#### **Algal Stem Blotch Update**

FBGA Fall 2019 FBGA Meeting and Show



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# algal stem blotch















# Life Cycle

- Spores are produced on the red felt-like growth we can see
  - Zoosporangia are wind dispersed
  - Each zoosporangium can produce 8 to 64 zoospores
- Zoospores are produced when the sporangia get wet
- Zoospores germinate, infect and grow into thalli
  - Motile, swimming spores
  - Primary inoculum

Brooks et al 2015. Plant Disease 99:740-753

#### **Disease Cycle**

- Spores are produced May through August
- Infections may take a full year to produce symptoms
- Cane infections persist and produce between
   72,000 and 198,000 spores per square cm
- The algae likely gets in plants through wounds
- Disease is most severe on stressed plants

### Managing algal stem blotch

- Copper fungicides may help
  - Two to four monthly applications in summer starting after harvest have been reported to keep the disease in check most years by growers
  - Where disease is known to be severe shorten intervals and reduce rates, stay within label
  - 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

#### **Management options**

- Kocide 3000 is an example product
  - use rates on the label are 1.0 to 3.5 lb per acre on
    7 to 28 day interval
  - follow label instruction for bacterial canker or
     Phomopsis twig blight and blueberry
  - Up to 28 lb total per acre per year
  - newly revised IPM guide has additional guidelines
- Growers report good results with many other Cu products:

– Magnabond, Badge, Bordeaux mixture

### Other methods?

- Phosphite fungicides applied for Phytophthora root rot management (but not immediately following copper) may help
  - Efficacy has been shown in blackberry (UGA)
  - Prophyt 4 pts/A, 14 to 21 day interval
- Sprayers need to achieve good cane coverage
- Overhead irrigation will contribute to canopy wetness and disease
- Farthing, Chickadee, Primadonna, older plantings of Emerald and Jewel, most varieties get the disease.

#### Research

- Arboreum root stock?
  - Arboreum is susceptible
- Herbicides?
  - Several different products at standard and reduced rates were trialed 2018
    - Severe phytotoxicity from some treatments with no real promising prospects
- Culturing the algae?

– Yes, cultured thanks to Dr. Norma Flor







#### **Curative treatment trials**

- Herbicides with potential or known algal activity were screened on Windsor blueberry plants
  - None of the herbicides reduced algal sporulation on affected canes or symptoms
  - None of the applications killed the plants, some did produce a burn
  - These were off label uses, research only, and didn't work, do not do this!

#### **Applications made 21 August 18**



#### Tested active ingredients:

- Diuron
- Hexazinone
- Mesotrione
- Oryzalin
- Sethoxydim
- Would still like to test:
- Simizine

#### **Products and Rates**

	Flag Color	Product	Rate	
1	(none)	Untreated		
2	Blue	Diuron 80	1.5 lbs/acre	
3	Blue and white	Diuron 80	0.5 lbs/acre	
4	Yellow	Surflan Pro	2 qt/acre	
5	Yellow and white	Surflan Pro	1 qt/acre	
6	Orange	Tenacity	3 fl oz/acre	
7	Orange and white	Tenacity	1 fl oz/acre	
8	Red	Velpar	2 pints/acre	
9	Pink	Velpar	0.2 pints/acre	
10	Green	Grass killer	1 pint/acre	
	(a nonionic surfactant was used with all products)			





## **Thyme Guard trial**

- Grower cooperator, David Morris—Thank you.
- Product was donated by Dominique Depaz, Agro Research International, Thank you.
  - Rate was 0.5%
  - Two applications July 16 and August 16, 2018
  - Ratings taken through August 31
  - Treated plants were Chickadee
    - severely pruned rows 2-yr-old
    - and in lightly pruned rows 2-yr-old
    - 1yr old
    - 6 replicates, three plant plots, treated and untreated

 No significant reduction in algal stem blotch or + plant regrowth vigor after prune, following two treatments

#### Trt plants 7/31/18 severely pruned



#### Trt plants 7/31/18 lightly pruned



#### Trt plants 7/31/18 1yr old

#### Culturing the Algae- 5 months growth!



# Algal Stem Blotch in Southern Highbush Blueberry in Florida<sup>1</sup>

Douglas Phillips, Norma Flor, and Phillip Harmon<sup>2</sup>

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.

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,

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Figure 1. Plant with chlorotic leaves and stunting due to algal stem blotch infection.

### Any Questions? Philip Harmon, University of Florida pfharmon@ufl.edu