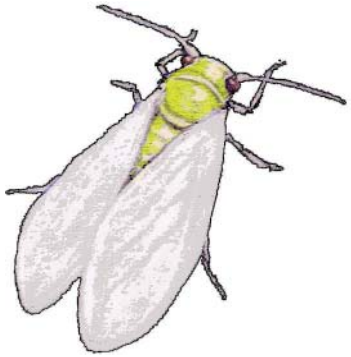
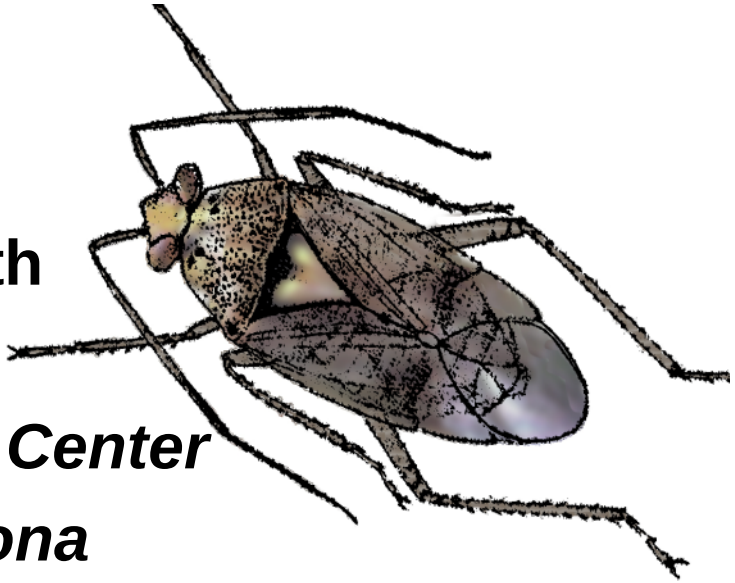
Update and New Considerations in Cotton Insect Management





Peter C. Ellsworth

IPM Specialist

Maricopa Agricultural Center

University of Arizona

Early Season Cotton Management Meeting

26 May 2004

Insect Management

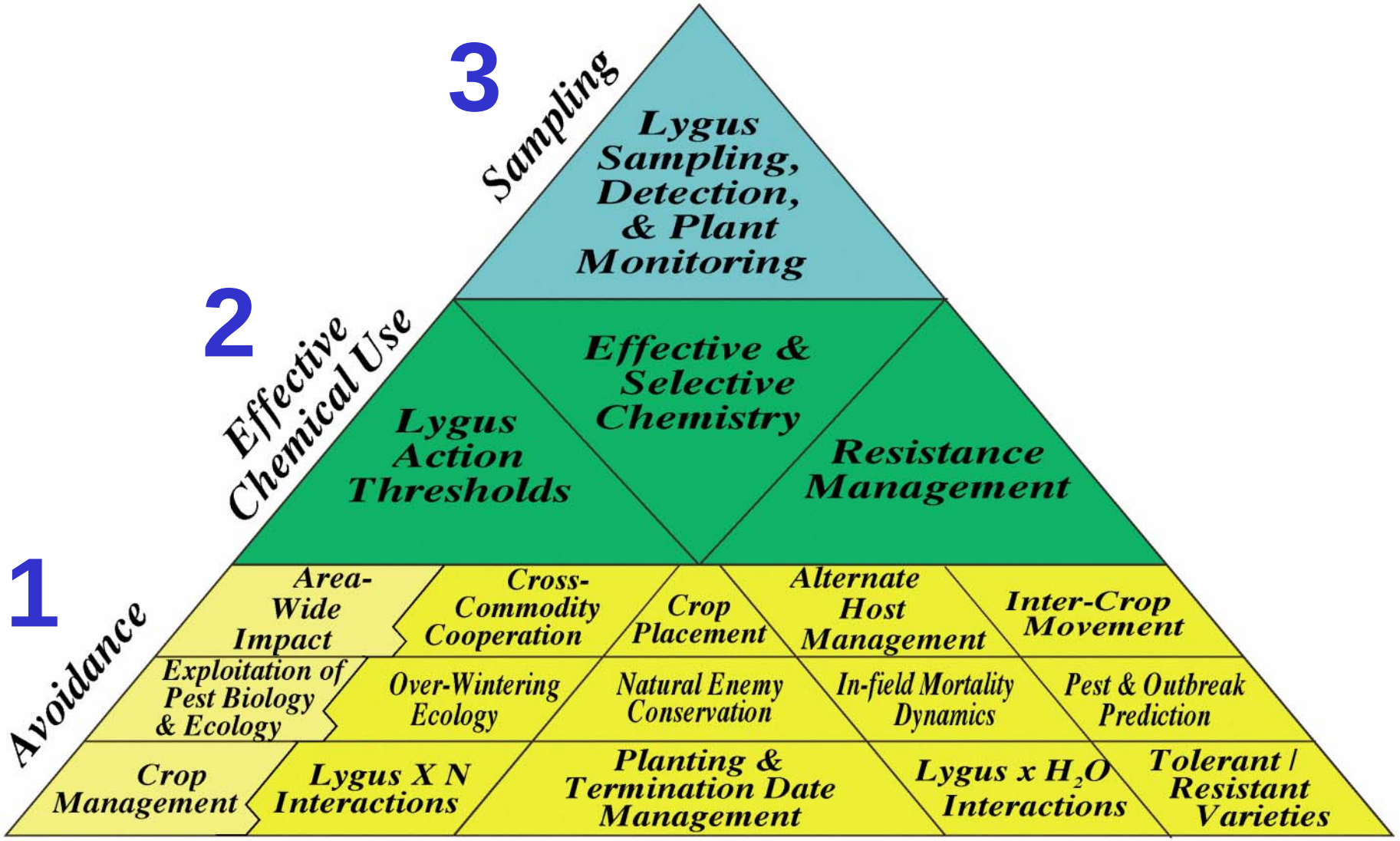
- **Review of status of Lygus IPM**
  - **What do we know & need to know?**
  - **Address two questions; Spatial & chemical control**
  - **Selective options for Lygus control?**

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

Ellsworth/UA

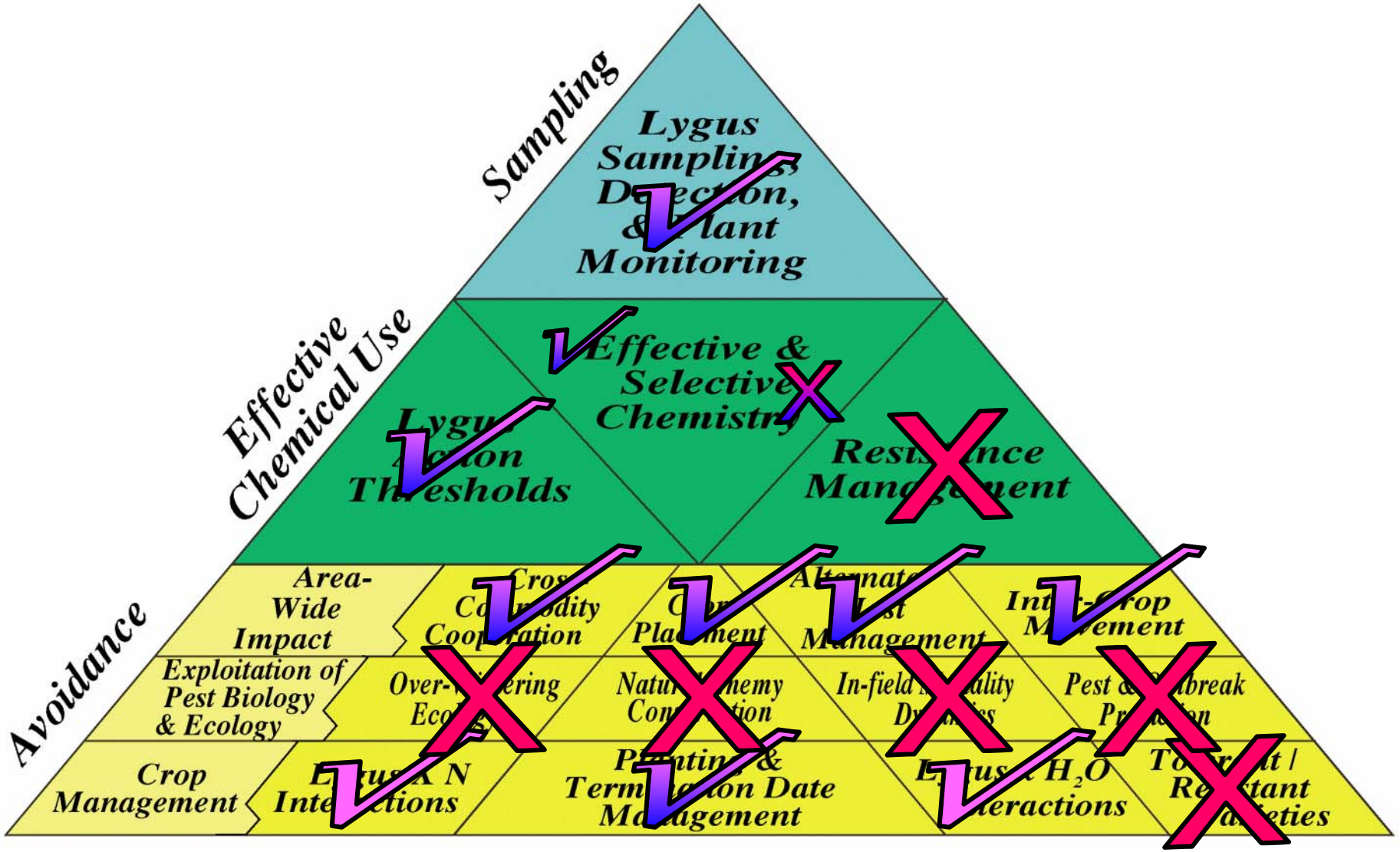
Lygus IPM…

…depends on 3 basic keys



Key Elements…

…what have we got?



Lygus Can Be Managed!

Even side-by-side

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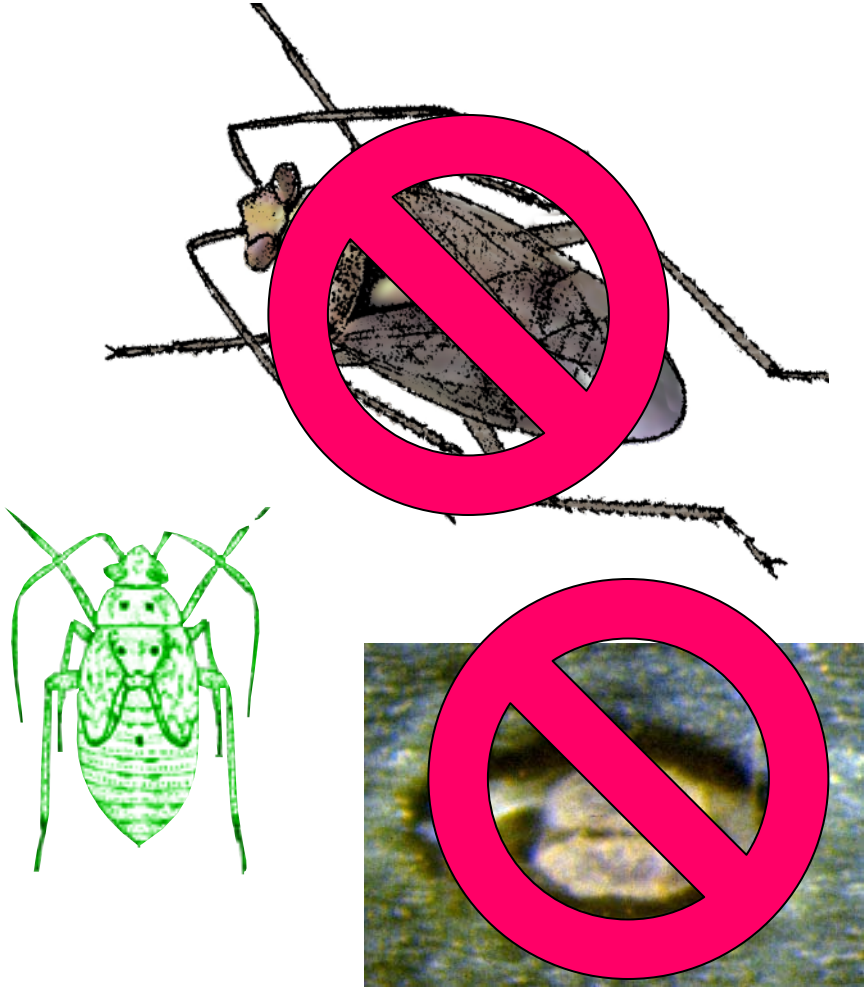
Avoid Adults; Control Nymphs



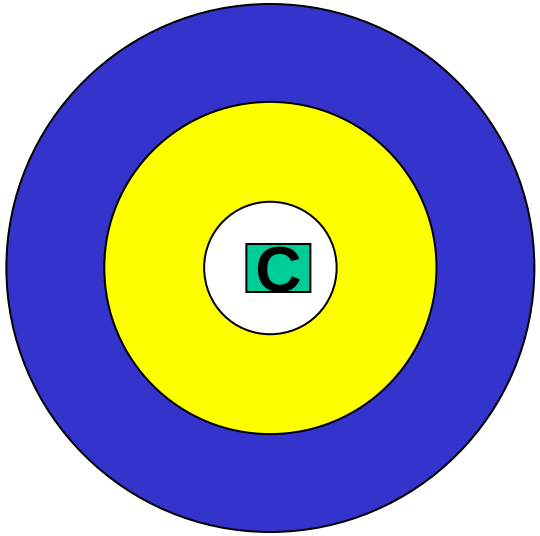
Lygus hesperus Adult

- **Can cause damage**
- **<u>Cannot</u> be reliably controlled**
- **Key to movement & reproduction**

Ellsworth/UA

Ring Analyses to Determine Range of Impact of Lygus

- **How are Lygus densities in focal fields related to source potential of surrounding crops?**



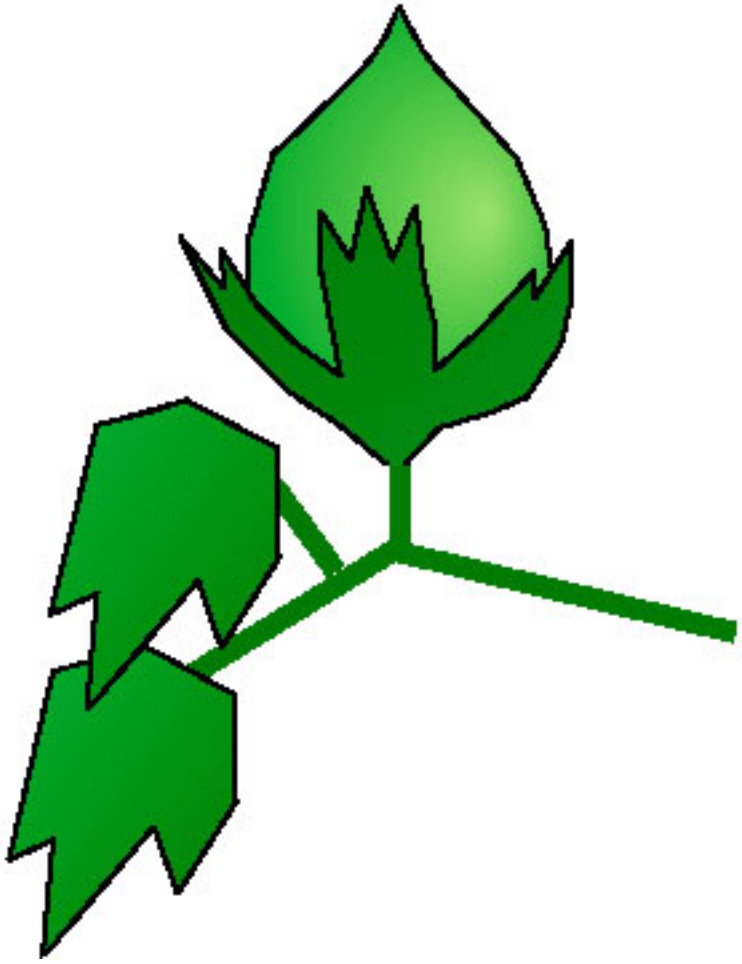
Ellsworth/UA

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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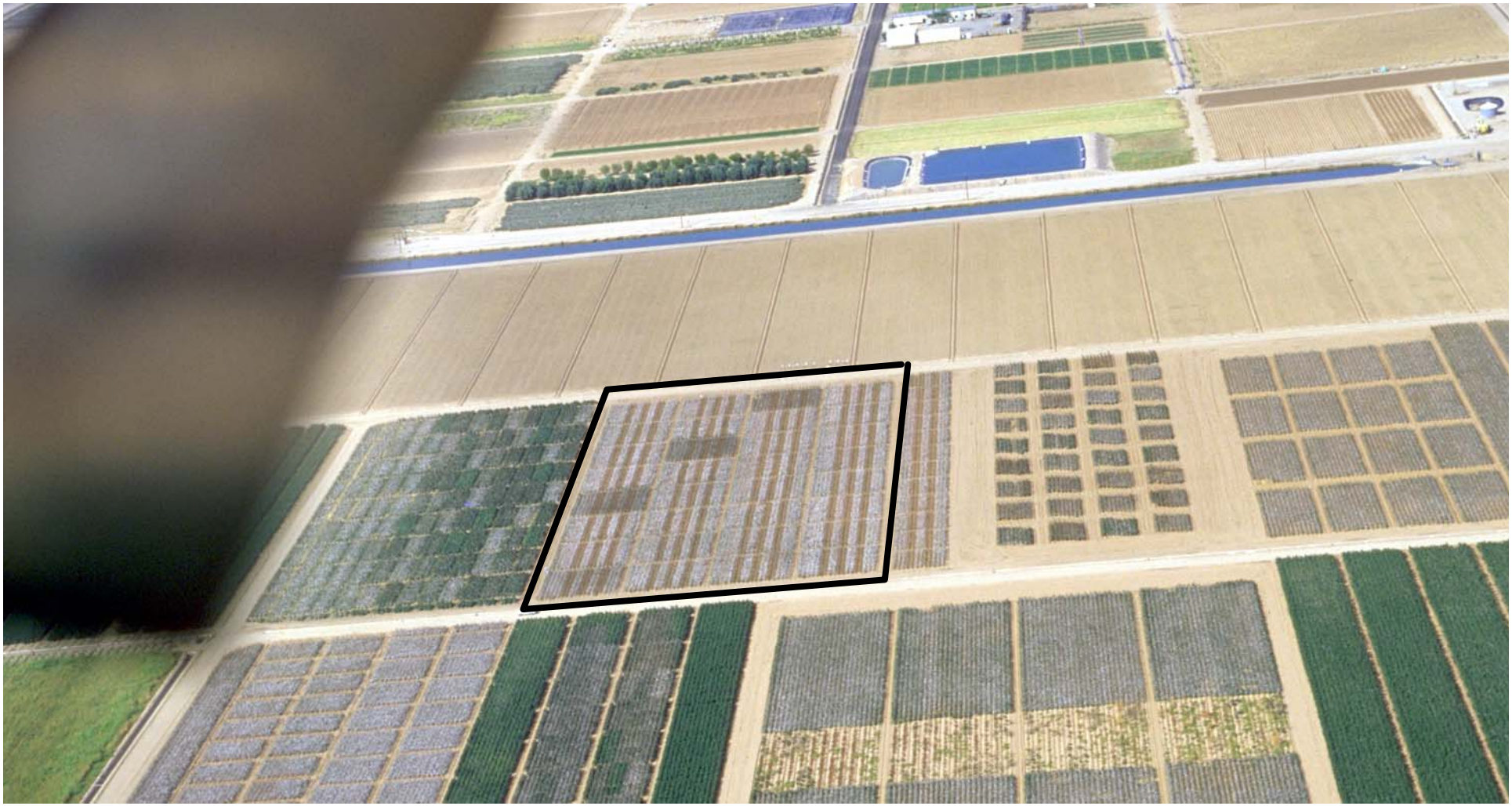
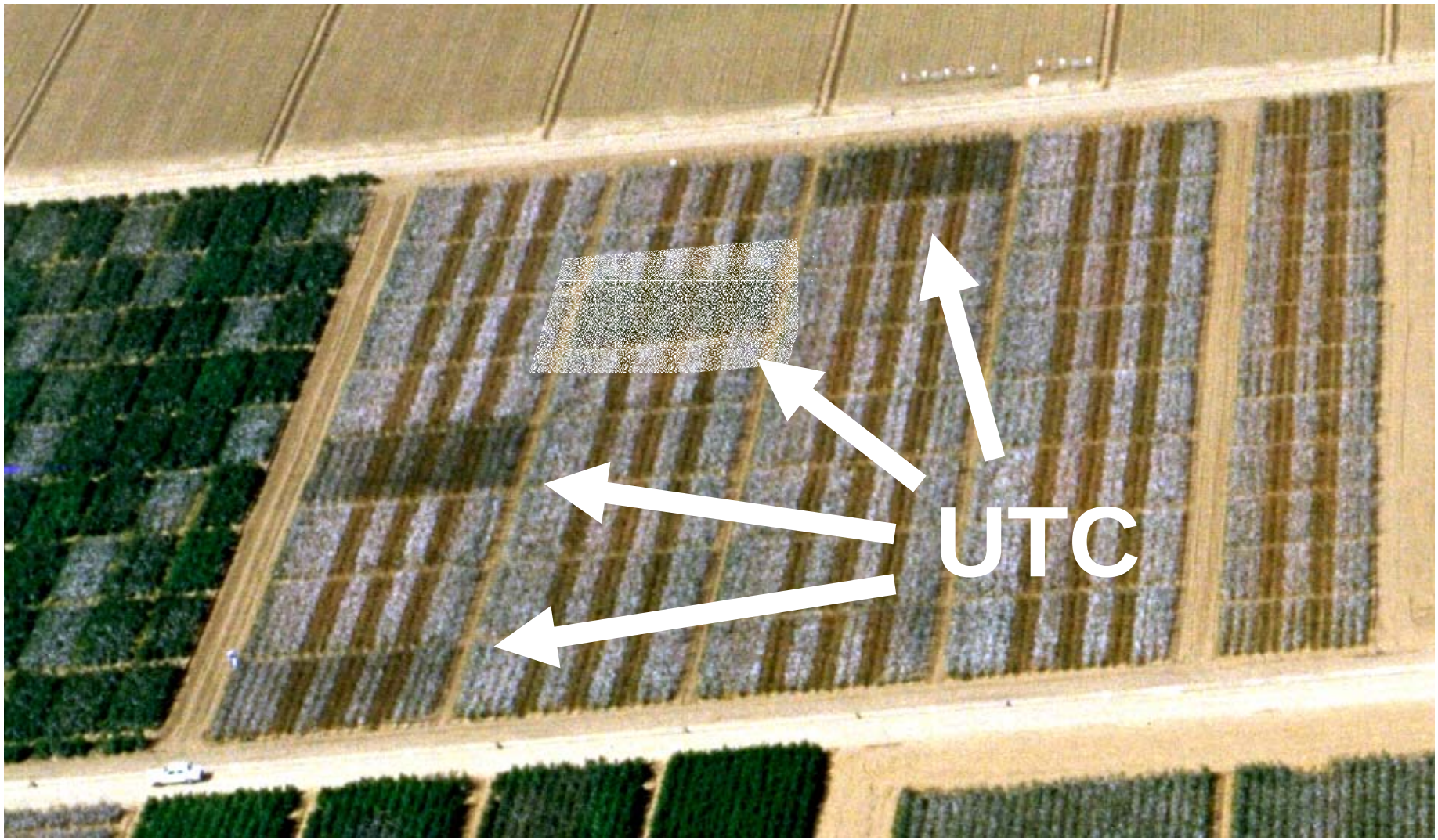
Adults move; Nymphs don’t



Ellsworth/UA

Adults move; Nymphs eat!



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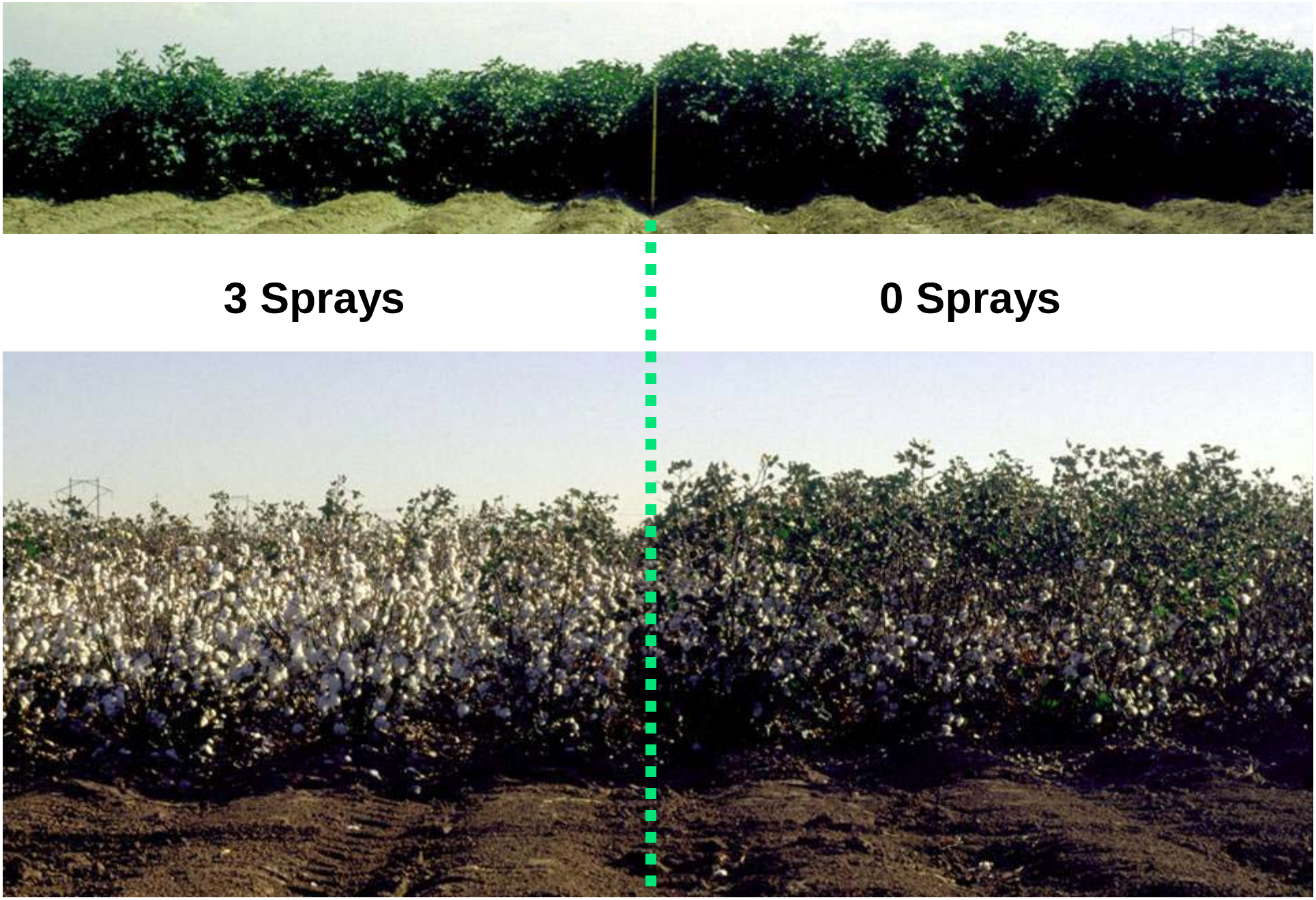

Note height difference

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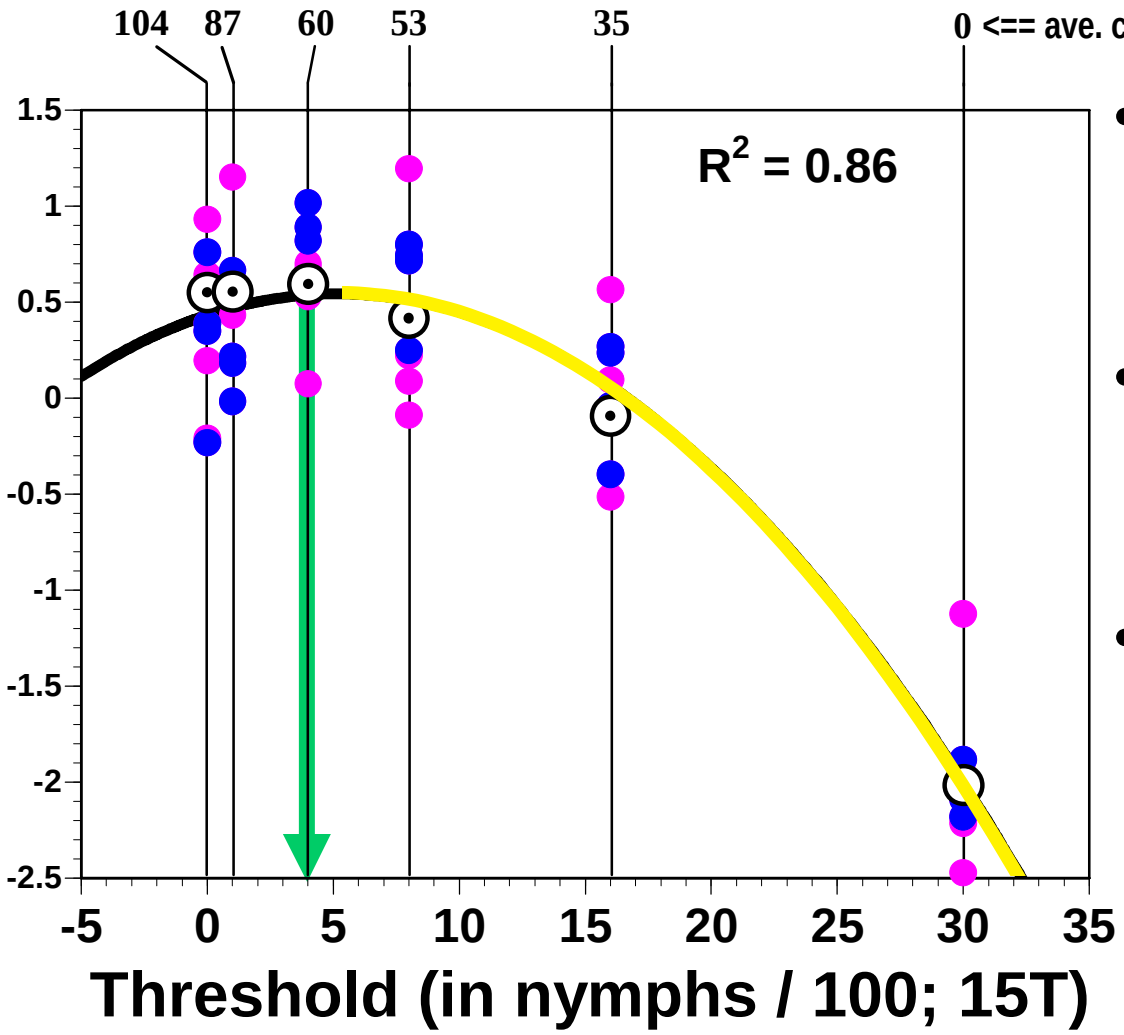
Avoid Adults; Control Nymphs!

Yield & Revenue : Density

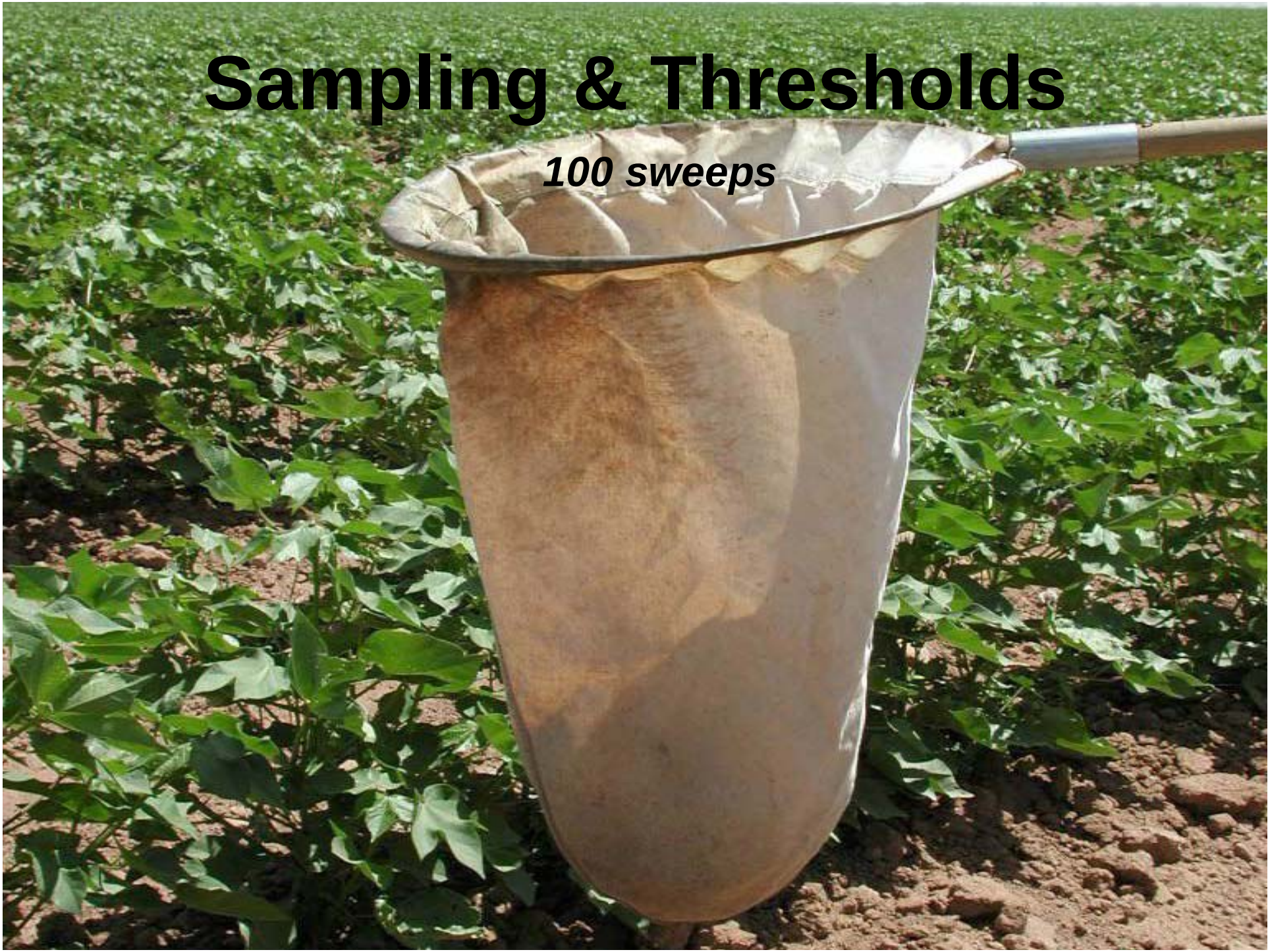


- **Maximum Yield @ 1.7 nymphs / 100**
- **Maximum Revenue @ 5.2 nymphs / 100**
- **Recommendation: 4 nymphs with at least 15 total Lygus per 100 sweeps ('15:4')**

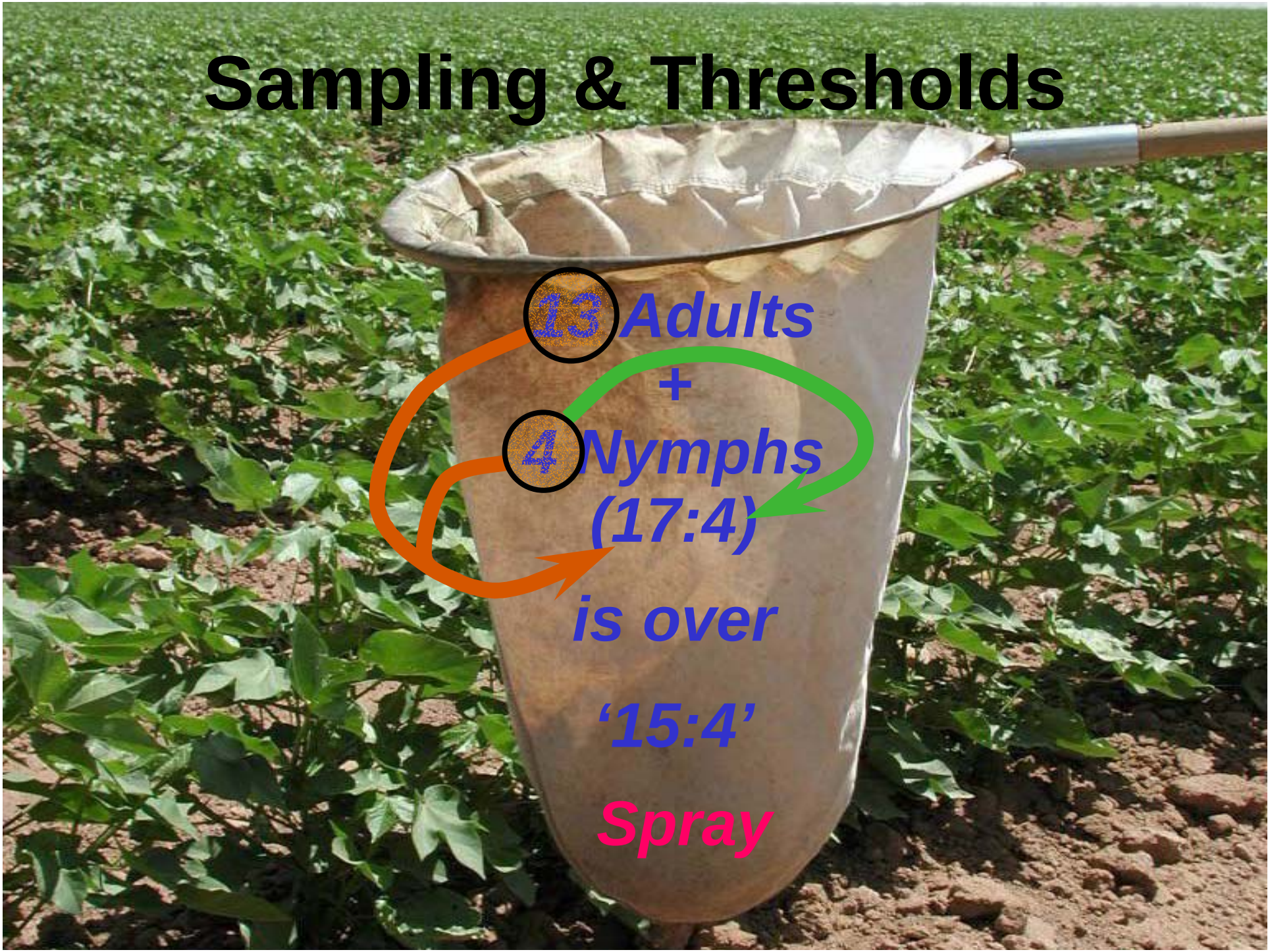
Ellsworth/UA

Sampling & Thresholds

100 sweeps



Sampling & Thresholds

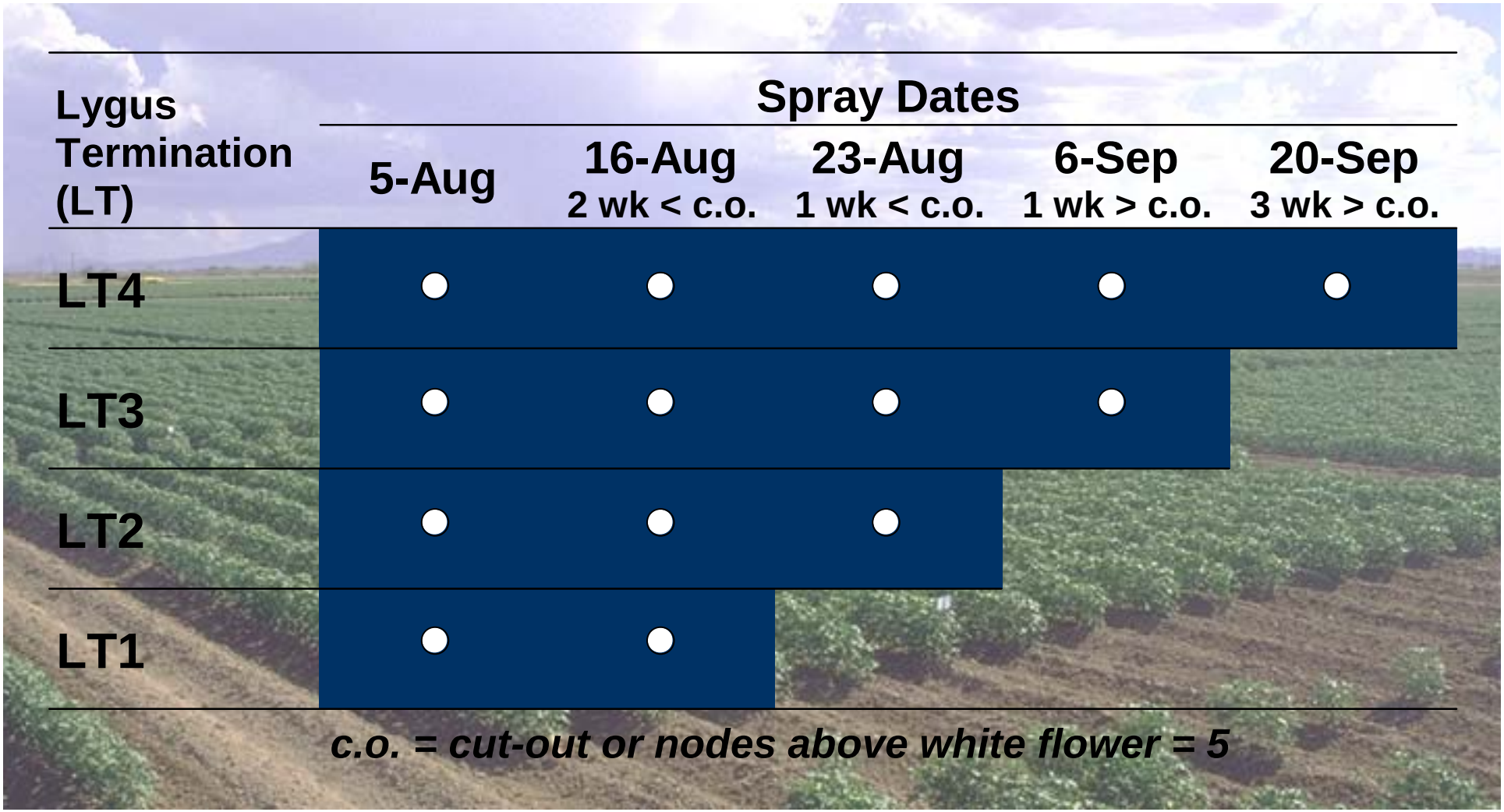


Sampling & Thresholds

13 Adults
+
3 Nymphs
(16:3)
is under
‘15:4’
Not Yet!

Timing Late Season Controls

(when should you stop spraying?)

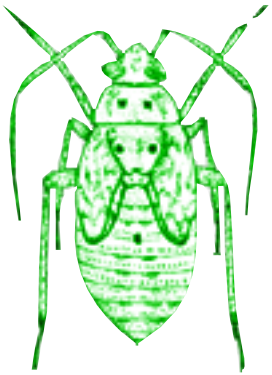


2003 Experiment

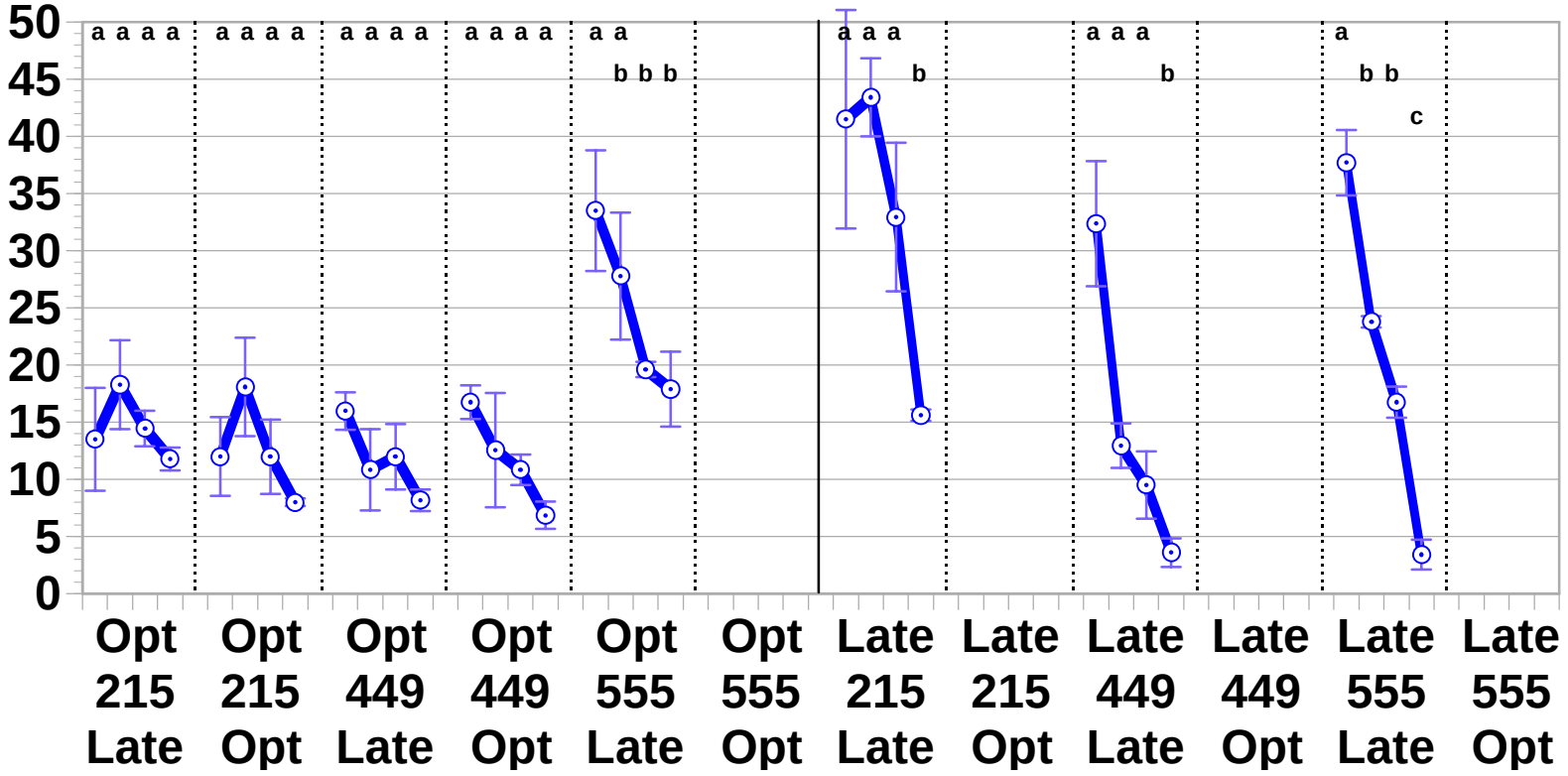
- **Two planting dates: April 30 & May 28**
- **Three varieties: SG215BR, DP449BR, DP555BR**
- **Two irrigation termination timings: Aug. & Sept.**
- **Four Lygus chemical control terminations**

High heat stress & fruit shed July-August

Extremely productive “fall”, long, open and dry

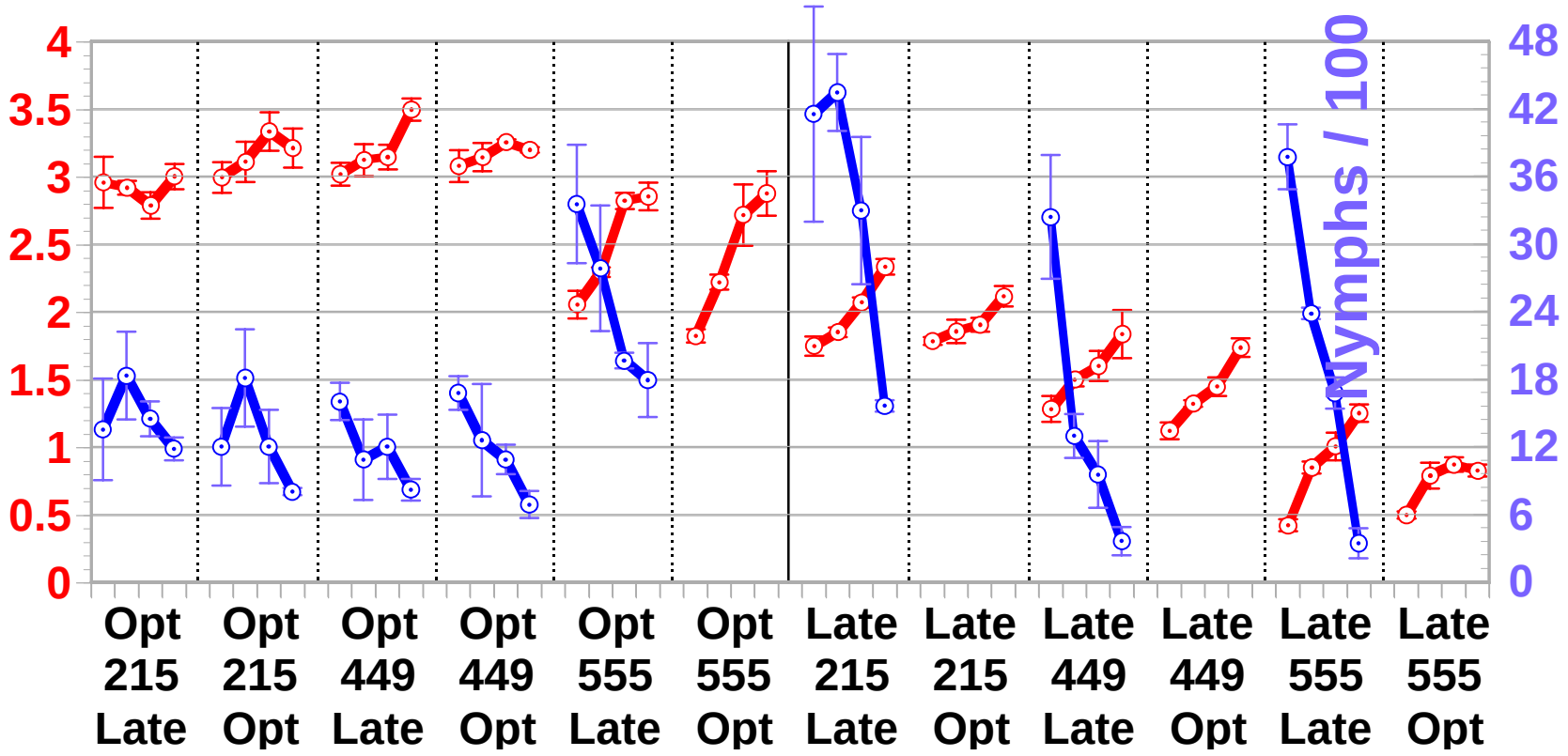


High Populations Late Season



Ellsworth/UA

Yield : Nymphs Relationship



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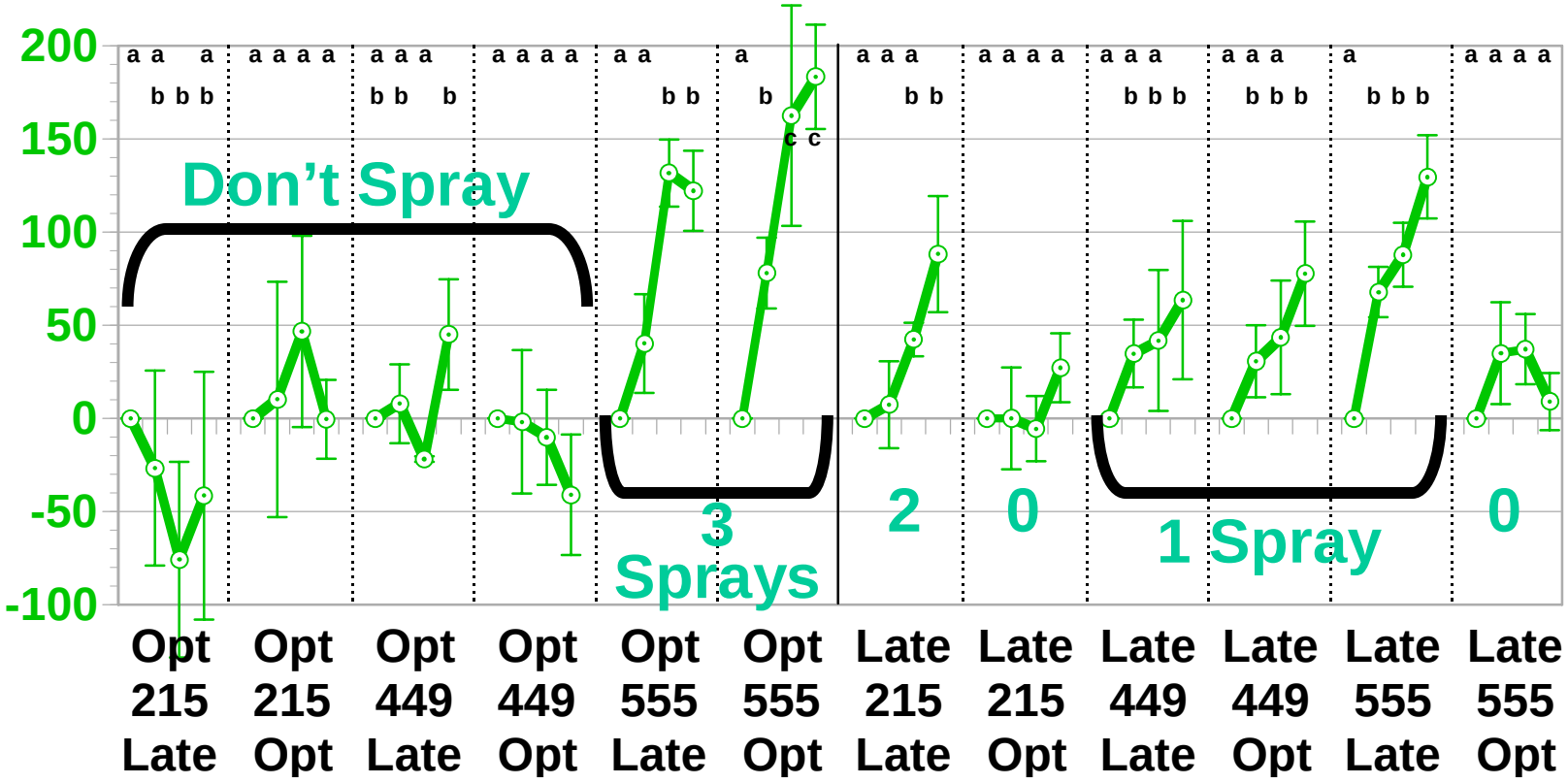
50¢ Cotton Returns



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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?**

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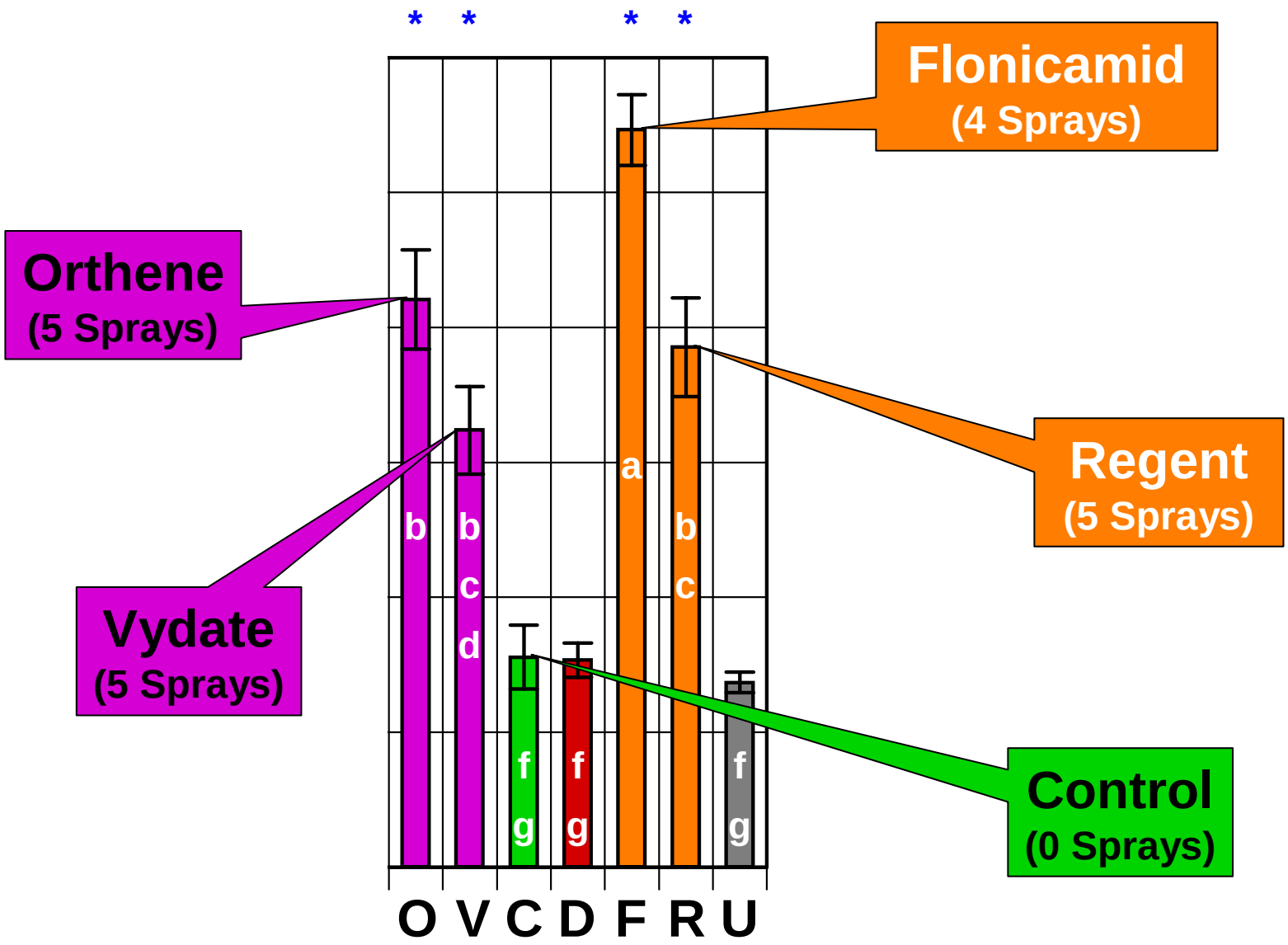
Yield (03F4Eff)



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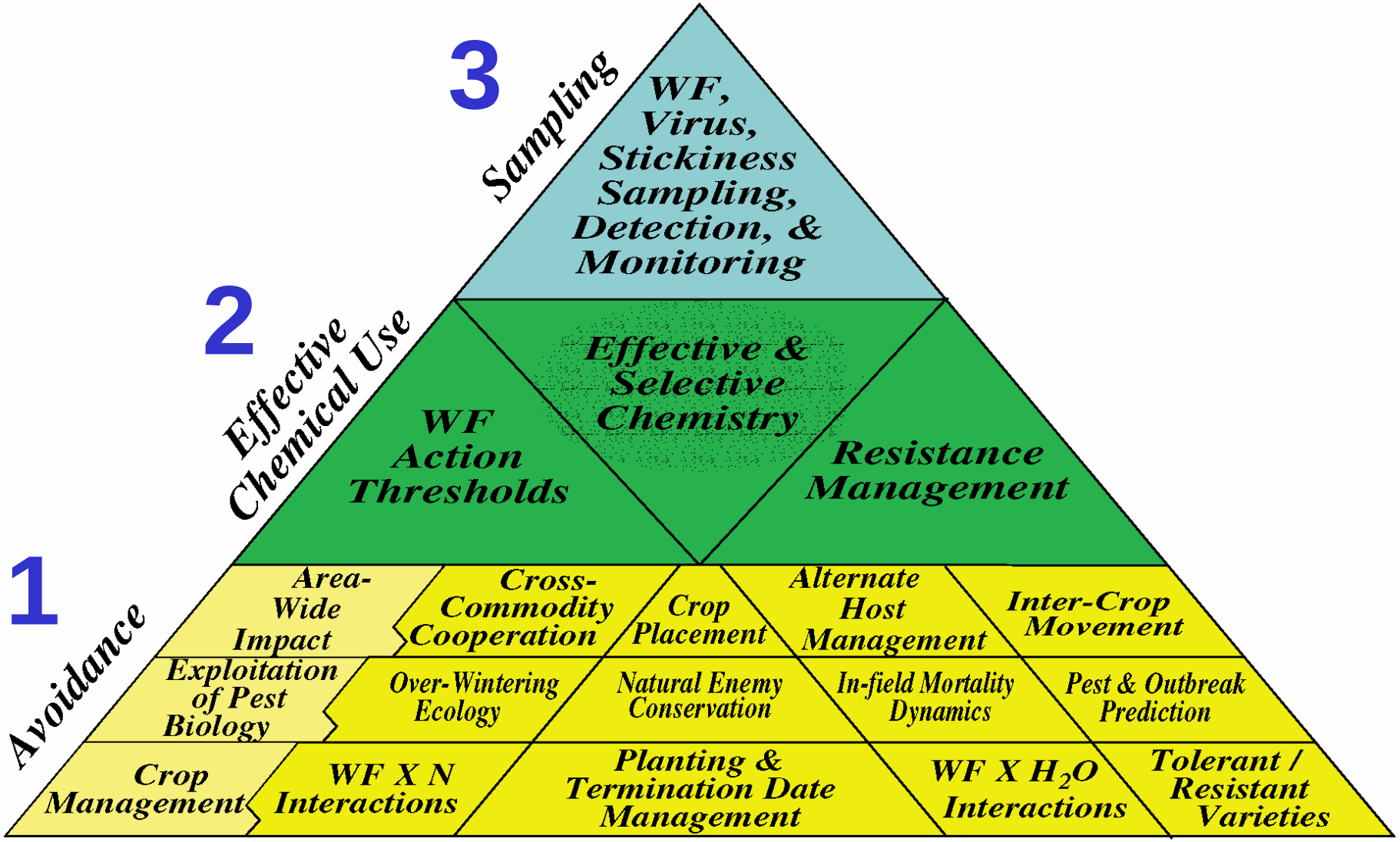
Whitefly IPM…

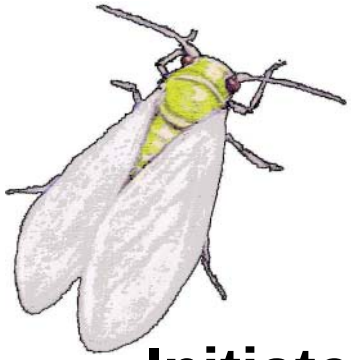
…depends on 3 basic keys



Snow in Phoenix?

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

Ellsworth/UA



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 <u>plus</u>**
  - **40% of leaf disks infested with 1 or more large nymphs**
- **Don't Get Distracted**

Ellsworth/UA

The Penalty is Severe & Lasting

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

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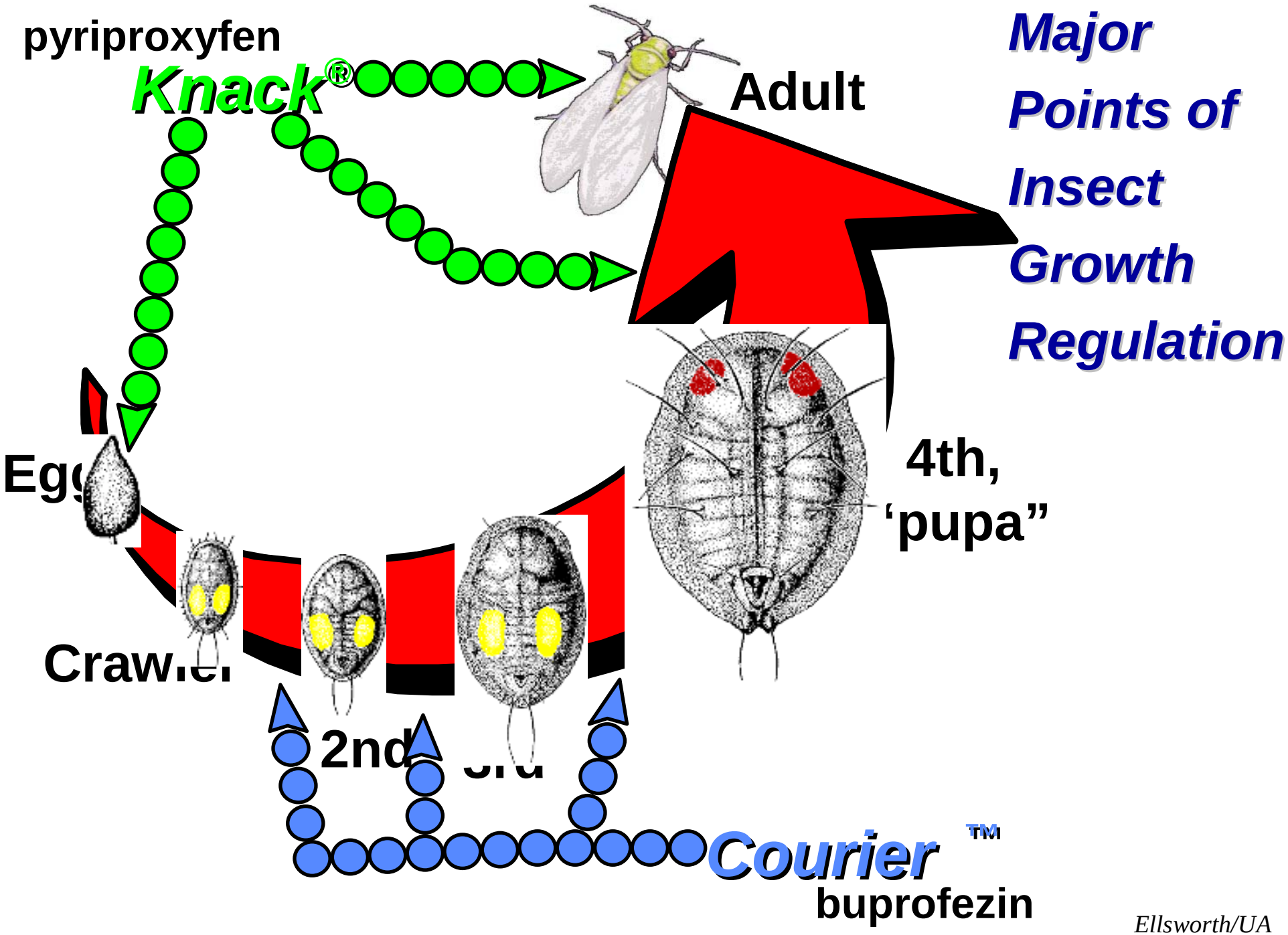

pyriproxyfen
Knack®
Adult
Major Points of Insect Growth Regulation
4th, 'pupa"
Courier™
buprofezin
Ellsworth/UA

IGR-treated Untreated

Ellsworth/UA

Bioresidual v. Chemical Residual

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

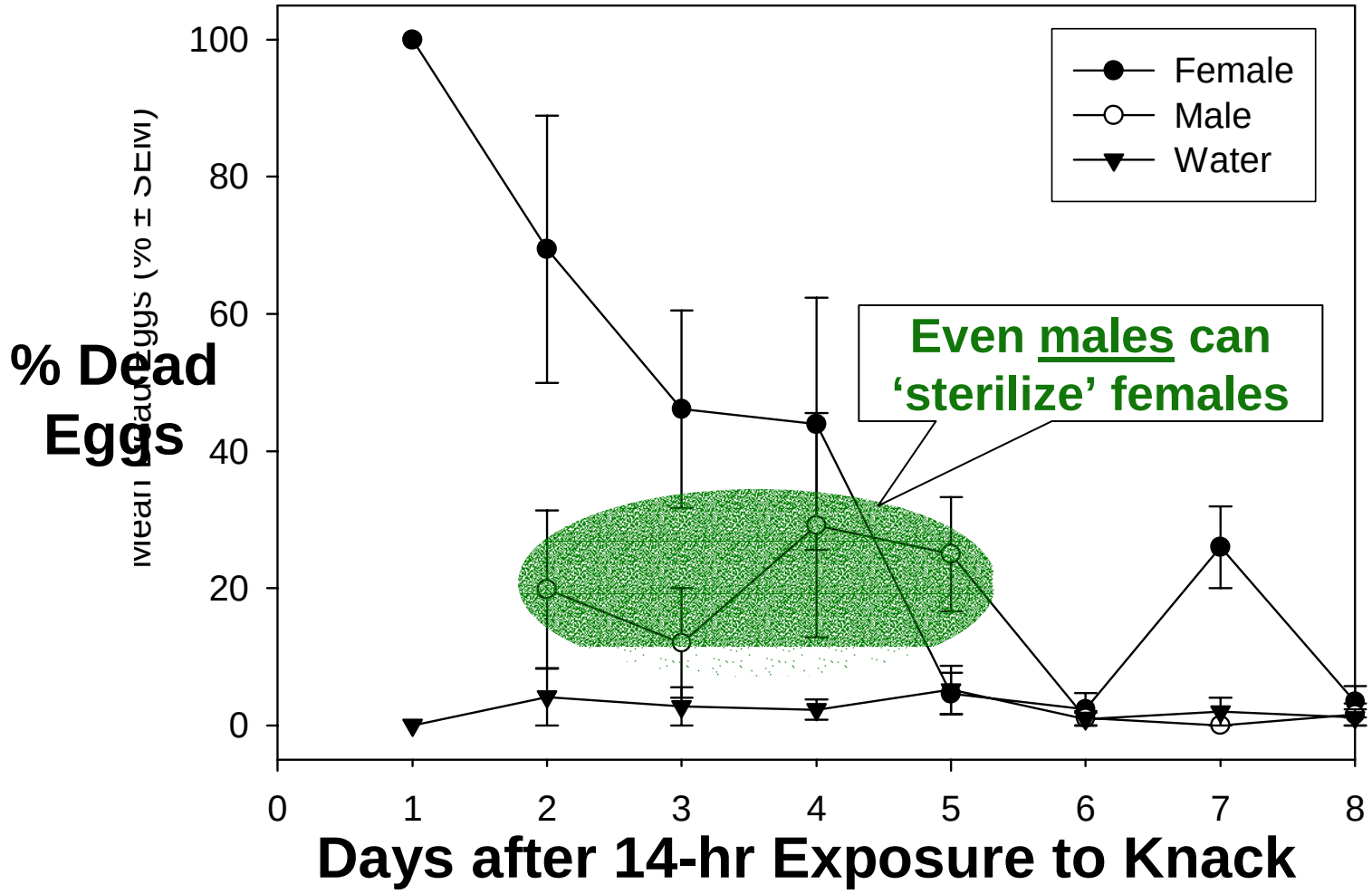
How long does Knack sterilize females for?

How long does Knack last on or in cotton leaves?

Ellsworth/UA

Females Sterilized for 4 d*

1 feeding bout



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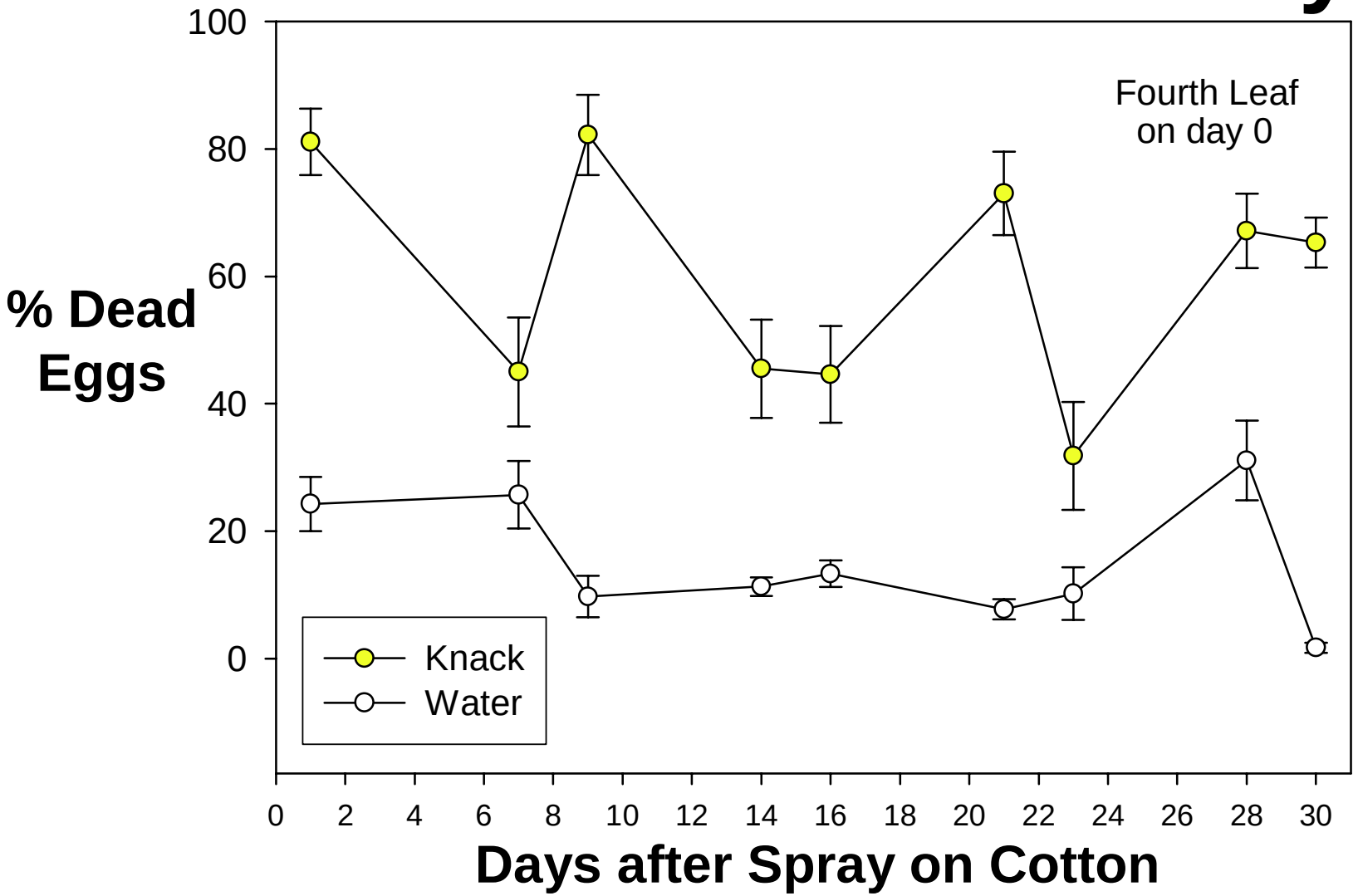
Knack Sterilized Eggs on Treated Leaves for 30 Days



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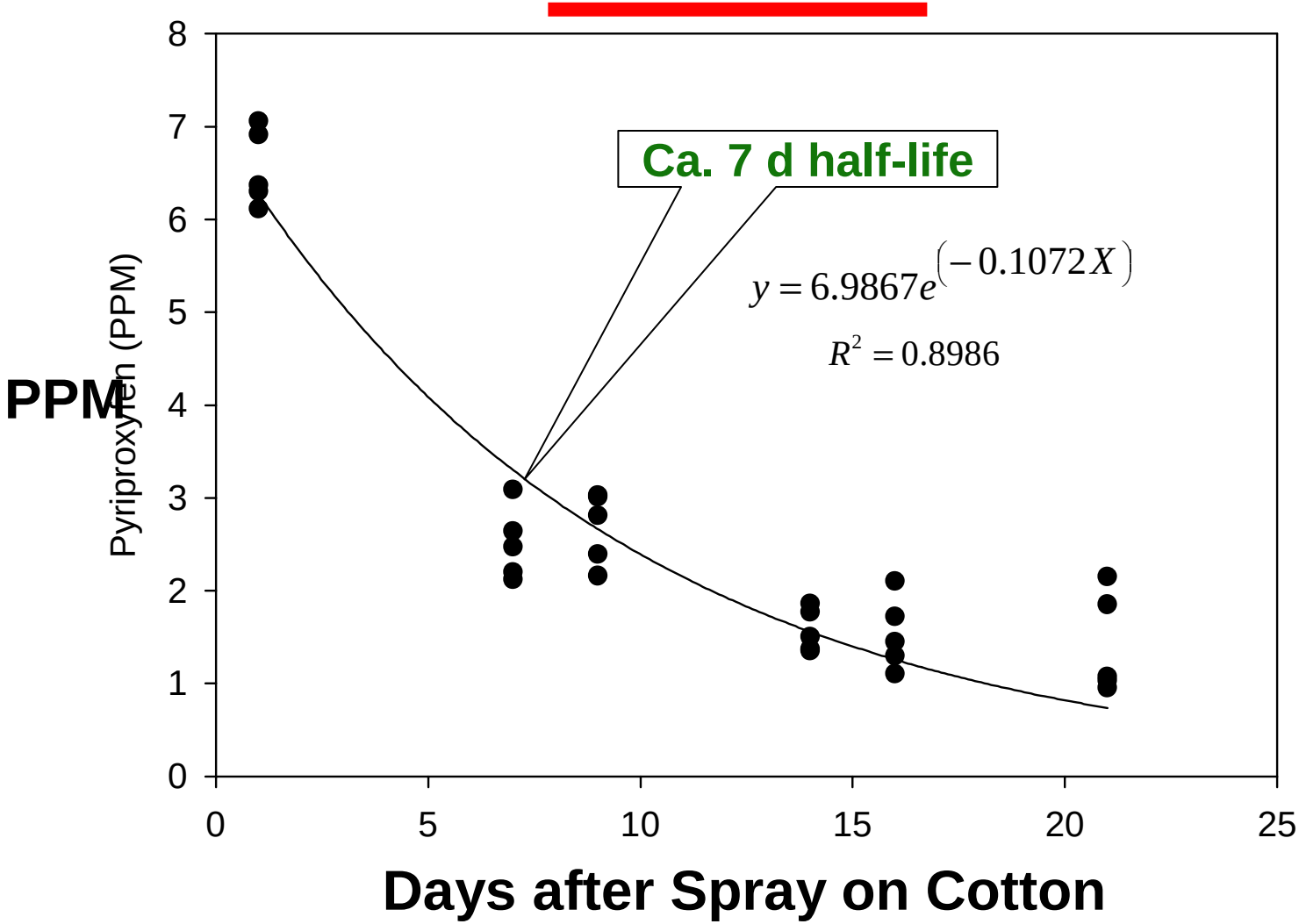
Field Decay of Knack Residues

Don't Cut Rates!



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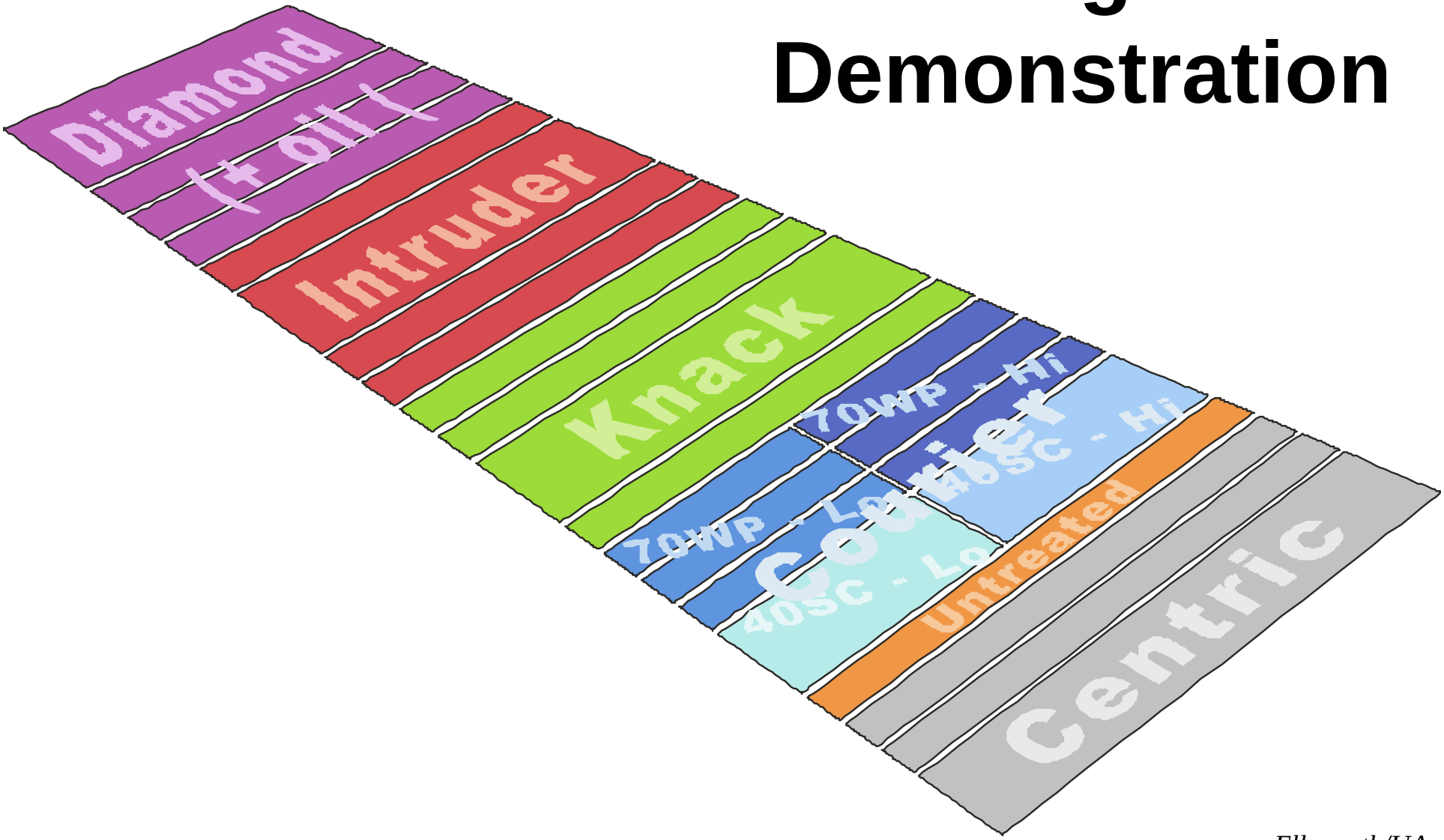
2003 WF Management Demonstration



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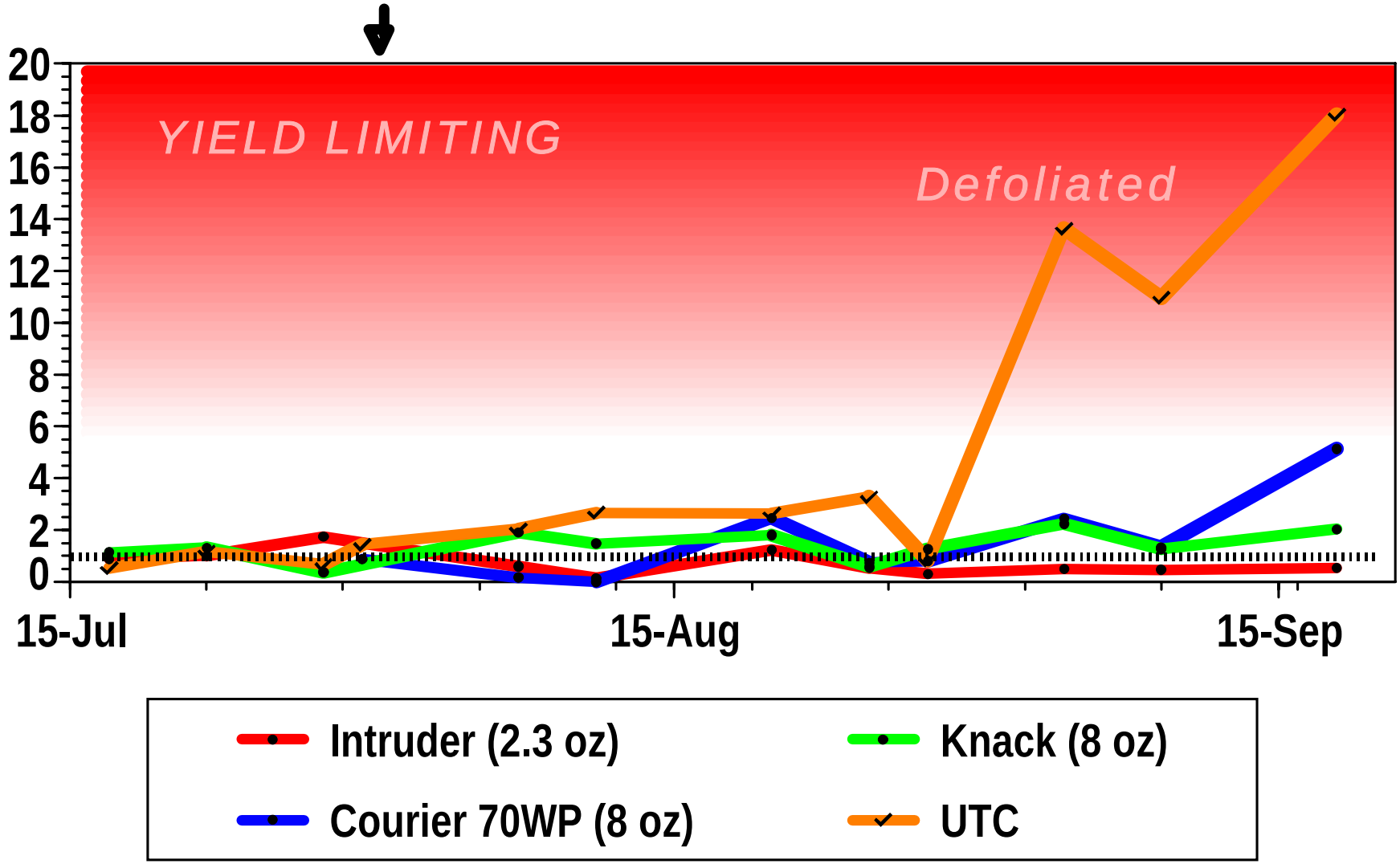
Real World Example (03F22)



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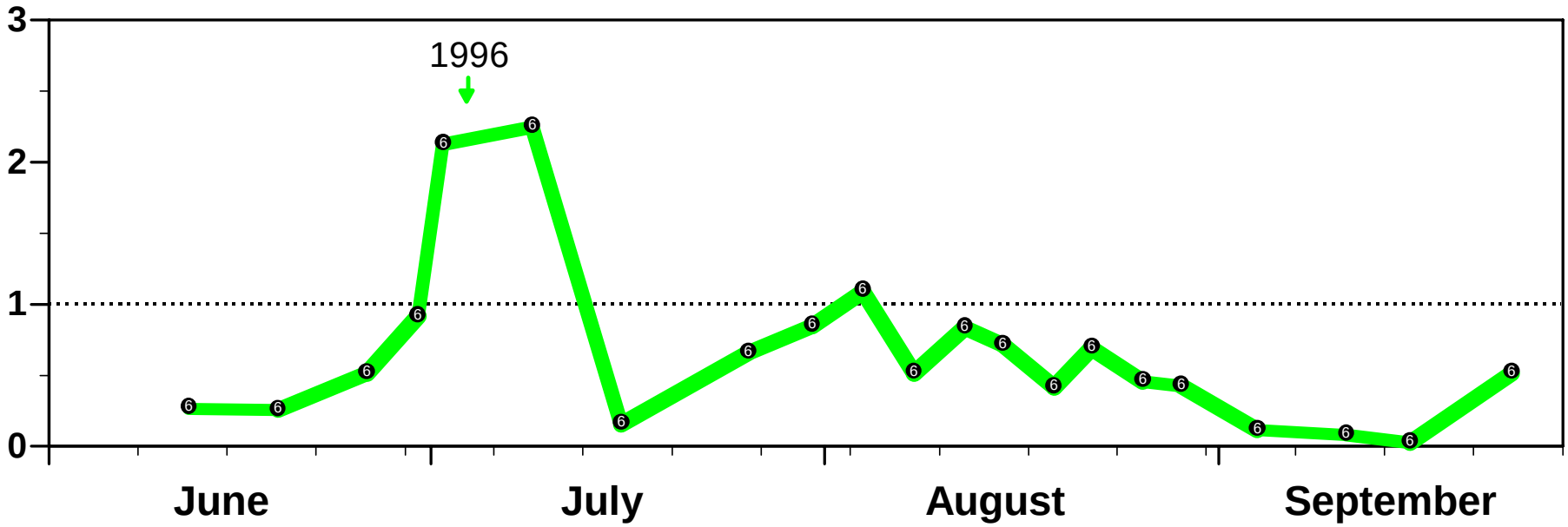
Historical Comparisons
Knack 1996



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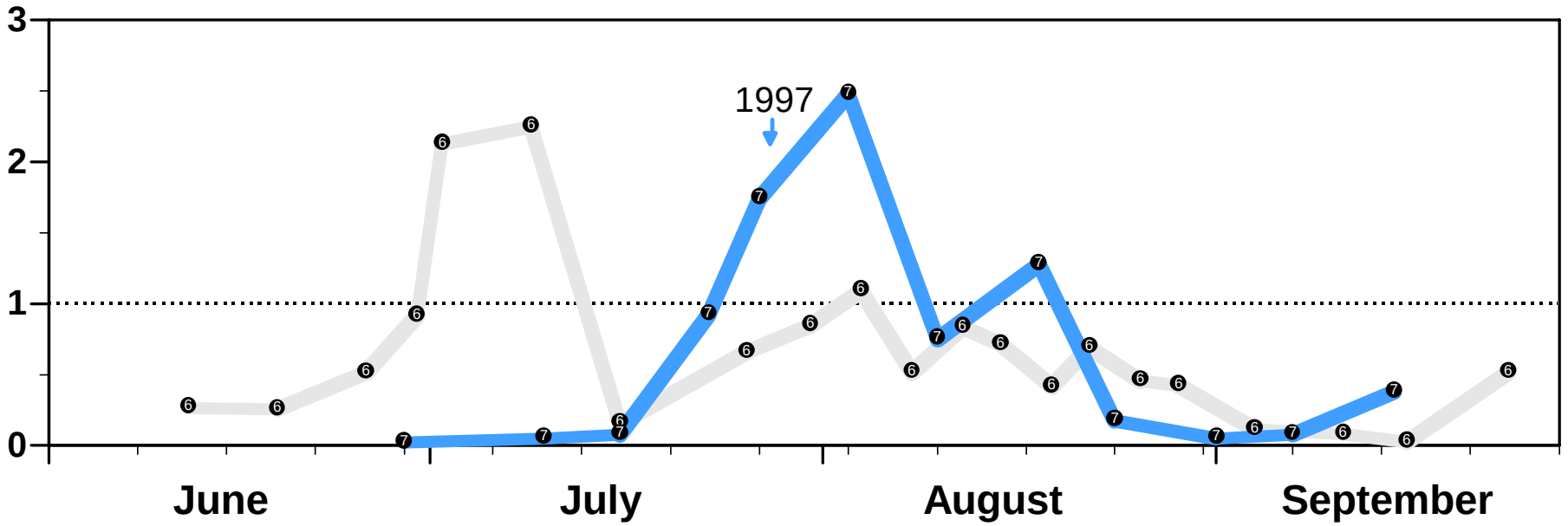
Knack 1997

UTC > 12.8 (9/16)



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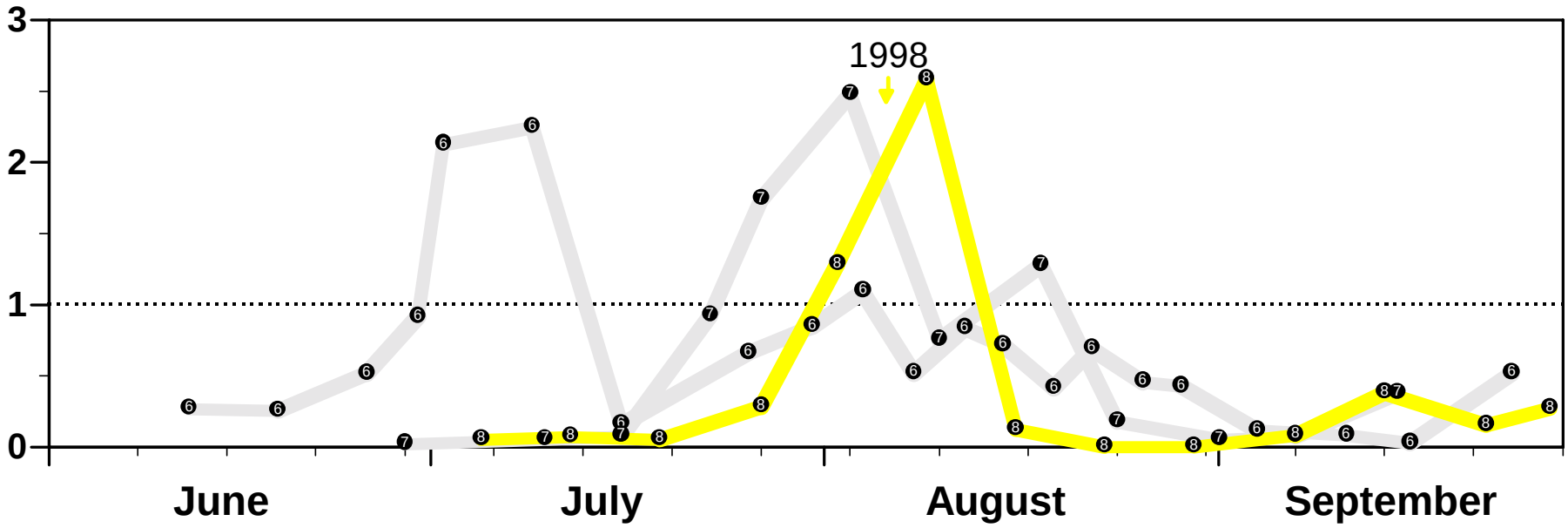
Knack 1998

UTC > 3.0 (8/10)



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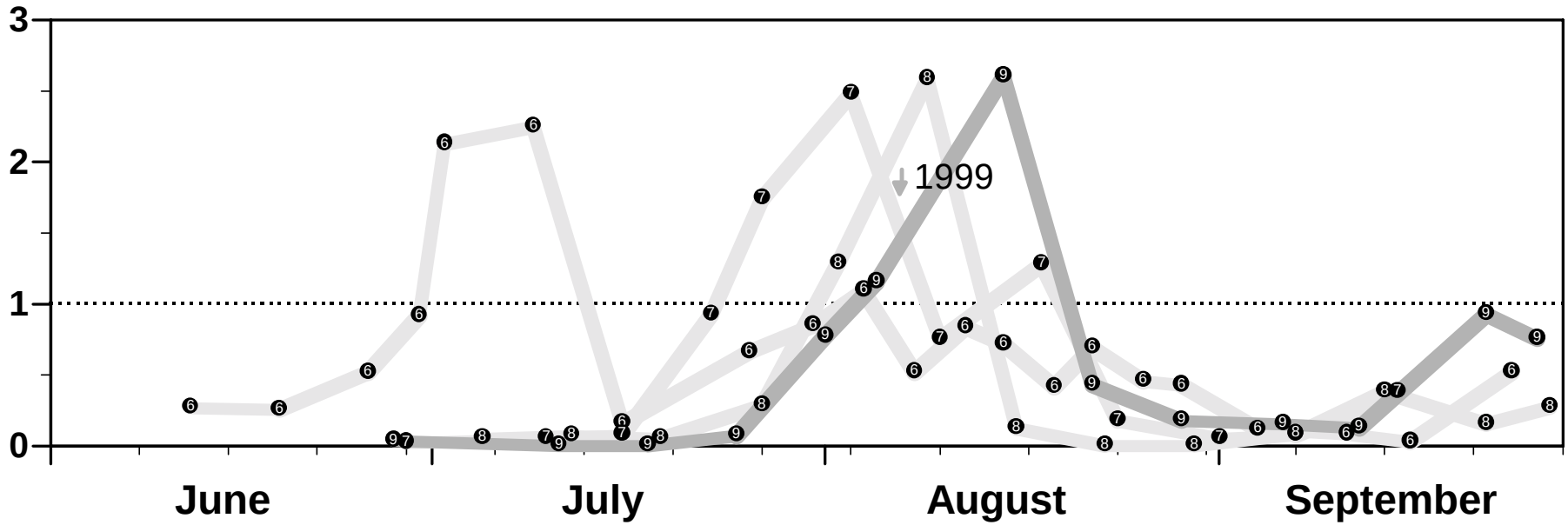
Knack 1999

UTC > 3.3 (8/16)



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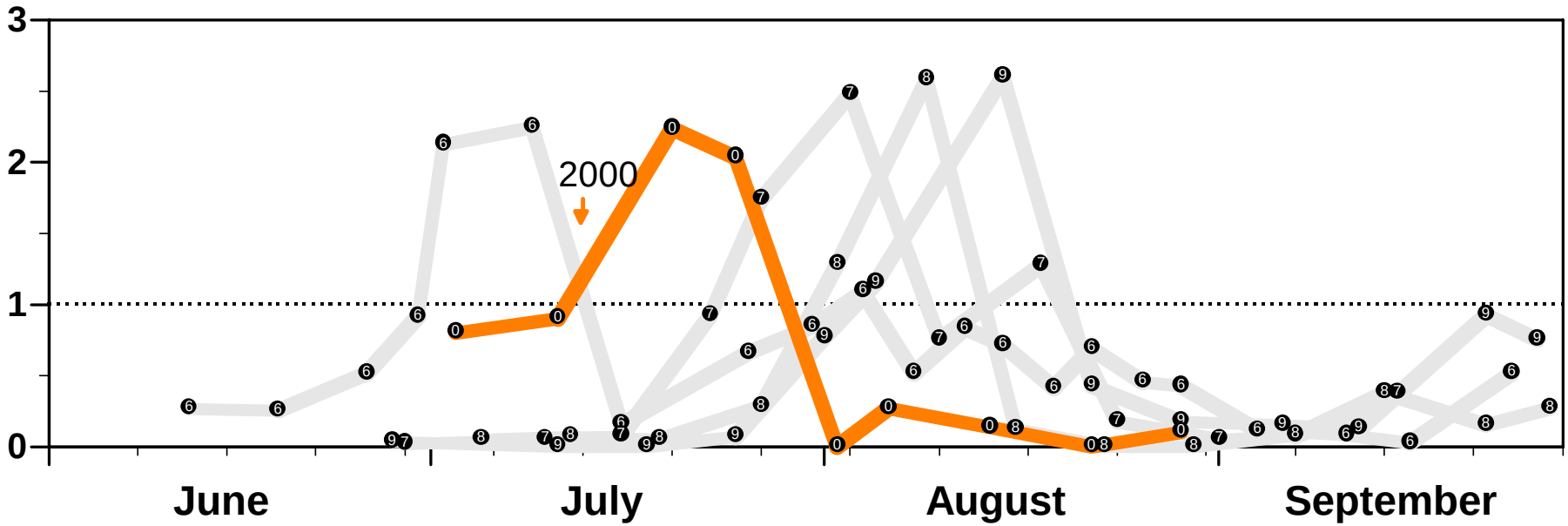
Knack 2000

UTC > 10.6 (8/3)



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Knack 2002

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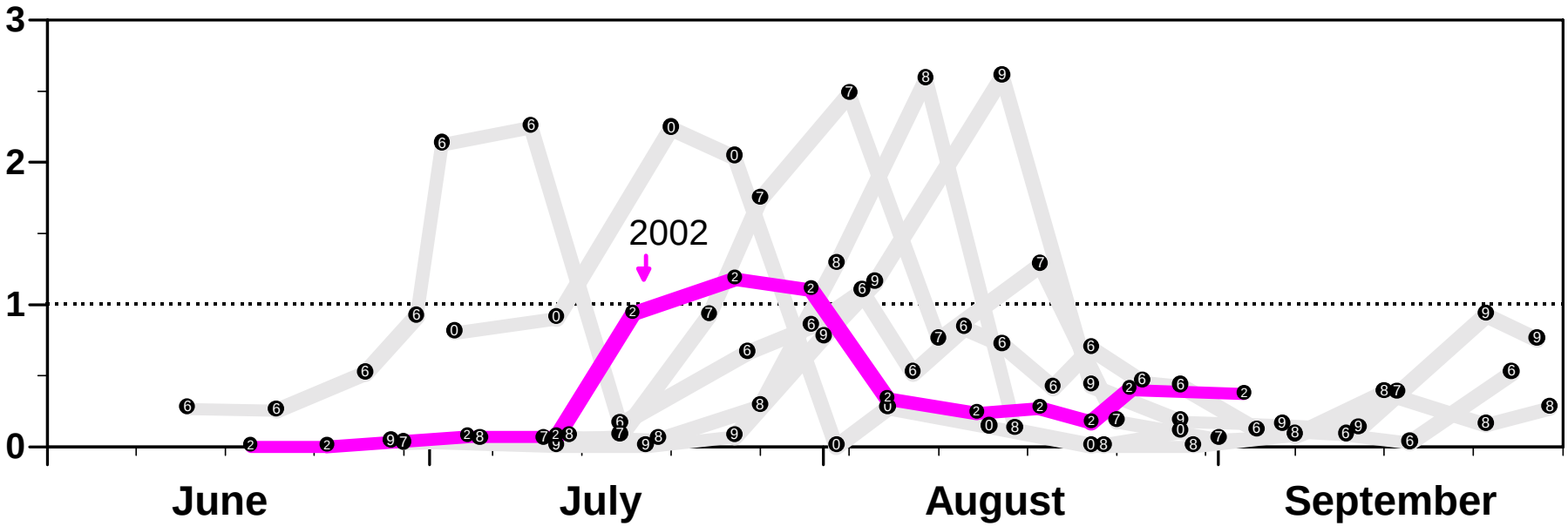

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Knack 2003

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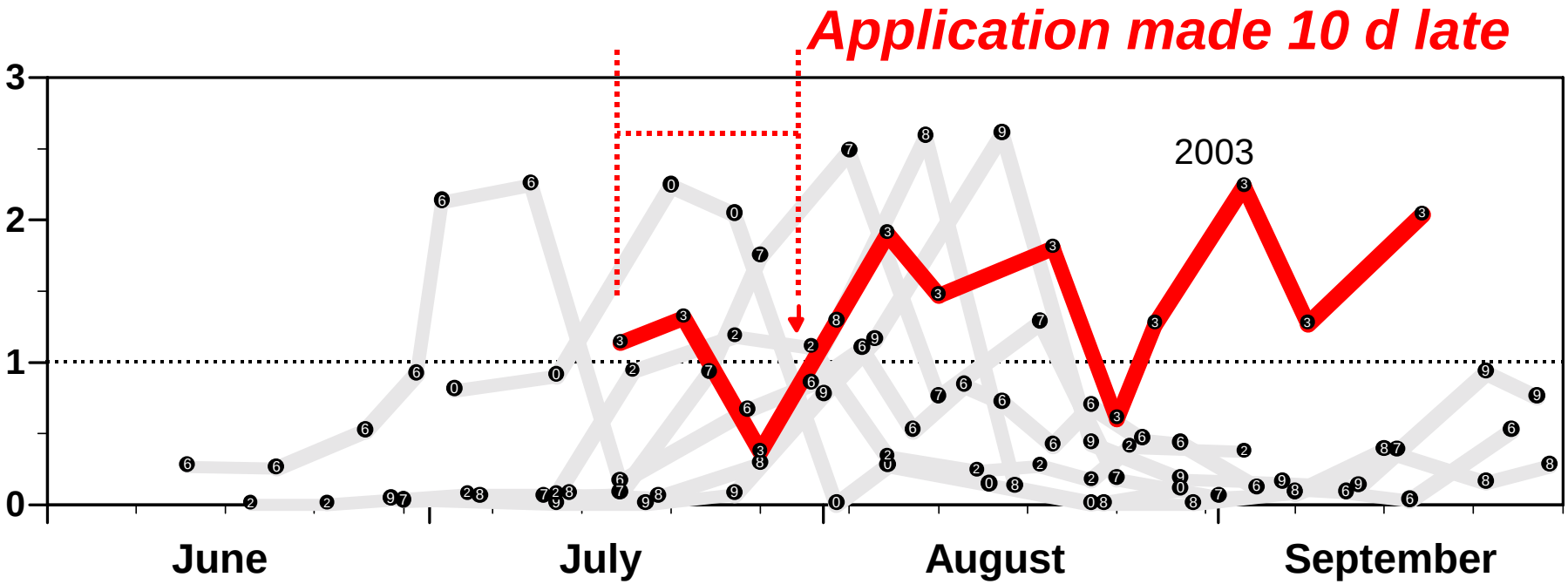

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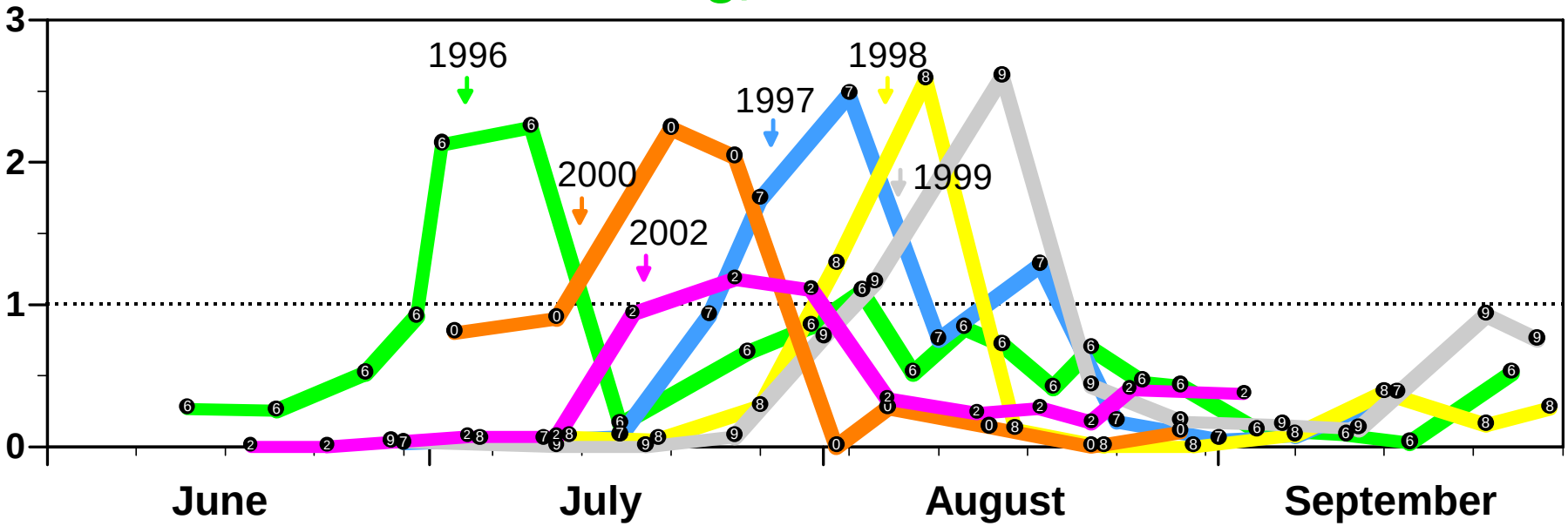
Historical Performance of Knack, 1996–2002

Consistent timing, consistent results



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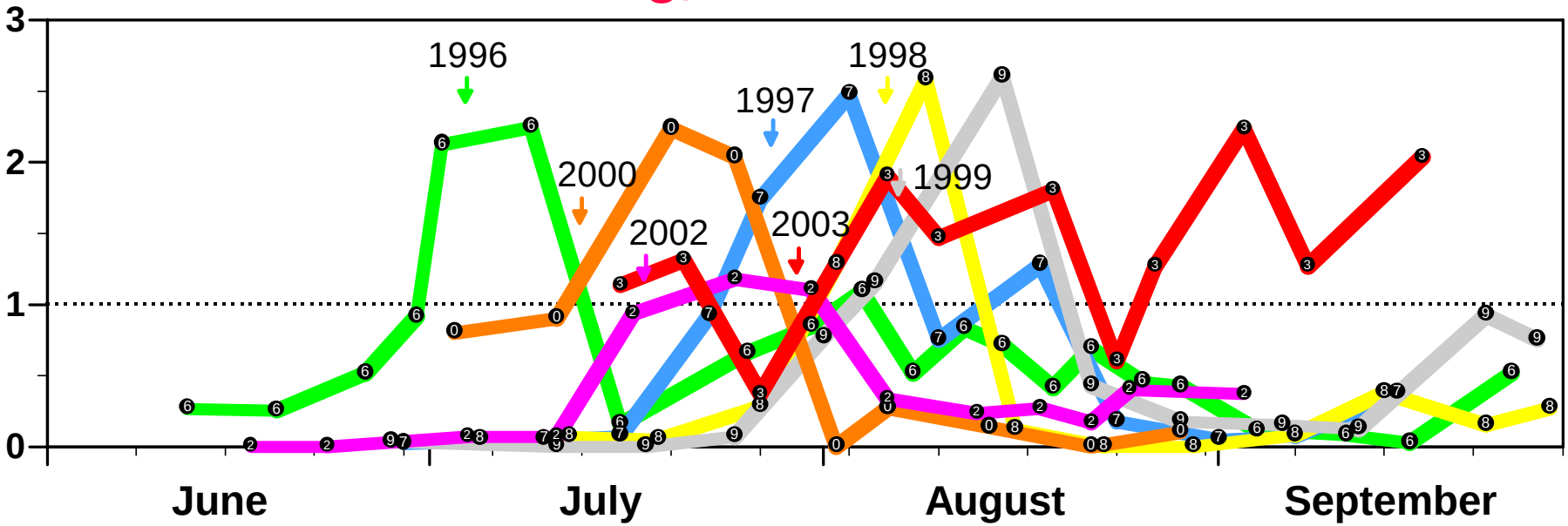
Historical Performance of Knack, 1996–2003

Incorrect timing, less effective results



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Don’t Forget! (1992)

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

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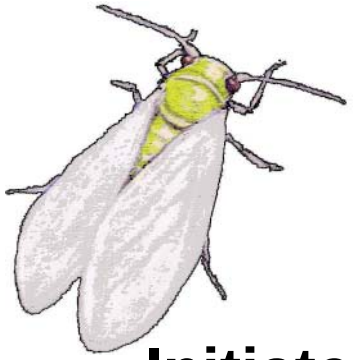

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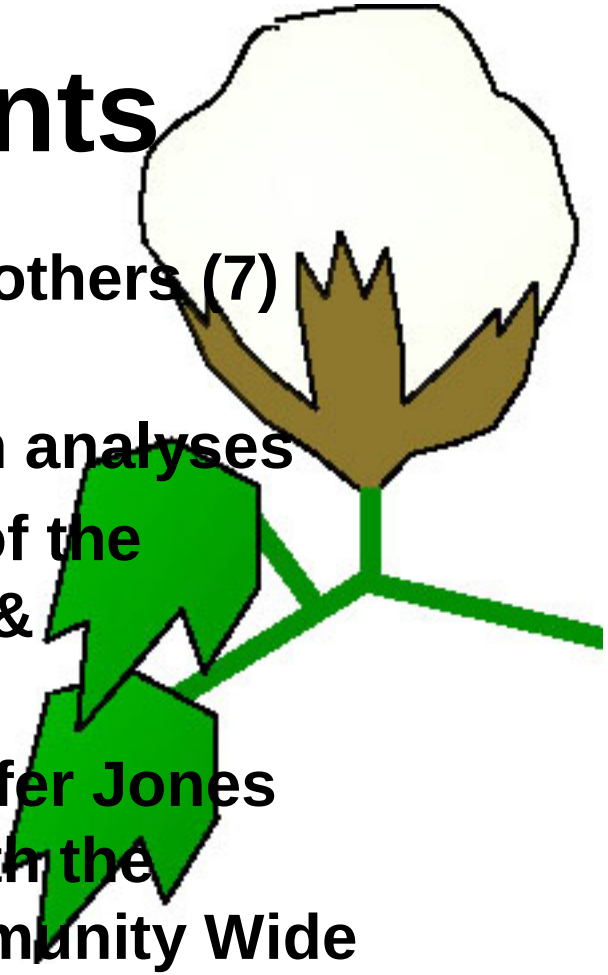

- Virginia Barkley who supervised and others (7) who conducted the sampling
- Christa Ellers-Kirk for assistance with analyses
- Larry Antilla, Jerry Kerr and the rest of the ACRPC staff who provide crop maps & coordinates
- Steve Husman, Dave Langston, Jennifer Jones and cooperating growers involved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

Information

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