Recent Advances in Lygus Management

ESA - Paper #TMP0190
26 October 2003
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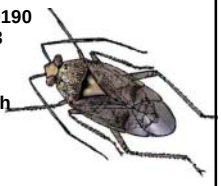

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Lygus hesperus Nymphs

Lygus Reduce Fruiting Sites

Untreated Treated

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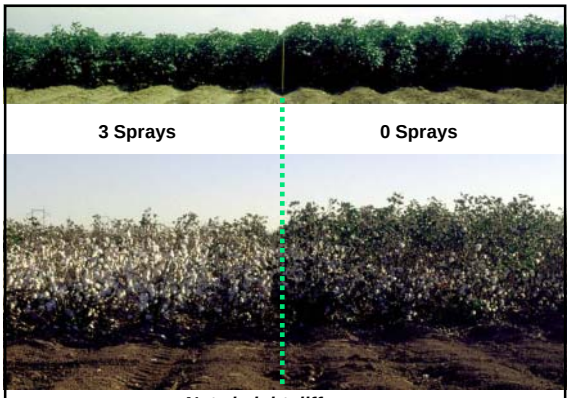

Note height difference

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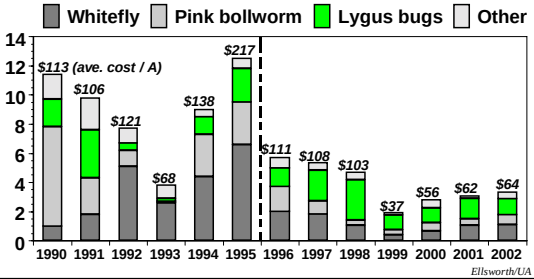
Insecticide Use in AZ Cotton

- Selective technologies have helped to stabilize & reduce usage overall (i.e., Bt cotton & whitefly IGRs in 1996)
- However, current usage reflects the importance of Lygus



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Major Threat to Cotton Production in AZ

- Over the last 5 years…
- 45% of all insecticide sprays have been targeted at Lygus
- 41% of the entire insecticide budget has been invested against Lygus
- 66% of the yield loss has been attributed to Lygus

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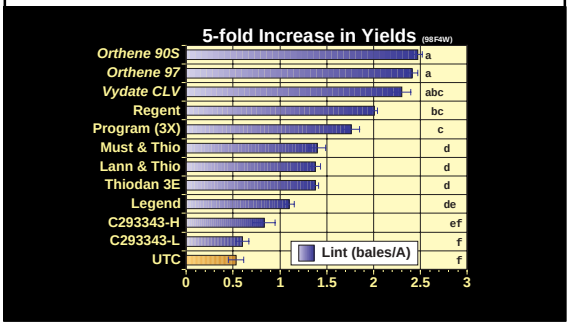
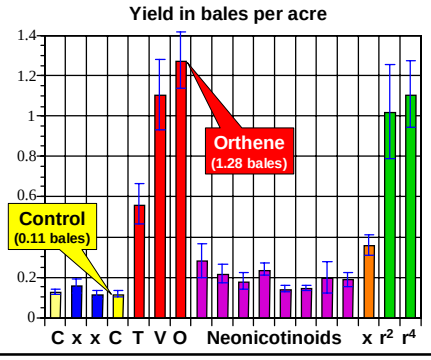
Studies Identified Effective Compounds

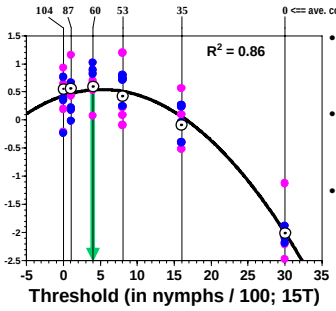
(5-fold increase in yield)



> 10-fold Increase in Yields (02F4L)



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')

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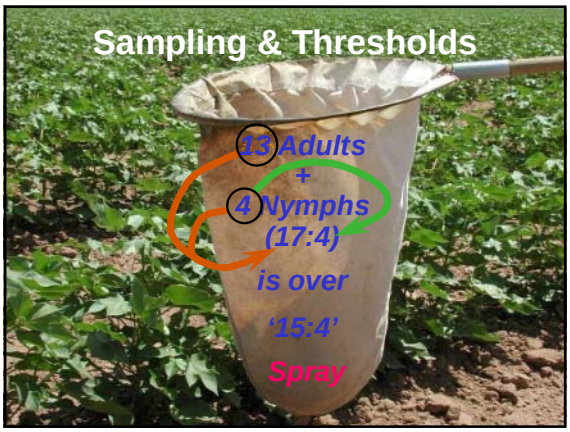
Sampling & Thresholds



Recent Questions in Lygus Management

Field

- When should managers <u>discontinue</u> any further Lygus chemical controls in cotton?
  - Late season populations can far exceed thresholds
  - Square (bud) populations decline as crop cuts-out

Landscape

- Can we estimate & characterize inter-crop effects of Lygus spatially?
  - Severe and negative interactions among forage hay (alfalfa), seed alfalfa, and cotton producers in 1999-2000

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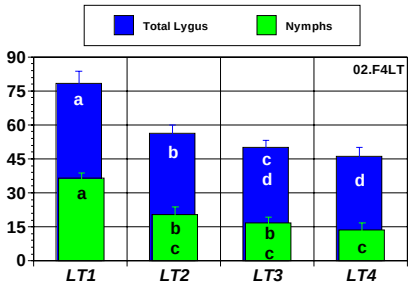
Timing Late Season Controls

(when should you stop spraying?)

Lygus Termination (LT)	Spray Dates 5-Aug	16-Aug 2 wk < c.o.	23-Aug 1 wk < c.o.	6-Sep 1 wk > c.o.	20-Sep 3 wk > c.o.
LT4	•	•	•	•	•
LT3	•	•	•	•	
LT2	•	•	•		
LT1	•	•			

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

Lygus Counts > Cut-out



Lygus Chemical Termination Timing (LT)

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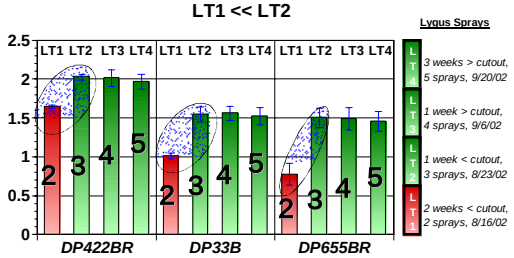
Large Yield Difference

LT1 << LT2



Lygus Chemical Termination X Variety

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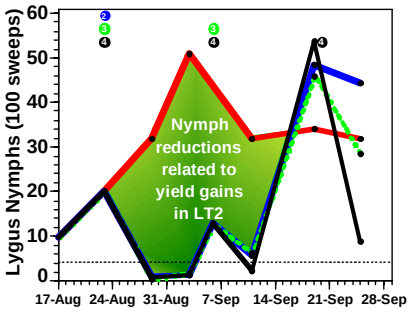
Control of Nymphs is Key!



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Cooperative Extension

Community-Wide Lygus Action Plan

Extension Program

- Initiated in 2000 in response to extreme and negative interactions among producers of different crops
- Communication / Awareness
- Education
- Systematic Survey / Research

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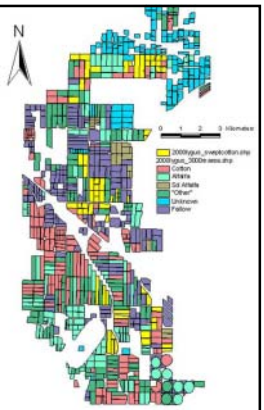
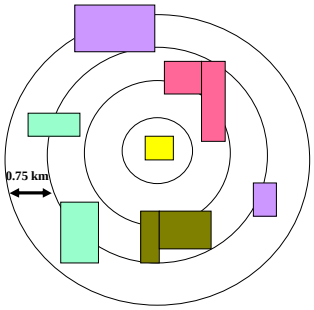
Spatial Study

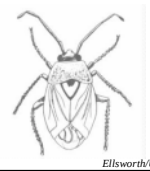
- Two townships, spring & early summer hosts (April - July)
- Cotton, alfalfa, seed alfalfa, fallow, weeds, and small grains; georeferenced
- Sweeps (15 in. diam.) from each potential host weekly
- Examine source / sink relationships among crops



Focal Cotton Fields (50)



- Focal cotton field
- Seed alfalfa
- Forage alfalfa
- Cotton
- Fallow



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Ring Analyses of Area & Distance Effects on Lygus

- Around focal cotton fields, estimate area of different crops within each 0.75 km concentric ring
  - Area of unidentified & unknown crops similar for each ring (ca. 21%)
- Each crop's area within a ring is multiplied by the mean density of Lygus; Estimate of source potential
- Estimate the association between Lygus density in focal fields and the source potential of each crop type

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Mean Lygus Density (adults & nymphs)

Crop Type	N	Lygus Density (log D + 1)*
Seed Alfalfa	9	1.50a
Forage Alfalfa	34	1.45a
Fallow	3	1.44a
Cotton	72	0.69b

* Values fb same letter not significantly different (P > 0.05)

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Source : Sink Effects

Ring	Crop Type	Coefficient from Multiple Regression $(x\ 10^{-6})^2$
1) 0.75 km	Seed Alfalfa	1.1**
	Forage Alfalfa	0.01
	Fallow	0.008
	Cotton	-0.58*
2) 0.75 - 1.5 km	Seed Alfalfa	0.7*
	Forage Alfalfa	0.2
	Fallow	0.04
	Cotton	0.1

no significant associations in rings 3 & 4; * P = 0.06; ** P < 0.001

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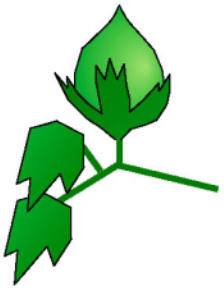
Lygus Associations

- Seed alfalfa fields are sources of Lygus for cotton fields. This effect does not extend beyond 1.5 km.
- Cotton fields are sinks for Lygus. This effect disappears beyond 0.75 km.
- Strategic placement of crops could help alleviate Lygus problems.



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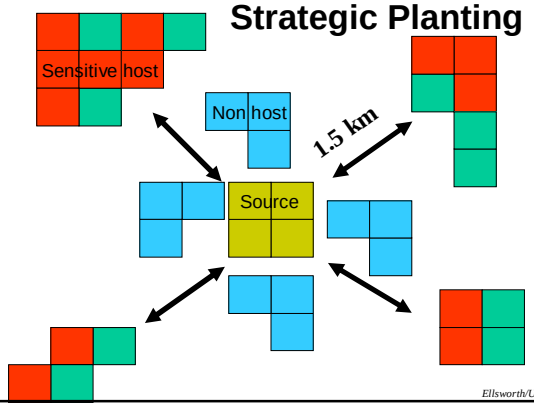
Strategic Planting



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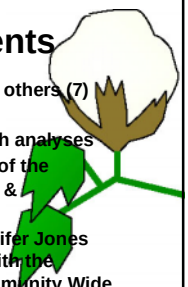
Acknowledgments

- Virginia Barkley who supervised and others (7) who conducted the sampling
- Christa Ellers-Kirk for assistance with analyses
- Larry Antilla, Jerry Kerr and the rest of the ACRPC staff who provide crop maps & coordinates
- Steve Husman, Dave Langston, Jennifer Jones and cooperating growers involved with the implementation of the Maricopa Community Wide Lygus Action Plan
- ACGA and Cotton Incorporated who supported (pce) the Lygus termination studies



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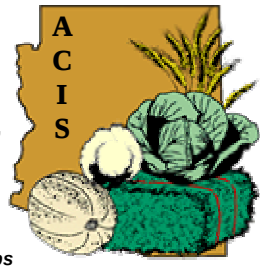
Information

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



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