Identification of diseases of blackberry in Florida

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Starting with diseases our group have already confirmed in FL…

Orange Felt or Orange Blotch

Orange Felt or Orange Blotch

- Caused by the parasitic algae species *Cephaleuros virescens*
- Algae sporangiophores form an orange-felt like material on stems; release zoospores under wet conditions
- Blotches first appear on primocanes in the late summer/fall
- Blotches crack canes and may provide entry for other pathogens
- Symptoms on canes can be mistaken for rust

Blotches on canes

Cracking blotches

Sporangiophores within blotch

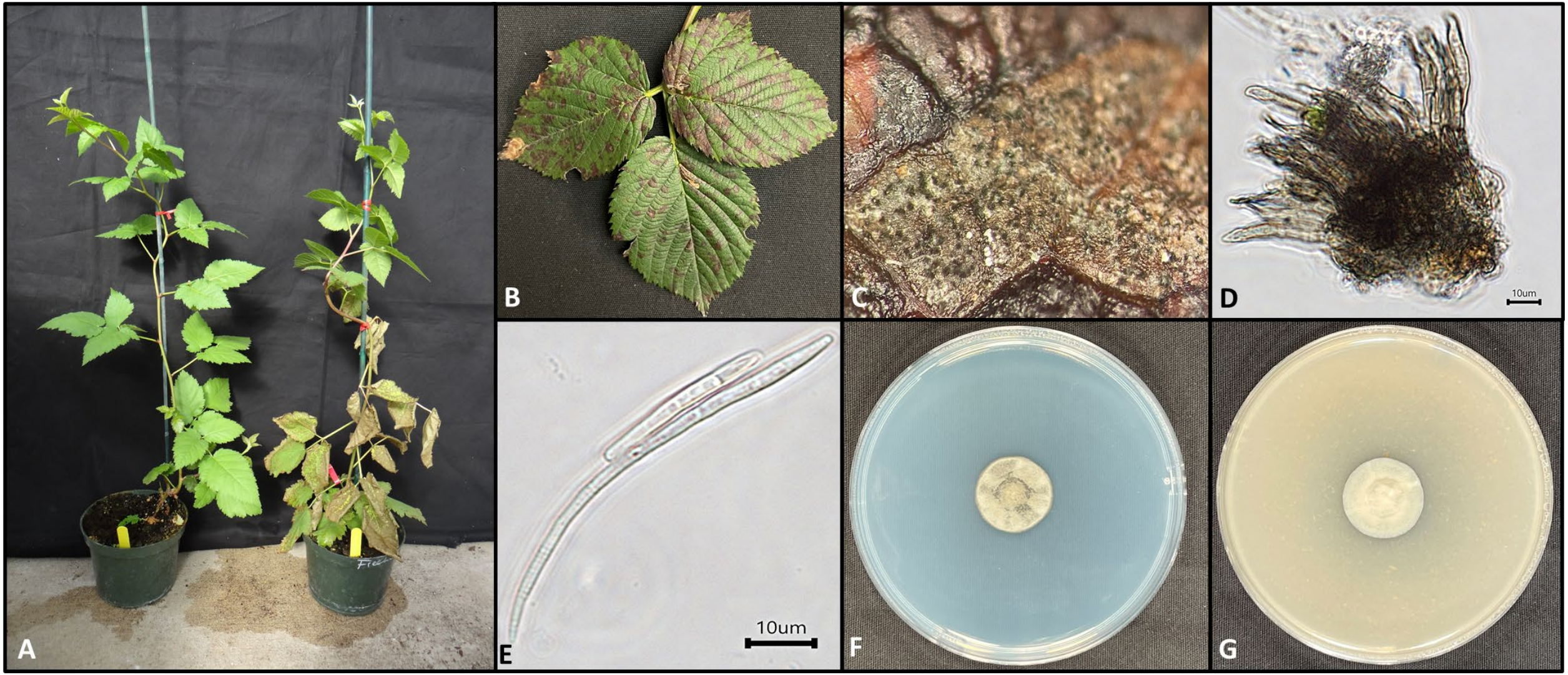
Source: Jonathan Oliver, Univ Georgia

Management of Orange Felt

- **Cultural practices:**
  - Removal of floricanes after harvest
  - Strategies that promote quicker drying of plants such as drip irrigation, black plastic, weed removal, etc.
  - Avoid planting in poorly drained fields

- **Chemical control:**
  - Phosphonate fungicides (ProPhyt, K-Phite, etc…)

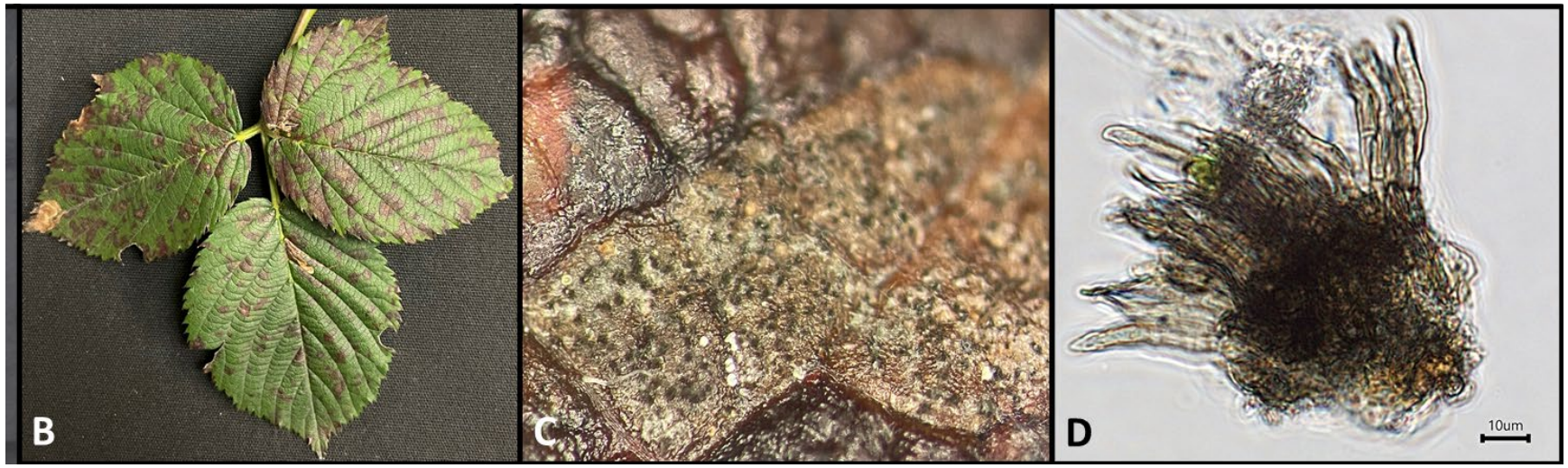
Leaf spots caused by *Pseudocercospora* sp.



First report of the disease in Florida accepted for publication in Plant Disease

Leaf spots caused by *Pseudocercospora* sp.

- Similar leaf spot symptoms followed by defoliation have been reported in other areas to be caused by *Cercospora* and *Septoria*
- Disease favored by warm and humid conditions
- Severe infestation and defoliation may affect yield

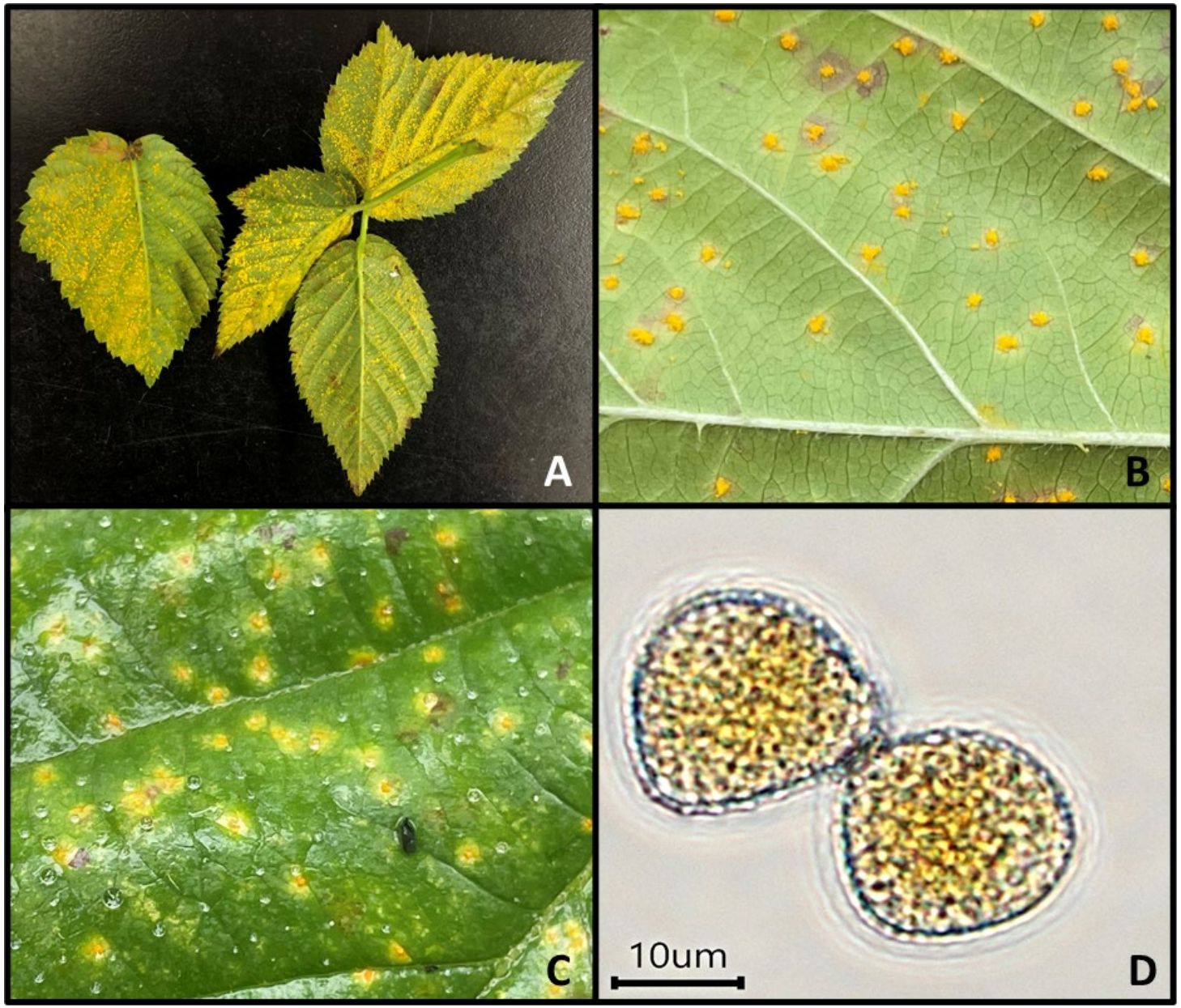


Management of *Pseudocercospora* leaf spot

- **Cultural practices:**
  - Increase air circulation to promote faster drying of the leaves
  - Removal of dead or damaged canes as soon as possible after harvest

- **Chemical control:**
  - Tilt (propiconazole) (FRAC 3)
  - Quilt Xcel (FRAC 3+11)
  - Pristine (FRAC 7+11)
  - Abound, Cabrio (FRAC 11)

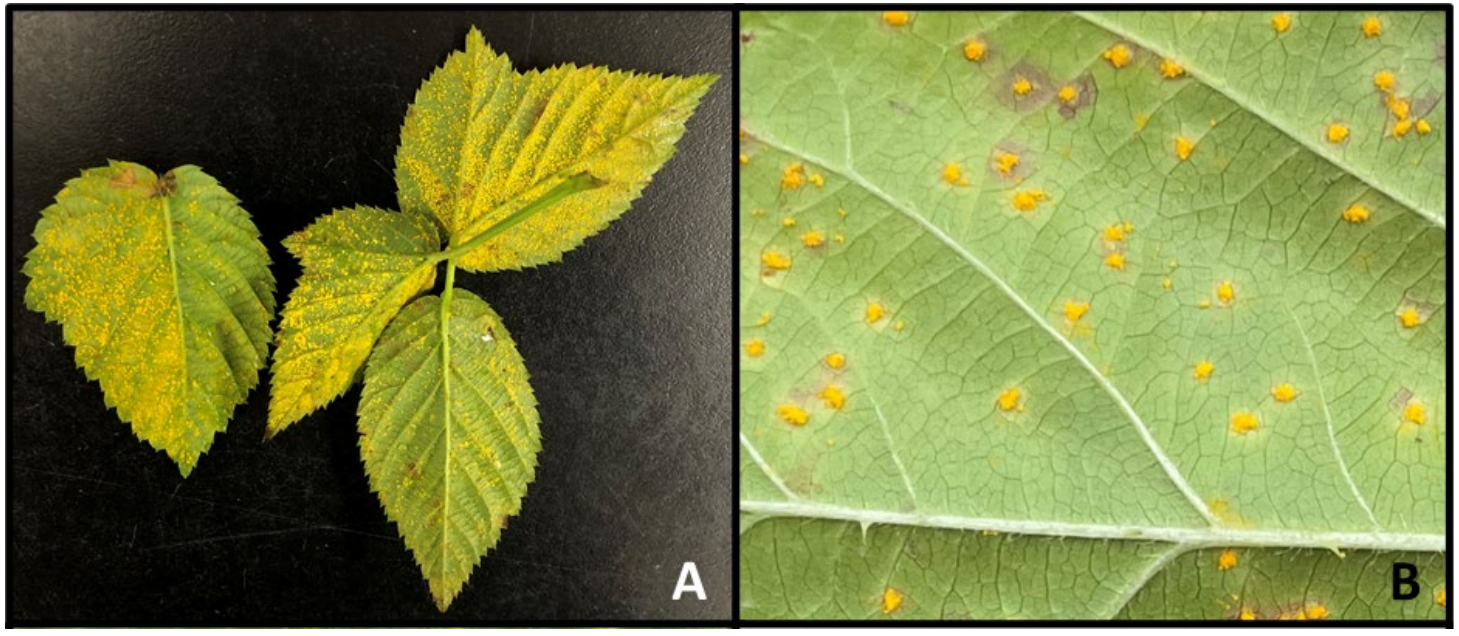
Leaf rust caused by *Kuehneola uredinis*



First report accepted for publication in Plant Disease

Leaf rust caused by *Kuehneola uredinis*

- Affects and causes pustules on leaves and canes
- Severe infestation causes premature defoliation and yield losses
- This is NOT systemic like Orange rust



Management of leaf and cane rust

- **Cultural practices:**
  - Removal of floricanes after harvest to limit infection of primocane

- **Chemical control*:**
  - Tilt (FRAC 3)
  - Quilt Xcel (FRAC 3+11)
  - Pristine (FRAC 7+11)
  - Abound, Cabrio (FRAC 11)

* Same chemicals as leaf spots - Fungicide resistance management important!!

Other diseases to watch for…

Orange rust

- Different than Leaf and Cane Rust
- Caused by *Arthuriomyces peckianus* and *Gymnoconia nitens*
- These fungi infect systemically and cause severe reductions in vegetative growth and fruit production
- Infected floricanes do not bloom

Distorted leaf margins

Bright orange blisterlike aecia


Spindly shoots

Source: Jonathan Oliver, Univ Georgia

Management of orange rust

- **Cultural practices:**

  At initial establishment:

  - Ensure plants are disease-free

  At established plantings:

  - Through inspection of plants
  - Promptly removal and destruction of infected plants

- **Chemical control:**
  - Not effective once plants are systemically infected

UNIVERSITY OF GEORGIA
College of Agricultural & Environmental Sciences
Department of Plant Pathology

Rust Diseases Side-By-Side

Cane and Leaf Rust	Orange Rust
Significant blackberry disease	**Significant blackberry disease**
Nonsystemic fungal disease	**Systemic** fungal disease
Lemon yellow pustules on **both** canes and leaves	**Bright orange** pustules on leaves **only**
Leaf pustules **don't distort** leaf margins	Leaf pustules **distort** leaf margins
Floricane removal after harvest is recommended	**Complete destruction** of infected plant is necessary
Sanitation and fungicide sprays can **provide satisfactory control**	Fungicides will **reduce new infections**, but infected plants must be destroyed

Source: Jonathan Oliver, Univ Georgia

Other diseases to watch for…

- **Viruses**
  - Reduce vigor, yield, fruit quality… can cause plant death
  - *Starting with clean plant stock highly recommended*

Many viral diseases affect caneberries including Blackberry Yellow Vein Disease (above)

Other diseases to watch for…

- **Phytophthora root rot**
  - Produce zoospores and spread via water
  - Often problematic in poorly drained areas
  - Damage to roots leads to primocane collapse

Reddish brown root discoloration

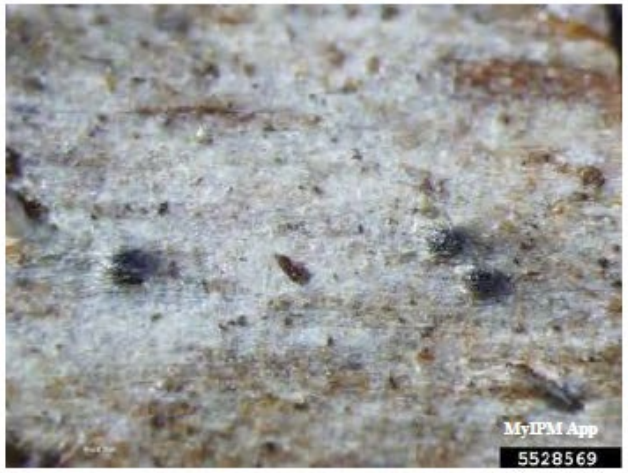
Cane collapse due to root rot

Root rot affected plant (left)

Other diseases to watch for…

- **Cane blight**
  - Caused by the fungus *Leptosphaeria coniothyrium*
  - Fungal spores (conidia) are rain splash and infect canes through wounds
  - Cane death occurs when lesions girdle the vascular tissue

Blighted canes often appear to be grey/silver



Fungal pycnidia on cane surface

Other diseases to watch for…

- **Botrytis fruit rot and blossom blight**
  - Caused by the fungus *Botrytis cinerea*
  - Conidia spread by wind and rain splash; prolonged wetness periods during bloom result in significant disease
  - Can cause preharvest as well as postharvest fruit rot

Postharvest fruit rot

Botrytis on ripening fruit

Conidiophore and conidia

Other diseases to watch for…

- **Anthracnose**
  - Caused by the fungus *Elsinoe necator*
  - Reddish-purple spots on primocanes
  - Spots develop into sunken lesions as the disease progresses

Early spots symptoms on primocanes

Sunken lesions

Other diseases to watch for…

- **Rosette (Double Blossom)**
  - Caused by the fungus *Cercosporella rubi*
  - More colorful, distorted petals (double blossom)
  - Infected flowers on floricanes produce conidia which can infect primocanes later
  - Primocanes don't show symptoms until following year

Distorted petals (Double blossoms)

Leafy shoots (witches'-broom)

Fungal spores (conidia)

Importance of disease diagnosis

- Management recommendations rely on proper identification of pathogen
- Proper identification rely on a good sample…

gcrec.ifas.ufl.edu/plant-clinic/

GULF COAST RESEARCH AND EDUCATION CENTER

PLANT CLINIC

There is a **$40 charge** per diagnostic sample. A check payable to University of Florida should be included at sample submission.

SAMPLE SUBMISSION

Samples should be accompanied by a complete data form, which is available at our center or can be found here:

Submission Instructions 2020

Form for Other Crops (not strawberry) 2020

MyIPM App

- Developed by researchers at Clemson University and University of Georgia; information updated by many University professors in the Southeast
- Available for free download
- Basic disease and management information for blackberry, blueberry, grape and strawberry

Fungicide resistance management

- Rely as much as possible on *multi-site fungicides* which are less prone to develop resistance (i.e. copper, chlorotalonil, captan, sulfur)
- Alternate fungicides from different classes (different modes of action)
- Tank-mixing fungicides is also recommended (in particular with multi-site fungicides)
- Follow label recommendations and do not apply more than the number of times recommended per season

Thank you!!

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