadine Diseases

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## Topics to be covered:

- How to identify fungal diseases on stems, leaves and fruit
- Other problems that can look like disease (but are not!)
- Disease resistance in muscadine
- Organic disease control
- Fungicides, sprayers and spray timing

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## What Causes Fruit to Rot?

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



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## Black Rot

- Fungus (*Guignardia bidwellii* f. *muscadinii*)
- Earliest leaf disease of the season
- Causes leaf spots and superficial scabs on fruit



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## Black Rot (Continued)

- Control with early-season fungicide sprays
- Monitor shoot growth and apply fungicides before disease appears



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## Powdery Mildew

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



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## Bitter rot

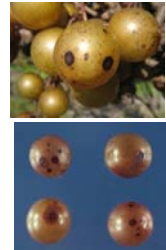
- Fungus (*Greeneria uvicola*)
- Common in 'Carlos' vineyards
- Infects fruit shortly after bloom
- green berries may drop off
- Causes speckling on leaves



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## Macrophoma rot

- Fungus (*Botryosphaeria dothidea*)
- Small sunken round spots
- May eventually rot entire berry
- Common on 'Carlos' and 'Triumph' in older vineyards



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## 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



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## Angular leaf spot

- Fungus (*Mycosphaerella angulata*)
- Light yellow spots in early season
- Becoming angular by late season
- Causes premature defoliation, affects yield and fruit quality



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Here are some problems that may look like fungal diseases but cannot be controlled with fungicides . . . .

- Insect injury (shown at right)
- Bacterial diseases (Pierce's Disease, Crown Gall, sour rot)
- Abiotic injury (hail, rain splitting, drowning)
- Chemical injury (herbicides, spray burn)



Leaf miner damage (insect)

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## Pierce's Disease (PD)

- Bacteria (*Xylella fastidiosa*)
- Muscadines are fairly resistant to PD
- Causes marginal leaf burn on 'Carlos'
- Over-fertilizing can also cause marginal leaf burn



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## Crown Gall

- Bacteria (*Agrobacterium tumefaciens*)
- Muscadines are commonly infected
- Fleshy, irregularly-shaped gall
- Associated with cold injury (note aerial roots above point of injury)



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## Japanese Beetle, June beetle

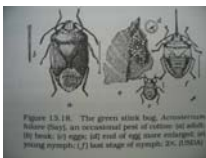
- Insects
- Leaves are “skeletonized”
- Also feeds on flower parts
- June beetles often feed on ripe fruit



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## Stink bugs

- Insect
- Egg masses on grape leaves
- Adults feed on many crops
- Punctures grapes and injures seeds, causing fruit drop



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Stink bug injury – feeding punctures seeds and causes fruit drop on ‘Carlos’ in mid-July



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## Spittlebug

- Insect
- Foamy, sticky masses on stems and leaf petioles
- Immature insects hide in foam



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Brevipalpid mite (flat mites) cause damage on ‘Carlos’; look for scars around the stem



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## Hail damage on stems, leaves and fruit



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## Gramoxone injury

- Herbicide (contact, non-selective)
- Drift from ground application
- Distorts young expanding leaves
- Yellow spots become tan to brown



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## Disease Resistance in Muscadines



Noble

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Cultivars vary greatly in susceptibility to rots. In general, the dark-fruited types are more resistant



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## Unsprayed 'Carlos' 'Doreen' and 'Summit' retain leaves fairly well



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At Castle Hayne, NC, unsprayed 'Granny Val' and 'Tara' may not retain enough leaves to ripen normally



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In general, dark grapes are more rot resistant than bronze ones



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## Organic Grapes in SE US?

- Most organic grapes come from arid production regions (west coast of US)
- Organic production of bunch-type grapes in the eastern US is very difficult (diseases, weeds)
- Muscadines are a good candidate for commercial organic production
- Muscadines in backyard plantings are usually not sprayed

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Muscadines are a good candidate for organic production --

- Immune to Downy Mildew
- Immune to Bunch Grape Anthracnose
- Resistant to Phomopsis
- Physically tough, thick-skinned
- Sulfur can be used to control the biggest disease threat, Powdery Mildew

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Fungicides, Sprayers and Spray Timing



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Spray Date #1. . . . .

- Mid-May (Before disease is visible!!)
- Shoots 6-10 inches in length
- Flowers not yet open
- Continue every 2 wk until early August



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Fungicides – the short version

- Alternate Nova with Captan, apply every 2 wks from Mid-May through August
- Where ripe rot is a problem, replace Captan with Abound, Pristine or Flint
- Use enough water for adequate coverage
- ALWAYS READ AND FOLLOW THE LABEL!!

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## Sprayers

- Airblast with 20-40 gallons per acre, OR
- High-pressure sprayer with 50-100 gallons per acre
- Sprayer must be designed to reach grapes underneath the canopy



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## Fan-assisted “airblast” sprayers



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## Web Sites

- Southern Region Small Fruit Consortium  
[www.smallfruits.org](http://www.smallfruits.org)
- Fruit Disease Information Notes  
<http://www.ces.ncsu.edu/depts/pp/notes/Fruit/fdin012/fdin012.htm>
- Organic Grape Production  
<http://attra.ncat.org/attra-pub/PDF/grape.pdf>

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