Terminating Spider Mite Applications in Cotton
Team Members

Mississippi
- Gore / Cook
- Catchot / Smith / Scott
- Musser
- Jackson

Arkansas
- Akin
- Lorenz
- Studebaker

Missouri
- Tindall

Louisiana
- Leonard

Tennessee
- Stewart

Part of a regional effort to better understand spider mites and effects on yield
Objectives

1) Standardize the evaluation of miticides

2) Quantify yield losses at different infestation timings

3) Determine the impact of mites on different cotton varieties
The Protocol
Infestation Timing*Yield

• RCBD, 4 Reps, 4 rows X 15 ft plots
• Only the two center rows infested
• Record stunting and injury at various timings
• Treatments included:
  – Noninfested
  – 3rd True Leaf
  – First Flower
  – First Flower + 200 HU
  – First Flower + 400 HU
  – Etc.
Impact of Spider Mites on Cotton Tennessee – 7/22/2010

- Stunting
- Injury

Graph showing the impact of spider mites on cotton at different stages:
- Third Leaf: High percent stunting and injury rating.
- First Flower: Moderate percent stunting and injury rating.
- FF + 200: Lower percent stunting and injury rating.
- FF + 400: Further decrease in percent stunting and injury rating.
- FF + 600: Further decrease in percent stunting and injury rating.
- Non-Infested: Lowest percent stunting and injury rating.
Impact of Spider Mites on Cotton Louisiana – 8/26/2011

The bar chart shows the percent stunting and injury rating for different stages of cotton development:

- **Third Leaf**
- **First Flower**
- **FF + 200**
- **FF + 400**
- **FF + 600**
- **Non-Infested**

The bar chart indicates a decrease in both stunting and injury rating as the cotton plants mature.
Evaluation of Yield Losses by Spider Mites 2009-2011 – Poor Infestation (9)
Evaluation of Yield Losses by Spider Mites 2009-2011 – Good Infestation (7)
Correlation Between Injury Rating and Yield 2009-2011

\[ y = -78.345x + 1364.1 \]

\[ R^2 = 0.4798 \]
# Standardized Efficacy Trial Treatments

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Rate (oz/acre)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brigade 2E</td>
<td>6.4</td>
</tr>
<tr>
<td>Dicofol 4E</td>
<td>48</td>
</tr>
<tr>
<td>Comite II</td>
<td>36</td>
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<tr>
<td>Portal 0.4E</td>
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<td>Zeal 72WSP</td>
<td>1</td>
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<tr>
<td>Zephyr 0.15E</td>
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<tr>
<td>Oberon 4F</td>
<td>4</td>
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<tr>
<td>Zephyr 0.15 E</td>
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<tr>
<td>Oberon 4F</td>
<td>8</td>
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<tr>
<td>Untreated</td>
<td>---</td>
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</table>
Spider Mites 3-5 DAT
Eleven Locations (2009-2010)
Numbers per 5 Square Inches

P = < 0.0001

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Numbers per 5 Square Inches</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dicofol48</td>
<td>24.4</td>
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<tr>
<td>Comite36</td>
<td>25.9</td>
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<tr>
<td>Zeal1</td>
<td>26.9</td>
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<tr>
<td>Brigade64</td>
<td>31.6</td>
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<tr>
<td>Zephyr12</td>
<td>33.2</td>
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<tr>
<td>Oberon8</td>
<td>36.2</td>
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<tr>
<td>Portal16</td>
<td>37.4</td>
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<tr>
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<tr>
<td>Zephyr4</td>
<td>43.8</td>
</tr>
<tr>
<td>Untrt</td>
<td>88.1</td>
</tr>
</tbody>
</table>
Spider Mites 7-9 DAT
Eleven Locations (2009-2010)

Numbers per 10 Square Inches

P < 0.0001

- Zephyr12: 8.8
- Zeal 1: 12.3
- Portal16: 15.7
- Dicofol48: 16.3
- Comite36: 19.6
- Oberon8: 20.6
- Zephyr4: 22.6
- Oberon4: 23.7
- Brigade64: 28
- Untrt: 67.5
Spider Mites 10-14 DAT
Six Locations (2009-2010)

Numbers per 5 Square Inches

P = 0.05

Zeal1: 14
Zephyr12: 24
Dicofol48: 24.5
Oberon4: 26.3
Oberon8: 28.1
Portal16: 29.2
Comite36: 29.9
Zephyr4: 30.7
Brigade64: 33.1
Untrt: 55.6
Yield
Five Locations (2009-2010)

Lint Yield per Acre

P = 0.02

<table>
<thead>
<tr>
<th>Variety</th>
<th>Yield Per Acre</th>
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<tbody>
<tr>
<td>Untrt</td>
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<tr>
<td>Zephyr4</td>
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<td>Dicofol48</td>
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<td>Zeal1</td>
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<tr>
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<tr>
<td>Oberon8</td>
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Spider Mites 8 DAT
Tennessee (2009)

Numbers per 10 Square Inches

P = 0.0005

<table>
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<tr>
<th>Treatment</th>
<th>Numbers per 10 Square Inches</th>
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<tbody>
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<td>Oberon8</td>
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</tr>
<tr>
<td>Untrt</td>
<td>45.7</td>
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</tbody>
</table>
Spider Mites 5 DAT-A
Mississippi (2010)

Numbers per 10 Square Inches

P = 0.0001

Portal16, Oberon8, Zeal1, Dicofo48, Zephyr12, Comite36, Brigade64, Oberon4, Zephyry4, Untrt
Spider Mites 12 DAT-A
Mississippi (2010)

Numbers per 10 Square Inches

P = 0.0001

Oberon8, Zephyr12, Comite36, Portal16, Zeal1, Oberon4, Zephyr4, Dicofol48, Brigade64, Untrt

Legend:
- f
- ef
- def
- cde
- cde
- cde
- bcd
- bc
- bc
- a
- a

Note: Letters indicate significant differences in mite numbers.
Spider Mites 4 DAT-B
Mississippi (2010)

Numbers per 5 Square Inches

P = 0.0001

<table>
<thead>
<tr>
<th>Product</th>
<th>Numbers per 5 Square Inches</th>
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<tbody>
<tr>
<td>Zephyr12</td>
<td>2.3</td>
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<tr>
<td>Portal16</td>
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<td>Comite36</td>
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<td>Zephy4</td>
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<tr>
<td>Zeal1</td>
<td>5.1</td>
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<td>20.7</td>
</tr>
<tr>
<td>Brigade64</td>
<td>22.1</td>
</tr>
</tbody>
</table>

Figures are rounded to one decimal point. Zephyr12, Portal16, Comite36 are significantly different from other treatments.
Spider Mites 4 DAT
Arkansas (2010)

Numbers per 5 Square Inches

P = 0.0001

Oberon8, Comite36, Zeal1, Dicofo48, Portal16, Zephyr4, Oberon4, Brigade64, Zephyr12, Untrt
Summary and Conclusions
Standardized Efficacy

• All miticides/insecticides provided control when averaged across locations.

• Some of the “older” miticides were less consistent.

• Newer miticides provided better control, especially at higher rates.
Summary and Conclusions
Infestation Timing*Yield

- Early infestations significantly stunted plants

- Spider mites caused significant yield losses up to 800 HU past first flower

- No significant yield losses were observed at ≥1000 HU
Summary and Conclusions
Infestation Timing*Yield

- Cotton should be protected at least until 1000 heat units past first flower

- Approximately 35-45 days