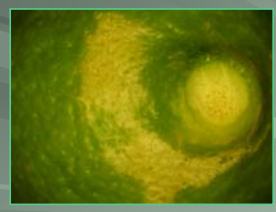
Recent Work in Citrus Entomology

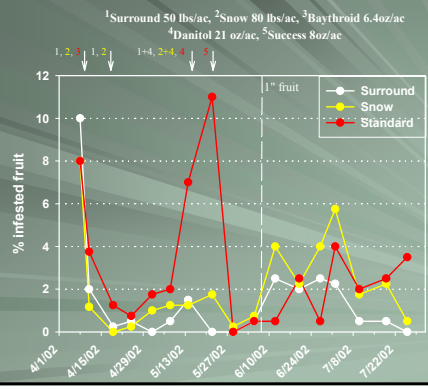
David Kerns
University of Arizona
Yuma Agricultural Center
Yuma, AZ

Citrus Thrips Research

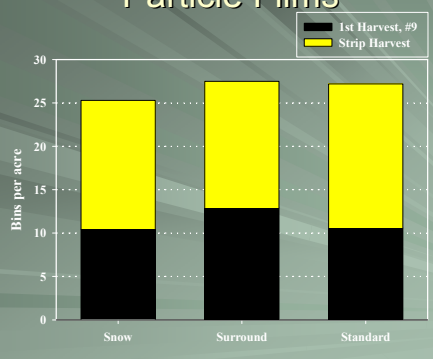


Particle Films

Particle Films vs Standard, 2002



Particle Films



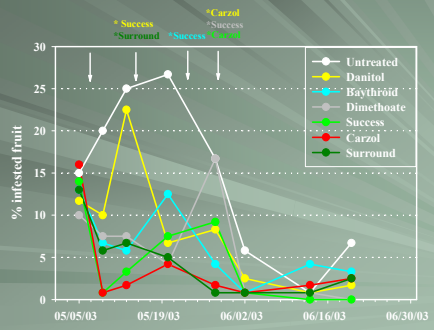
Pyrethroid Use

- Use only in early Spring.
- Do not use when temperatures exceed 95ºF.

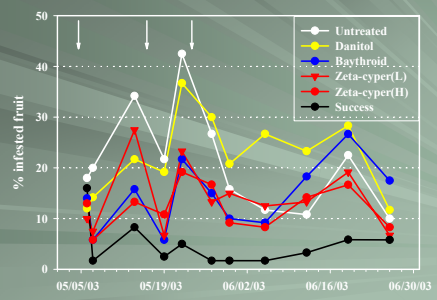
Rotation Test, 2003

Application #1	Application #2	Application #3
Danitol 21oz	Success 6 oz	Carzol 1.25 lbs
Baythroid 6.4 oz	Success 6 oz	Carzol 1.25 lbs
Dimeth. 2 lbs á	Success 6 oz	Carzol 1.25 lbs
Success 6 oz	Carzol 1.25 lbs	Success 6 oz
Carzol 1.25 lbs	Success 6 oz	Success 6 oz
Surround 35 lbs	Surround 35 lbs	Surround 35 lbs
Untreated	Untreated	Untreated

Rotation Test, 2003



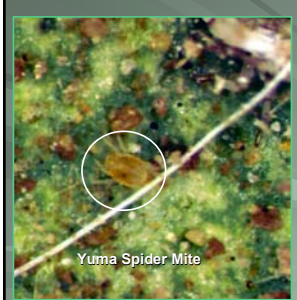
Pyrethroid Efficacy 2003



Predaceous Mites

Tydeus sp.

Yuma Spider Mite

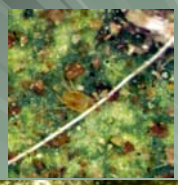


Yuma Spider Mite Recommendations

- Ignore or conserve them when relegated to the leaves.
  - Predaceous habit far outweighs minor leaf damage.
  - Mature citrus can withstand a great deal of foliar damage.
- Treat with a miticide when they move to the fruit in significant numbers.
  - Probably 1 mite per 10 fruit, before May.
  - Probably 2 to 5 mites per fruit, May - July.

New Pyrethroid Recommendations

- Use only one application of any pyrethroid per season.
- Use Danitol for thrips control only when mites are also problematic.
- Use Baytrhoid when targeting only thrips.

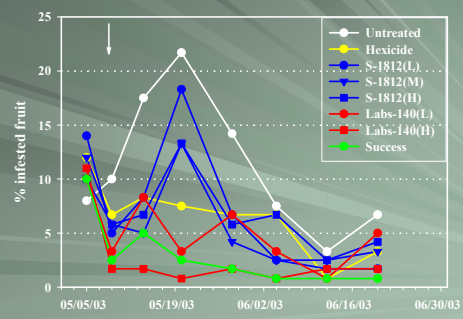


New Thrips Control Methods

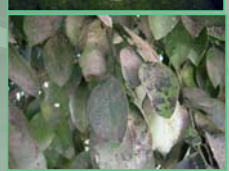
Experimental Insecticides

Name	Chemical	MOA	Rates
Hexacide	Rosemary oil	Octopamine neuroreceptor inh.	2 lbs /ac
S 1812	Pyridanil	Not reported	0.15, 0.20 & 0.30 lbs /ac
Labs 140	Not reported	Feeding paralysis	200 & 400 g /ha

Experimentals Test



Woolly Whitefly (*Aleurothrixus floccocus*)

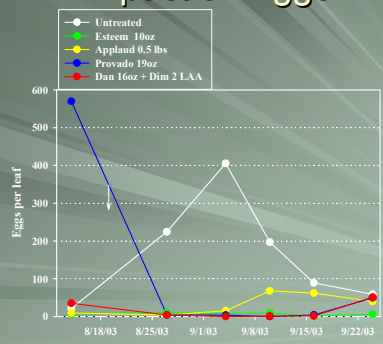


Foliar Insecticides

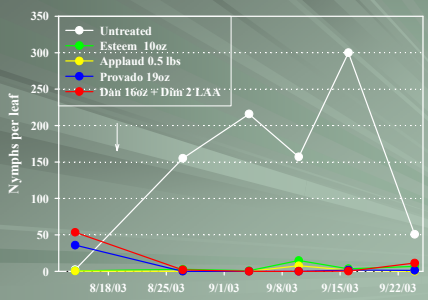
Foliar WWF Test

Treatment	Rate
Esteem	10 oz/ac
Provado	19 oz/ac
Applaud	0.5 lbs/ac
Danitol + Dimethoate	16 oz/ac + 2 lbs- a/ac
Untreated	

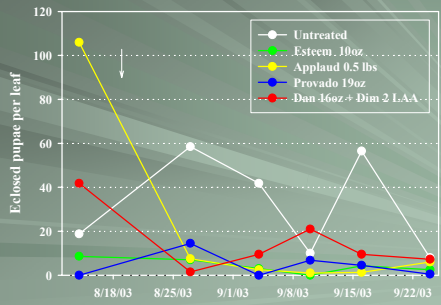
Impact on Eggs



Impact on Nymphs



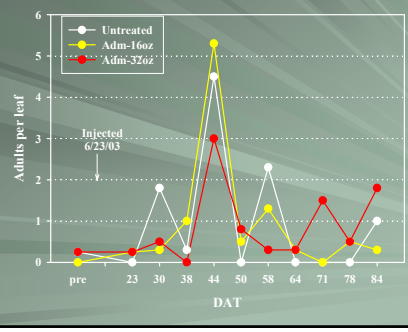
Impact on Eclosed Pupae



Admire for Woolly Whitefly

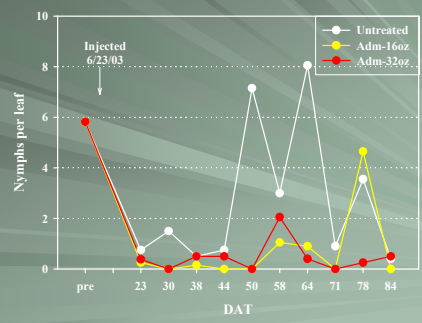
Admire at 16 & 32 oz/ac injected 8 inches at 9 gal/ac volume

Impact on Adults

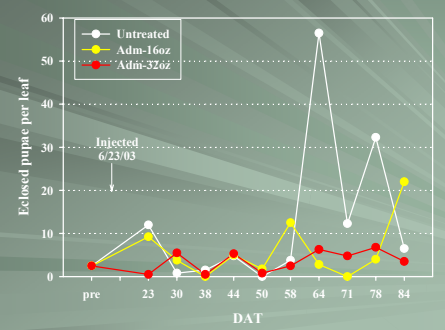


Impact on Eggs

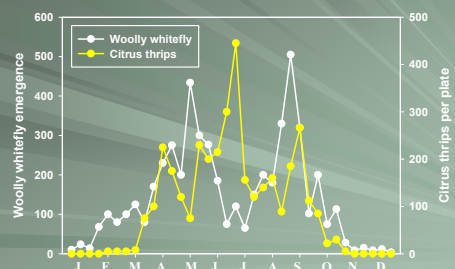
Impact on Nymphs



Impact on Eclosed Pupae



Woolly Whitefly / Citrus Thrips Population Dynamics



Key to WWF Management is Biocontrol

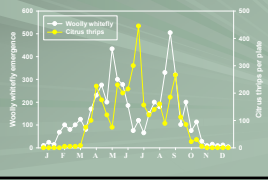
- There are a number of naturally occurring parasitoids that prey on WWF in Arizona.
- An *Eretmocerus* sp. appears to be the primary parasitoid, and appears to be key to sustainable WWF management.
- A number of predators including lacewings and mites have been observed feeding on WWF.

Eretmocerous sp.

Insecticide Choices

Current recommendations for woolly whitefly management

- Spring
  - use oils to suppress WWF populations.
  - avoid harsh insecticides for thrips when WWFs are present, ie use Success.
- Summer
  - primarily adults present - use Provado or Danitol / OP tank mixes (hard on beneficials).
  - when large numbers of immatures begin to appear – use Esteem or Applaud.
- Use only ground applications.
- On large trees or tight groves, use high spray volumes 200-400 gpa.



Citrus Mealybug Management

Traditional Control

- Lorsban
- Supracide

- Interfere with natural control
  - *Anagraphus sp.*

Mealybug Test

Treatment	Rate
Applaud – 1 application	1 lbs/ac
Applaud – 1 application	2 lbs/ac
Applaud – 2 applications	1 lbs/ac
Applaud – 2 applications	2 lbs/ac
Untreated	

Applaud Efficacy