



# Impact of CLRDV on Plant Development and Yield

**T. Wilkerson**, T. W. Allen, N. Aboughanem-Sabanadzovic, S. Sabanadzovic, and J. Scheffler

Row Crop Short Course

December 2, 2019

# What are we seeing in the field?



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# In 2019.... We observed

- Symptoms observed in 2019 include
  - small, puckered, thick, brittle leaves
  - stacked internode
  - sterile flowers
  - irregular shaped bolls
- Response is different by variety
  - symptoms are difficult to pinpoint
  - similar to responses to other stressors
    - herbicide application/ misapplication (dicamba.. 2,4-D)
    - breeding abnormalities
    - delayed harvest
- No varieties observed to be resistant at this point
  - narrow range of germplasm
  - winter nurseries in parts of the world which historically have reported viral diseases
    - Cotton blue disease
    - Cotton “leaf curl” diseases



# Cotton Development

- Excessive vegetative growth can delay maturity and increase problems with insects and boll rots
  - More attractive to aphids
- Excessive fruiting may cause early cessation of flowering “cutout” which promotes fruit shed and reduced yield.



# Infection timing?

- Dependent on when infection occurred
  - Infection early
    - shorter plants.. lacking the “whip-like” appearance in upper canopy
    - symptoms visible throughout the plant
  - Infection post-reproductive
    - tall plants... “whip” visible
    - crazy growth in upper portion of the plant
      - excessive fruiting
      - tiny leaves
      - leaf regrowth
- Timing dictates where bolls are lost on the plant= yield loss =\$loss
  - early infection-more bolls misshapen, aborted
  - late infection-more positions towards the top of the plant

# Infection timing?





# Why are we concerned?

- Flowers with misshapen parts
  - No pollen production
- Plants with no bolls
- Plants with random “dead” squares and bolls
- Parrot beaked bolls (misshapen)
- Bolls that will never open



# Importance of boll retention

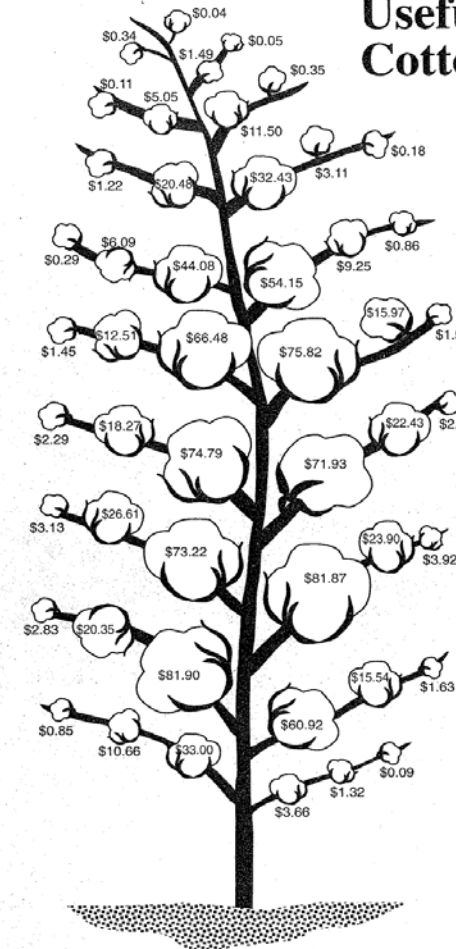
Bulletin 1024

May 1995

- Seed cotton yield and lint quality tend to decrease away from the main stem.
  - First position
    - 60-75%
  - Second position
    - 18-21%
  - Third + positions
    - 10%
- Weights of bolls at position 1 increase from node 6-12 and then decrease for the remaining nodes.

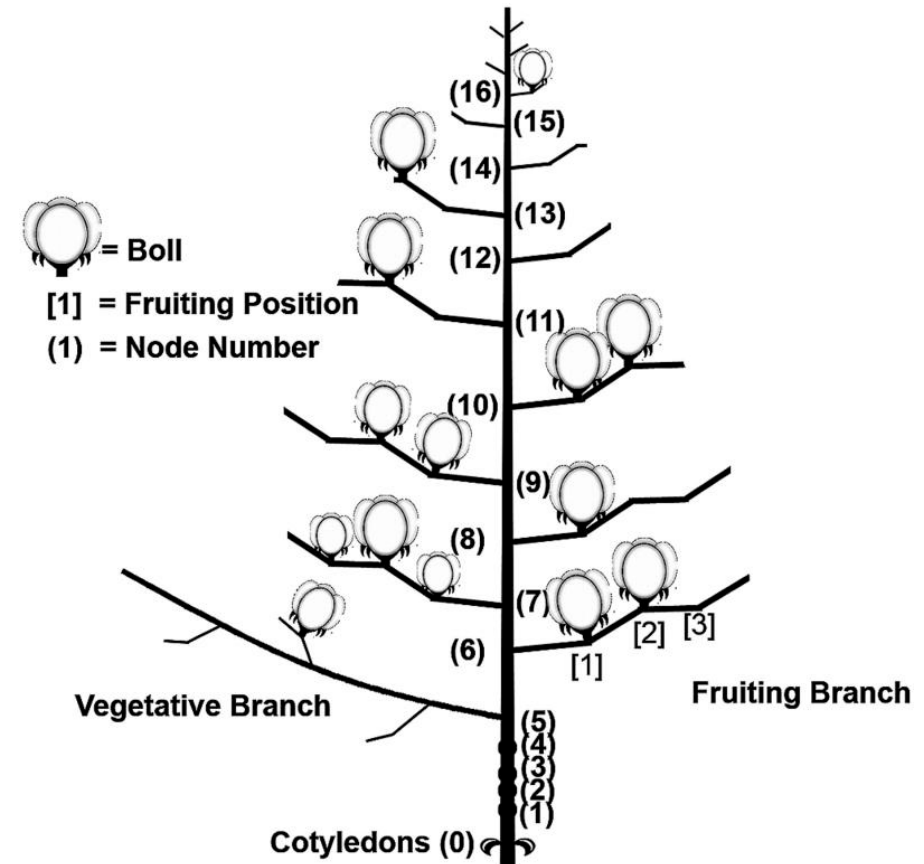
**Useful Tools in Managing Cotton Production:**

**End of Season  
Plant  
Maps**



# Plant mapping

- Stoneville OVT
  - Varieties chosen which have been confirmed positive in other locations and had symptoms associated with the virus in this particular field.
    - DP1646B2XF
    - NG 5711B3XF
    - PHY 580W3FE
  - 25 plants in a row per replication for a total of 100 plants
  - Unopened bolls were collected and allowed to dry and open in greenhouse





# Stoneville Variety Trial

<u>Variety</u>	<u>% First position</u>	<u>% Second position</u>	<u>% Third position</u>
<b>PHY580 W3FE</b>	55.4	34.4	10.2
<b>NG5711B3XF</b>	58.3	30.6	11.1
<b>DP1646B2XF</b>	62.3	28.1	10.0

# Stoneville Variety Trial

<b>Variety</b>	<b>Seedcotton Yield (lb/acre)</b>	<b>Lint Yield (lb/acre)</b>
<b>PHY580 W3FE</b>	3273.25	1276.57
<b>NG5711 B3XF</b>	4591.90	1790.84
<b>DP1646 B2XF</b>	4066.60	1585.98

# Commercial Field

- Itta Bena, MS
- Plants with symptoms associated with the virus
- 25 plants per replication for a total of 100 plants
- Unopened bolls were collected and allowed to dry and open in greenhouse

<u>Variety</u>	<u>% First position</u>	<u>% Second position</u>	<u>% Third position</u>
<b>DP1646B2XF</b>	60.5	29.4	10.1
	<b>Seedcotton Yield (lb/acre)</b>	<b>Lint Yield (lb/acre)</b>	
	3356.65	1309.10	

# Management?

- **DON'T PANIC.....**
  - This may have been around longer than we think
  - 2019 yields are good
- Manage weeds
  - alternate hosts
- Varietal resistance.... Possibly
- Insecticide applications
  - manage aphids as usual



# Research Constraints

- Just starting to scratch the surface
- Overloading the virologists
  - timely process
  - no quick test yet
- No resistant varieties to compare

A TON MORE WORK TO DO!

# As far as yield loss?

- Cotton blue disease in Brazil is associated with up to 80% losses
  - **NOT** the same disease
- State cotton averages are going to be high this year
  - hard to define losses
  - losses will be on a field by field basis
- Viral diseases don't always cause major impacts... but they can.
  - keeping a close eye on this one until we have more information
- **AT THIS POINT WE DON'T KNOW**
  - 2019 Disease Loss Estimates
    - 0.01%

# Questions?

Contact Info:

Tessie Wilkerson

662-820-0549

662-686-3277

[twilkerson@drec.msstate.edu](mailto:twilkerson@drec.msstate.edu)

Twitter: [@t\\_birdpathology](https://twitter.com/t_birdpathology)

