A Multi-Tactical Approach for Managing Tarnished Plant Bugs

Scott Stewart, UT Extension, and the Midsouthern Entomology Team
Some Midsouth Facts

- Currently about 2,000,000 acres of cotton in LA, MS, AR, TN, MO
  - 700,000 acres in the hot zone
- 2009 Stats for TPB
  - 103,391 bales lost (≈ $33 Million)
  - Insecticide costs (≈ $49 Million)

Using multiple control tactics is especially important in the hot zone
We know what the problem is …

- High and sustained populations of TPB
  - Insecticide resistance (Dr. Snodgrass’ presentation)
- Increased insect control costs
  - Yield loss
  - Secondary pests outbreaks (e.g., spider mites)
  - Insecticide resistance (plant bugs, cotton aphid, others)

5 Applications:
1700 lbs vs. 700 lbs
So is there an answer?

• Improved decision making
  ◦ Better sampling methods and thresholds
  ◦ Improve the timing of insecticide applications

• Cultural controls and other non-insecticidal approaches
  ◦ Dr. Cook’s presentation
  ◦ Managing for earliness, variety selection, management of non-crop habitats, farmscaping, etc.

• The better use of insecticides
MULTISTATE EVALUATION
of Tarnished Plant Bug Sampling Methods
in Blooming Cotton

• Regional Research on Plant Bugs
  ▪ Sampling
  ▪ Thresholds
  ▪ Efficacy trials
  ▪ Alternative approaches
These publications are available …

MID-SOUTH MULTI-STATE EVALUATION OF

Treatment Thresholds for Tarnished Plant Bug in Pre-Flowering Cotton

Midsouth Multistate Evaluation of Treatment Thresholds for Tarnished Plant Bug in Flowering Cotton

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Kelly Tindall (University of Missouri)
Ralph Bagwell and B. Rogers Leonard (LSU AgCenter)
Ryan Jackson (USDA ARS)
**Plant Bug Sampling & Thresholds**

Making Our Decisions with More Confidence

<table>
<thead>
<tr>
<th>Crop Stage</th>
<th>Per 100 Sweeps</th>
<th>Per Drop Cloth</th>
</tr>
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<tbody>
<tr>
<td>First 2 weeks of squaring</td>
<td>8+</td>
<td>1 (0.2 per foot)</td>
</tr>
<tr>
<td>Third week to first bloom</td>
<td>15+</td>
<td>2 (0.4 per foot)</td>
</tr>
<tr>
<td>After first bloom</td>
<td>15+</td>
<td>3 (0.6 per foot)*</td>
</tr>
</tbody>
</table>

Maintain 80% or higher square retention prior to bloom
Using Insecticides Better

- **Products**
  - New insecticides (Dr. Akin’s presentation)
  - Rates

- **Use patterns**
  - Tank mixes and rotations, consideration for other pests, insecticide resistance management (IRM)

- **Application**
  - Nozzle selection, aerial vs. ground, site specific scouting and treatment
Size matters …sometimes even winning is like kissing your sister

Even a good treatment can “fail”
Product Selection and Rate Matter
Tennessee, August, 2010

Check = 28 per 10 Row Ft (4 DAT1) and 49.3 per 10 Row Ft (4 DAT2)
No. of TPB - Regional TPB Efficacy Trial
Averaged Across Five Locations, 2009

- ORTHENE 0.75 lb/a
- Bidrin 6 oz/a
- Vydare 12 oz/a
- CENTRIC 2 oz/a
- Tri-Max Pro 1.5 oz/a
- Carbine 2.5 oz/a
- Leverage 4.5 oz/a
- Intruder 1.1 oz/a
- Endigo 5 oz/a
- Diamond 9 oz/a
- Brigade 5.12 oz/a

Numbers / 10 Row Ft

- 6-10 DAT 2
- 12 DAT 2

Legend:
- a
- b
- bc
- bcd
- cd
- d

Note: The chart shows the number of TPB averaged across five locations for the years 2009. The data points are labeled with letters indicating significant differences in efficacy.
Yield - Regional TPB Efficacy Trial
Tennessee, 2010 (4 Applications)
Tank Mixing Insecticides
6 DAT2, Tennessee, 2010

TPB

Number / 10 Row Ft

Untreated  Baythroid XL 1.9  Dimethoate 6  Bayth. XL 1.9 + Bidrin 2  Karate 1.9 + Dimeth. 6

TPB  Green Stink Bugs

Bollworms on drop cloths
Pyrethroid = 4
No pyrethroid = 15
Rotate Chemistries
Jeff Gore, MSU

TPB

Nymphs / 6 Row Feet

Orthene-Untreated-Orthene
Orthene-Orthene-Orthene
Orthene-Centric-Orthene
Shorten Spray Intervals vs. High Pressure
Jeff Gore, MSU

Re-treatment interval:
- 4 Days
- 5 Days
- 6 Days
- 7 Days

No. of TPB 4 DAT with Orthene

Pre-test counts:
- Pre-treatment: 23
- No: 8

Percent control:
- 4 Days
- 5 Days
- 6 Days
- 7 Days

TPB
Nymphs / 6 Row Feet

Percent
Nozzle Effects on Tarnished Plant Bug Control with Acephate 90S (0.5 lb), Tennessee, 2006

<table>
<thead>
<tr>
<th>Nozzle Type</th>
<th>Nymphs / 10 Row Feet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Check</td>
<td>18</td>
</tr>
<tr>
<td>Teejet XR FF 11004</td>
<td>7.7</td>
</tr>
<tr>
<td>GL Airmix 11003</td>
<td>7.7</td>
</tr>
<tr>
<td>GL Airmix 11002</td>
<td>6.7</td>
</tr>
<tr>
<td>Teejet FF 11003</td>
<td>6.0</td>
</tr>
<tr>
<td>Turbo Tee 11003</td>
<td>5.7</td>
</tr>
<tr>
<td>Turbo Tee 11002</td>
<td>5.0</td>
</tr>
<tr>
<td>Turbo Tee 11004</td>
<td>4.0</td>
</tr>
<tr>
<td>Air Induction 11001.5</td>
<td>4.0</td>
</tr>
<tr>
<td>Air Induction 11002</td>
<td>3.7</td>
</tr>
<tr>
<td>Hollow Cone TX-8</td>
<td>3.5</td>
</tr>
<tr>
<td>Hollow Cone TX-3.2</td>
<td>2.3</td>
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More Applications by Ground
Aerial vs. Ground Application with Transform (sulfoxaflor)

Angus Catchot, MSU, 2010

Bar chart showing nymphs/5 row ft for Check, Air, and Ground applications at different DATs (Days After Treatment): 4 DAT1, 5 DAT2, 9 DAT2, and 14 DAT2.
Insecticide Resistance Management

- Using different classes of chemistry in a logical sequence (and manner) to prevent or delay resistance
  - For example, I typically do not recommend the use of neonicotinoid insecticides after bloom
  - Sometimes easier said than done

An Encouraged Use Pattern for TPB in Tennessee …

<table>
<thead>
<tr>
<th>Neonic’s</th>
<th>OPs / Carbamates / etc.</th>
<th>Tanks Mixes</th>
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<tbody>
<tr>
<td>Centric, Imidacloprid, Carbine</td>
<td>Acephate, Bidrin</td>
<td>Pyrethroids + OPs, Vydate, Diamond</td>
</tr>
<tr>
<td>Prebloom</td>
<td>Early Bloom</td>
<td>Late Bloom</td>
</tr>
</tbody>
</table>
Cultural Controls, etc…

- Farmscaping
  - Site specific scouting and targeted insecticide applications
- Nectariless cotton

Scout more often!  
Treat more often?

Minimize Corn/Cotton Borders

Photo: Chism Craig
Summary

• It will take multiple control tactics to manage TPB in high pressure areas
  ◦ Insecticides will still be at the core of this program
    ▪ We must use them efficiently
    ▪ The presence of other pests and resistance levels will dictate insecticide selection
    ▪ New insecticides, especially new classes, and other new technologies are critically needed
  ◦ Cultural controls can help bridge the gap