Update and New Considerations in Cotton Insect Management

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Early Season Cotton Management Meeting
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Insect Management

- Review of status of Lygus IPM
  - What do we know & need to know?
  - Address two questions: Spatial & chemical control
  - Selective options for Lygus control?

- Whitefly Management
  - Review basic guide for cotton
  - New information on Knack
  - Historical performance

Lygus IPM...
...depends on 3 basic keys

Key Elements...
...what have we got?

Lygus Can Be Managed!

Avoid Adults; Control Nymphs
**Lygus hesperus**

**Adult**
- Can cause damage
- Cannot be reliably controlled
- Key to movement & reproduction

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**Ring Analyses to Determine Range of Impact of Lygus**
- How are Lygus densities in focal fields related to source potential of surrounding crops?

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**Lygus Associations**
- Seed alfalfa fields are sources of Lygus for cotton fields. This effect does not extend beyond 1 mile.
- Cotton fields are sinks for Lygus. This effect disappears beyond 0.5 miles.
- Strategic placement of crops could help alleviate Lygus problems.

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**Adults move; Nymphs don’t**

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**Adults move; Nymphs eat!**

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**Spray all you want!**
Avoid Adults; Control Nymphs!

Yield & Revenue: Density

- Maximum Yield @
  1.7 nymphs / 100
- Maximum Revenue
  @ 5.2 nymphs / 100
- Recommendation:
  4 nymphs with at least 15 total Lygus
  per 100 sweeps (‘15:4’)

Sampling & Thresholds

100 sweeps

13 Adults
+ 4 Nymphs (17:4)
is over
‘15:4’ Spray

Timing Late Season Controls

(when should you stop spraying?)

<table>
<thead>
<tr>
<th>Lygus Termination (LT)</th>
<th>Sprays Dates</th>
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<tbody>
<tr>
<td></td>
<td>5-Aug</td>
</tr>
<tr>
<td>LT4</td>
<td>✓</td>
</tr>
<tr>
<td>LT3</td>
<td>✓</td>
</tr>
<tr>
<td>LT2</td>
<td>✓</td>
</tr>
<tr>
<td>LT1</td>
<td>✓</td>
</tr>
</tbody>
</table>

c.o. = cut-out or nodes above white flower = 5
2003 Experiment

- Two planting dates: April 30 & May 28
- Three varieties: SG215BR, DP449BR, DP555BR
- Two irrigation termination timings: Aug. & Sept.
- Four Lygus chemical control terminations

High heat stress & fruit shed July-August
Extremely productive “fall”, long, open and dry

Yield : Nymphs Relationship

50¢ Cotton Returns

Effective & Selective Chemistry

- Effective chemistry is available, but limited to broad spectrum materials (i.e., Orthene or Vydate)
- Selective technologies have been key to managing whiteflies and pink bollworm
- Can selective agents be found for Lygus?
Whitefly IPM... ...depends on 3 basic keys

**Basic Guide**
- Initiate WF control with IGRs!
  - Consider either IGR, if Courier (= Applaud) is not used locally in melons; Use Knack, otherwise.
  - Use full rates (8 oz product); DON'T CUT RATES!
- Avoid neonicotinoids in cotton, where they are depended on locally for melon & vegetable production
  - I.e., Intruder or Centric
- Follow timing guidelines
  - 40% of leaves infested with 3 or more adults plus
  - 40% of leaf disks infested with 1 or more large nymphs
- Don’t Get Distracted

The Penalty is Severe & Lasting

IGR-treated

Untreated
**Bioresidual v. Chemical Residual**

Recent studies on field residues of pyriproxyfen (Knack) to understand where and when Knack is capable of killing whiteflies.

- How long does Knack sterilize females for?
- How long does Knack last on or in cotton leaves?

**Females Sterilized for 4 d**

1 feeding bout

![Graph: Females Sterilized for 4 d](image)

Even males can 'sterilize' females.

**Knack Sterilized Eggs on Treated Leaves for 30 Days**

![Graph: Knack Sterilized Eggs on Treated Leaves for 30 Days](image)

**Field Decay of Knack Residues**

![Graph: Field Decay of Knack Residues](image)

**2003 WF Management Demonstration**

![Graph: 2003 WF Management Demonstration](image)

**Real World Example (03F22)**

![Graph: Real World Example (03F22)](image)
**Knack 2003**

UTC > 18.0 (9/18)

Application made 10 d late

**Historical Performance of Knack, 1996–2002**

Consistent timing, consistent results

**Historical Performance of Knack, 1996–2003**

Incorrect timing, less effective results

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**Acknowledgments**

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- ACGA and Cotton Incorporated who supported (pce) the Lygus termination studies

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QuickTime™ and a Cinepak decompressor are needed to see this picture.
Information

- All University of Arizona crop production & crop protection information is available on our web site.
- Arizona Crop Information Site (ACIS), at
  - [http://cats.arizona.edu/crops](http://cats.arizona.edu/crops)