Spider Mites: A Persistent Problem in Mid-South Cotton

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Cotton Incorporated
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(QUOTE FROM 2006) Spider Mites “The Insecticide Budget Busters of Cotton Production in the Mid-South” STILL TRUE IN 2008!
Trends in Spider Mite Treatments in Mississippi (Acres Treated)
Mid-South Spider Mite Control Costs - 2004

US average Cost/A- $1.66
Mid-South Cost/A-$1.56
Mid-South Spider Mite Control Costs - 2007

US average Cost/A - $2.96
Mid-South Cost/A - $8.23
2007 Mississippi Cotton Insect Losses

- Tarnished Plant Bug
- Bollworm/Budworm
- Spider Mites
- Stink Bugs

Bales Lost

Grains: 20,000

Grains: 12,000

Grains: 10,000

Grains: 4,000
Twospotted Spider Mite Biology

- Egg, larval (3 pair of legs), two nymphal stages, adult
- Generation time is highly temperature dependent
- Lay ~100 eggs in 2-4-week lifespan
- Multiple overlapping generations per year
- Adults overwinter in leaf litter or debris
- Become active in early-spring
Spider mites feed on the underside of leaves puncturing epidermal cells, reducing photosynthesis
Early-Season Damage
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
Impact of Spring Burndown Timing on Mite Outbreaks

4/3/08 – Date of First Burndown
Impact of Spring Burndown Timing on Mite Outbreaks

5/8/08 – at-planting
Impact of Spring Burndown Timing on Mite Outbreaks

Number Mites/Leaf in Cotton

- Untreated Check
- Roundup + Clarity (4/3/08)
- Roundup + Clarity (4/3/08) & Ignite (at-planting)
- Gramoxone (4/25 - 12 d before planting)
- Ignite (4/25 - 12 d before planting)

Stages: Cotyledon, 2-3 Leaf Stage, 4-5 Leaf Stage, Pin-Head Square, Match-Head Square
Avoid the “Green Bridge”
Seed Treatments
Materials and Methods

- Cotton infested from 1\textsuperscript{st} to 4\textsuperscript{th} true leaf
- Bean leaves w/ mites stapled to cotton cotyledons
- Uppermost full-size leaf examined with a microscope for mites/eggs at ~7 and 14 DAI
- 4-6 reps, 5-10 plants/plot
- 5 trials conducted in 2007
  2 trials conducted in 2008
Effect of Seed Treatments, Temik and Foliar Insecticides on Mites

Starkville, MS - June 2008.
Number of Immature Mites/Leaf.

7 DAT - P=0.0473
14 DAT - P=0.0103
Effect of Seed Treatments, Temik and Foliar Insecticides on Mites

Starkville, MS - June 2008

Visual Rating of Mite Injury (1-10, 10=best)
Number of Times That Each Treatment Had the Greatest Number of Mites or Eggs in Each Test or Sampling Date

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Mites</th>
<th>Eggs</th>
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<tbody>
<tr>
<td>Untreated</td>
<td>2</td>
<td>0</td>
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<tr>
<td>Neonicotinoid</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>Temik</td>
<td>1</td>
<td>1</td>
</tr>
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</table>

*Trends - Only 2 trials had significant differences*
YIELD IMPACT

Greenwood – Non Irrigated
Yield of Damaged and Undamaged Cotton
Dryland Field – Greenwood

-51.2%
Yield of Damaged and Undamaged Cotton

Irrigated Field - Tchula

**Yield**

- Undamaged: 23%
- Damaged: 9%

**Fruiting Zone**

- Bottom (N5-10): 22%
  - P=0.034
- Middle (N11-16): -23%
  - P=0.001
- Top (N16+): -68%
  - P=0.004

Overall, the yield is reduced by **9%**.
Cotton yield loss from infesting mites beginning at first bloom then at 200 HU intervals thereafter
Yield Effects from Spider Mite Infestation

- First Bloom
- First Bloom + 200 HU: 976.2
- First Bloom + 400 HU: 1028.4
- Uninfested: 1066.01

NS (Non-Significant)
Summary

• Winter Weed Management
• Seed Treatments
• Yield Loss
Questions?

Special Thanks

The Cotton Foundation

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