

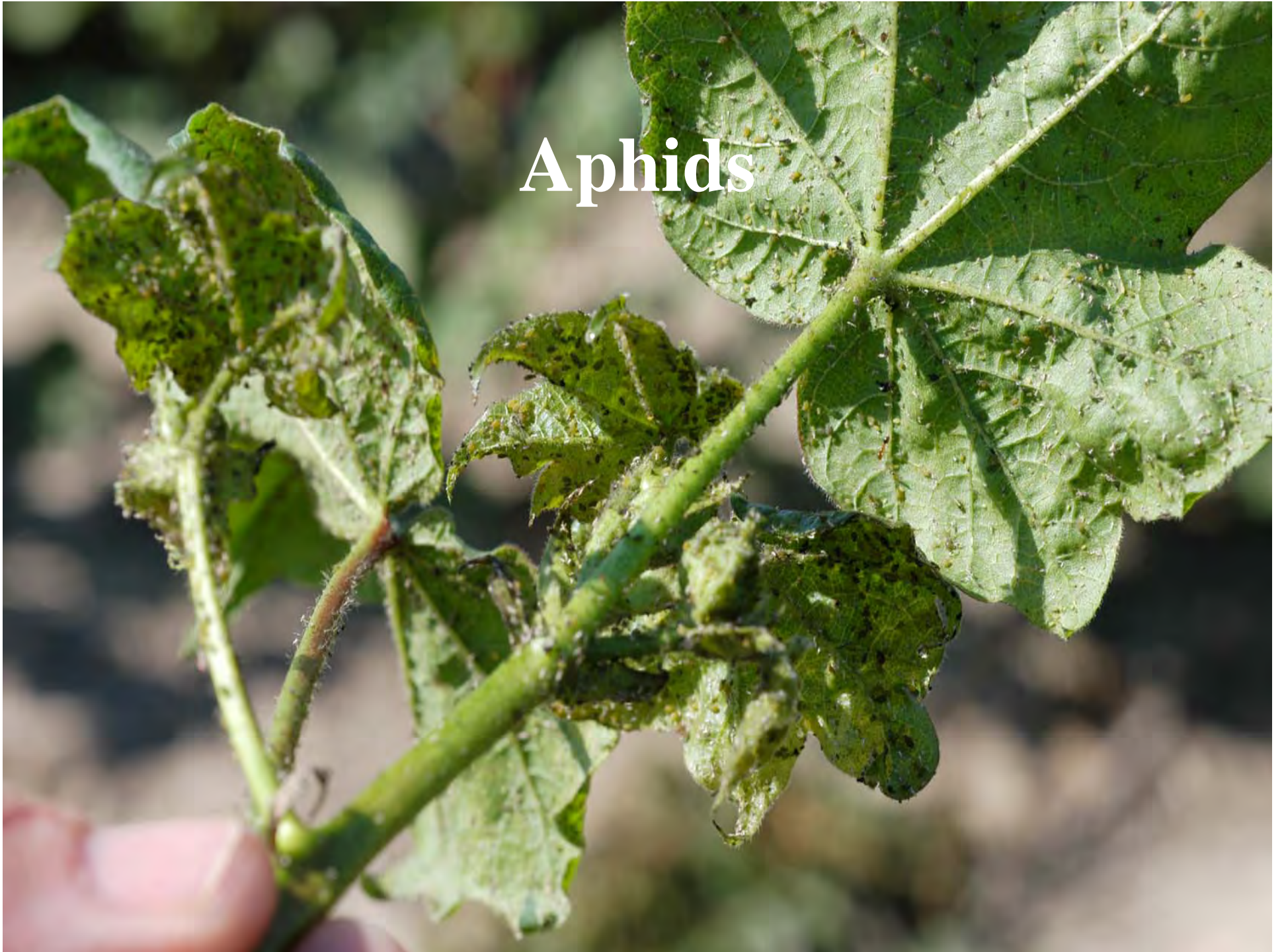
Cotton Insect Management

Crop College 2007

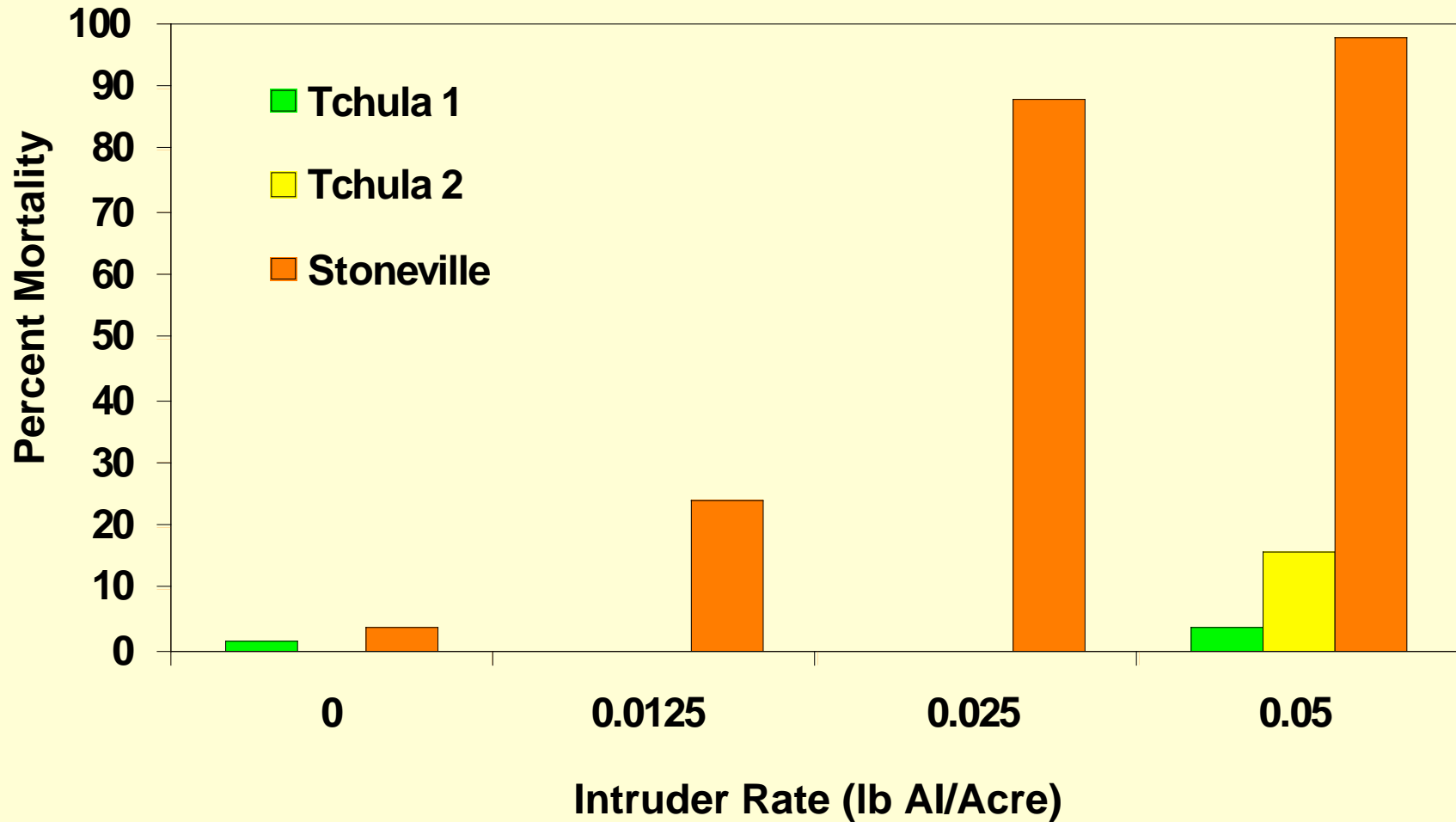
Angus Catchot, Extension Entomologist
Mississippi State University



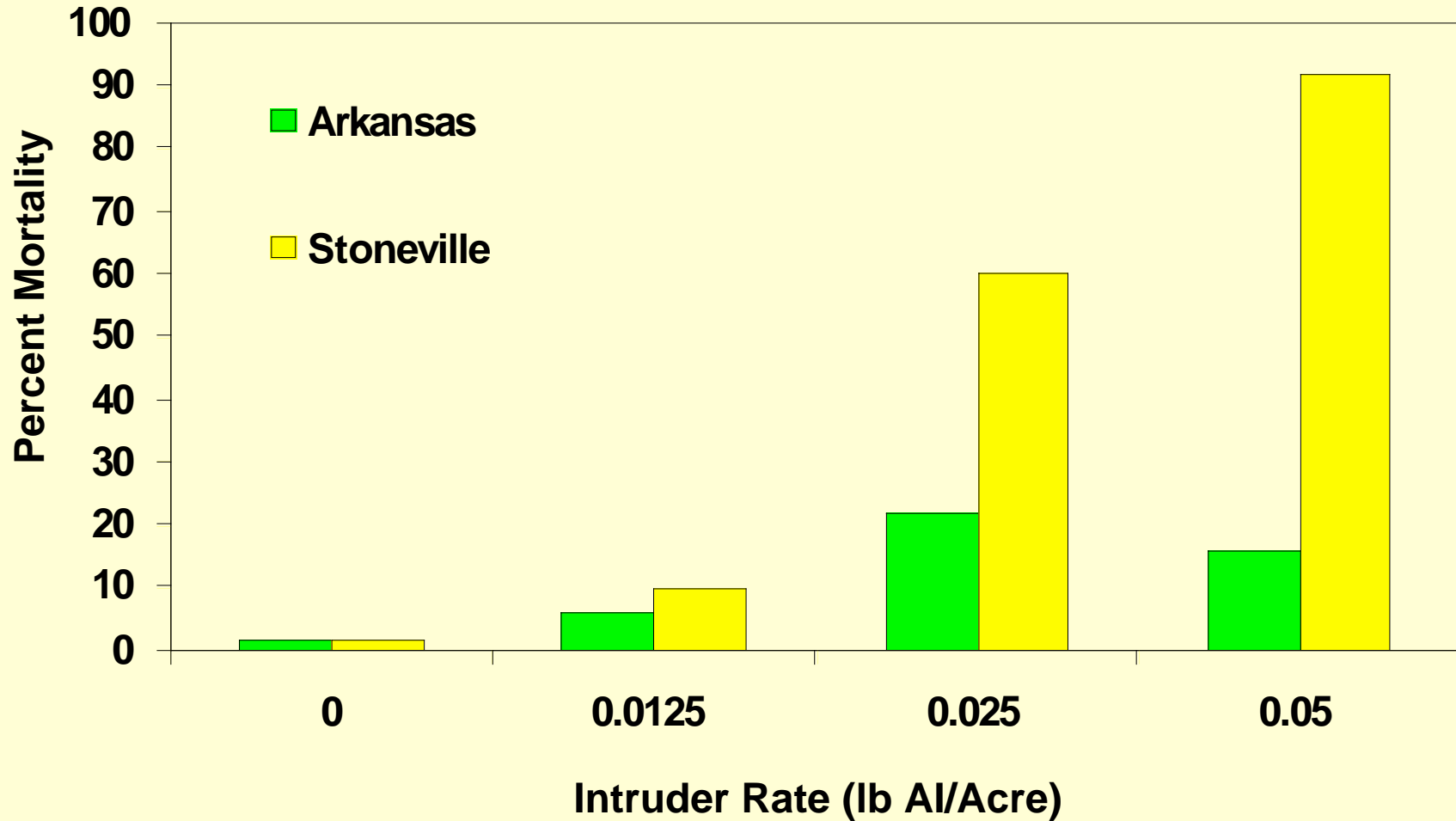
Aphids



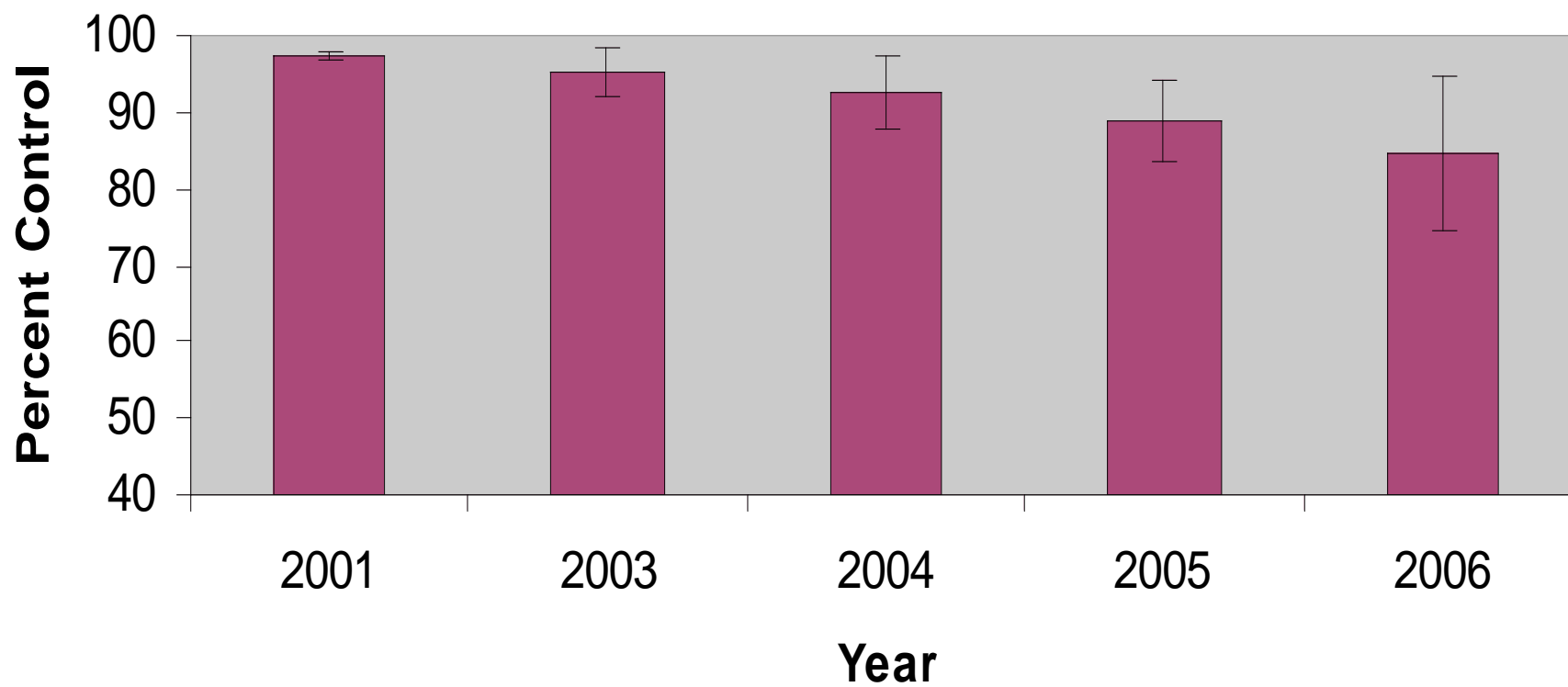
Cotton Aphid Bioassay - MS



Cotton Aphid Bioassay - AR



Neonicotinoid Efficacy Against Cotton Aphid LSU AgCenter - Macon Ridge Station



Thresholds

MS – Consider treatment when spots of high aphid populations are causing heavy localized honeydew accumulation, aphid numbers are increasing over the remainder of the field, and no signs of diseased aphids are present.

Important factors to consider before treatment:

- 1) Possibility of a fungal epizootic that will likely occur under high aphid infestation.**
- 2) Possibility of control failure with recommended insecticides.**
- 3) Predator and parasite populations that may suppress aphids.**
- 4) Presence of additional stress factors, such as drought or low plant vigor**
- 5) Need to apply insecticide for control of other pests.**

New Arkansas Threshold

Kring and others

<http://entomology.uark.edu/faculty/kringAphidNaturalEnemyThreshold.pdf>

IF 50% of plants are infested with an aphid colony and the population is building

Are there at least 0.3 lady beetle adults or 0.2 lady beetle larvae per row ft. (1 adult per 3 ft. or 1 larva per 5 ft.)?

If NO – Treat

If YES – Wait 7-10 days and sample again. At this time, if the aphid population has increased (growing), treat with insecticide.

Aphids

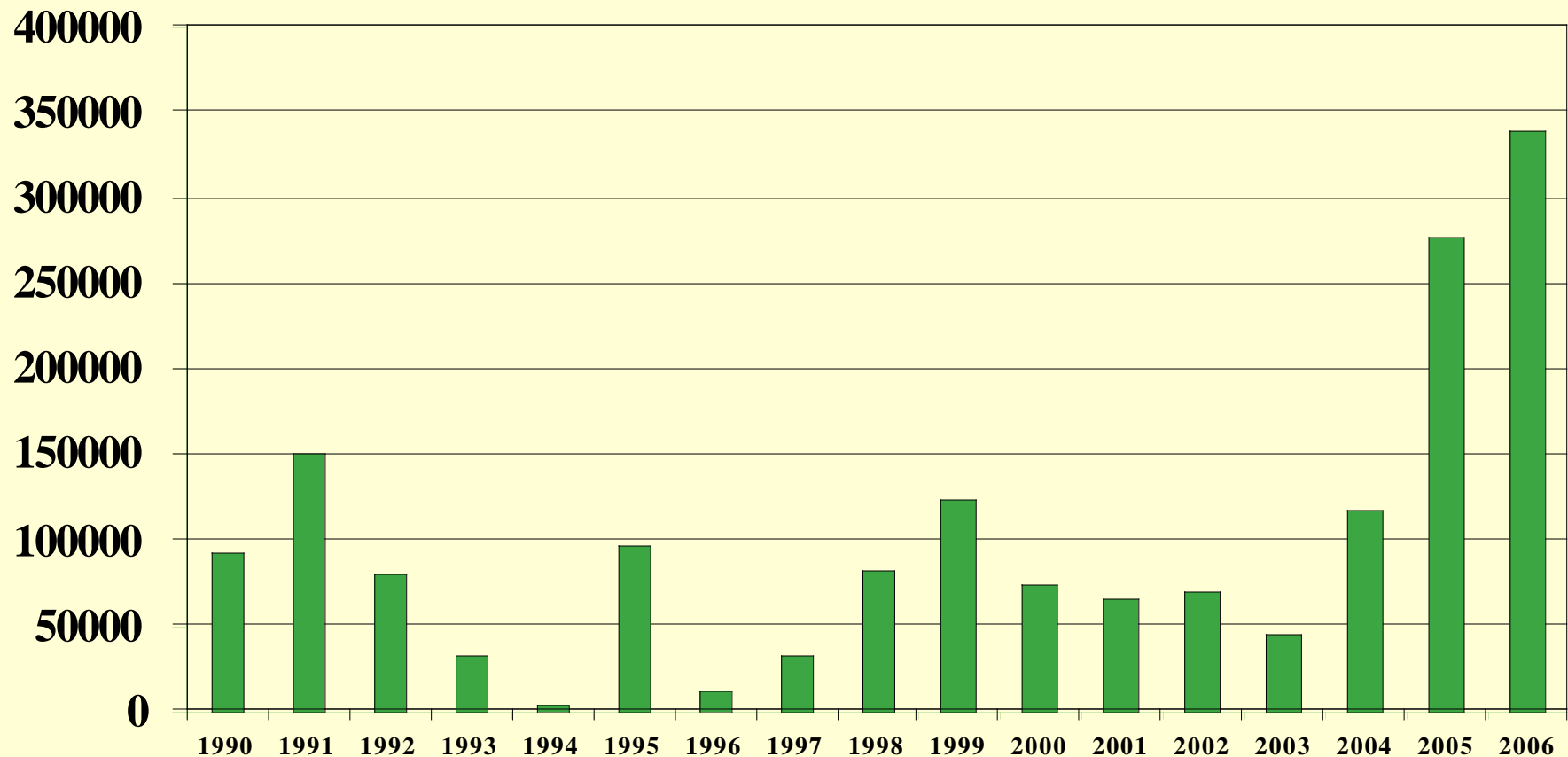
Summary and Conclusions

- **Limit insecticide applications early that will flare aphids.
(Pyrethroids and Organophosphates)**
- **Rotate chemistries when appropriate.**
- **Don't apply foliar neonicotinoids following neonicotinoid seed treatments.**
- **Use accurate thresholds and spray only when necessary.**
- **Eliminate unnecessary applications.**
- **Use full labeled rates.**

Spider Mites



Trends in Spider Mite Treatments in Mississippi (Acres Treated)



Possible Factors Contributing to Increased Frequency of Spider Mite Outbreaks in the South

- **Delayed burndown/Field Border Management**
- **Hot and Dry Conditions**
- **Beneficial Insect Reduction (Flaring)**
- **Increased use of Insecticide Seed Treatments vs. Temik?**
- **Resistance**

Spider Mite Product Review

Miticides

- Zephyr
- ABBA
- Oberon
- Zeal
- Acramite
- Fujimite
- Comite II
- Onager
- **Kelthane**

Insecticides

- **Bifenthrin**
- **Bidrin**
- **Curacron**
- **Dimethoate**
- **Lorsban**

Thresholds

- **“Treat when 40-50% of plants have spider mites and conditions are favorable for populations to increase”**
- **Need to treat out to at least 600-650 DD60's**

Summary

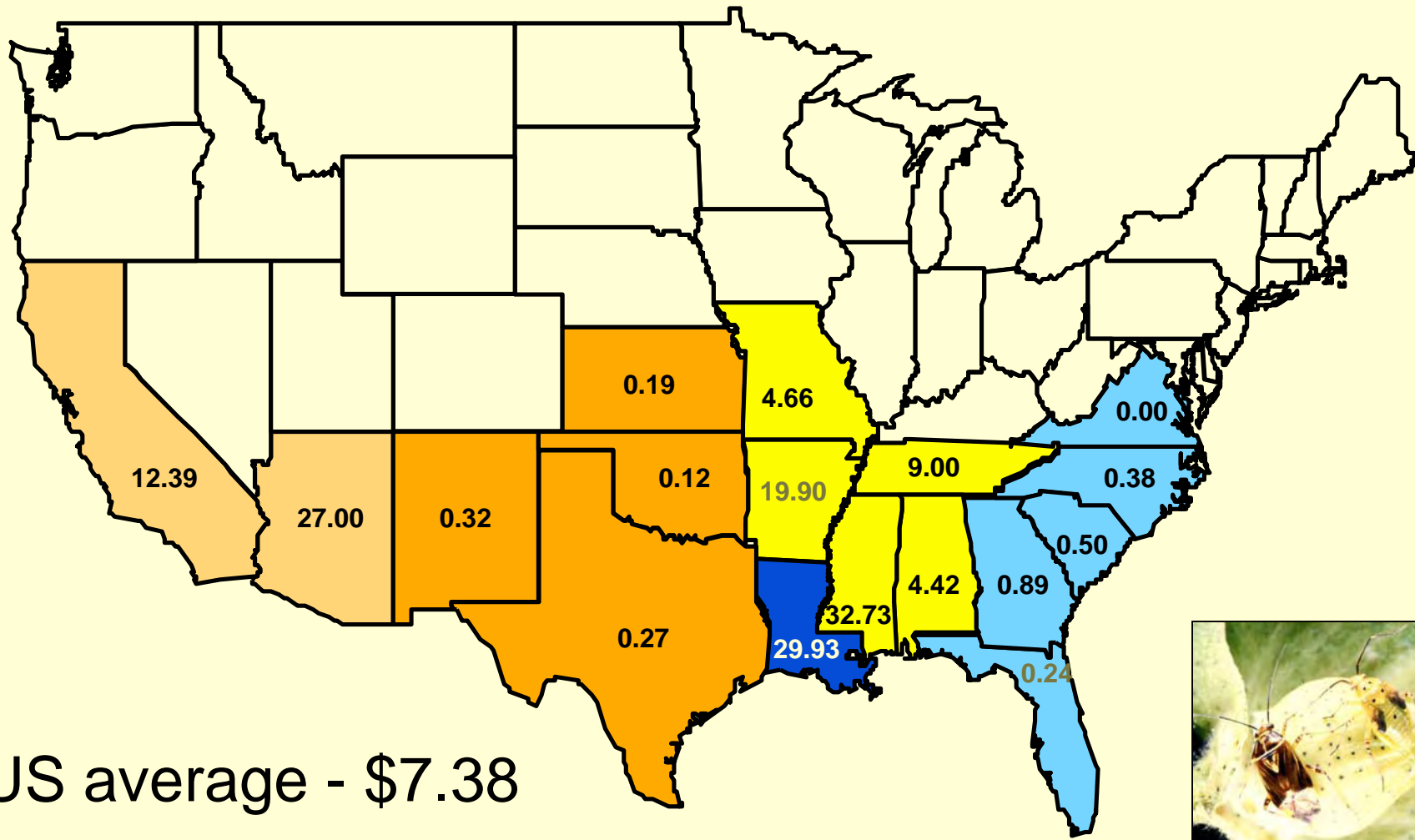
- **Don't create a your own problem**
- **Early season insecticide applications can “flare” mites**
- **Start clean, burndown early**
- **Watch moving equipment from infested fields to non-infested fields**
- **Increase volume and stay away from low drift tips**

Tarnished Plant Bug



U.S. Cotton Belt

Lygus spp. Control Costs - 2005

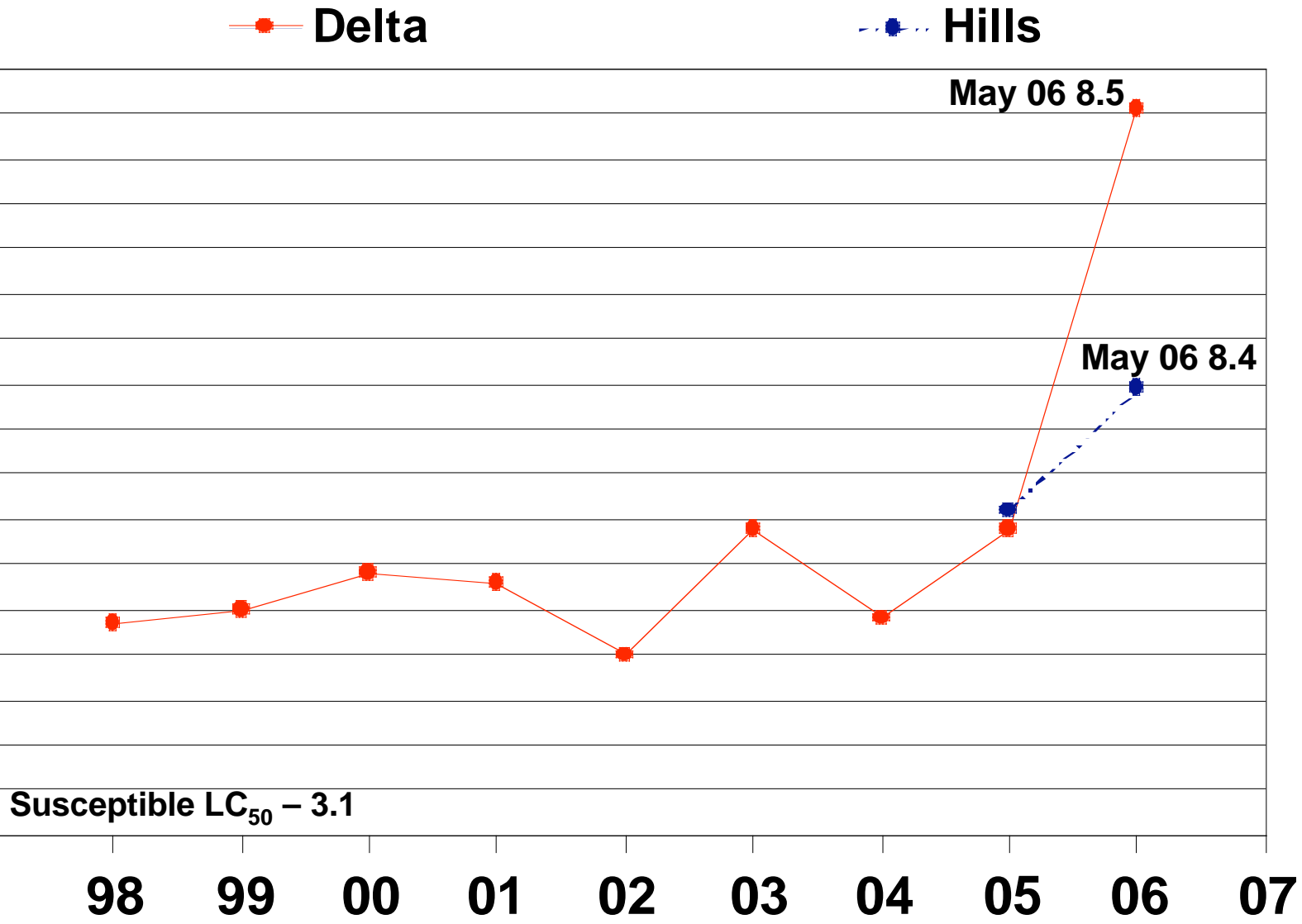


US average - \$7.38



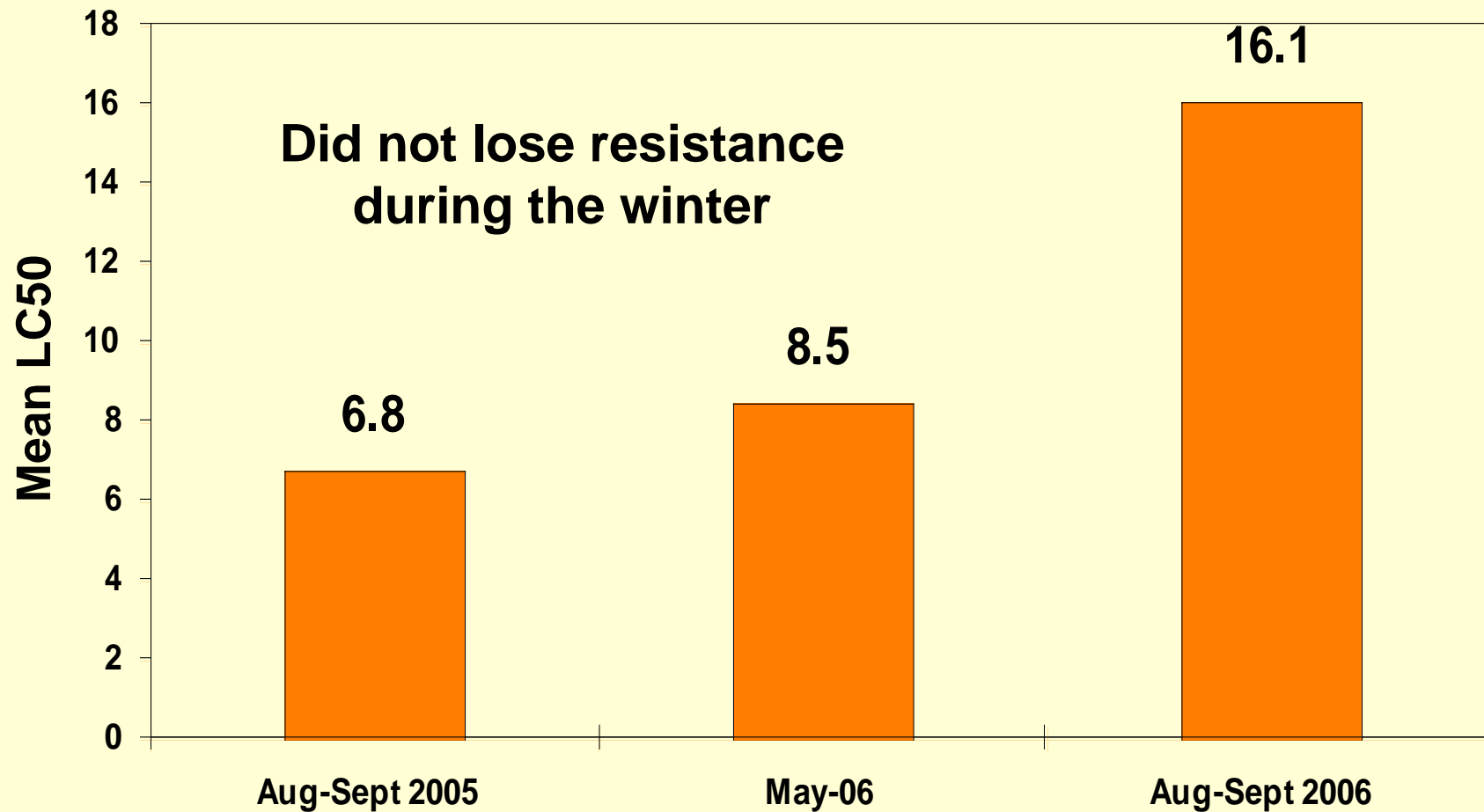
Orthene Mean LC_{50}
(20 Delta, 10 Hill Locations Aug. – Sept.)

17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0



Year (>3600 Adults Tested Each Year)

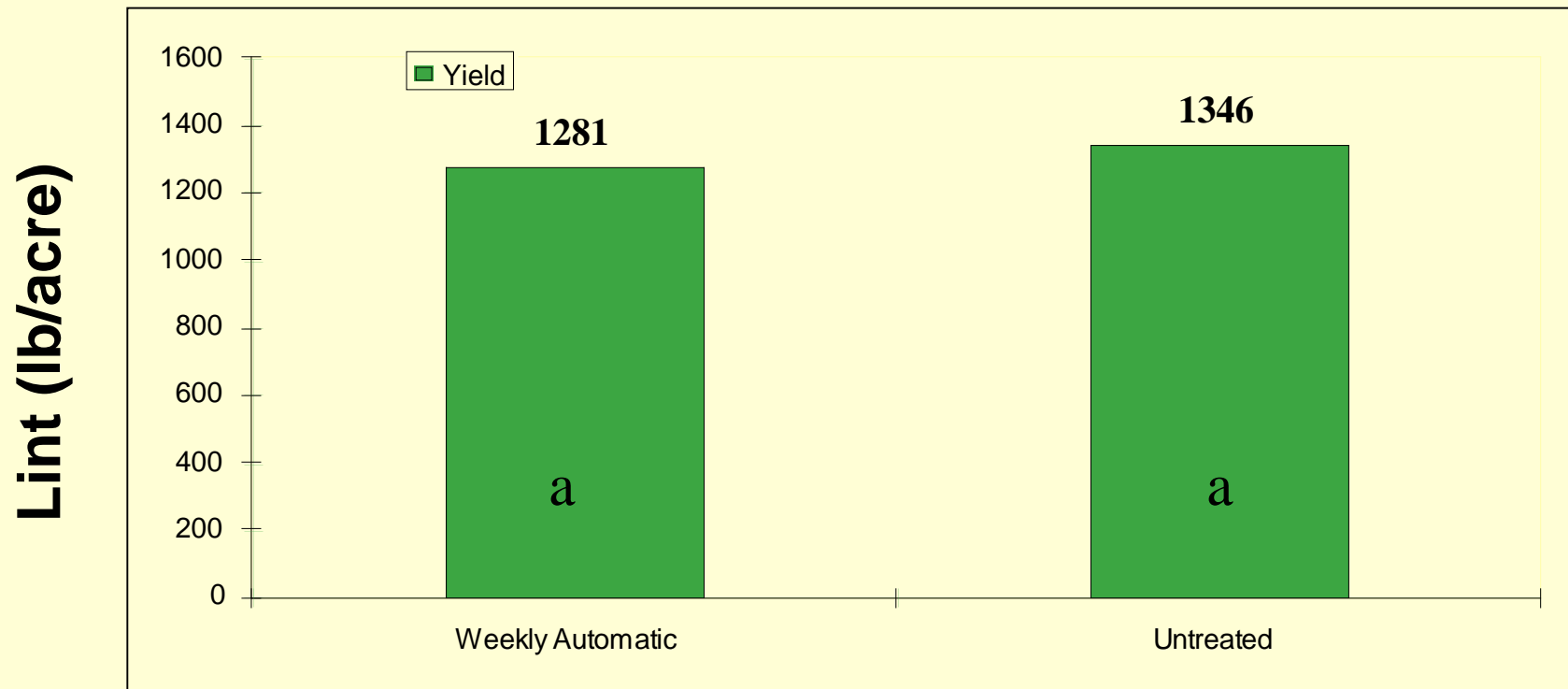
Acephate Resistance Survey



Early Season Plant Bug Threshold Study Methodology

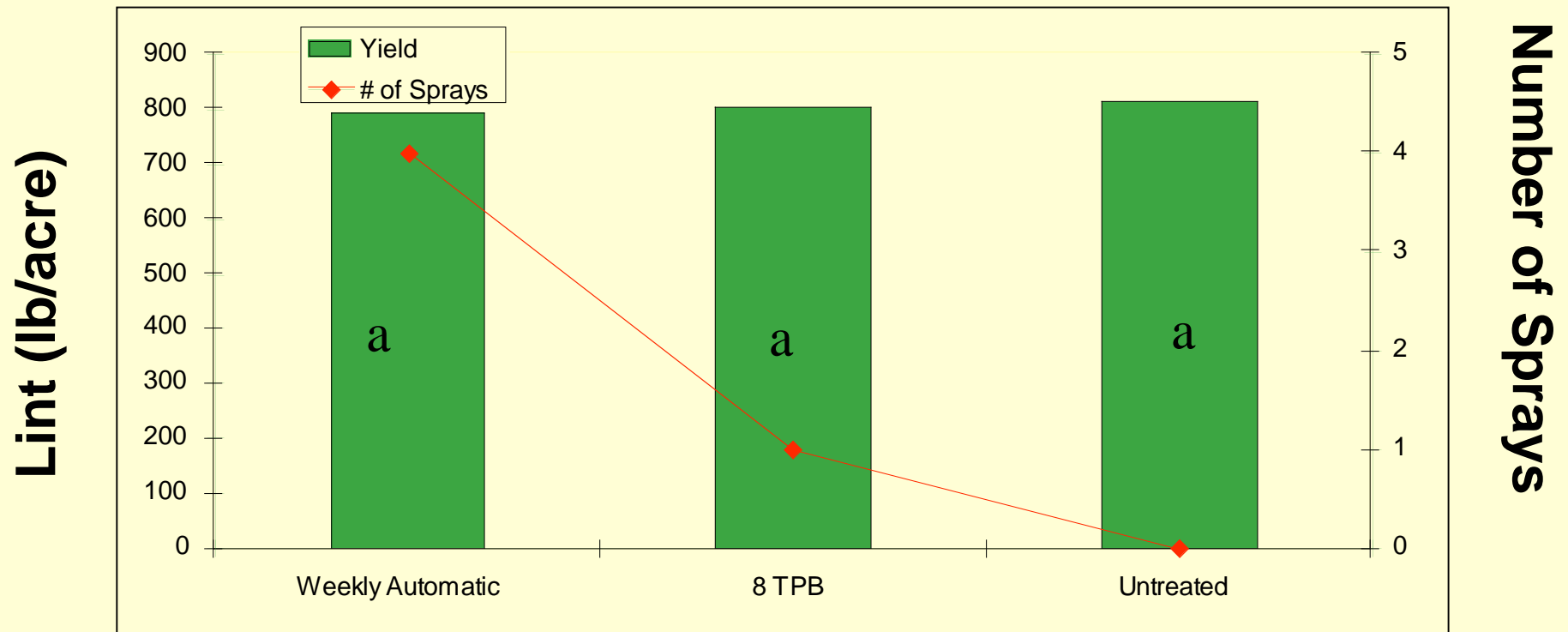
- Large Block Trials 24-36 rows X 100 ft
- Centric @ 2 oz/ A
- 4 Treatments to Trigger Applications:
 1. Untreated (for plant bugs prior to bloom)
 2. Low = 8 Plant bugs/ 100 sweeps
 3. High = 16 plant bugs/ 100 sweeps
 4. Automatic applications (weekly)

Pre-bloom TPB Thresholds MS (Greenwood), 2006



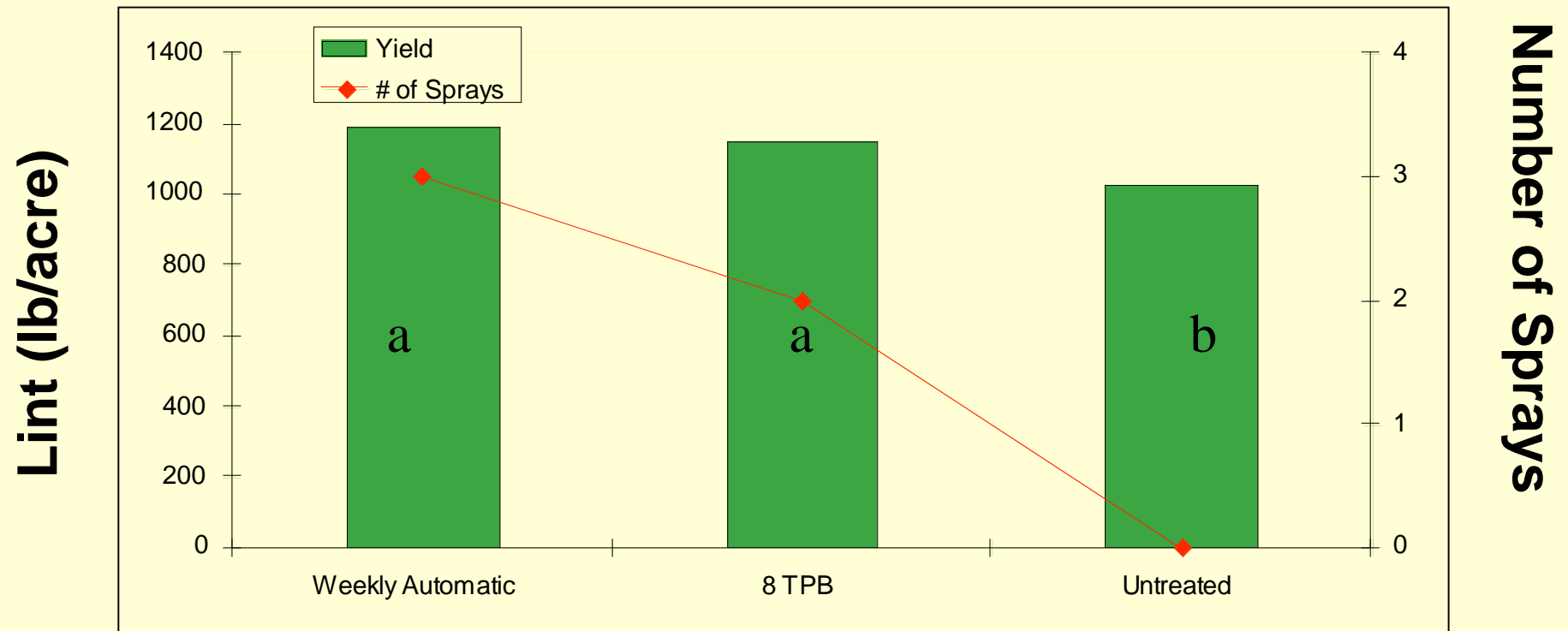
Early Season TPB Thresholds

Pre-bloom TPB Thresholds AR (Stevens), 2006



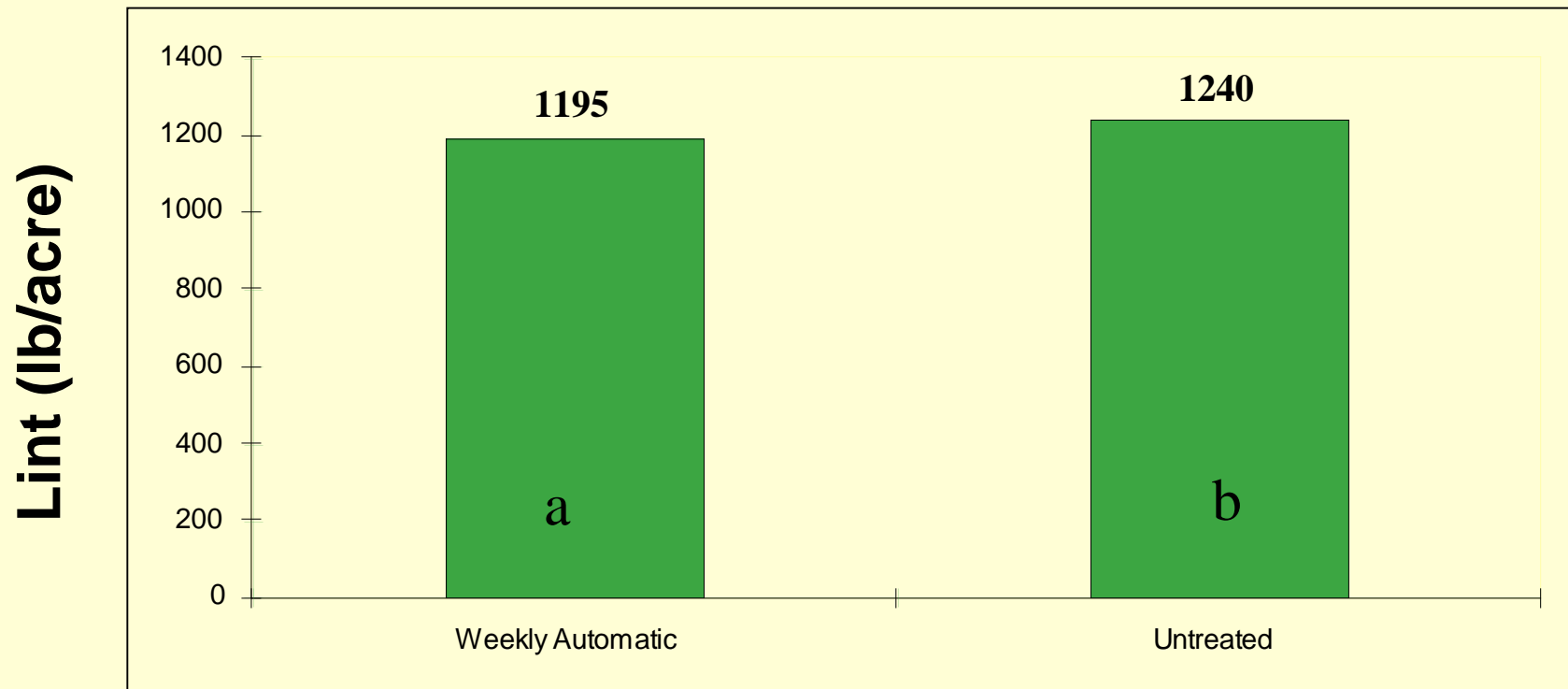
Early Season TPB Thresholds

Pre-bloom TPB Thresholds LA, 2006



Early Season TPB Thresholds

Pre-bloom TPB Thresholds 7 Mid-South sites, 2006



Early Season TPB Thresholds

Pre-Bloom TPB Threshold Summary

When $TPB < \text{threshold}$ we so no yield benefit
from automatic applications

Where bugs were above threshold it paid to spray

2005 Methods

- 120 commercial fields in TN, MS, LA, AR
- 4 sites in each field
- 5 direct sampling methods (# bugs, time)
- 4 indirect sampling methods (damage, time)

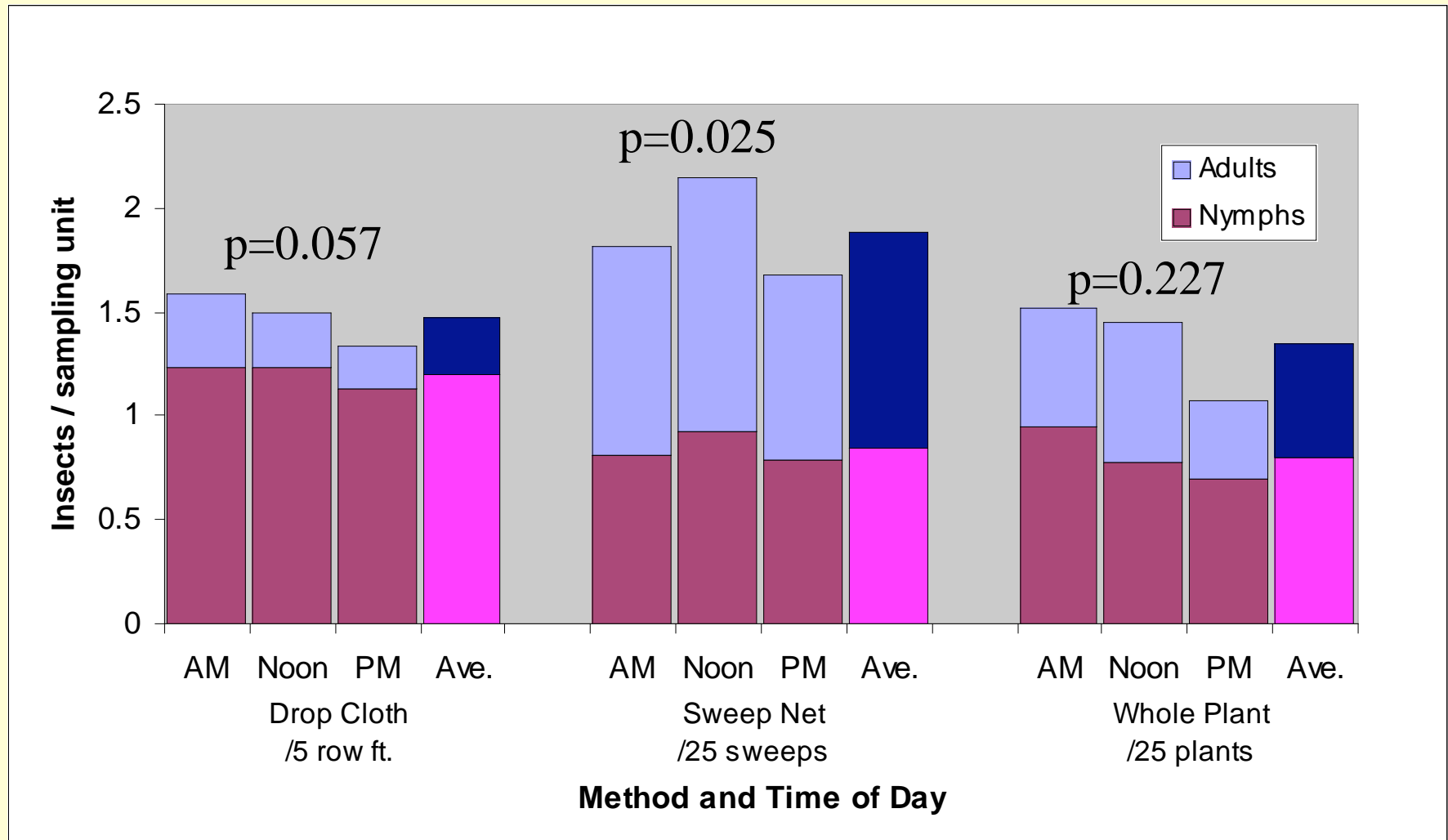


2006 Sampling Methods

- 60 commercial fields in TN, MS, LA, AR
- 4 sites in each field
- 3X per day (6-9 AM, 11 AM-2 PM, 4-7 PM)
- Three direct sampling methods (# bugs, time)
 - Sweep net (25 sweeps)
 - Drop cloth (5 row ft.)
 - Modified whole plant (25 plants)
 - Terminal, 2 squares, 1 bloom, 1 boll



Time of Day Variation



Sampling Equivalencies

1 TPB per 2 row ft on a black drop cloth equals

Method

Equivalent

Sweep Net

12 TPB/100 sweeps

Modified whole plant

9 TPB/100 plants

Dirty squares

8 /100 squares

Dirty blooms

14 /100 blooms

External bolls

12 /100 bolls

Internal bolls

9 /100 bolls

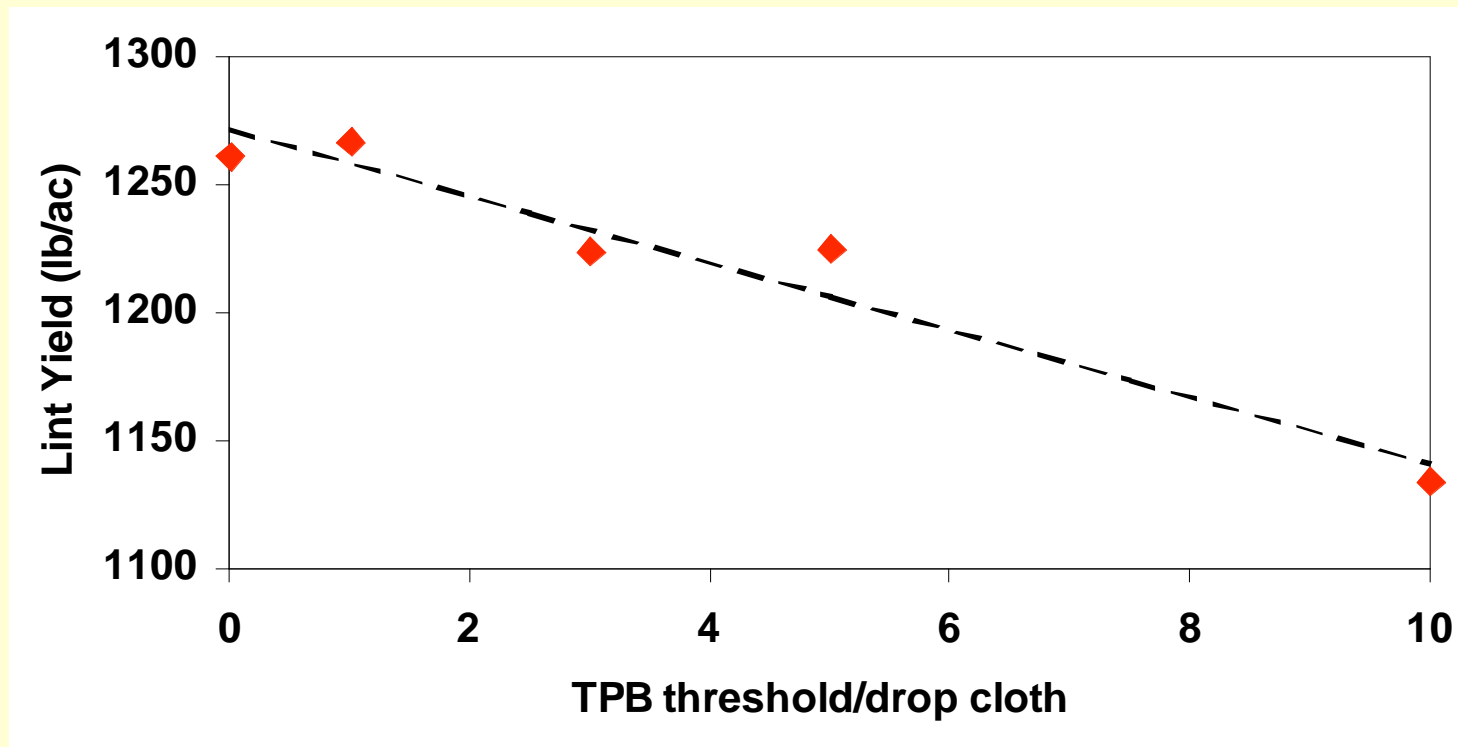
TPB Thresholds- Mid Season

Trial Treatments

- **Auto:** Insecticide application every 7 days from first bloom to cutout
- **Low:** Threshold of 1 PB / 5 row ft.
- **Med:** Threshold of 3 PB / 5 row ft.
- **High:** Threshold of 5 PB / 5 row ft.
- **VHigh:** Threshold of 10 PB / 5 row ft.

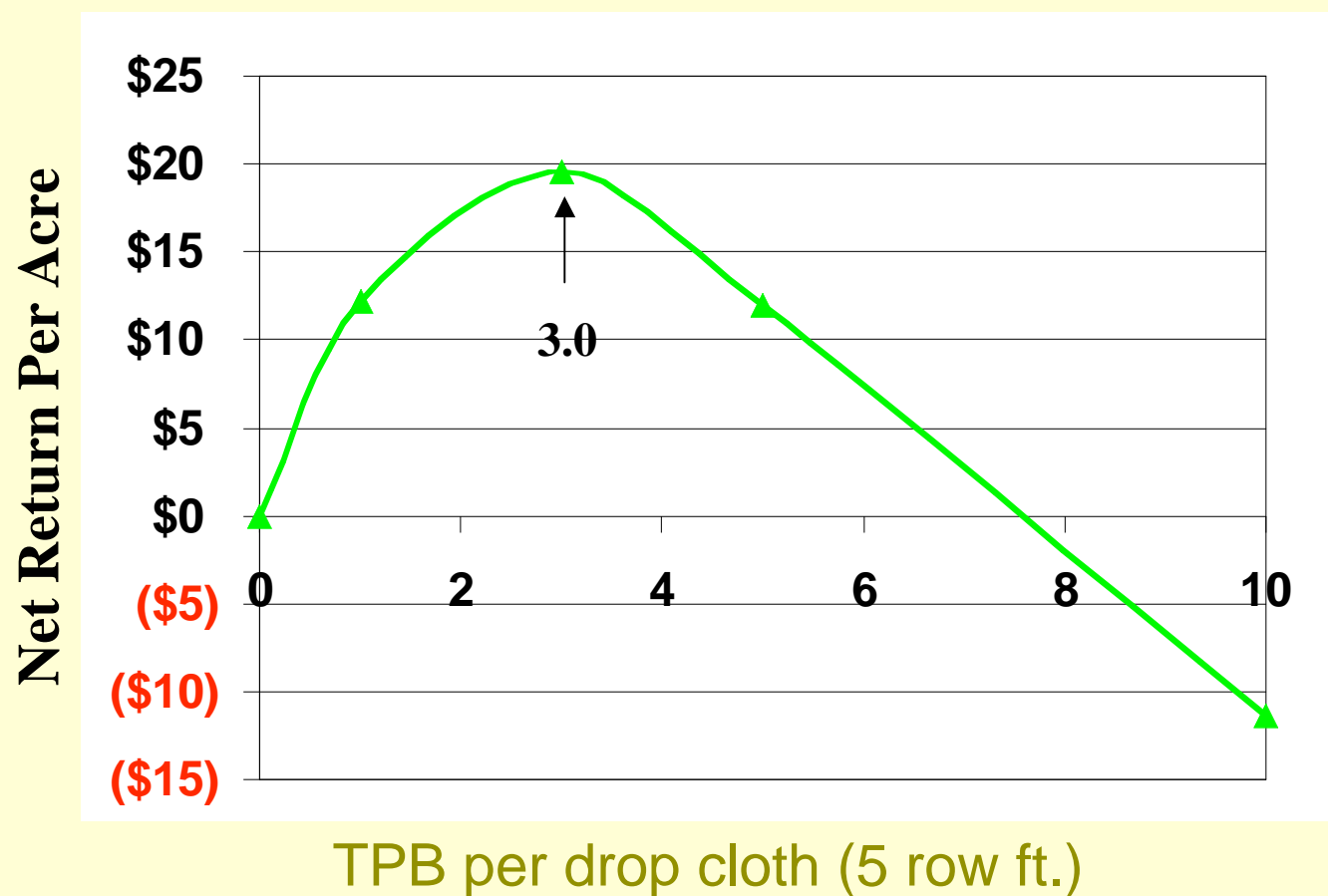
All applications made using acephate, Bidrin, or Vydate

Mid-Season TPB Threshold Summary



Lost 13 lb lint per acre for each 1 TPB /5 row ft.
increase in threshold

Mid-Season TPB Threshold Current Economics

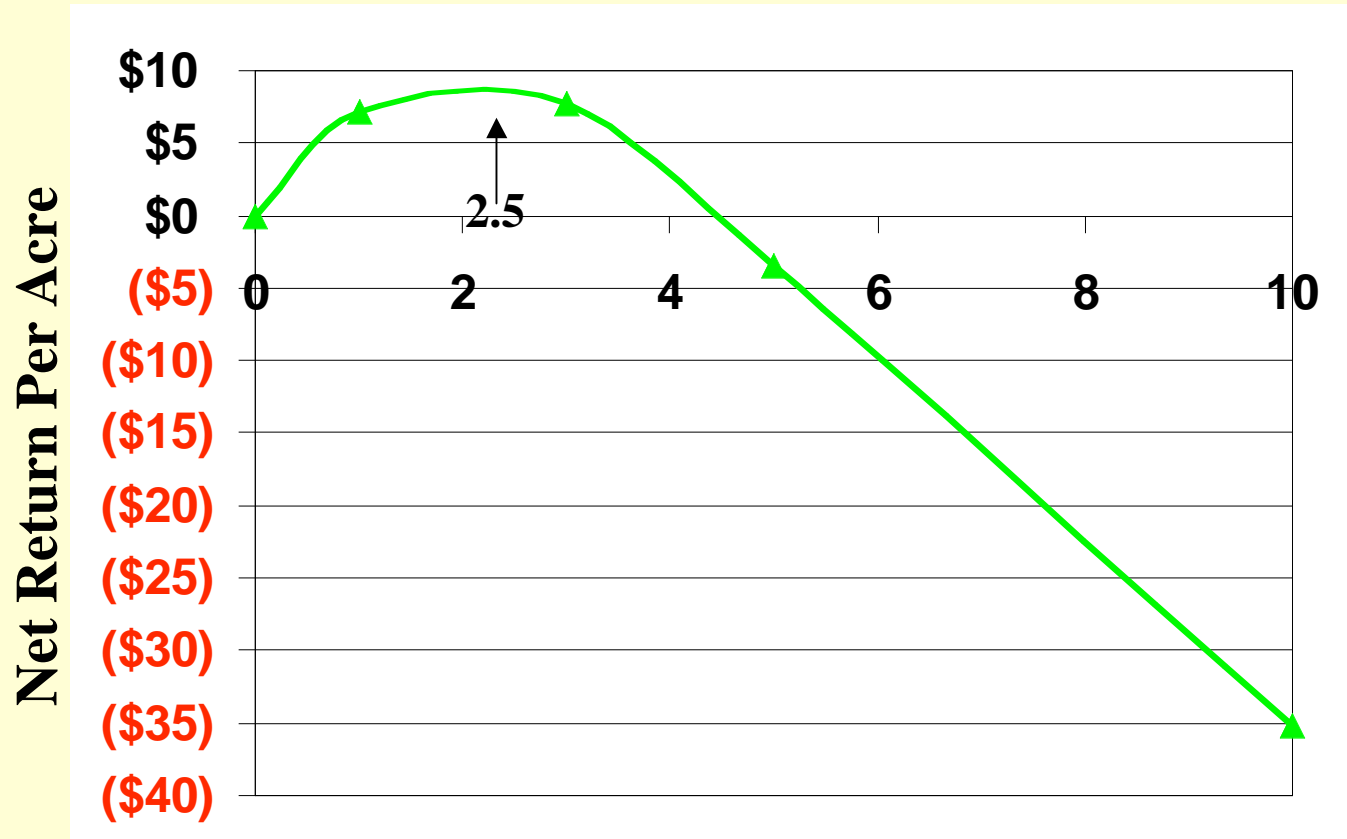


insecticide =
\$10/application

cotton value =
\$0.50/lb

Mid-Season TPB Threshold

Low Cost, High Value Economics

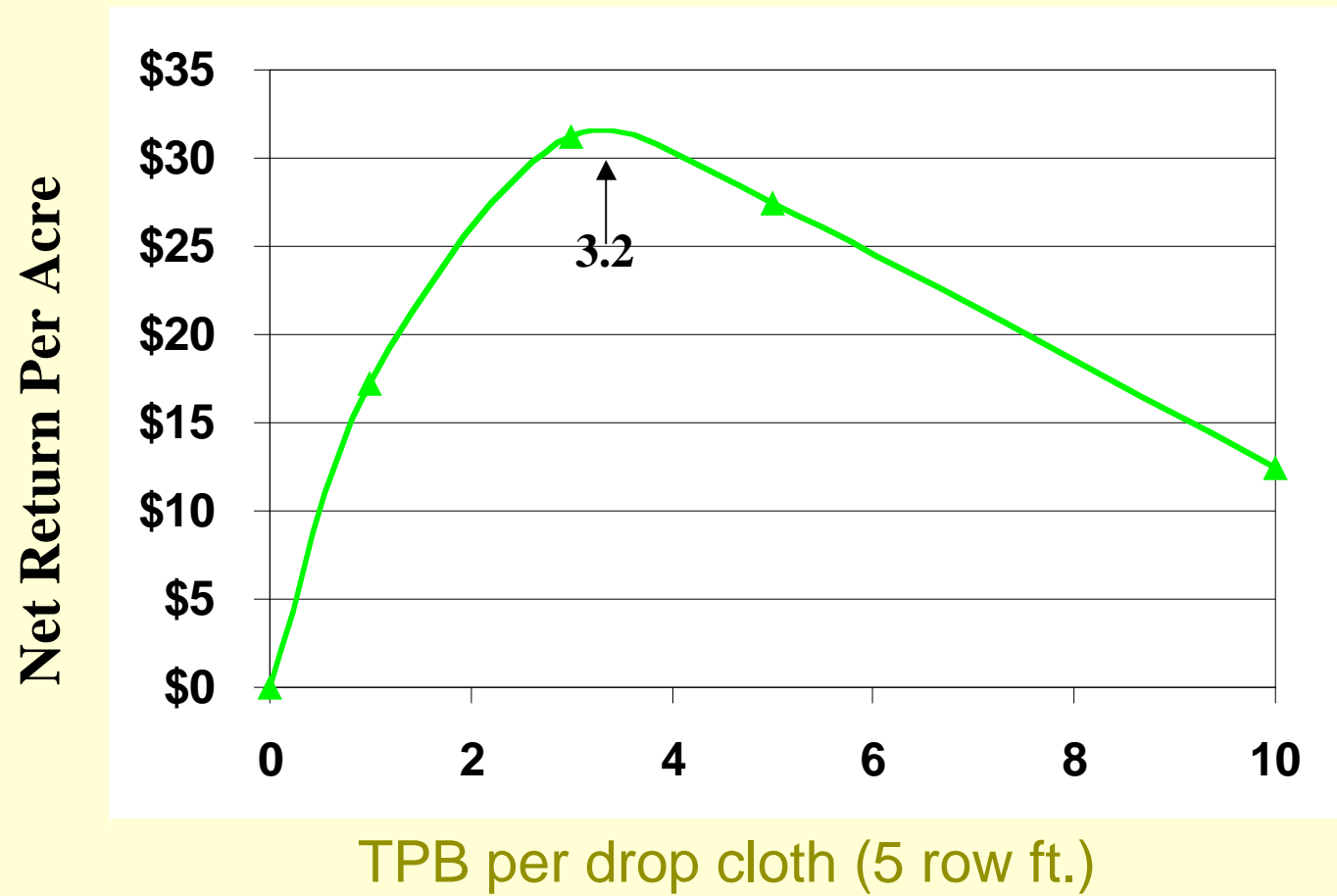


insecticide =
\$8/application

cotton value =
\$0.60/lb

TPB per drop cloth (5 row ft.)

Mid-Season TPB Threshold High Cost, Low Value Economics



insecticide =
\$12/application

cotton value =
\$0.40/lb

Summary

Currently confident in 3 bugs/5 ft.

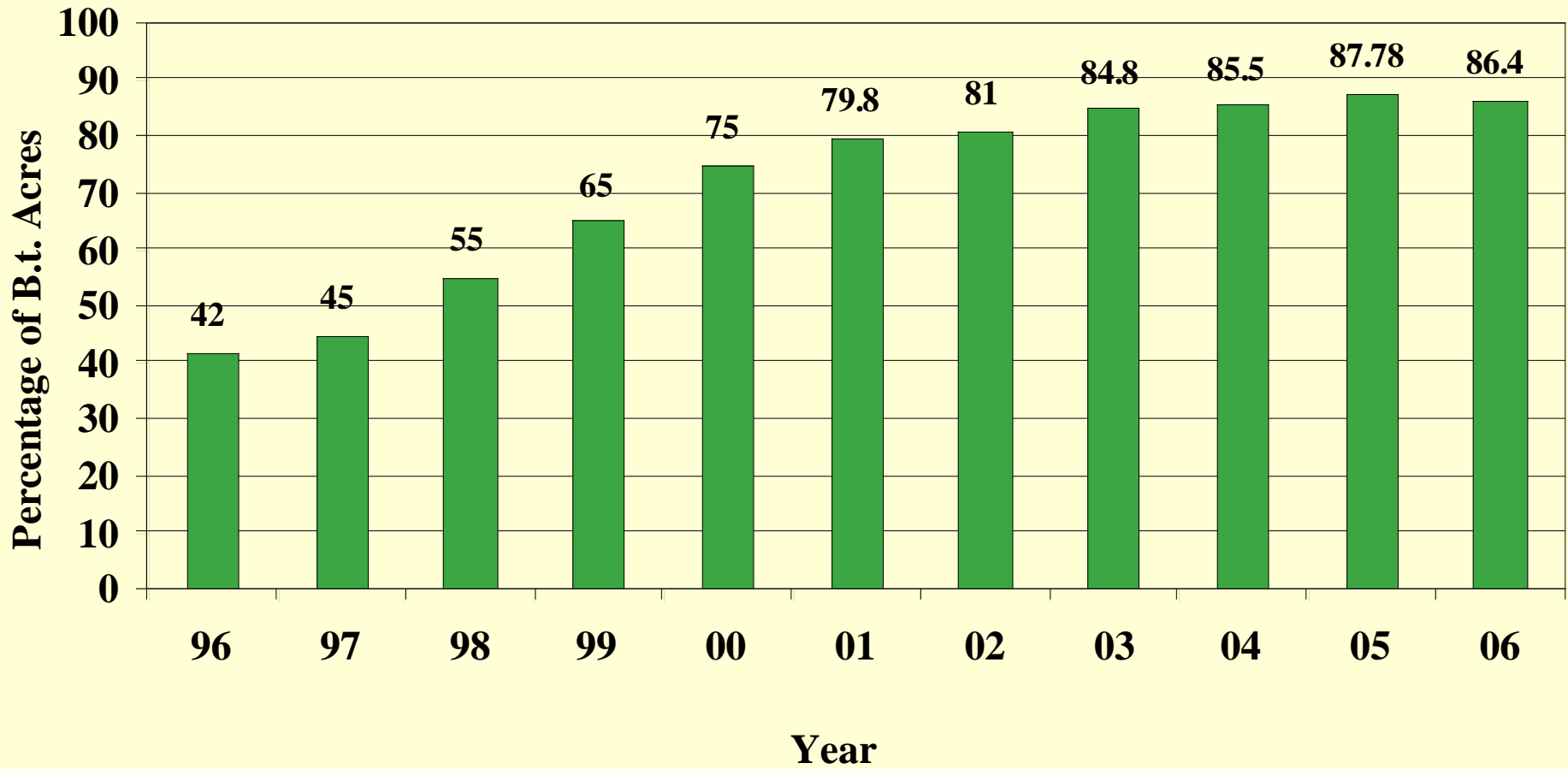
Current sweep net and whole plant thresholds are too high compared to drop cloth

- **12 TPB/ 100 sweeps \approx 9 TPB/ 100 plants \approx 3 TPB / 5 row ft on black cloth**

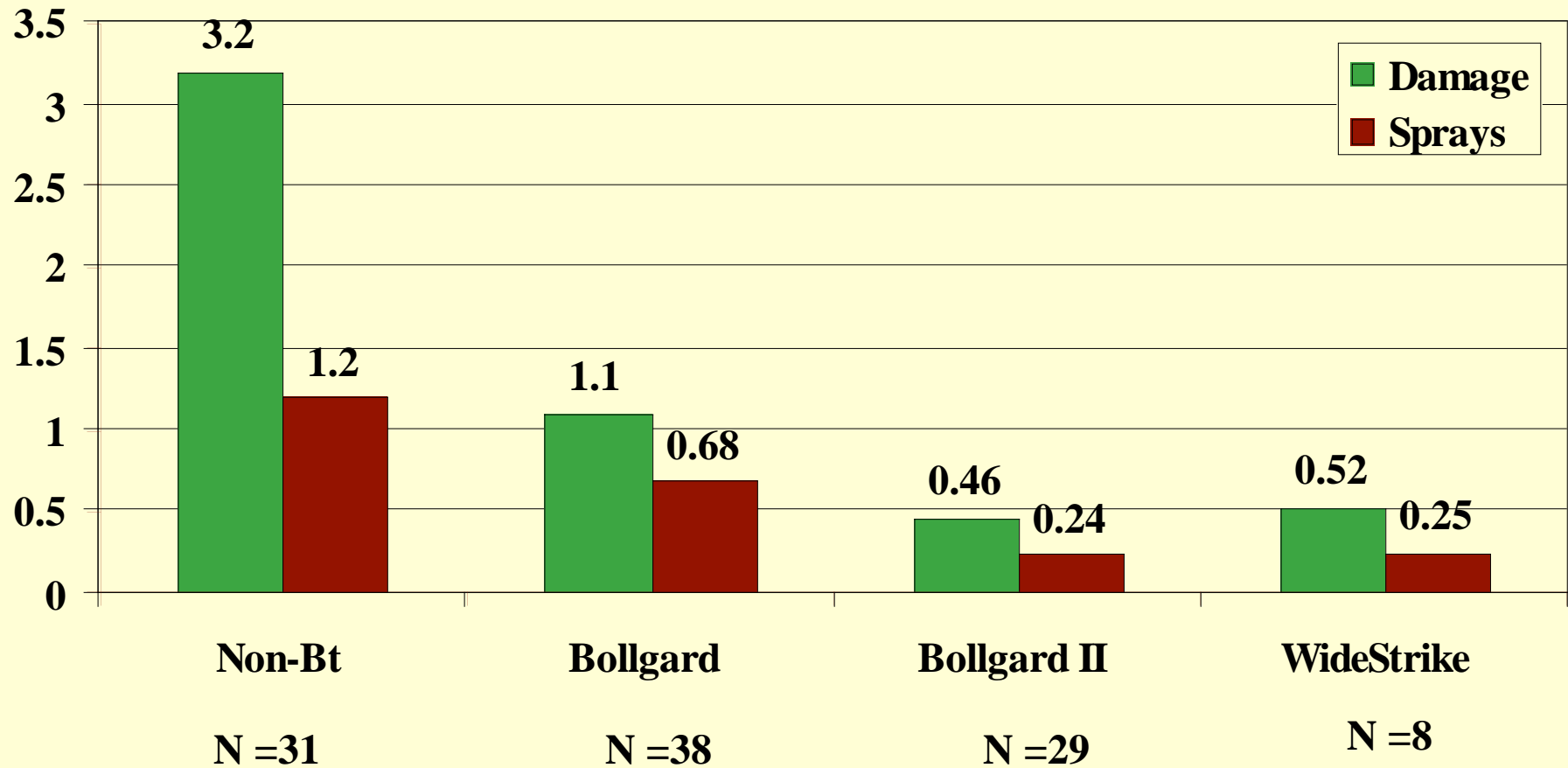
Budworm/Bollworm



Percent of B.t. Cotton Acres in Mississippi

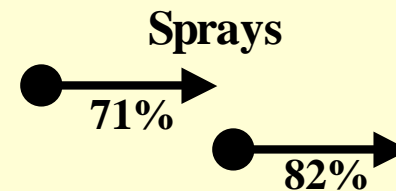
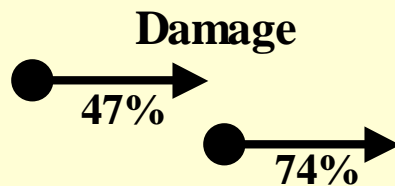
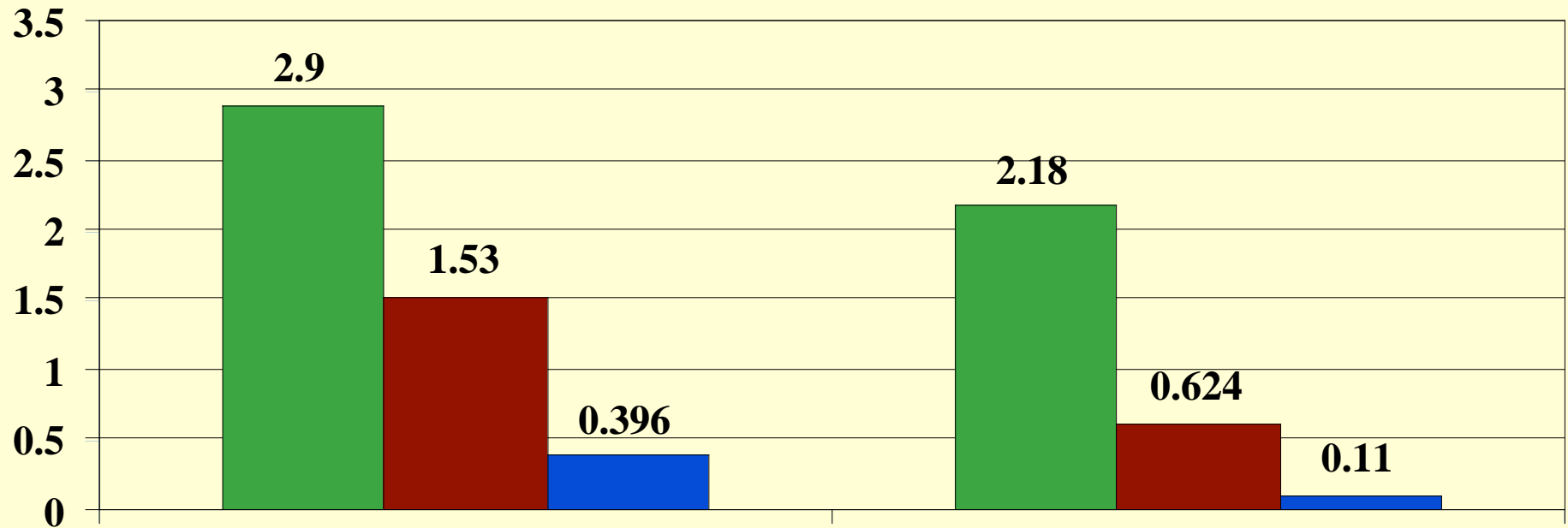


2006 End of Season Damage Boll Survey



Mississippi Average 1996-2006

■ Non-Bt ■ BG ■ BG2

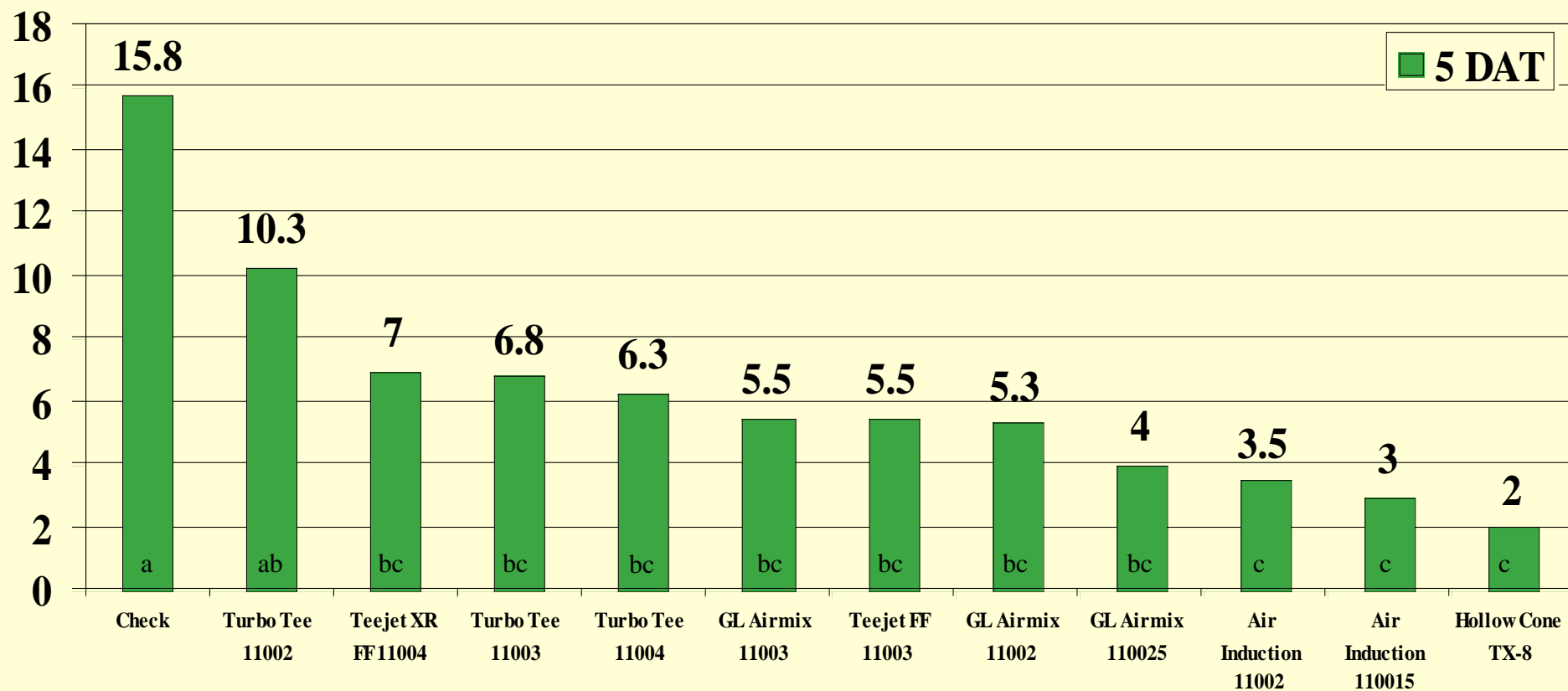


Application



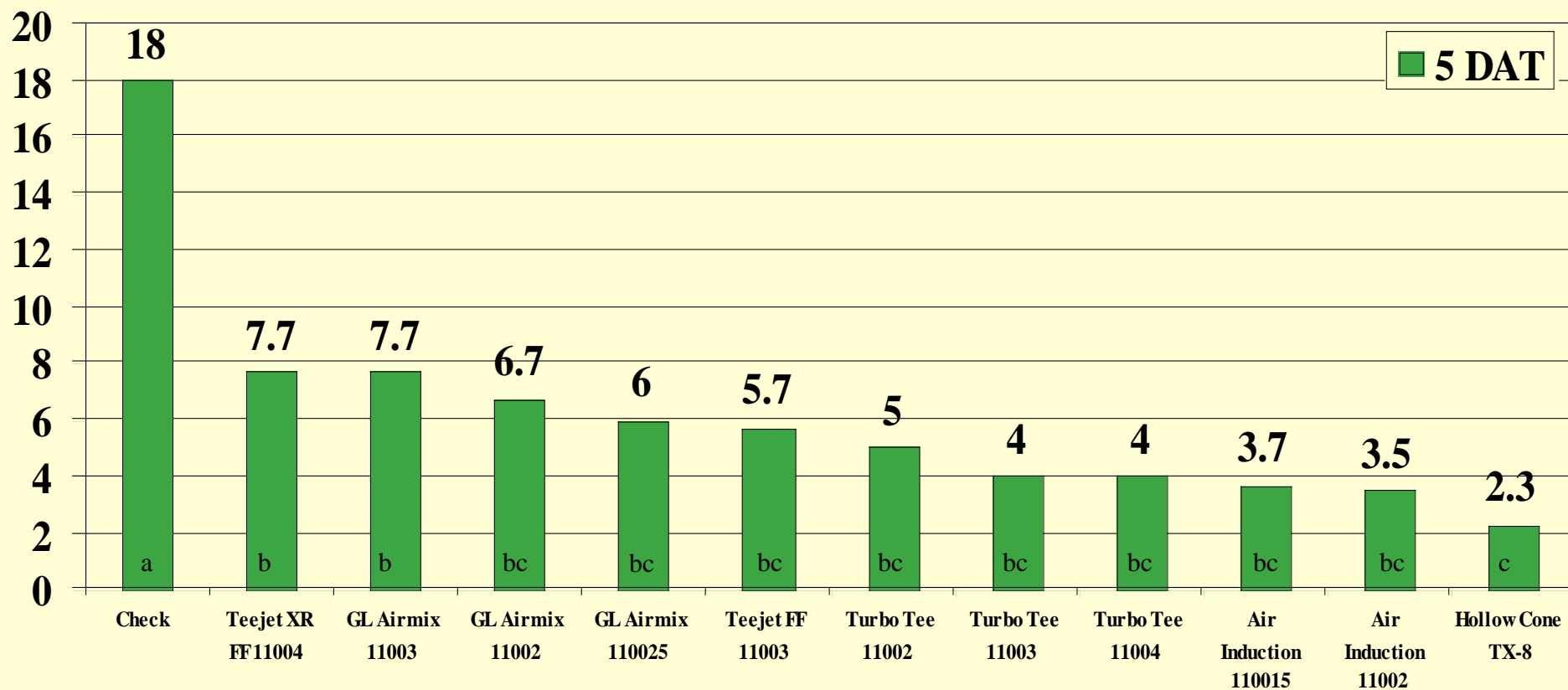
Nozzle Type Efficacy with Acephate-Tarnished Plant Bug

Greenwood, MS 8/9/06 TPB Nymphs/10 row ft.



Nozzle Type Efficacy with Acephate-Tarnished Plant Bug

Goldust, TN 8/7/06 TPB Nymphs/10 row ft.



A photograph of a cotton field during harvest. The plants are densely packed, and the cotton bolls are white and fluffy, contrasting with the brown, woody stems. The text is overlaid in the center of the image.

Questions
Angus Catchot
Cell: 662 418-8163