

# Thrips Management and Neonicotinoid Resistance

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LSU AgCenter

Macon Ridge Research Station

Winnsboro, LA





# Thrips







# Cruiser - Improperly Treated or Poor Performance ?



2011

Stoneville  
(Aeris)

PhytoGen  
(Cruiser)



# Thrips Species Composition

Across 10 locations Mid-South

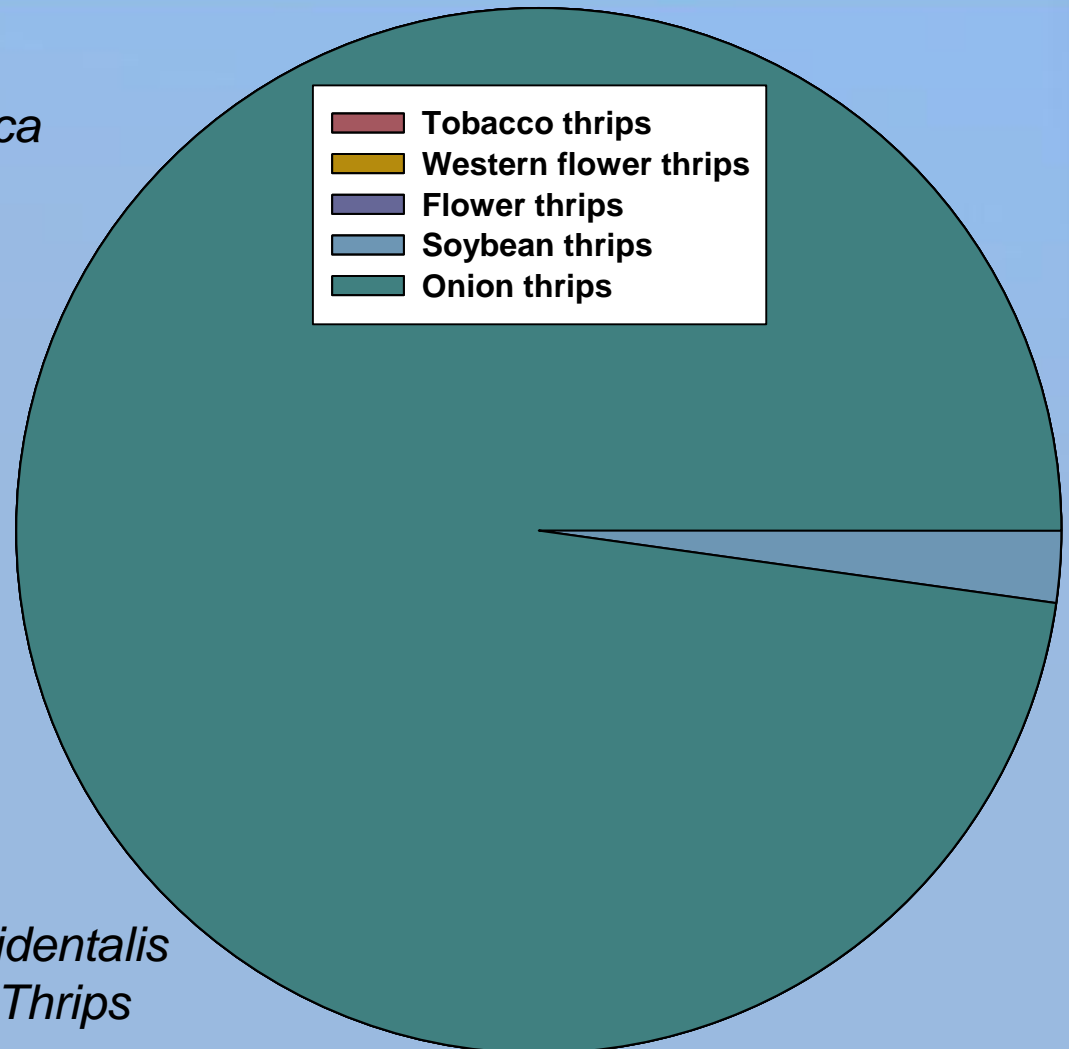


*Frankliniella fusca*  
Tobacco Thrips

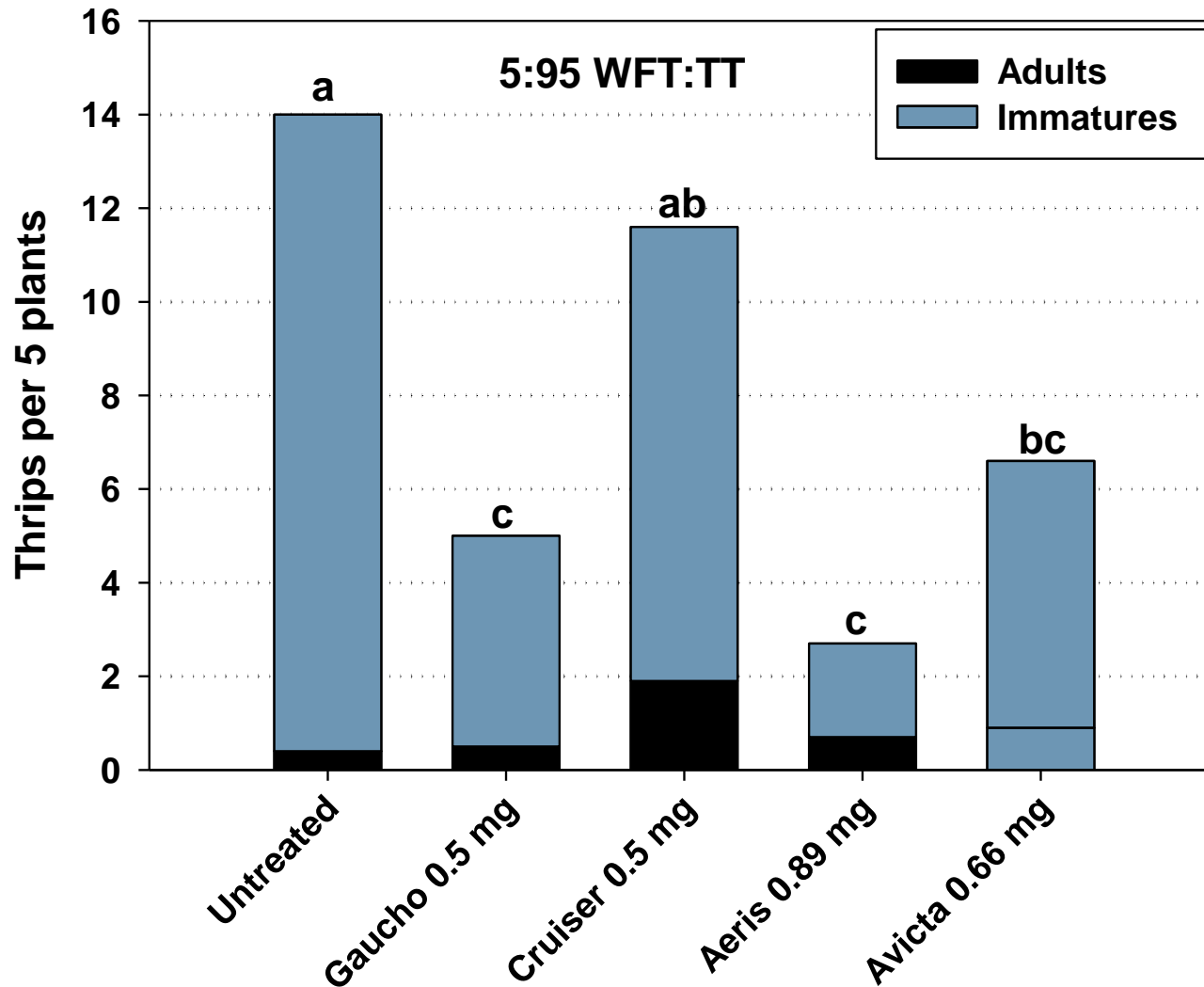
Adult Female



*Frankliniella occidentalis*  
Western Flower Thrips



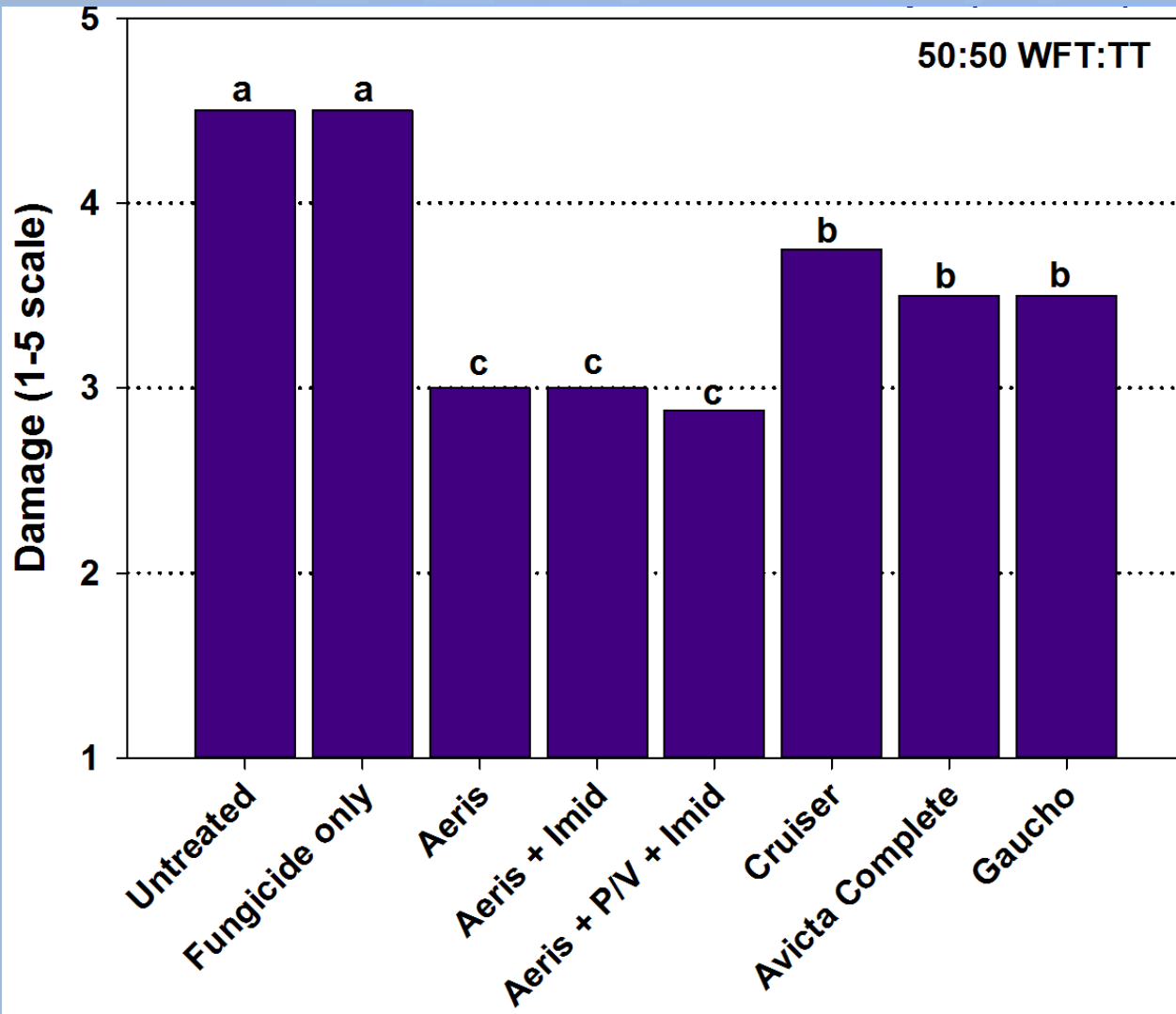
# Winnsboro, LA – 2013 (21 DAP)



> 95%  
Tobacco thrips



# St. Joseph, LA – 2012 (25 DAP)



~ 50:50%  
Tobacco thrips  
Western flower thrips



# Possible explanations

- 1) Pre-emergence herbicides are having a negative effect on plant growth, thus making plants more susceptible to thrips injury
  - Perhaps they interfere with the uptake of insecticides
- 2) Soil microbes have evolved to metabolize neonicotinoid insecticides?
- 3) Formulation change or problem
- 4) Thrips have developed resistance

**And thiamethoxam is more affected than imidacloprid**



# Stress on Stress

PHY375 WRF / Cruiser

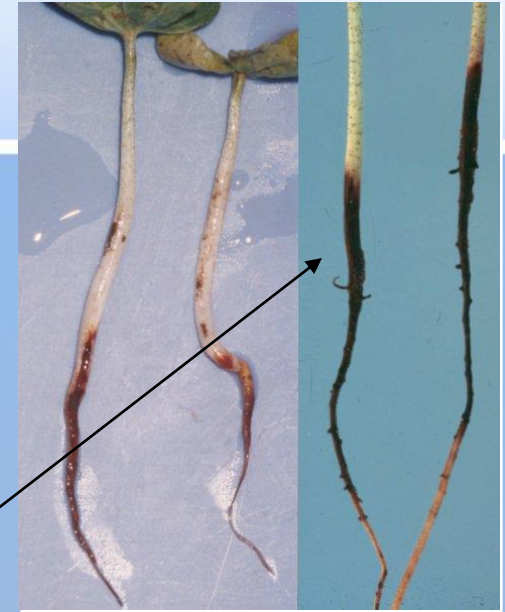
Roundup WM (24 oz) +  
Dual Magnum (16 oz)

PHY375 WRF / Cruiser

Roundup WM (24 oz) +  
Dual Magnum (16 oz) +  
Liberty (32 oz)



# Early Stress Interactions



Renders plants weaker, temperature, thrips, and more susceptible to nematodes, herbicides, seedling diseases & stunted growth above and greater probability of death below ground





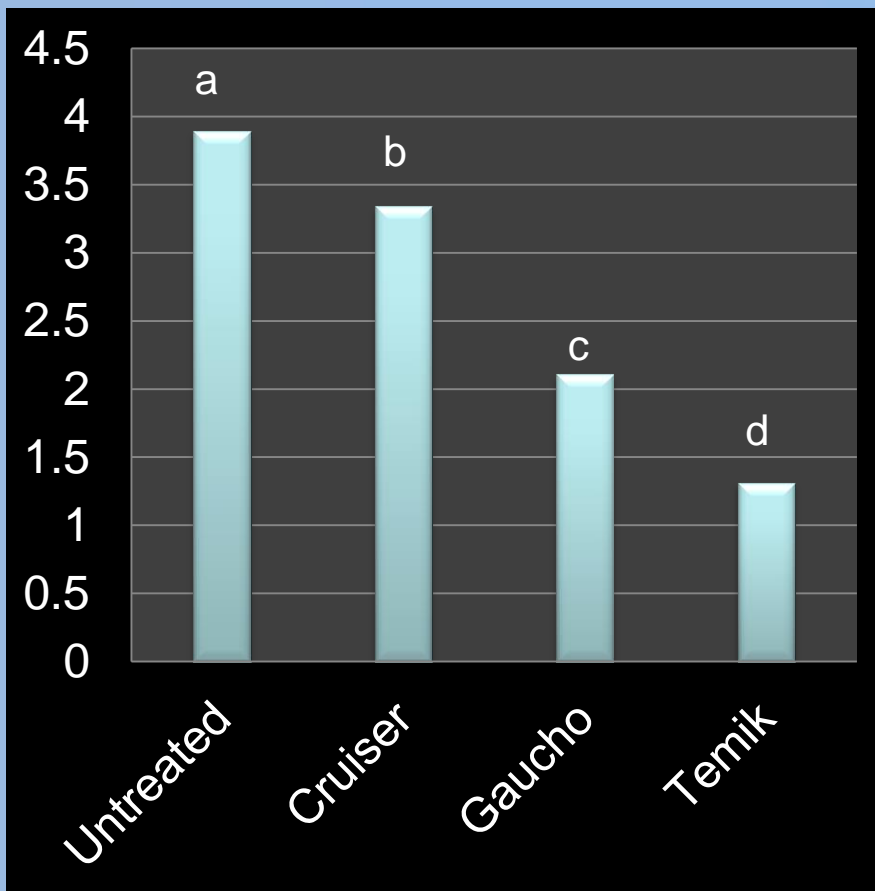
# Thrips Injury (0 – 5)

24 DAP, 18 DAE

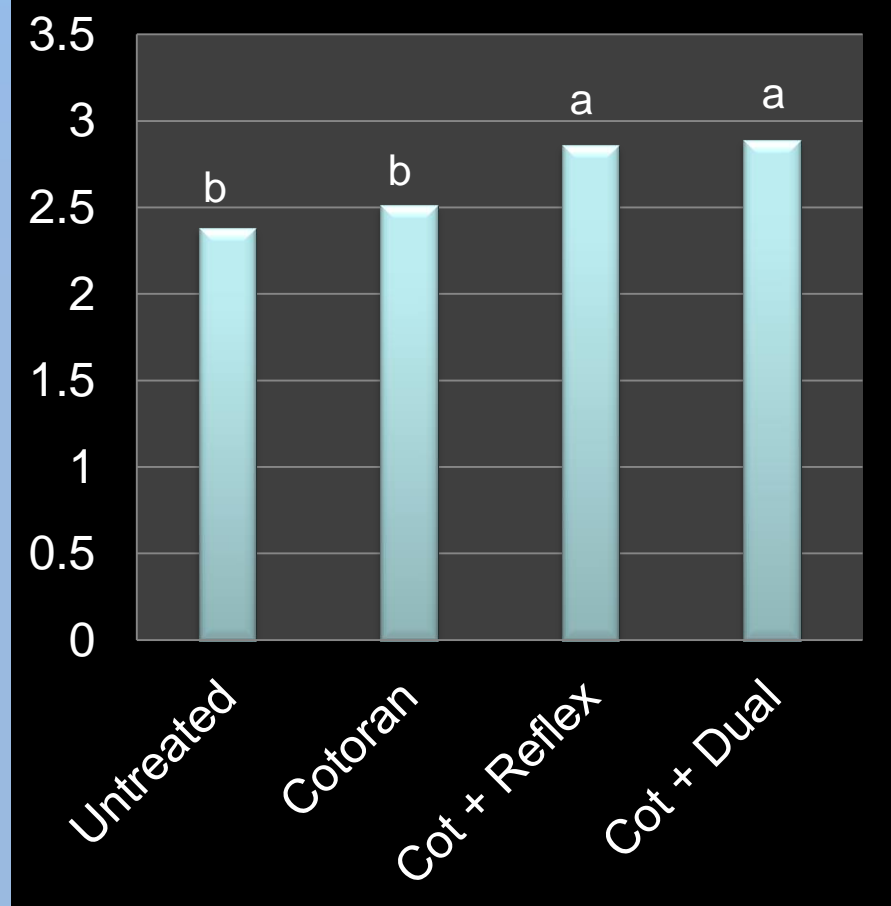
Scott Stewart

$P(I \times H \text{ Interaction}) = 0.6366$

**Insecticide ( $P < 0.0001$ ,  $LSD = 0.40$ )**



**Herbicide ( $P = 0.0022$ ,  $LSD = 0.25$ )**



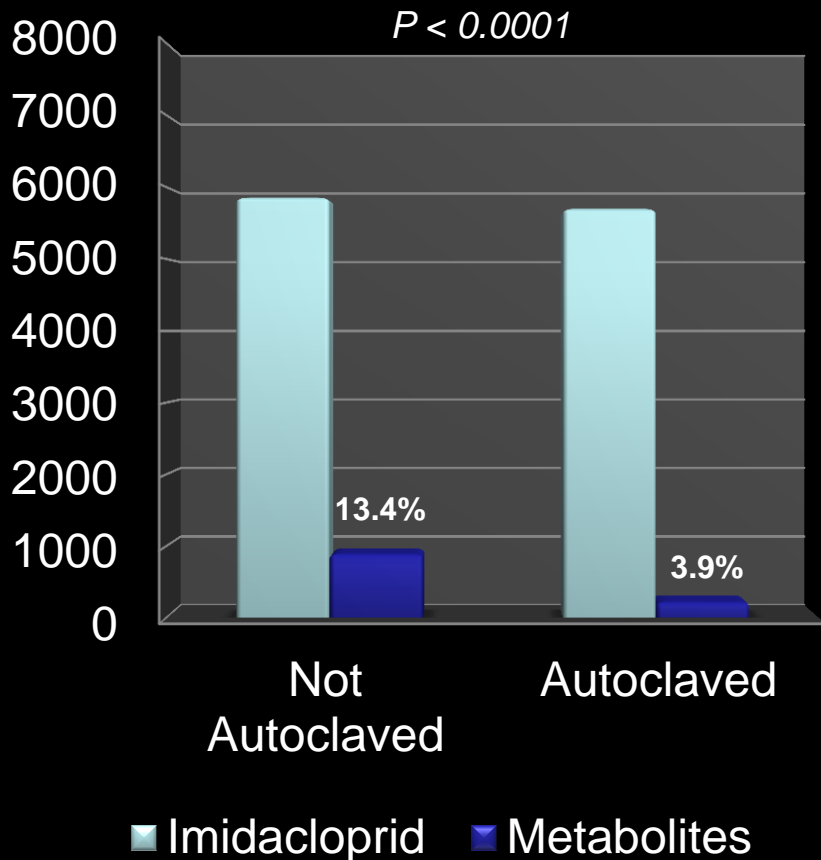


# Metabolism by soil Microbes ???

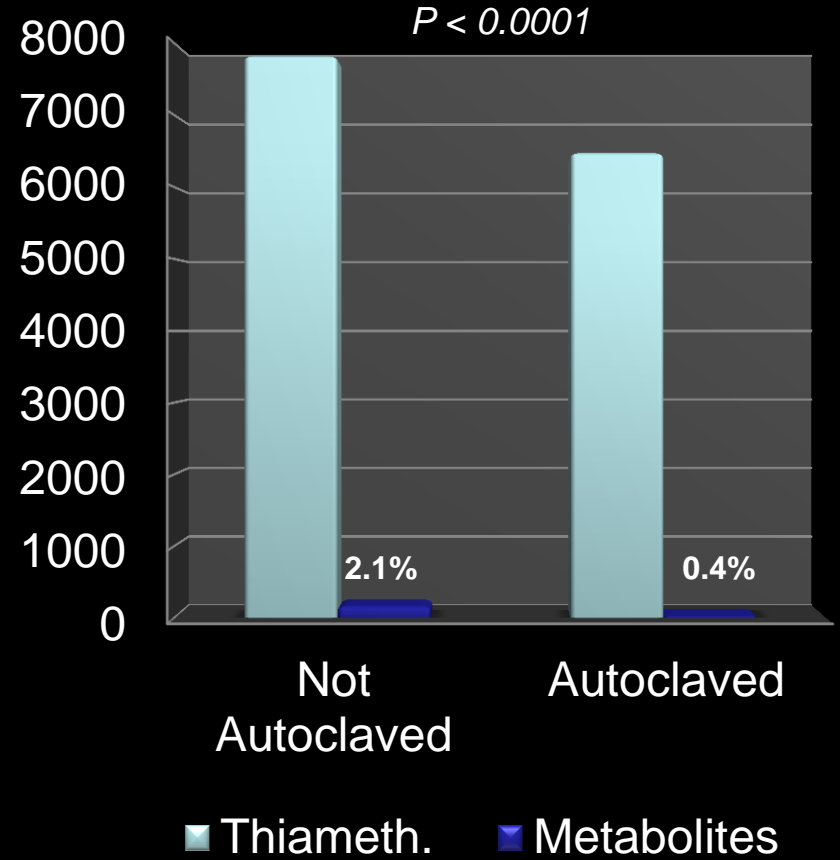
## Concentrations In Soil from Milan, TN

Scott Stewart

### PPB in Gaucho Treated Soil



### PPB in Cruiser Treated Soil

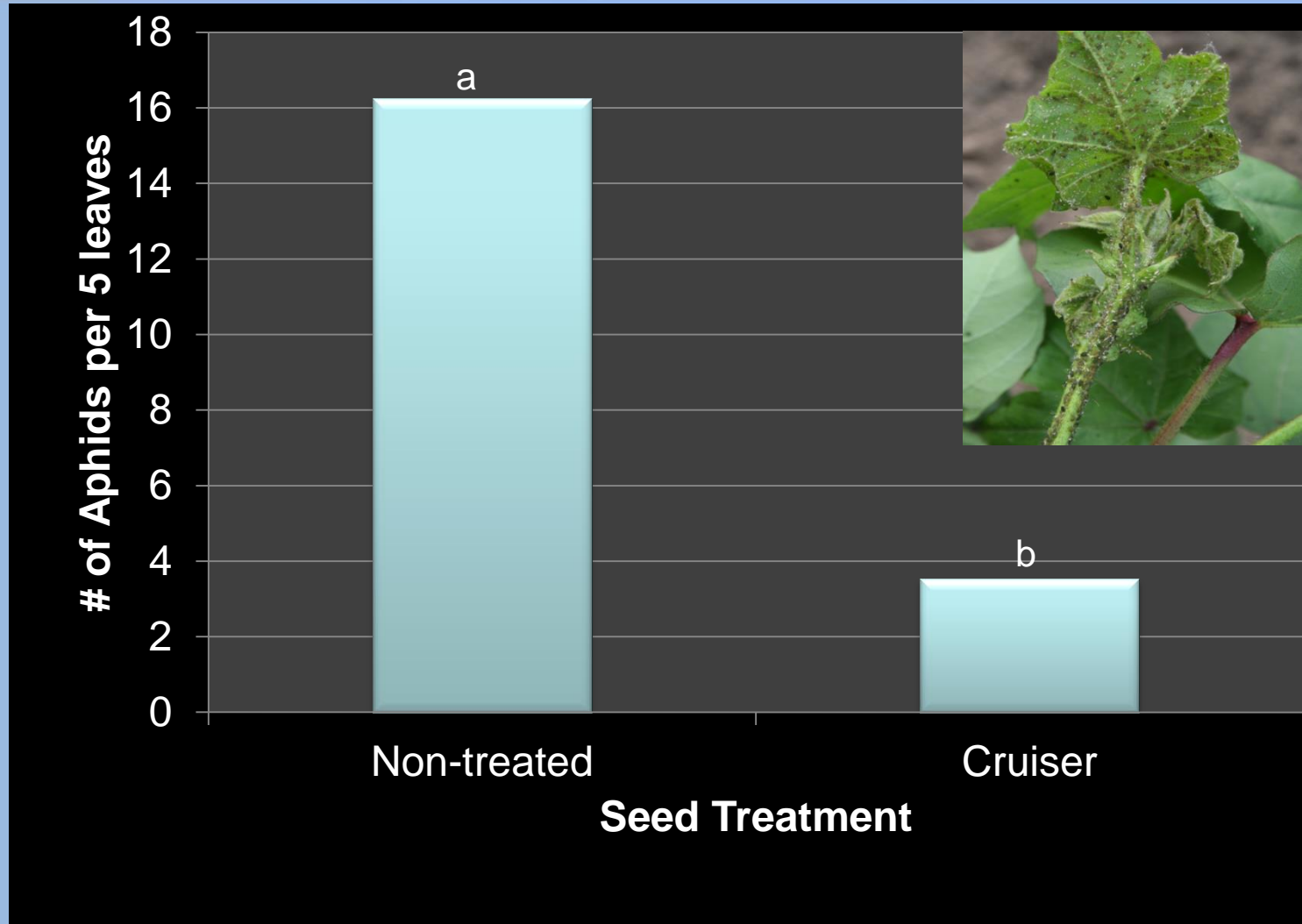






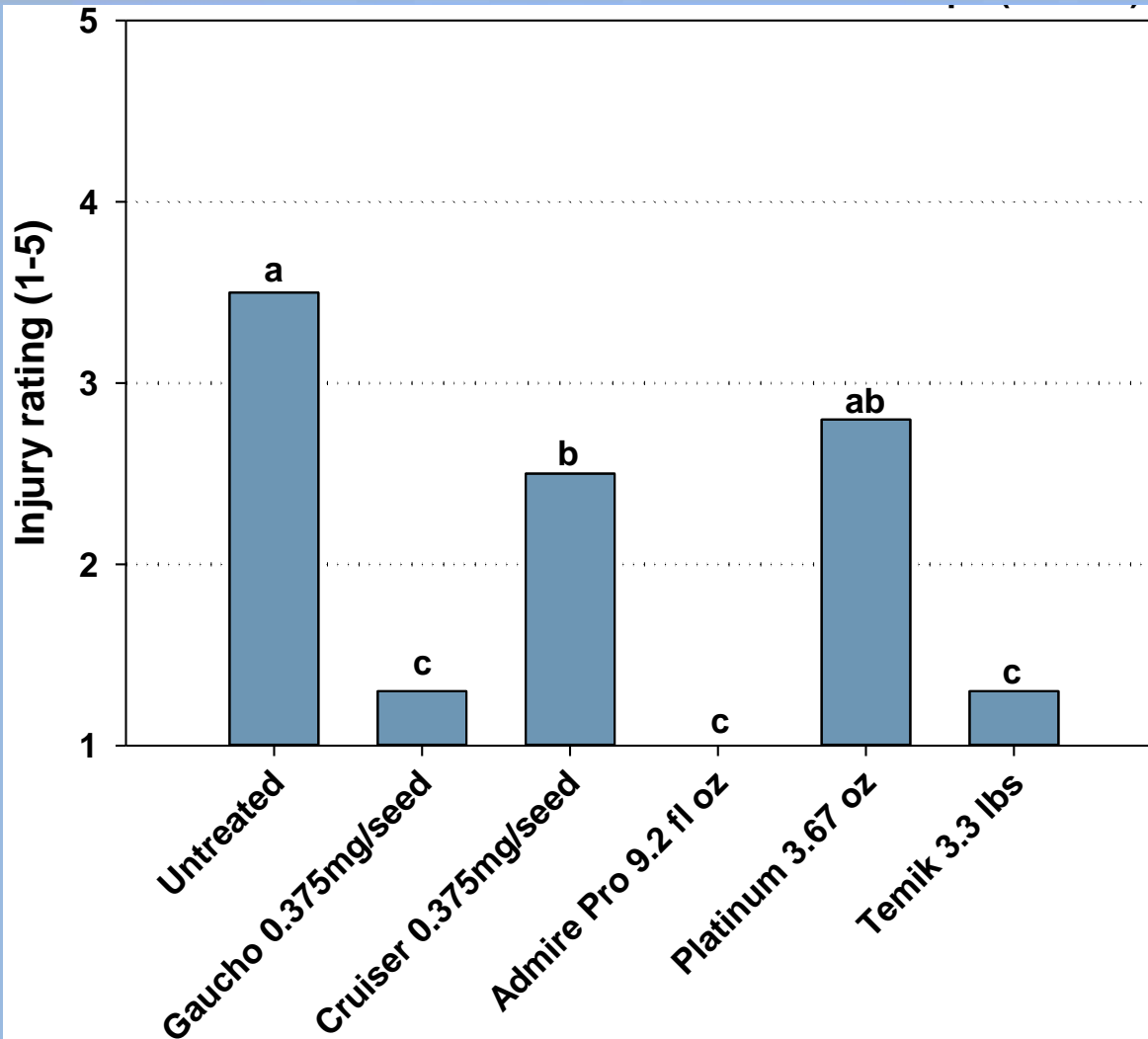
# Cruiser seed treatment has activity on cotton aphid

## Winnsboro, LA (2013) - 37 DAP





# St. Joseph - 2013 (29 DAT) Infurrow spray test



> 95%  
Tobacco thrips



# So What's up with Cruiser?

- In 2013, Syngenta screened 7 populations of tobacco thrips
  - “... definitely measured a decrease in susceptibility to thiamethoxam” in the 4 populations from Arkansas, Louisiana, Mississippi, and Tennessee
  - The population from Mississippi showed signs of tolerance to imidacloprid
  - The populations from NC, TX and VA were susceptible
- This was a late and limited effort
  - There will be a lot of screening next year to determine the extent of the problem





# Thrips take home message

- Anticipate that Cruiser (thiamethoxam) will not provide adequate control of thrips in the Mid South during 2014 and beyond
  - Resistance appears likely and spreading
  - Be alert in other geographies
  - Cotton will be more affected than other crops
  - Imidacloprid may or may not be affected
  - Seedling disease or use of pre- or post-emergence herbicides may compound the effects of thrips injury

# Sampling Thrips





# Adult Thrips



***Frankliniella occidentalis***  
Western Flower Thrips



***Frankliniella fusca***  
Tobacco Thrips





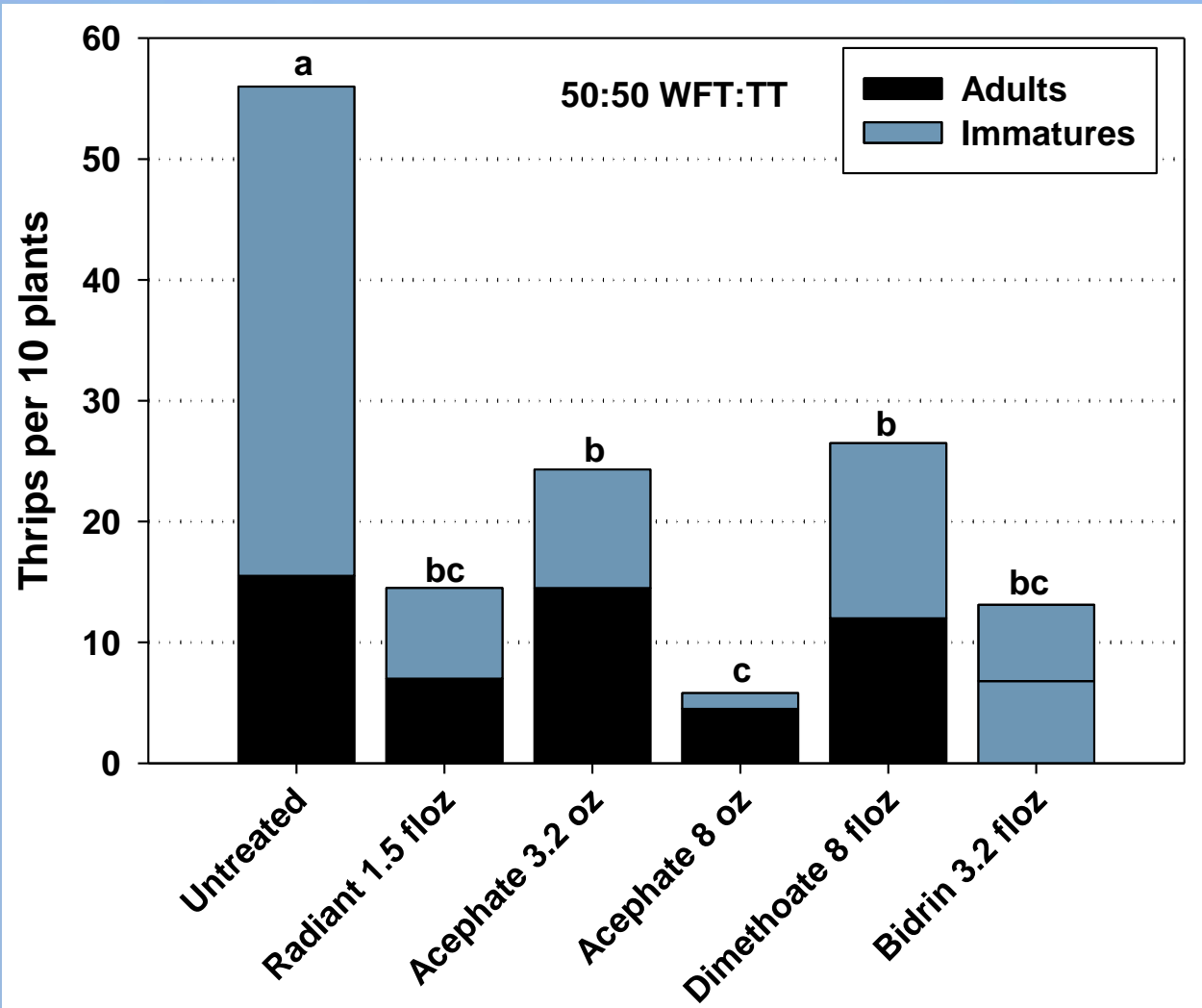
# Immature Thrips





# Foliar Thrips Trial in Cotton

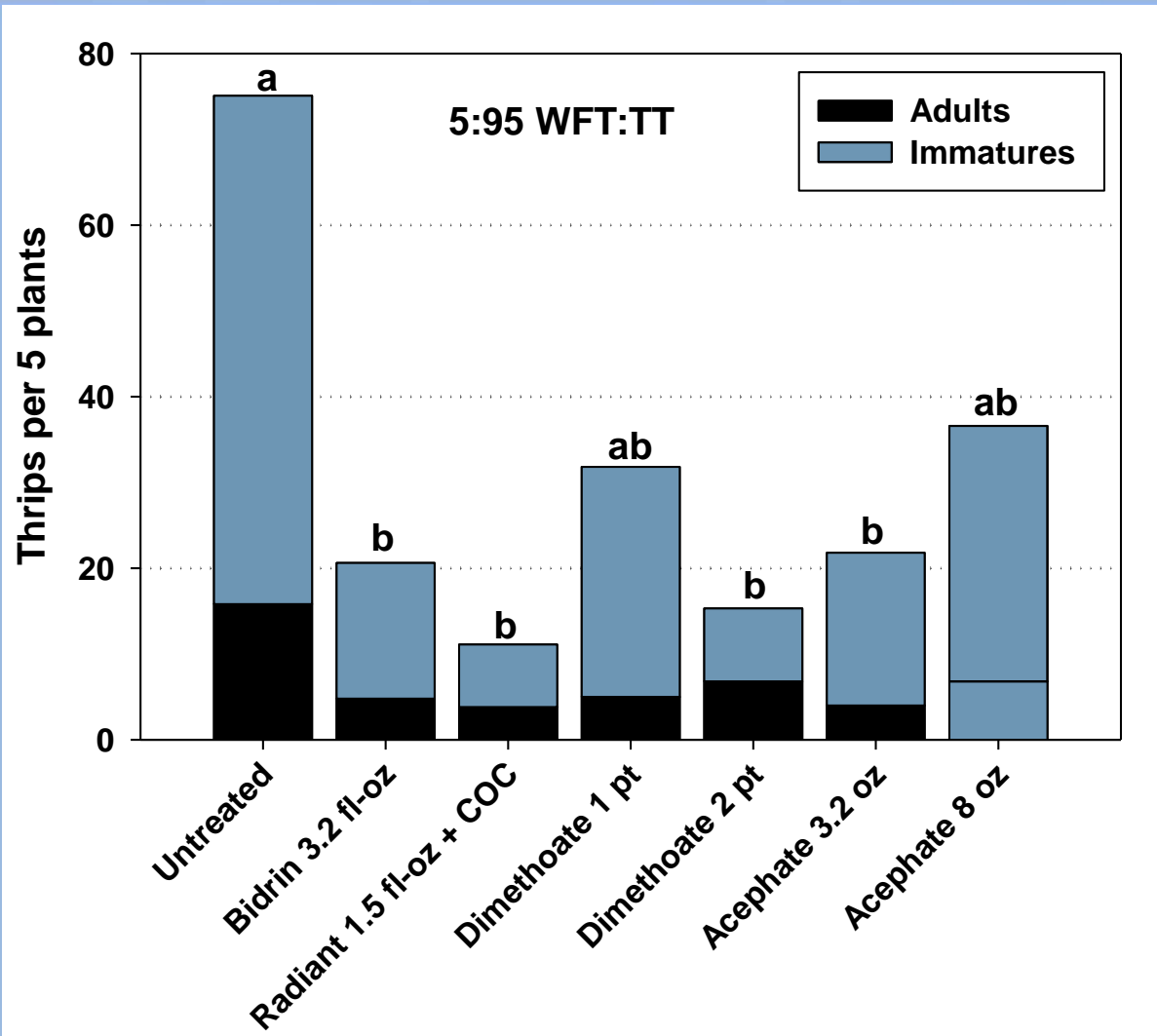
Winnsboro, LA - 2012 (8 DAT)





# Foliar Thrips Trial in Cotton

St. Joseph, LA - 2013 (5 DAT)







# Questions?

**Research Supported by:**

