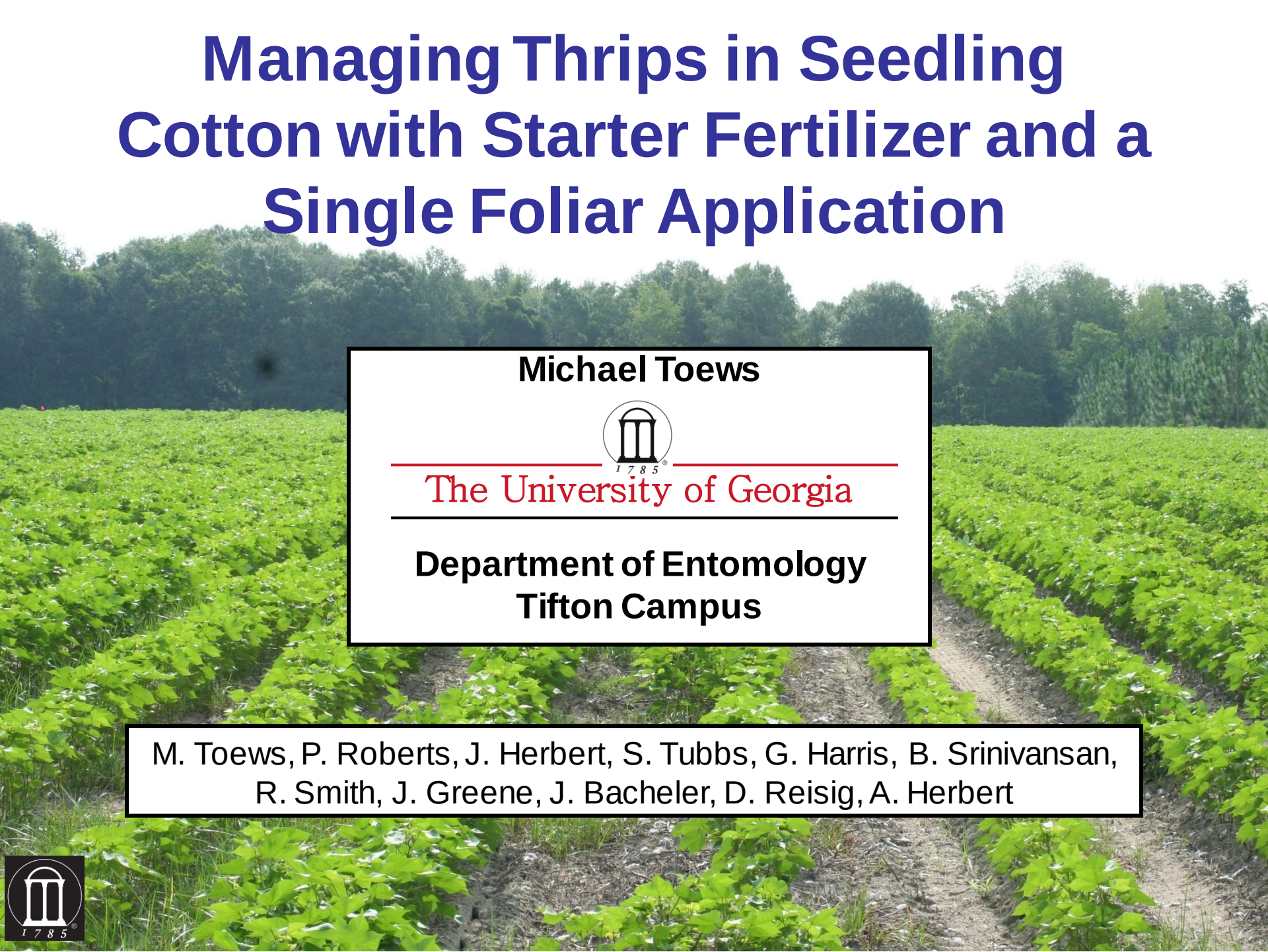
Managing Thrips in Seedling Cotton with Starter Fertilizer and a Single Foliar Application



Michael Toews

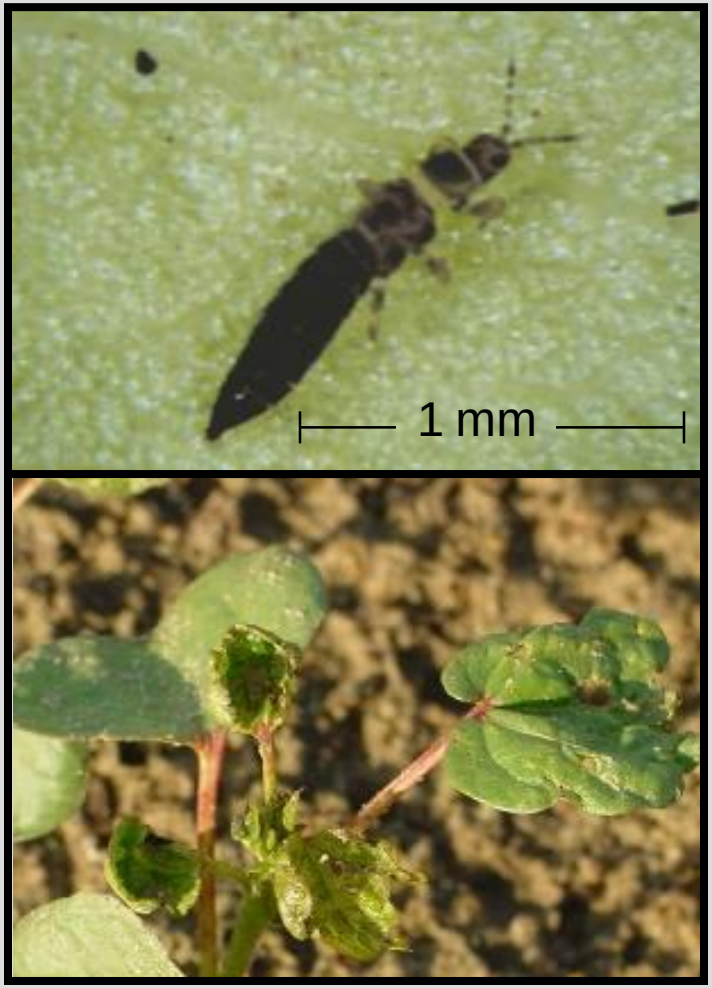
The University of Georgia

Department of Entomology
Tifton Campus

M. Toews, P. Roberts, J. Herbert, S. Tubbs, G. Harris, B. Srinivansan, R. Smith, J. Greene, J. Bacheler, D. Reisig, A. Herbert

Background

- Thrips are the most consistent insect pests of SE cotton production
  - Damage includes leaf curling, delayed maturity, loss of apical dominance and stand loss
  - Loss of aldicarb is driving thee need for alternatives
  - Damage is most intense under conventional tillage with planting dates before May 12



Background

- University generated data show:
  - Neonicotinoid seed treatments by themselves are inadequate for early planting and conventional tillage
  - Repeated foliar applications will lead to insecticide resistance and secondary pest outbreaks

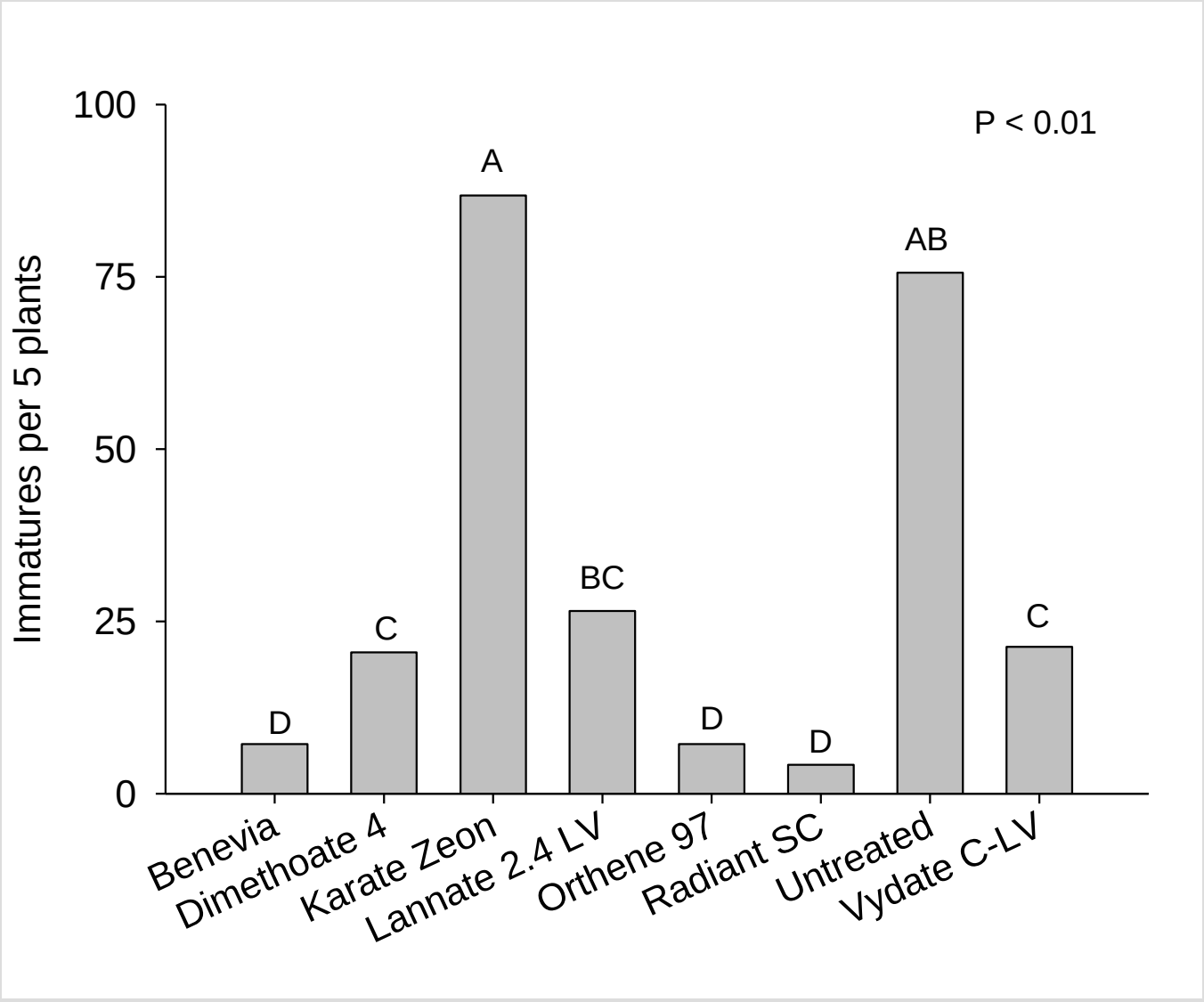
Research Objectives

- Evaluate efficacy of potential foliar insecticides for managing thrips in seedling cotton
- Examine how a seed treatment in combination with starter fertilizer and a well timed foliar application may mitigate thrips injury
  - Determine the optimal timing for the single foliar application
- Examine strip tillage and how it affects thrips populations
- Response variables reported here:
  - Counts of immature thrips
  - Above ground plant biomass
  - End of season lint yield

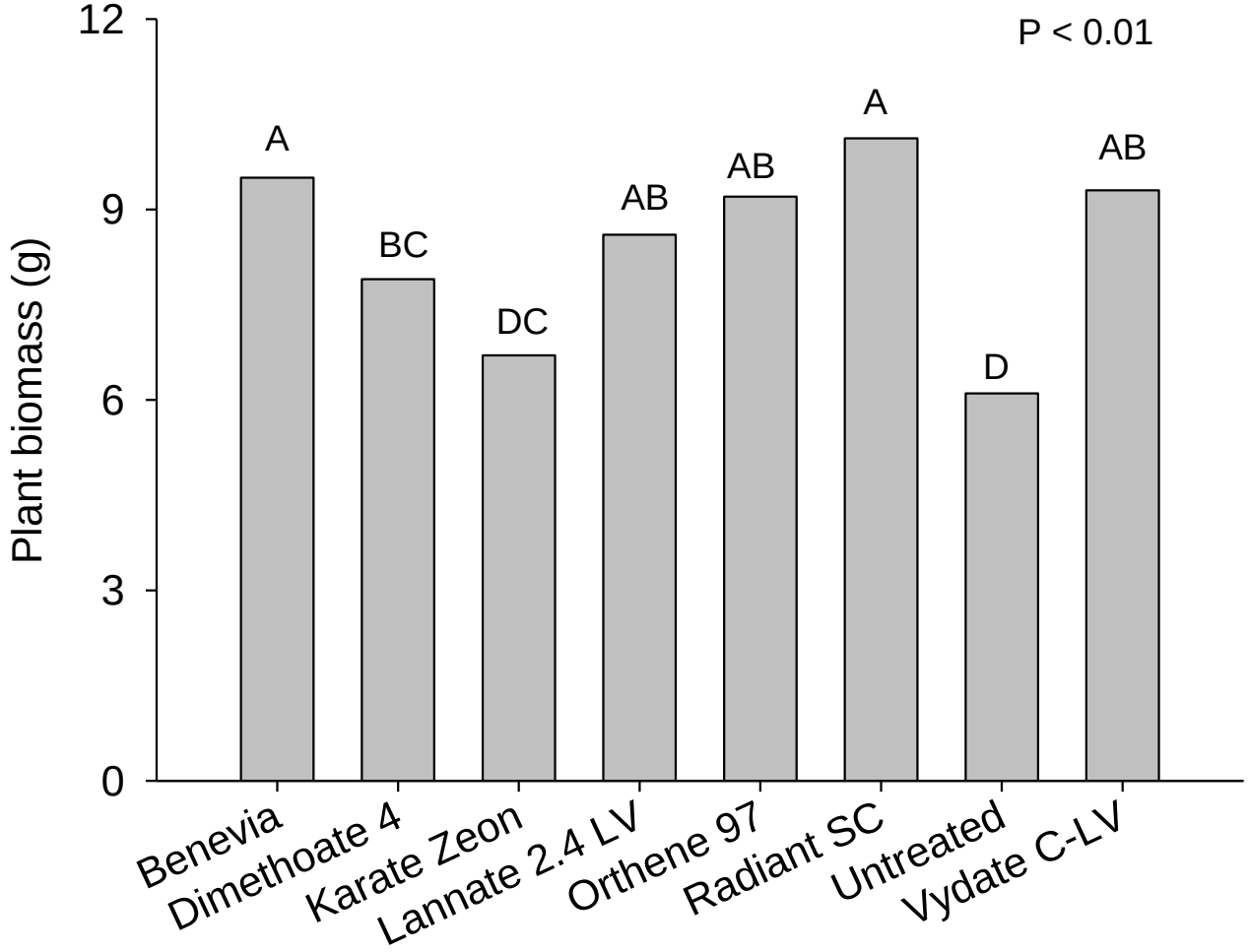
Experimental Methods

- All trials (AL, GA, NC, SC, and VA) planted in April under conventional tillage
- Insecticide trials (fungicide treated PHY 375 WRF) were sprayed twice with high rates of Benevia, Dimethoate 4, Karate Zeon, Lannate 2.4 LV, Orthene 97, Radiant SC or Vydate C-LV
- Independent starter fertilizer trials (10 gal 10-34-0) were conducted under irrigated and dryland conditions
- Both starter trials (fungicide + Cruiser treated PHY 375 WRF) received foliar applied acephate at 90% 1st true leaf bud or at second true leaf

Insecticide Trials: Immatures

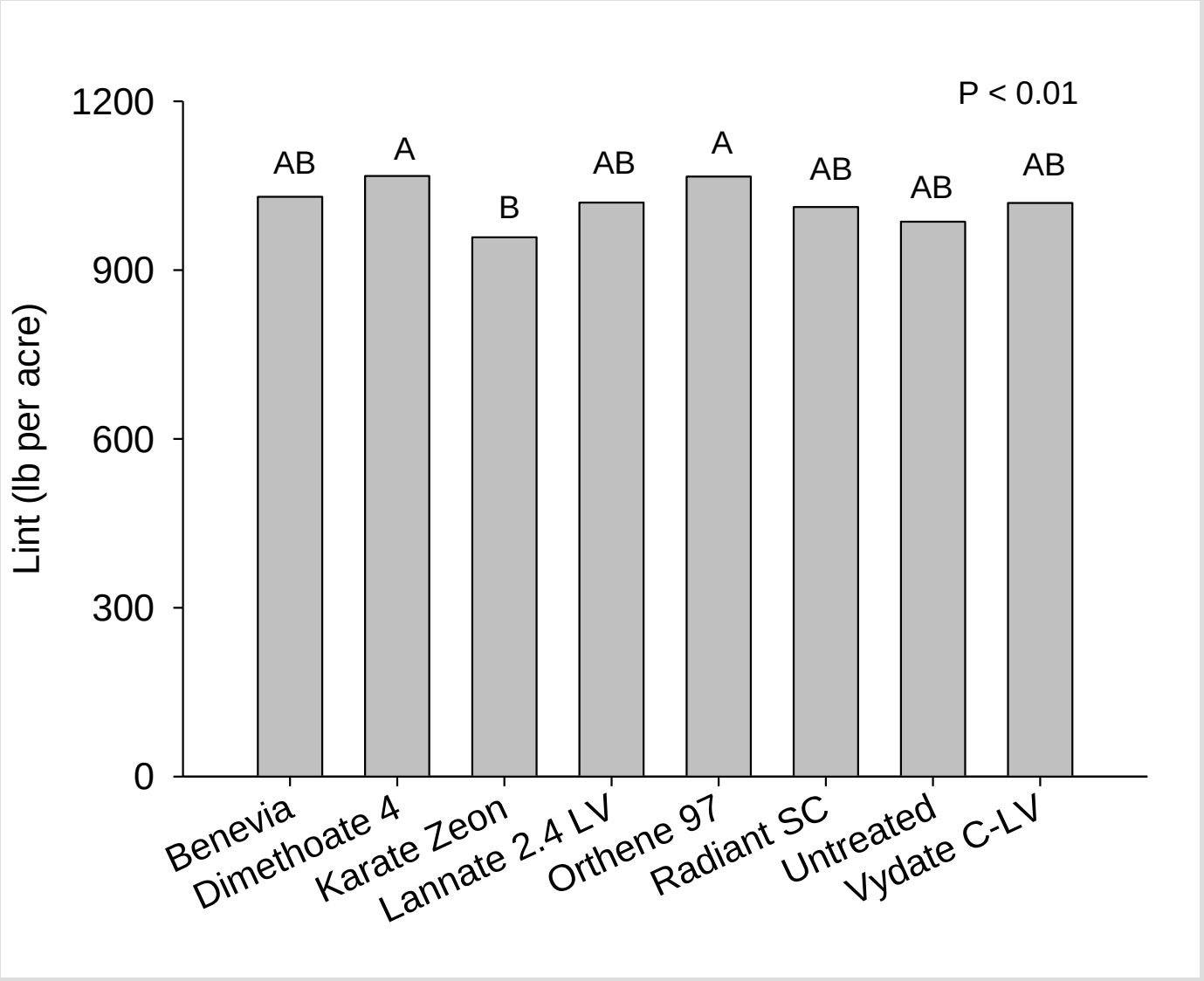


Insecticide Trials: Biomass



Inverse correlation between biomass and immatures P< 0.01

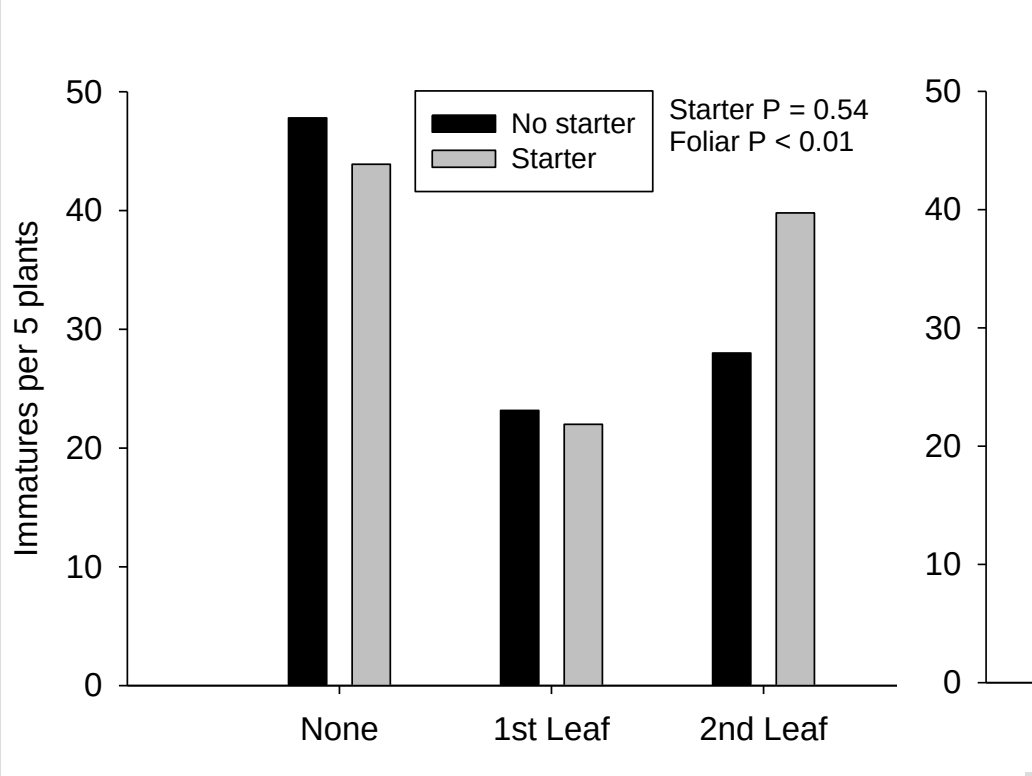
Insecticide Trials: Lint



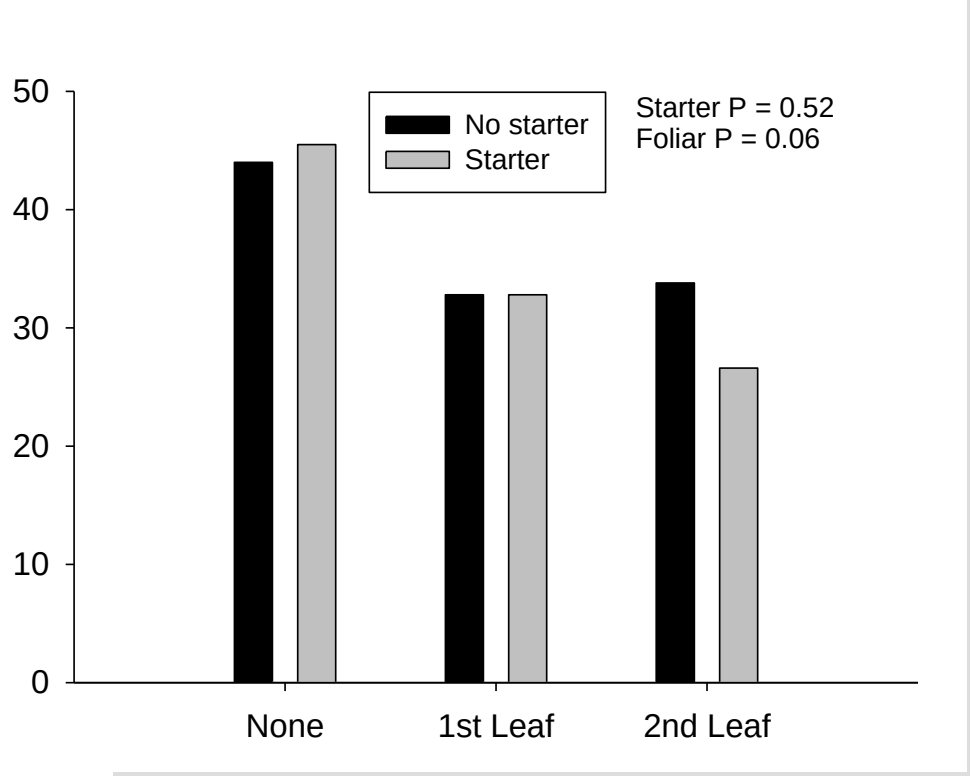
Inverse correlation between lint and immatures
P = 0.22

Yield equals cumulative plant stress!

Starter Trials: Immatures

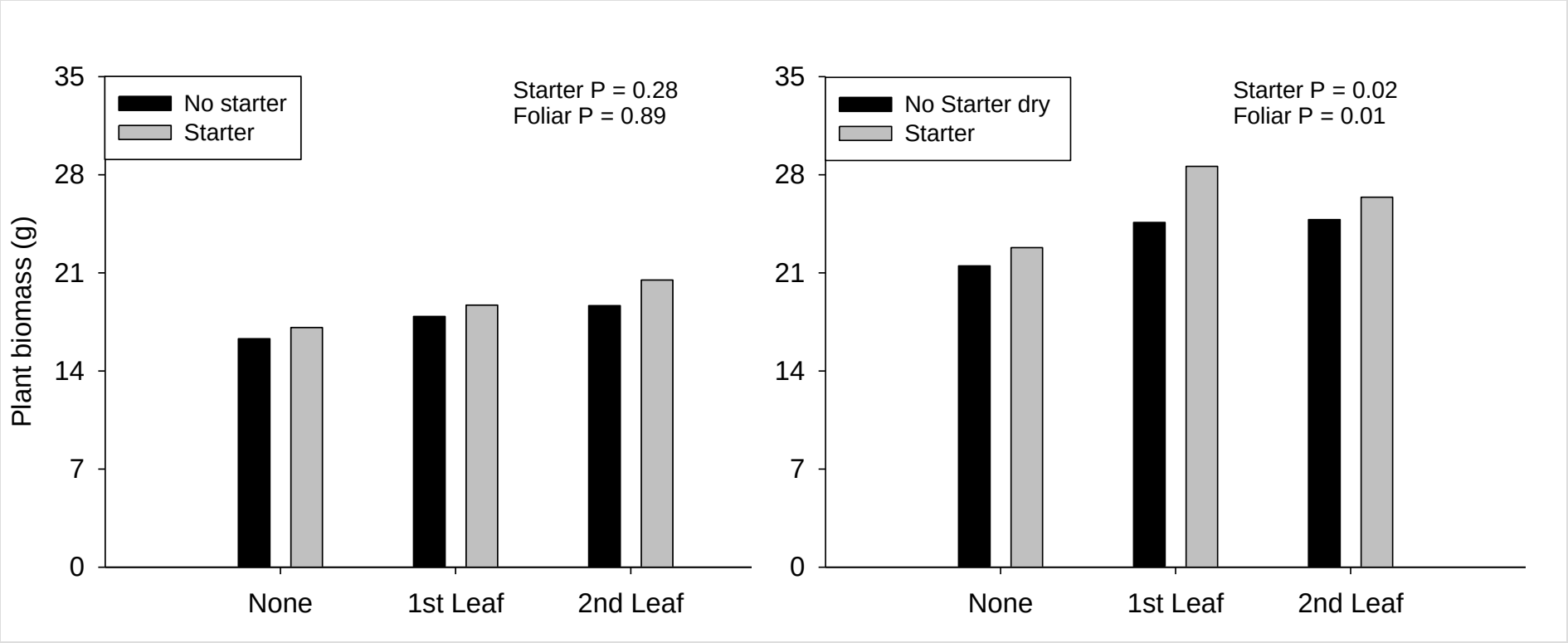


Dryland



Irrigated

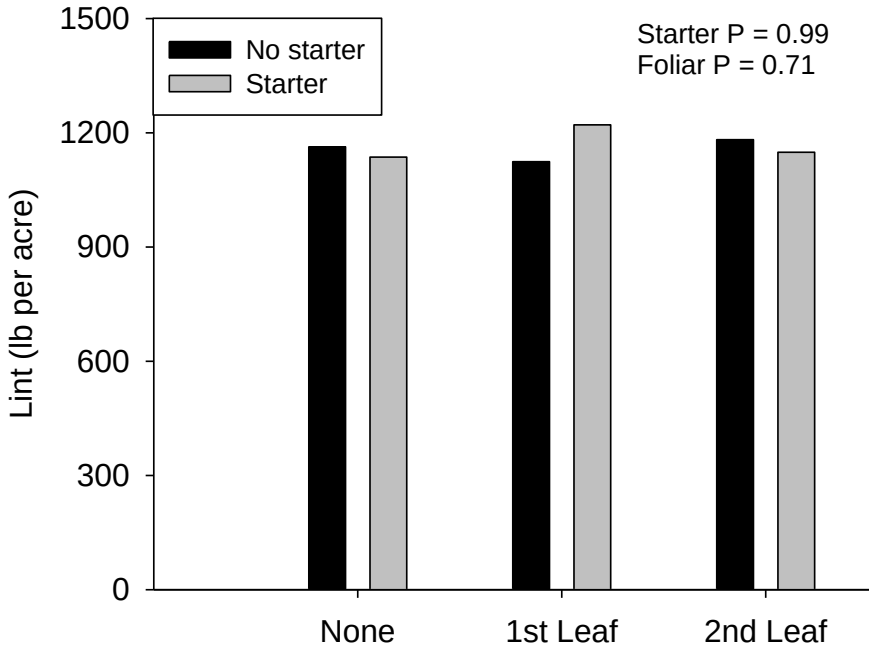
Starter Trials: Biomass



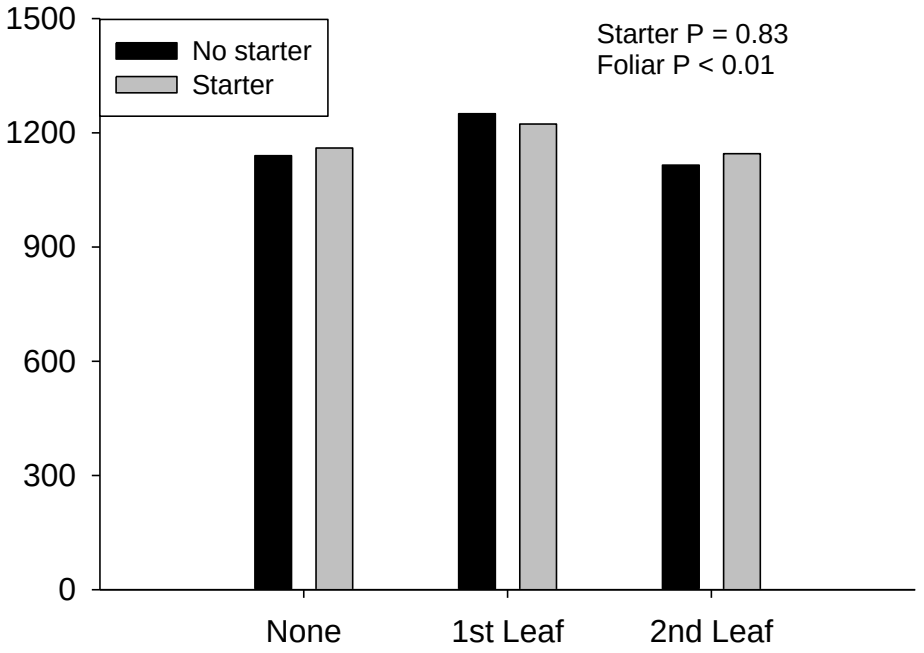
Dryland

Irrigated

Starter Trials: Lint



Dryland



Irrigated

Discussion

- Insecticide trials
  - Benevia and Radiant SC provided similar levels of immature suppression to Orthene 97
  - The pyrethroid provided very little immature suppression and performed poorly relative to other trts
  - Generally speaking, plants receiving two foliar treatments developed less biomass than plants with a seed treatment only

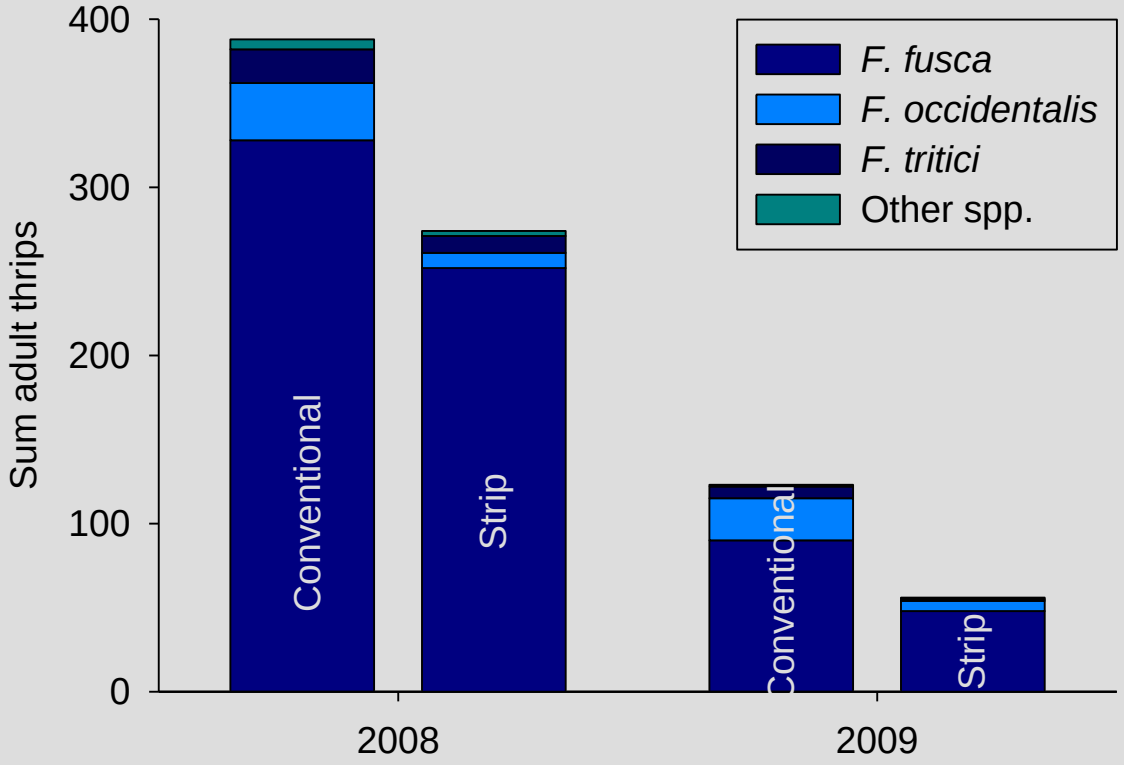
Discussion

- Dryland starter trials
  - No obvious advantage to use of starter fertilizer
  - Inconsistent differences attributed to foliar applied insecticides
  - Trials received little rainfall for the first 60 days
- Irrigated starter trials
  - There was a measurable increase in plant biomass when using starter fertilizer
  - Application of foliar insecticide at 90% first true leaf bud provided optimum thrips suppression

Strip Tillage Work

- Experiments were conducted in 2008-2009 at Tifton, GA
  - RCBD (2 x 3 factorial arrangement) with 4 reps (8-row by 45')
    - Conventional tillage vs. strip tillage
    - Winter cover crops (crimson clover, wheat, or rye)
  - Cotton (DP 164 B2RF) was planted during 1st wk of May

Results: Species Composition

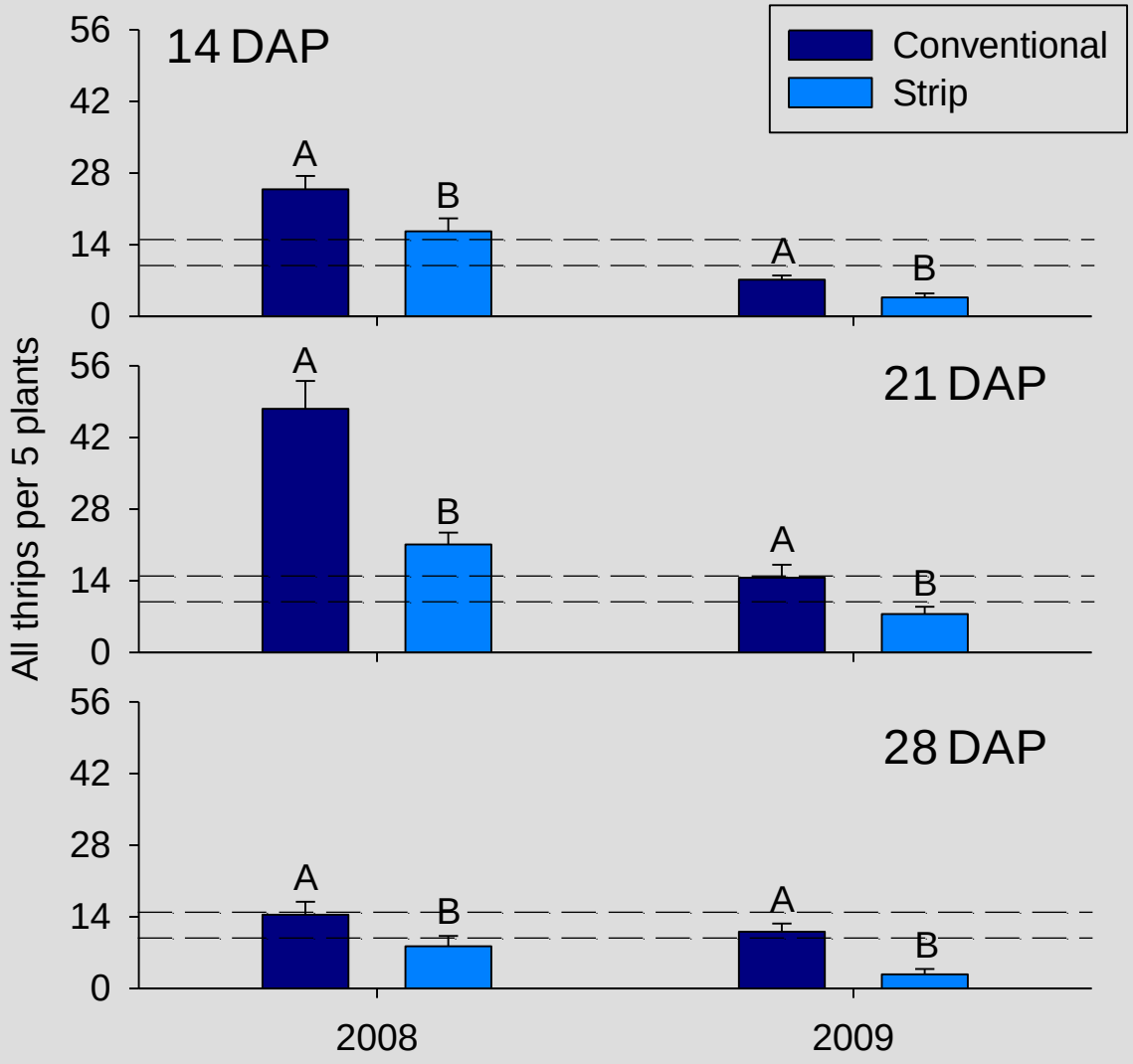


662 adults
931 immatures

179 adults
383 immatures

85.4% *F. fusca*, 8.8% *F. occidentalis*, 4.5% *F. tritici*, 1.3% other spp.

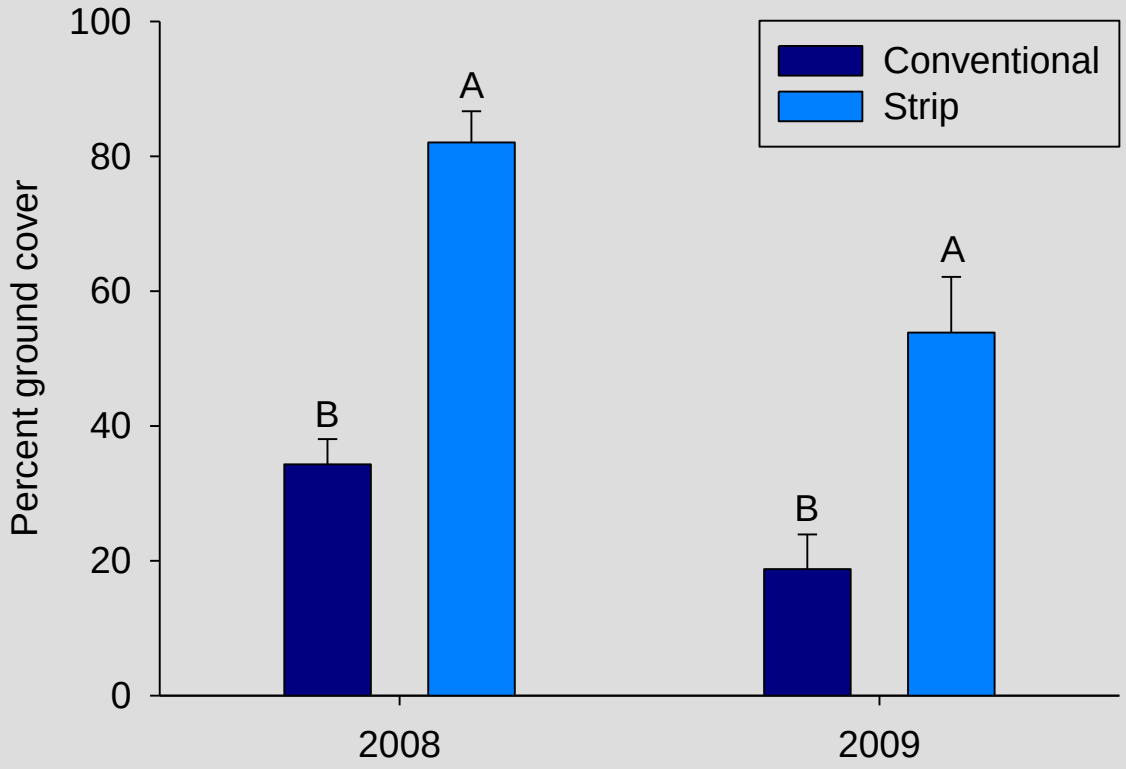
All Thrips per 5 Plants



There were no tillage by cover crop interactions, and there were no significant differences among cover crops

Dotted lines designate the extension recommended foliar treatment threshold of 2 to 3 thrips per plant

Percent Ground Cover



There were no tillage by cover crop interactions in either year

In 2008 only, there was more ground cover in wheat and rye than crimson clover

Discussion

- Why were thrips populations 1/3 smaller in 2009 compared to 2008?
  - Temperature: in 2008 there were 415 dd above 15.6º C, compared to 411 dd in 2009
  - Rainfall: in 2008 there was a total of 4.9 cm (5 events) compared to 17.0 cm (16 events) in 2009
- Across variable conditions, thrips counts exceeded the foliar threshold in all but one sample date in conventionally tilled plots
  - Data suggest that seed treatments and conventional tillage did not provide enough protection for early planting windows
  - Seed treatments and strip tillage did provide the required protection

Acknowledgements

- Technical support: David Griffin, Corey Thompson, Annie Horak, Dan Mott, Sean Malone, Steven Roberson, Jess Samler
- Funding: Cotton Incorporated
- Product donations: Amvac Chemical Corp., BASF, Bayer CropScience, DuPont, Dow AgroSciences, Monsanto Co., and Syngenta Crop Protection

email: mtoews@uga.edu, webpage: www.ent.uga.edu