

# CLRDV: What we know, and what we don't

Allen, T. W., Wilkerson, T. H., Aboughanem-Sabanadzovic, N., and Sabanadzovic, S.

2019 Row Crop Short Course

Starkville, MS

December 2, 2019





Tom Allen  
DREC; Stoneville, MS  
(662) 402-9995

[tallen@drec.msstate.edu](mailto:tallen@drec.msstate.edu)  
[www.mississippi-crops.com](http://www.mississippi-crops.com)

**Twitter:** [@baldpathologist](https://twitter.com/baldpathologist)

# So, what's in a name?

- Virus vs. the plant disease
  - The plant virus infects the plant and leads to disease, the specific virus in question has a particular name
    - Cotton leafroll dwarf virus – is the name of the virus itself within the plant
  - The virus within the plant causes the disease:
    - Cotton leafroll dwarf disease
- Abbreviations are obviously the easiest way to present this particular situation:
  - Cotton leafroll dwarf virus = CLRDV
  - Cotton leafroll dwarf disease = CLRDD

# What we currently know about the virus

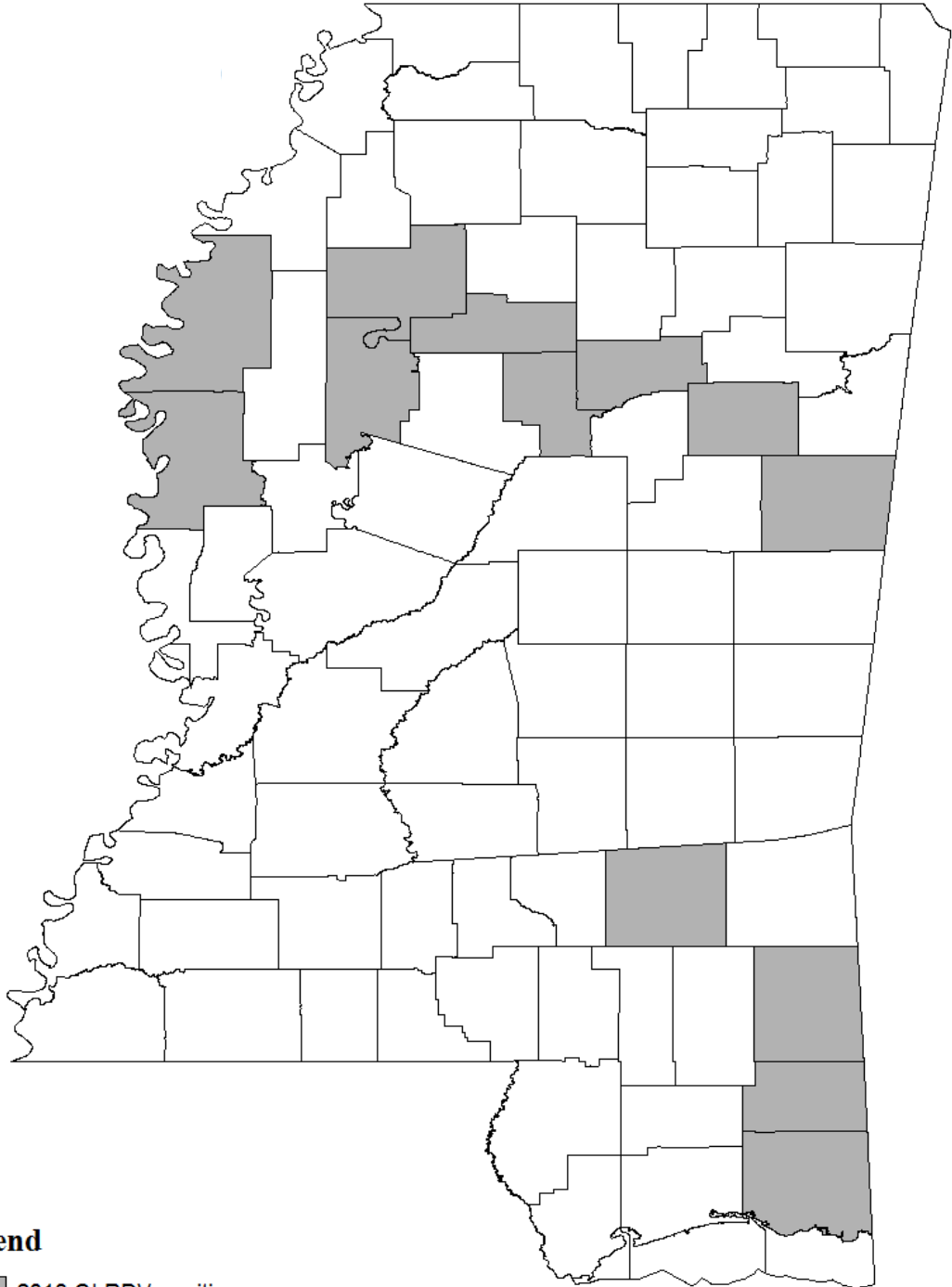
- Initially observed in Alabama during the 2017 season
- Closely related to a virus of cotton in South America, which has been referred to as “blue disease”
  - Called blue disease due to the leaf coloration
  - However, we do **NOT** have blue disease in the U.S.
- Transmitted by the cotton aphid
- To date, officially reported from:
  - AL, FL, GA, MS, SC, TN, TX
- Symptom expression appears to vary by cotton cultivar





# Distribution following the 2018 season

So by mid-November 2018, we had identified virus-infected cotton in 13 MS counties



**Legend**  
2018 CLRDV positive



# Cotton leafroll dwarf virus (CLRDV): 2018

- Symptoms:
  - Stunting due to shortening of the internodes
  - Leaf rolling
  - Petiole and vein reddening
  - Distorted new growth (youngest leaves)
  - Reduced flower set
  - Reduced boll size
  - Sterility
- Transmitted by the cotton aphid
- Up to 80% yield losses reported in Brazil



And so, 2019 came around.....











# CLRVD symptoms I – early symptoms

- Easiest to break symptom expression into observations at different times of the season
  - **BUT**, take note that CLRDD symptom expression can mimic herbicide injury
  - **Early-season symptoms (that we observed in MS):**
    - Yellowing of leaf margins
    - Puckering of leaves along the veins
    - Reddish leaf coloration (that some are referring to as a “bronze wilt-type” symptom)
    - Symptoms may tend to be masked over time with new growth from the plant making diagnosis of symptoms in the field difficult











# CLRDV symptoms II – late-season in MS

## –Leaf symptoms

- Yellowing leaves
- Rubbery, thicker leaves
- Puckering of leaves along veins
- Brittle leaves
- Folded leaves in the upper canopy
- Mis-shaped leaves
- Smaller leaf size

## –Stem/petiole symptoms

- Thicker stems
- Reddening of stems/petioles
- Don-turned petioles

## –Flower/boll symptoms

- Increased square proliferation
- Square abortion/cavitation
- Flower sterility
- Mis-shaped flower parts
- Parrot-beaked bolls

## –Whole plant symptoms

- Stunted plants
- Increased terminal growth
  - Referred to as a “whip”
- Increased vegetative branching
- Shortening of internodes
  - Or node stacking
- Greener plants late in the season



































# Additional hosts

- Serve as a reservoir for the virus and can result in early and late-season infection post-aphid feeding
- Over-wintering hosts
  - Reported on:
    - Henbit
    - White clover
    - Perennial peanut
- In-season hosts
  - Reported on:
    - okra
    - Pigweed (MS)











# So what's left to determine?

- Overwintering hosts (both for aphids and virus reservoir)
  - Where do the aphids go?
- In-season additional hosts
- Variety susceptibility
  - Presence of resistance within commercial or experimental germplasm?
- Impact of the virus on yield
  - Even though we had the virus in a lot of places during 2019 we can't assume that we lost a lot of yield as a result



# Acknowledgements



- Dr. Bob Nichols
- Dr. Don Parker
- Dr. Jodi Scheffler



- Nick Tadlock
- Sanfrid Shaifer
- Walter Solomon
- Tessie Wilkerson

