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Southern Highbush Blueberry Disease Update for Florida

2020 UF Virtual Grower Update

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IFAS Extension

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Overview

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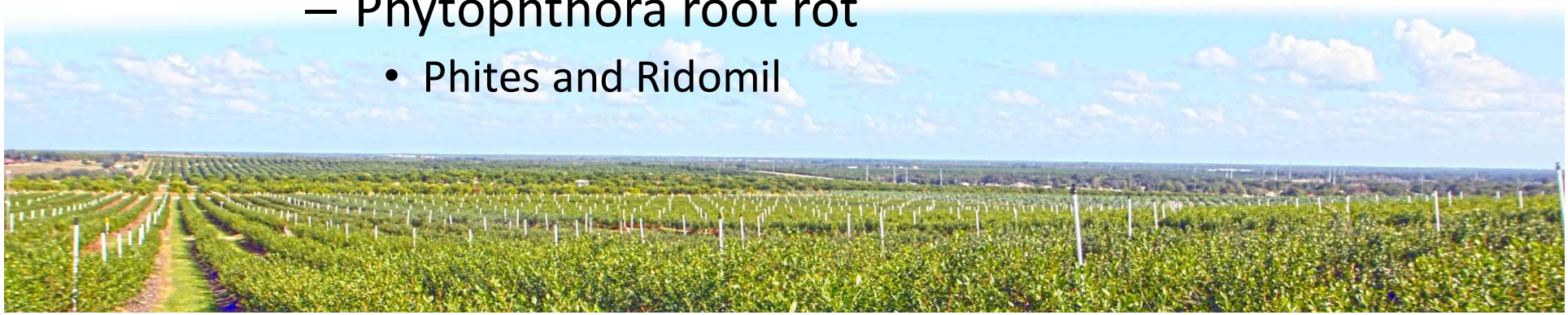
Disease challenges to review

- Foliar fungal diseases of summer
  - Target spot
  - Leaf rust
  - Anthracnose
- Bacterial wilt
  - Ongoing research
- Algal stem blotch
  - Copper on schedule
- Phytophthora root rot
  - Phites and Ridomil



Disease Happenings 2019-20

Small Fruit		
Southern highbush blueberry		
23	No Pathogen Found	
23	Anthracnose	*Colletotrichum gloeosporioides*
14	Stem Blight	*Botryosphaeria sp./spp.*
10	Bacterial Wilt	*Ralstonia solanacearum*
9	Phytophthora Root Rot	*Phytophthora sp.*
7	Leaf Rust	*Pucciniastrum vaccinii*
6	Pythium root rot	*Pythium sp./spp.*
5	Phomopsis twig blight	*Diaporthe vaccinii*
5	Phyllosticta leaf spot	*Phyllosticta sp./spp.*
4	Target Spot	*Corynespora cassiicola*
4	Algal stem blotch	*Cephaleuros virescens*
3	Bacterial Leaf Scorch	*Xylella fastidiosa*
3	Abiotic Edema	*Oedema; Edema*
1	Botrytis Fruit Rot	*Botrytis sp./spp.*
1	Armillaria root rot	*Armillaria sp.*
1	Girdling Roots	*Abiotic disorder*
1	Stem Borer	*Insect*
120	**Total for Southern highbush blueberry**	

IPM Guide

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- Seasonal guide
- Integrated options
- Based on the SE guide

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HS1156

2017 Florida Blueberry Integrated Pest Management Guide[1]

Jeffrey G. Williamson, Philip F. Harmon, Oscar E. Liburd, and Peter Dittmar[2]

This publication was adapted for Florida from the *Southeast Regional Blueberry Integrated Management Guide*, available at http://www.smallfruits.org/SmallFruitsRegGuide/Guides/2016/2016BlueberrySprayGuideFINAL.pdf. Thus, major contributions were made by the original editors: Hannah Burrack (commodity editor, N.C. State University); section editors, Phil Brannen (pathology, University of Georgia), Bill Cline (pathology, N.C. State University), Hannah Burrack (entomology, N.C. State University), Frank Hale (entomology, University of Tennessee), Dan Horton and Ash Sial (entomology, University of Georgia), Mark Czarnota (weed science, University of Georgia), Katie Jennings (weed science, N.C. State University), David Lockwood (vertebrate management, University of Tennessee), Bob Bellinger (pesticide stewardship and safety, Clemson University); and senior editors, Phil Brannen (University of Georgia) and Powell Smith (Clemson University).

Additional contributions by Allen Straw (Virginia Tech University), Scott Nesmith and Harald Scherm (University of Georgia), Steve Bost (University of Tennessee), Phil Harmon (University of Florida), Charlie Johnson (Louisiana State University), Carol Hicks (N.C. State University), and Kathryn Fontenot (Louisiana State University).

Recommendations are based on information from the manufacturers' labels 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.

Pesticide Emergencies

Poisonings: 1-800-222-1222

The above number automatically connects you with a local Poison Control Center from anywhere in the United States.

1. This document is HS1156, one of a series of the Horticultural Sciences Department, UF/IFAS Extension. Original publication date March 2009. Revised March 2013 and March 2016. Visit the EDIS website at http://edis.ifas.ufl.edu.

2. Jeffrey G. Williamson, professor, Horticultural Sciences Department; Philip F. Harmon, associate professor, Plant Pathology Department; Oscar E. Liburd, professor, Department of Entomology and Nematology; and Peter Dittmar, assistant professor, Horticultural Sciences Department; UF/IFAS Extension, Gainesville, FL 32611.

New EDIS Resources

- Leaf disease guide
- Diagnostic key

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UF/IFAS PEER REVIEWED PP348

Florida Blueberry Leaf Disease Guide[1]

Douglas A. Phillips, Norma C. Flor, and Philip F. Harmon[2]

This publication is intended for Florida blueberry growers to use as a diagnostic field guide in the identification and management of common leaf diseases on southern highbush blueberry (SHB). Management recommendations include fungicide applications and horticultural inputs intended to reduce disease severity.

Introduction

Southern highbush blueberry (SHB) cultivars are commercially grown throughout much of Florida, in both deciduous and evergreen production systems. Growers in deciduous production should strive to keep leaves healthy through flower bud differentiation in fall to ensure optimum yield potential. In evergreen production, it is critical to maintain the prior year's foliage through winter months to support early fruit production the following season. In both systems, leaves can be damaged by many factors, such as environmental conditions, chemical applications, insects, and diseases.

This publication includes basic information to assist growers in determining 1) the likely cause (fungal, viral, algal, or bacterial) of leaf symptoms, 2) when specific leaf spots are likely to occur, 3) characteristic symptoms of common leaf problems, and 4) some of the available management options. Not all diseases can be definitively diagnosed by symptoms because symptoms can vary over time and on different blueberry cultivars. Symptoms with different causes can have similar appearances, and more than one disease can occur on the same leaf. Growers should consult UF/IFAS Extension or use a lab diagnostic service. Blueberry disease samples can be sent to the UF/IFAS Plant Diagnostic Center (plantpath.ifas.ufl.edu/extension/plant-diagnostic-center) or another diagnostic lab for accurate identification of the problem.

Several leaf diseases affect SHB in Florida and have the potential to defoliate bushes. For fungal leaf diseases, growers have many effective chemical management options; however, proper product selection and timing of application depends on correct disease diagnosis. Because fungicides are only effective for fungal diseases, differentiating between symptoms caused by fungi and other factors can help prevent unnecessary fungicide use and costs.

The first step in diagnosing the cause of leaf symptoms in blueberries is to determine if the cause is an abiotic factor (e.g., environmental conditions such as freeze or drought stress, nutrient deficiency or toxicity, herbicide damage, mechanical damage, etc.) or a biotic factor (e.g., plant pathogens). Abiotic and biotic factors are not mutually exclusive; in fact, some abiotic factors can increase biotic susceptibility. A University of Florida blueberry scouting guide to be released in the future will contain images of

1. This document is PP348, one of a series of the Plant Pathology Department, UF/IFAS Extension. Original publication date May 2019. Visit the EDIS website at https://edis.ifas.ufl.edu for the currently supported version of this publication.

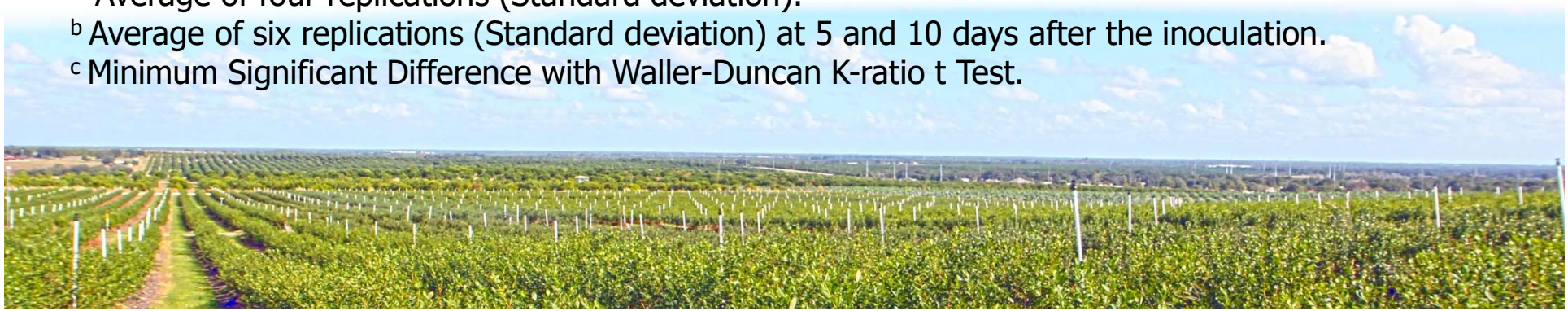
2. Douglas A. Phillips, blueberry Extension coordinator, Horticultural Sciences Department; Norma C. Flor, postdoctoral researcher, Plant Pathology Department; and Philip F. Harmon, professor, Plant Pathology Department; UF/IFAS Extension, Gainesville, FL 32611.

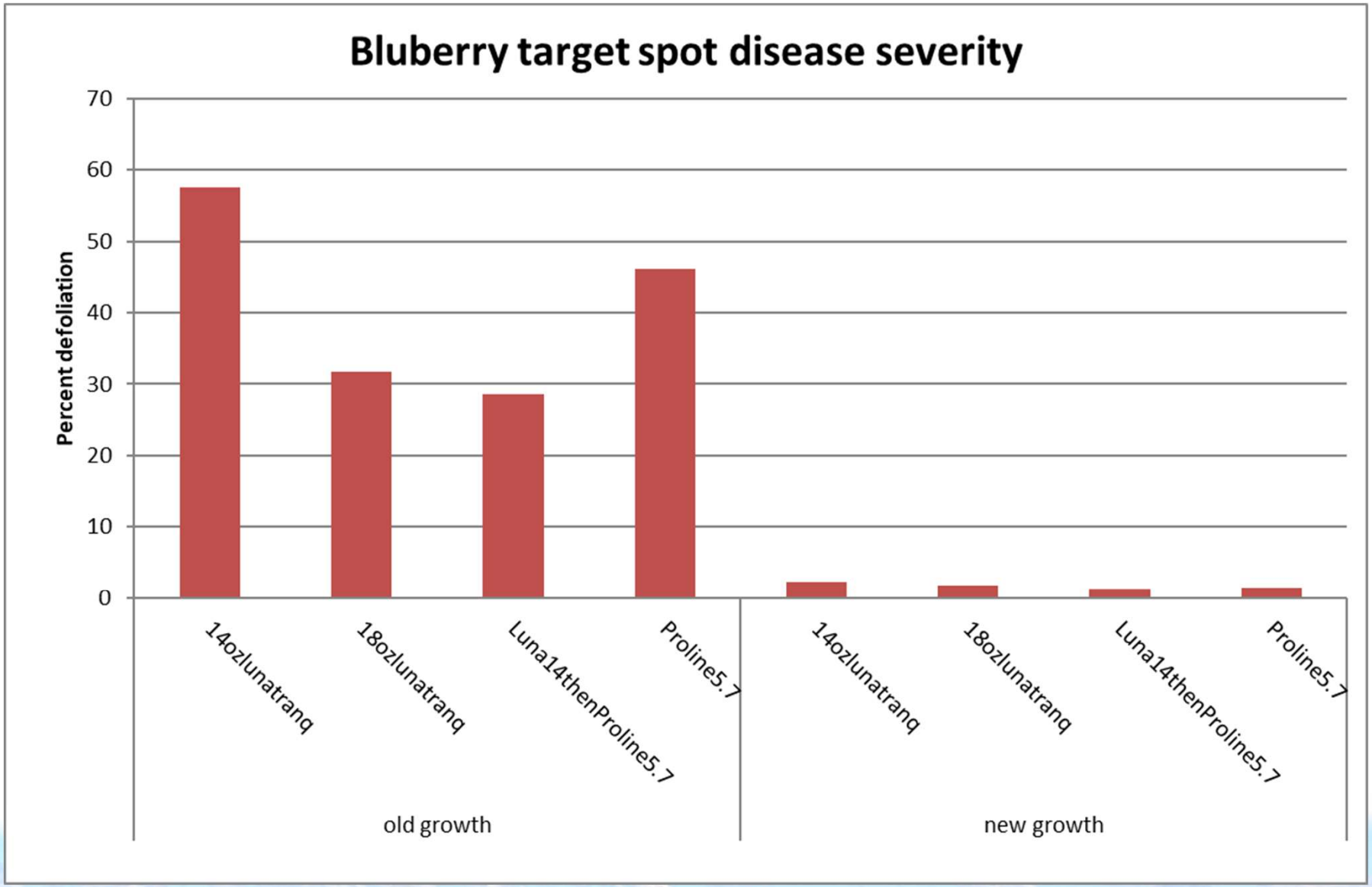
Target spot

Target spot cultivar screen

Cultivar/ Genotype	Lesion size (cm) average (SD) [a] 5 dai	Disease severity (%) average (SD) [b] 5 dai	Disease severity (%) average (SD) [b] 10 dai
11-35	2.68 (1.2) a	39.17 (18.5) a	70.48 (16.4) a
Sweetcrisp	1.5 (0.07) ab	25.83 (12.4) ab	37.60 (20.8) b
Indigocrisp	1.38 (0.3) b	14.17 (5.8) b	59.20 (14.8) ab
Minimum Significant Difference [c]	1.22	16.70	21.95

[a] Average of four replications (Standard deviation).
[b] Average of six replications (Standard deviation) at 5 and 10 days after the inoculation.
[c] Minimum Significant Difference with Waller-Duncan K-ratio t Test.





Luna Tranquility 13.6 to 27 oz/acre

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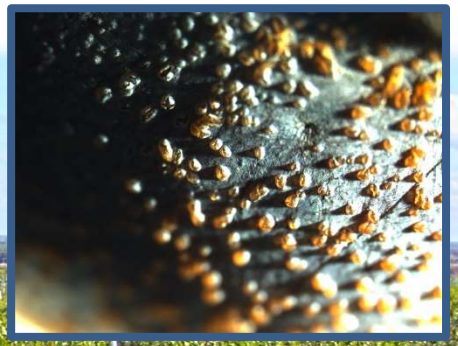
- **Anthracnose:**

Stem canker

Leaf spot

Ripe rot

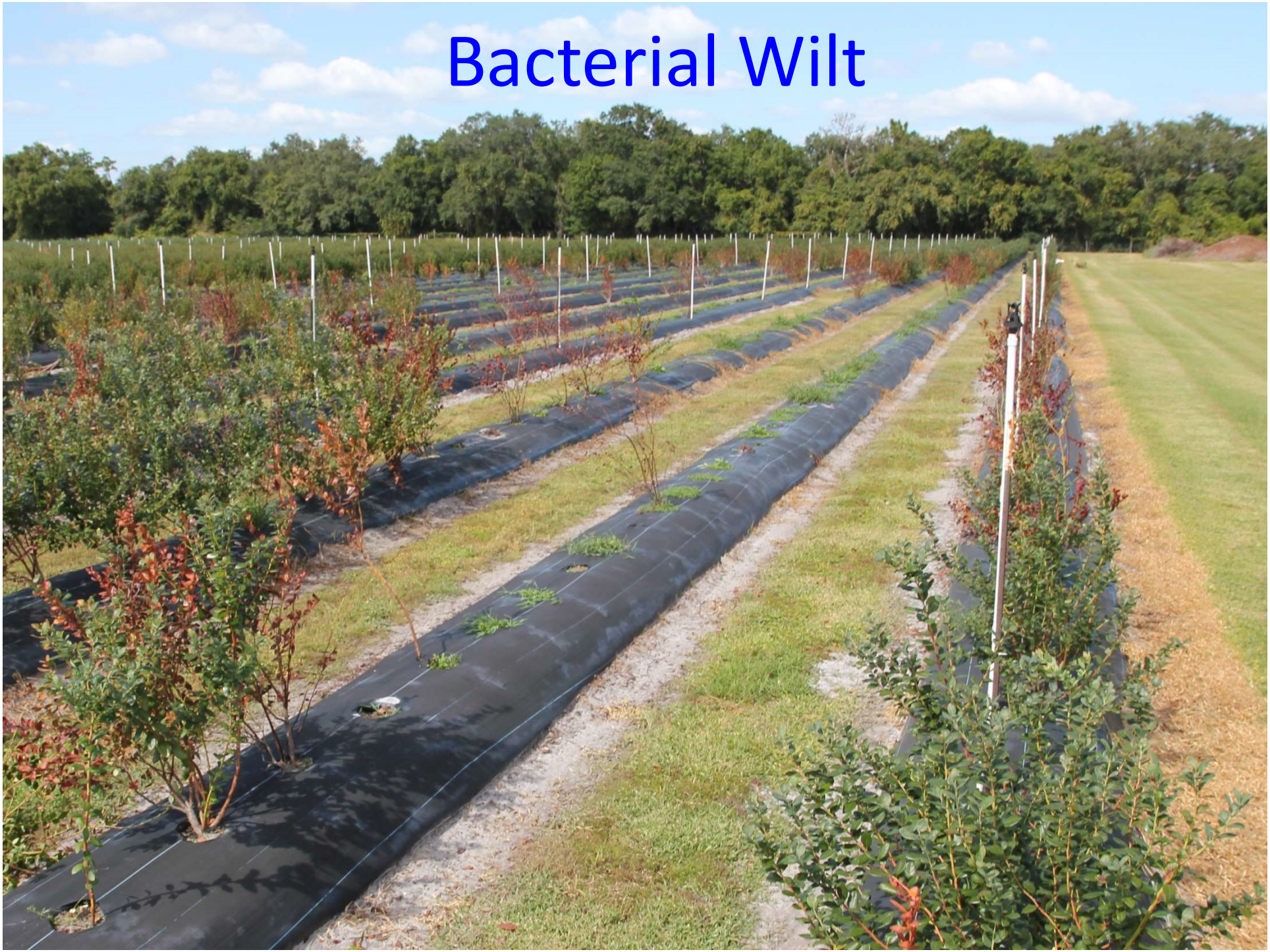


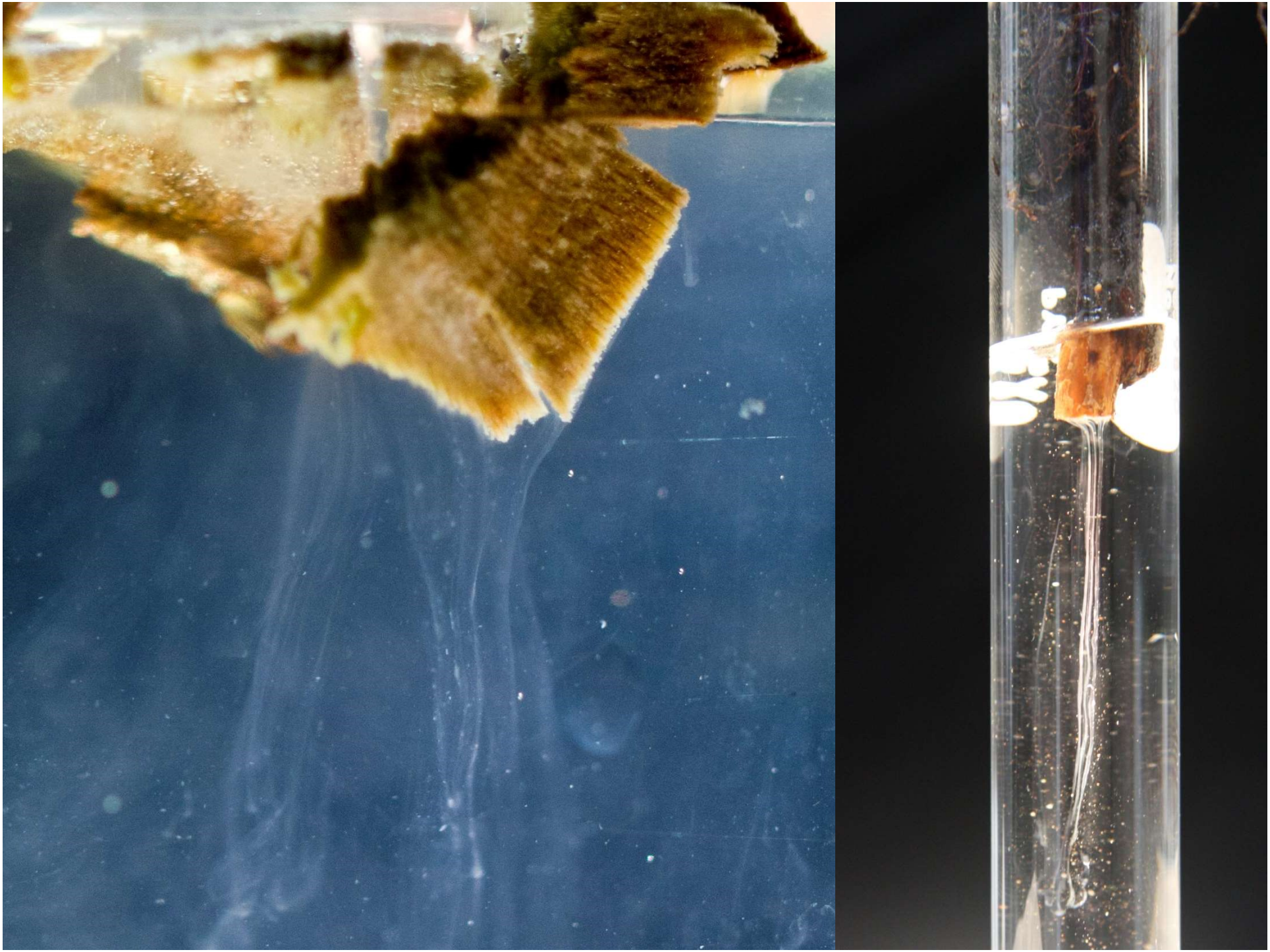

Leaf Rust

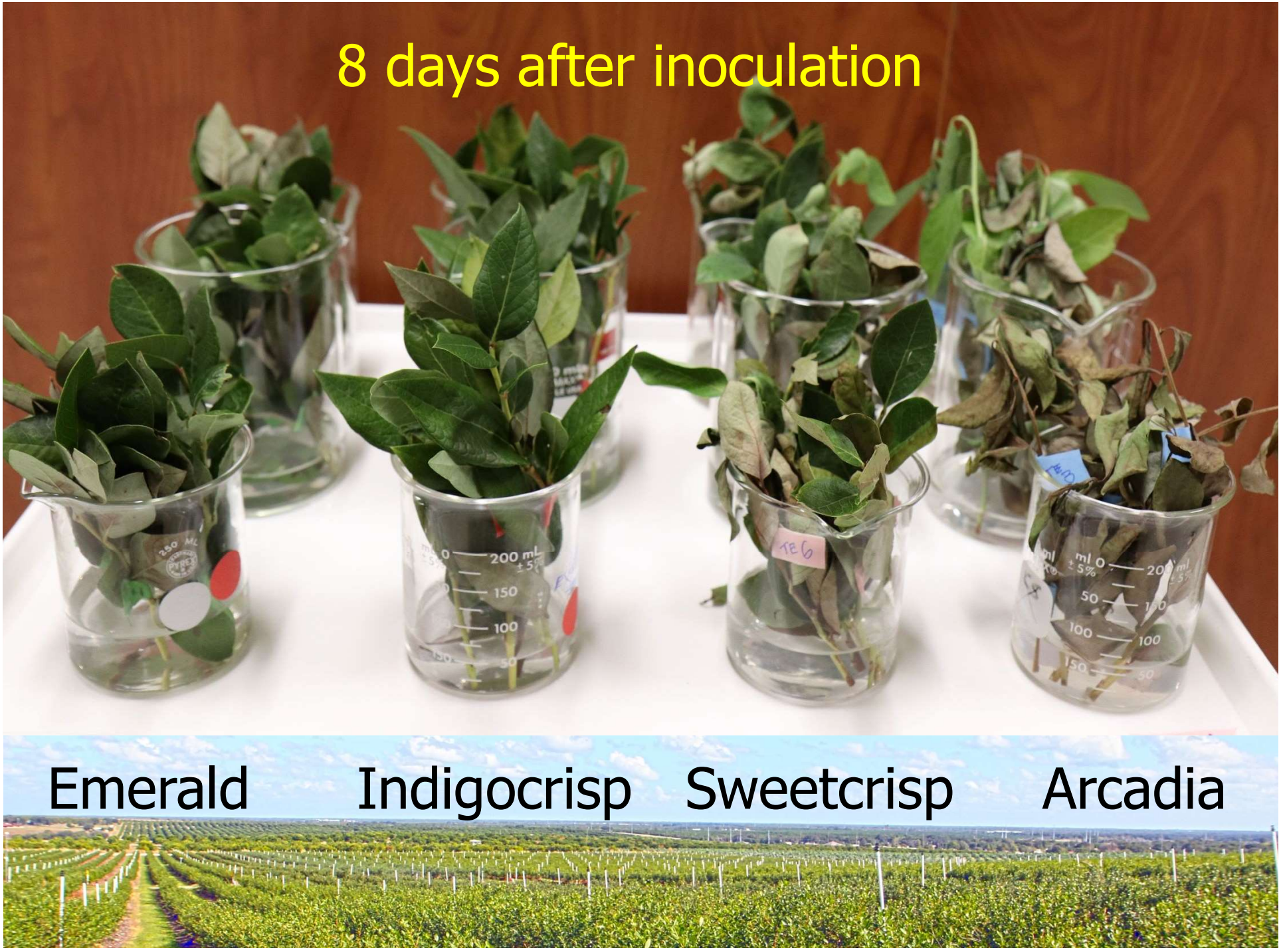
Managing foliar fungal

- Avoid overhead irrigation
- Bravo post harvest
- Rotate or tank mix systemic fungicides with compatible contact fungicides
- Do not apply more than the labels allow for any one active ingredient for the season
- Proline, Abound for rust
- Avoid stand-alone Abound for anthracnose

Bacterial Wilt






8 days after inoculation
Emerald
Indigocrisp
Sweetcrisp
Arcadia

Management

- EDIS publication: http://edis.ifas.ufl.edu/pp332
- K-Phite is an example product that is labeled for the disease and for blueberry
  - chemigation
    - 2 to 4 quarts in at least 200 gal of water per acre
  - drench
    - 2 to quarts in at least 100 gal of water
  - banded application
    - 2 to 4 quarts in at least 20 gal of water followed by light irrigation
  - 7 to 28 day interval

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PP344

Algal Stem Blotch in Southern Highbush Blueberry in Florida[1]

Douglas Phillips, Norma Flor, and Phillip Harmon[2]

Algal stem blotch has become a significant disease on southern highbush blueberries (SHB) in Florida. It can cause stunted growth and leaf yellowing (Figure 1), as well as increased susceptibility to Botryosphaeria, in some cases leading to plant death. Information contained in this publication is intended for Florida blueberry growers to use as a guide in the identification and management of algal stem blotch on SHB.

Figure 1. Plant with chlorotic leaves and stunting due to algal stem blotch infection.
Credits: P Harmon, UF/IFAS

Algal stem blotch is a blueberry disease caused by the parasitic green alga *Cephaleuros virescens* Kunze. Although most blueberry pathogens are fungi, *C. virescens* is a unique alga in the order Trentepohliales and the phylum Chlorophyta. The disease occurs on many cultivars of SHB (*Vaccinium corymbosum*) and on the native sparkleberry (*V. arboreum*) throughout Florida. The pathogen and closely related species also cause orange cane blotch on blackberry, as well as common leaf diseases of camellia (*Camellia japonica*), southern magnolia (*Magnolia grandiflora*), and a range of tropical fruits and ornamental plants. Worldwide, *C. virescens* is most common in tropical and sub-tropical


algal stem blotch

Managing algal stem blotch

- Most fungicides do not work on algae
- Copper fungicides can help
  - Two to four monthly applications in summer starting after harvest have been reported to keep the disease in check most years by growers
  - Kocide 3000 (also Kocide 2000) as well as several other products and formulations of copper
  - Avoid tank-mixes of Cu products
    - with phites and pesticides with EC formulation

Root rot

- *Phytophthora cinnamomi*
- Poorly drained soils
- Excessive irrigation
- Ridomil (2 apps/yr)
- Phites, foliar apps

New EDIS Resources

- Stem blight guide

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PP347

Botryosphaeria Stem Blight on Southern Highbush Blueberry in Florida[1]

Norma C. Flor, Douglas A. Phillips, and Philip F. Harmon[2]

Information contained in this publication is intended for Florida blueberry growers to use as a guide in the identification and management of Botryosphaeria stem blight on southern highbush blueberry (SHB).

Figure 1. Symptoms of stem blight disease on southern highbush blueberry.
Credits: P. Harmon, UF/IFAS

Introduction

Vascular pathogens (fungal and bacterial) represent constant challenges for southern highbush blueberry (SHB) growers. Botryosphaeria stem blight is the most common and damaging fungal vascular disease on SHB in the southern United States, causing stem and cane dieback and reductions in yield. Advanced stages of this disease may cause premature plant death, which results in significant replanting costs for growers. Biotic or abiotic stresses from a variety of sources can make plants more susceptible to infection by stem blight pathogens. All SHB and rabbiteye blueberry cultivars are susceptible to stem blight, although cultivars do show differences in their level of susceptibility both under field conditions and in artificial inoculations.

Members of the Botryosphaeriaceae (Bot. family) that cause stem blight are well-known fungal pathogens of several woody host species in tropical regions worldwide. In Florida, *Neofusicoccum ribis* and *Lasiodiplodia theobromae* are the most important stem blight pathogens on SHB. However, names of fungi in the Bot. family continue to change as scientists learn more about this diverse group. Many references still refer to *Botryosphaeria dothidea* as the

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Any Questions?

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