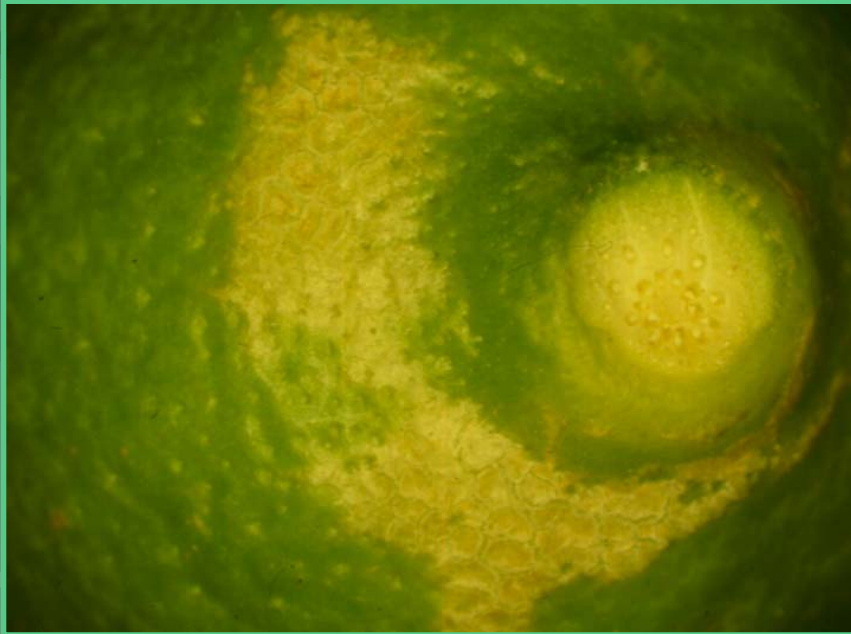


Recent Work in Citrus Entomology

David Kerns
University of Arizona
Yuma Agricultural Center
Yuma, AZ

Citrus Thrips Research



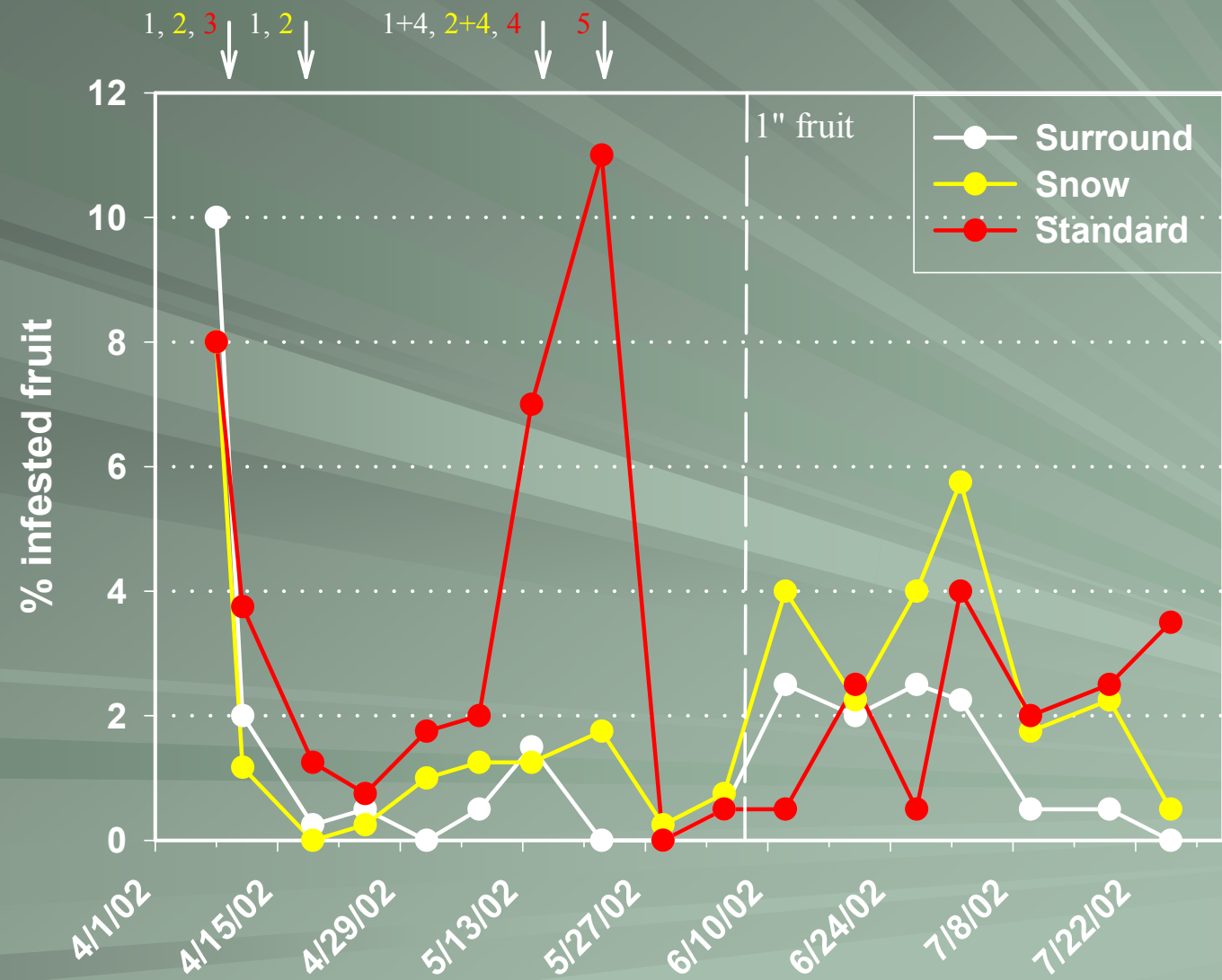
Particle Films



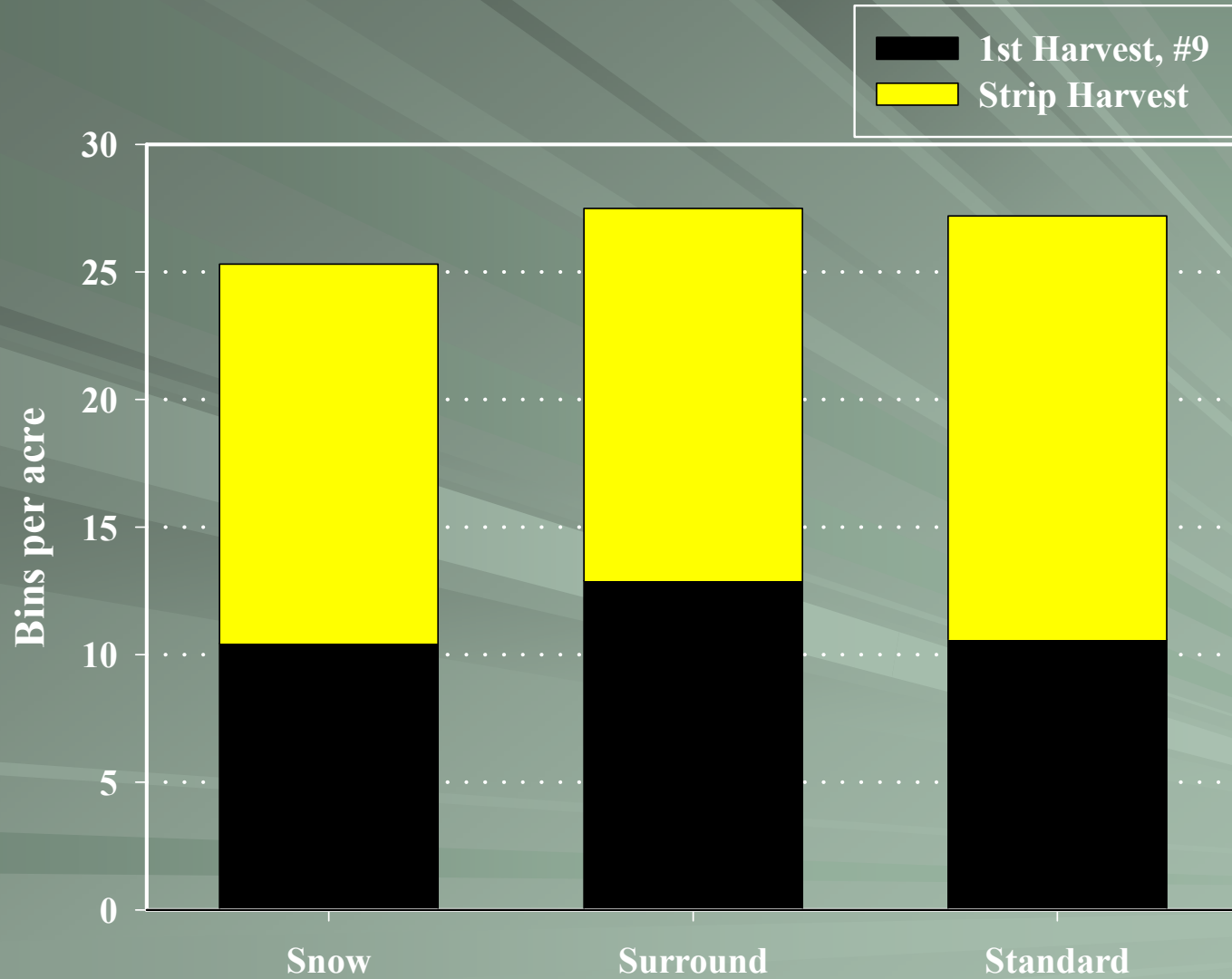
Particle Films vs Standard, 2002

¹Surround 50 lbs/ac, ²Snow 80 lbs/ac, ³Baythroid 6.4oz/ac

⁴Danitol 21 oz/ac, ⁵Success 8oz/ac



Particle Films



Pyrethroid Use

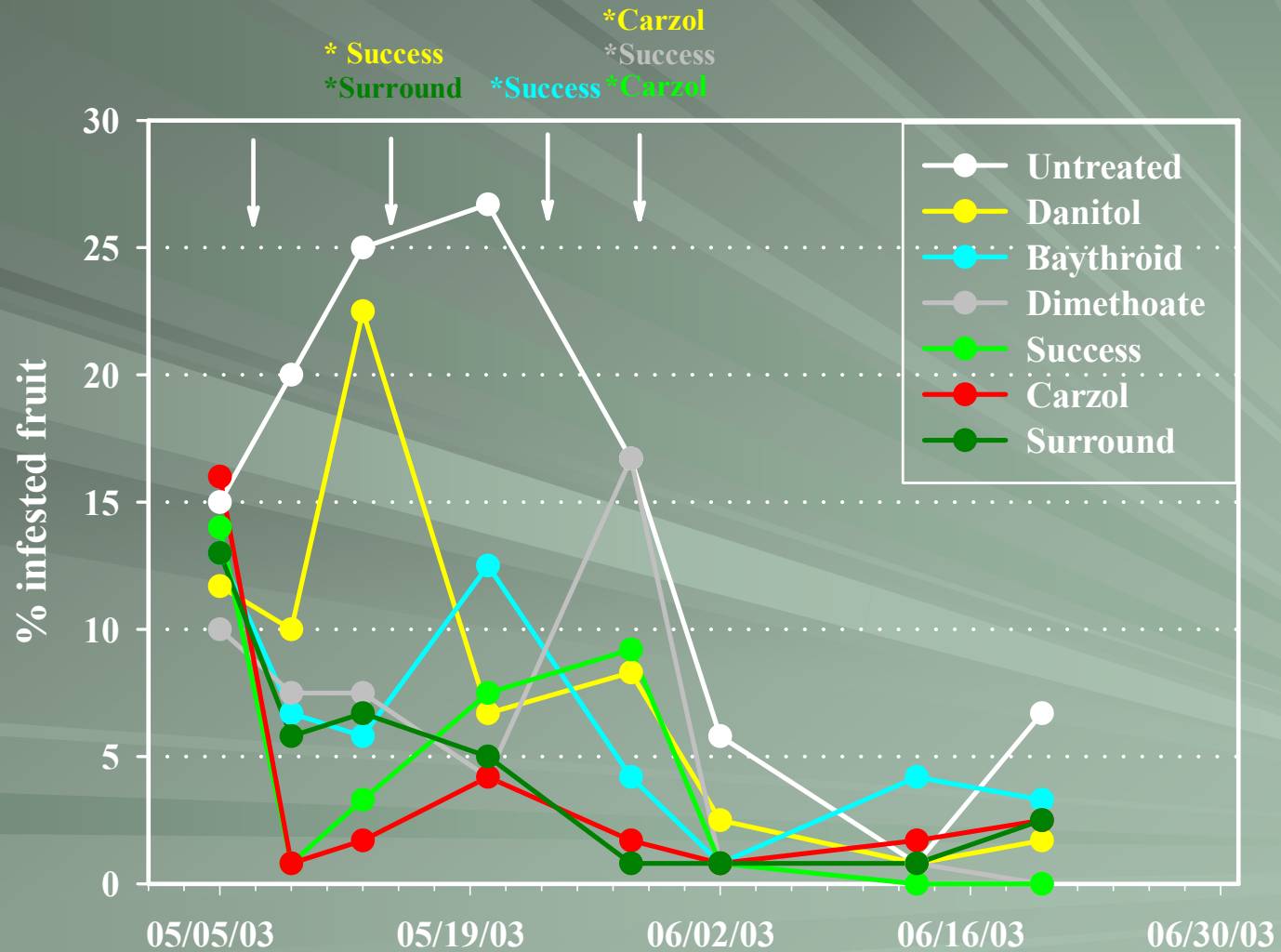
- Use only in early Spring.
- Do not use when temperatures exceed 95°F.



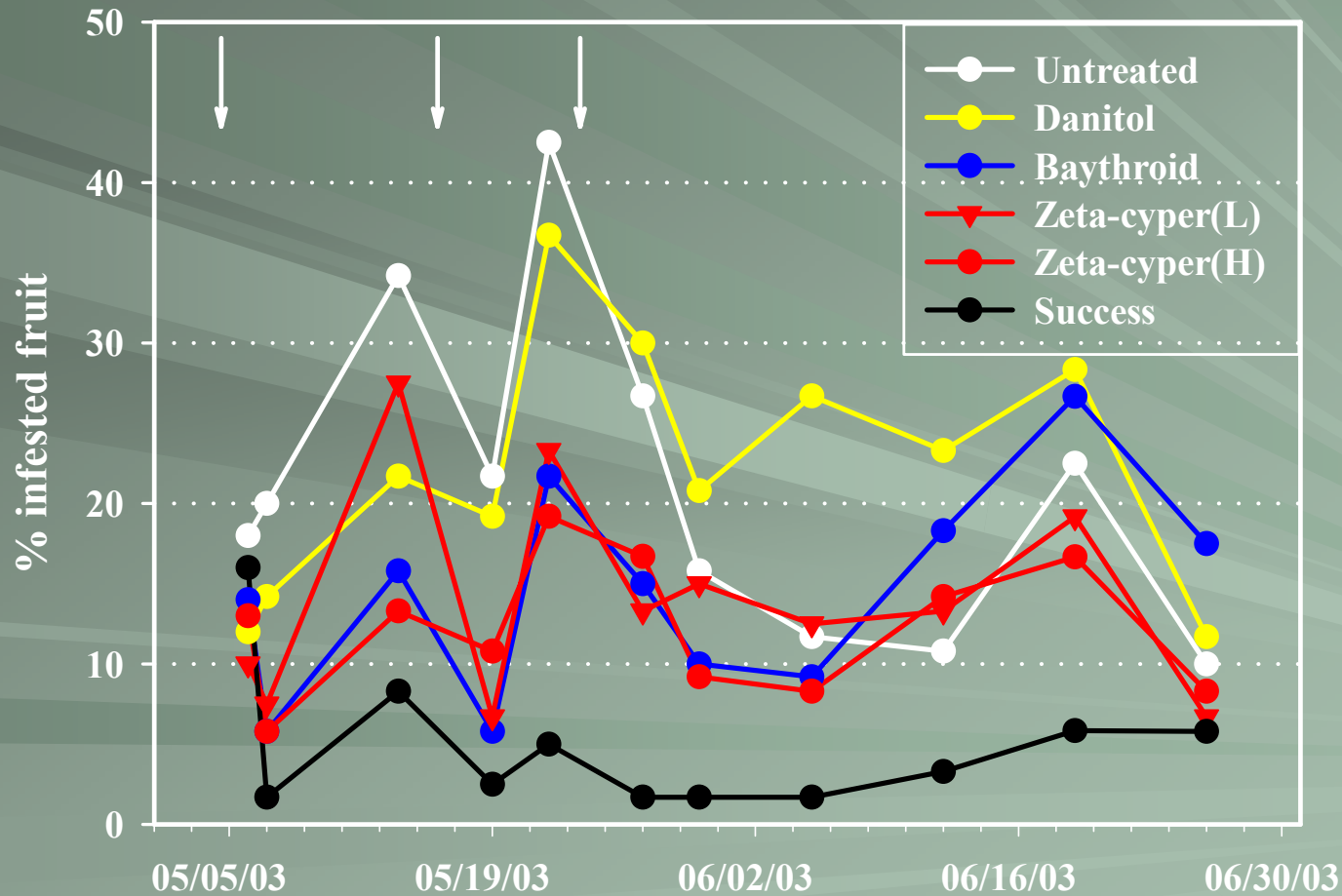
Rotation Test, 2003

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-ai	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

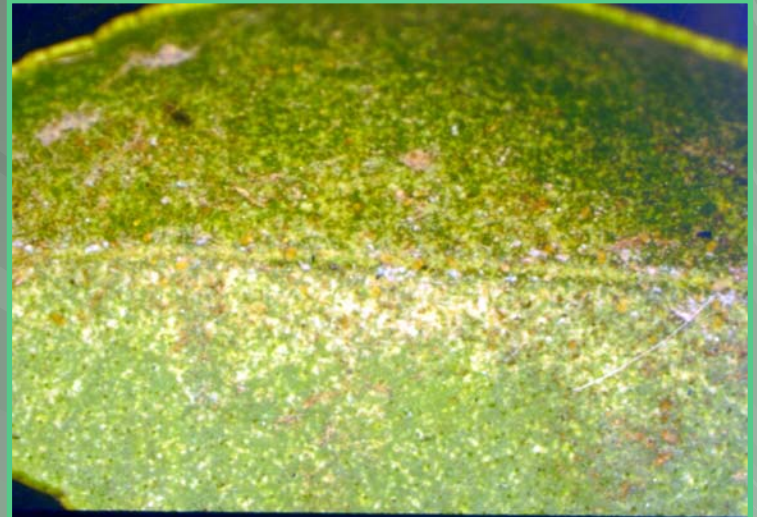


Predaceous Mites



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.



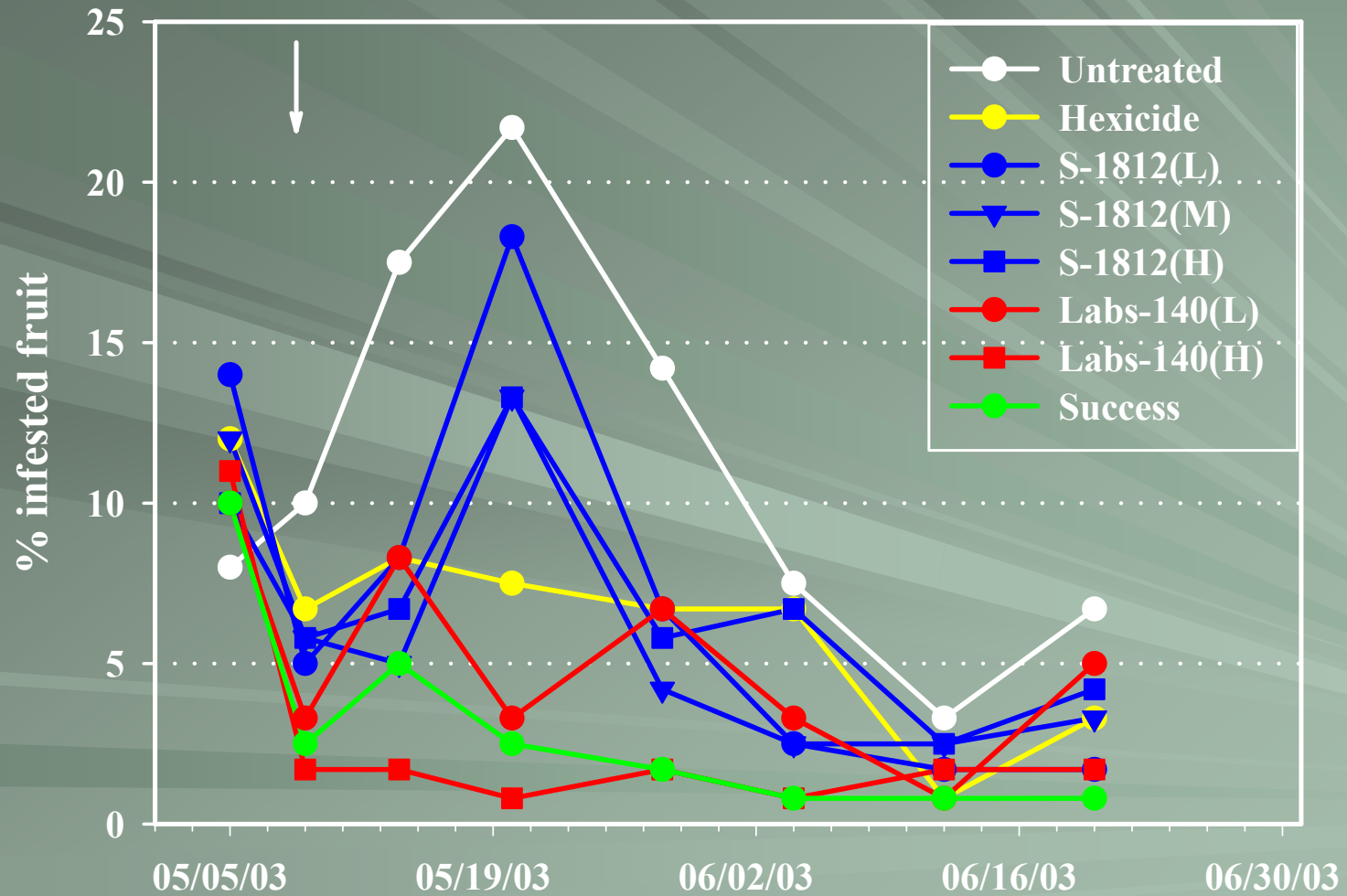
New Thrips Control Methods



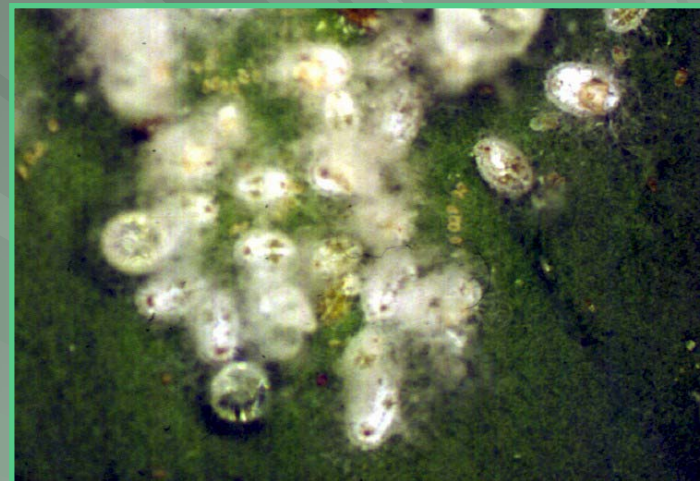
Experimental Insecticides

Name	Chemical	MOA	Rates
Hexacide	Rosemary oil	Octopamine neuroreceptor inh.	2 lbs-ai/ac
S-1812	Pyridanil	Not reported	0.15, 0.20 & 0.30 lbs-ai/ac
Labs-140-F01	Not reported	Feeding paralysis	200 & 400 g-ai/ha

Experimentals Test



Woolly Whitefly (*Aleurothrixus floccococcus*)



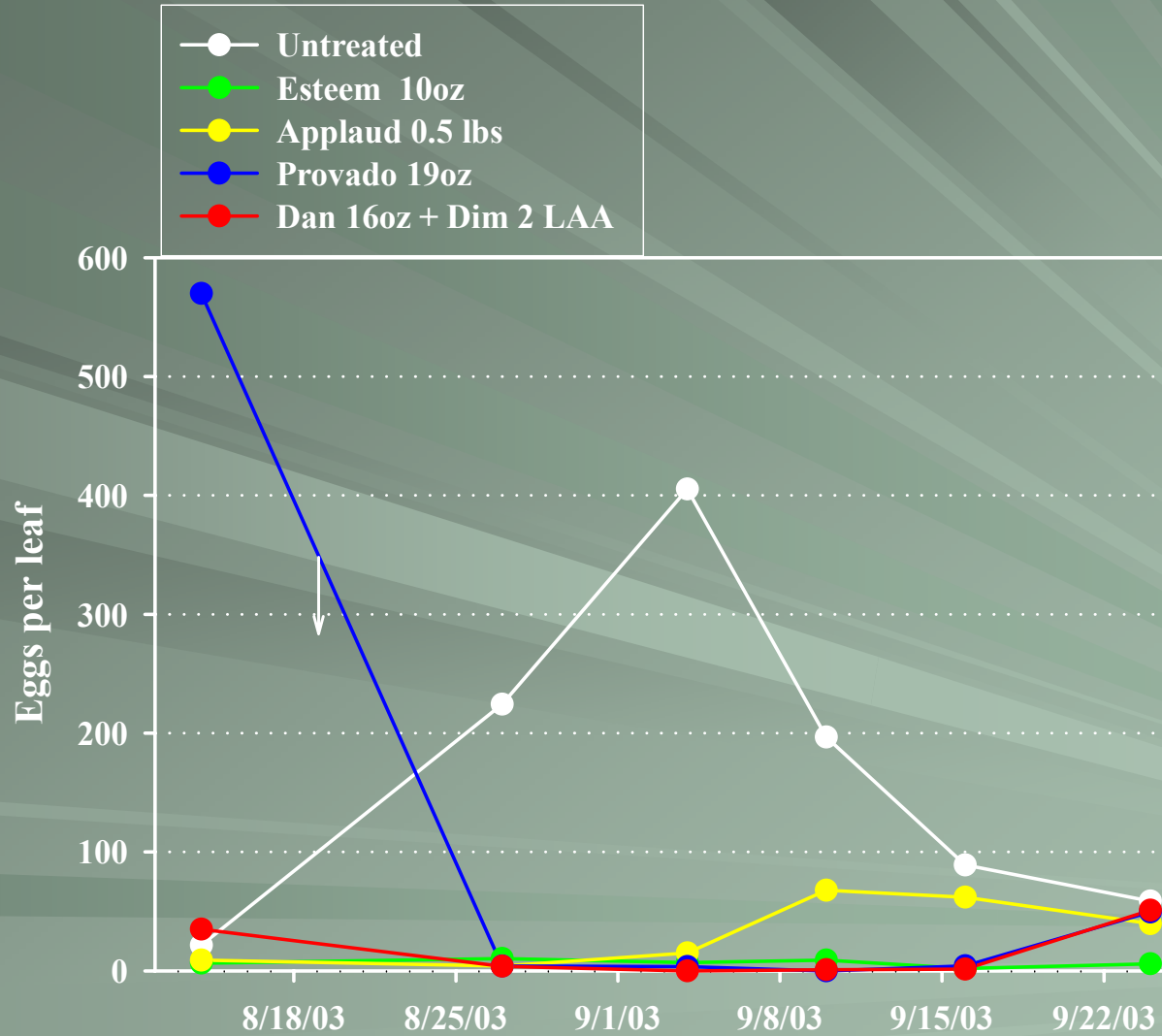
Foliar Insecticides



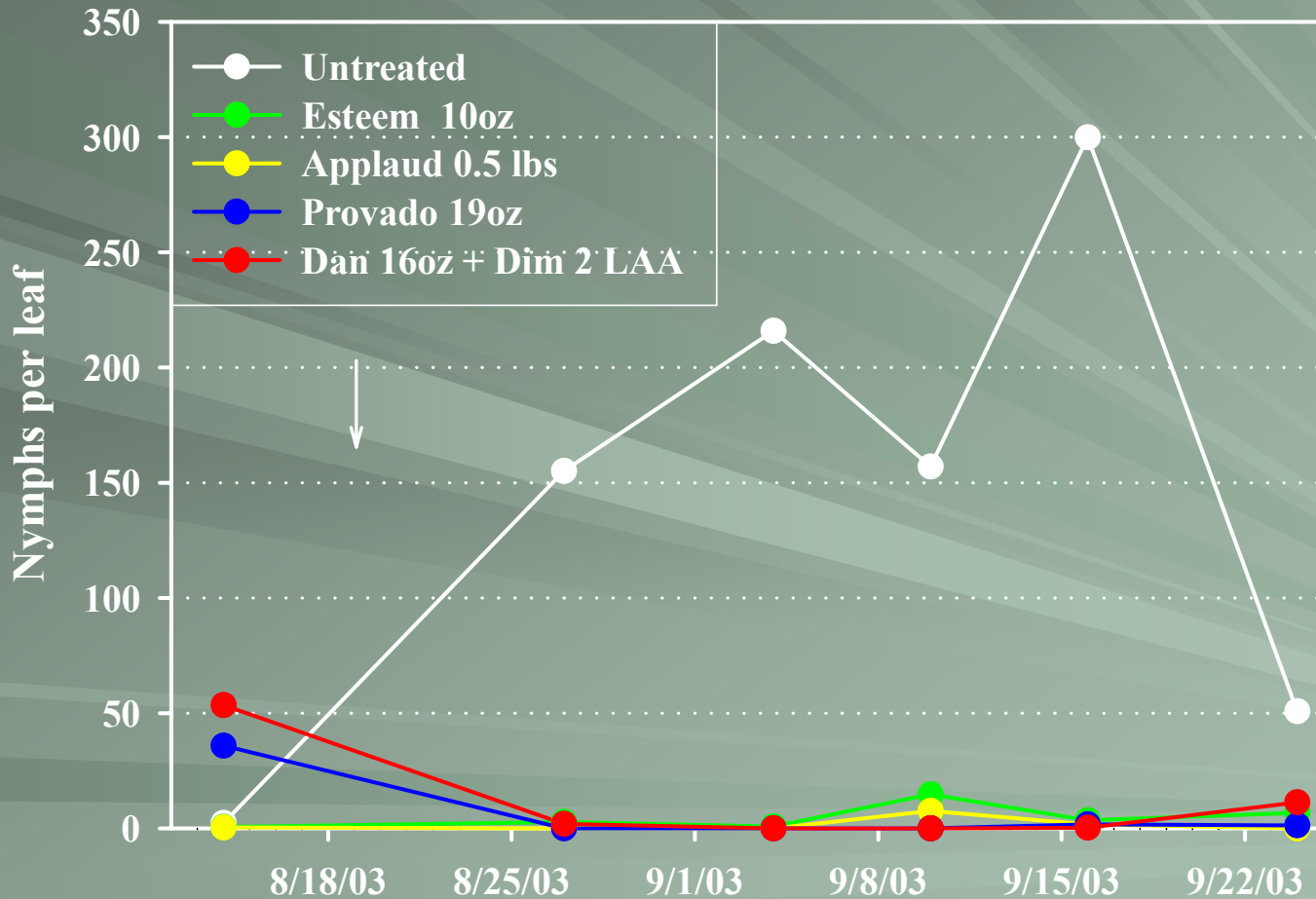
Foliar WWF Test

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

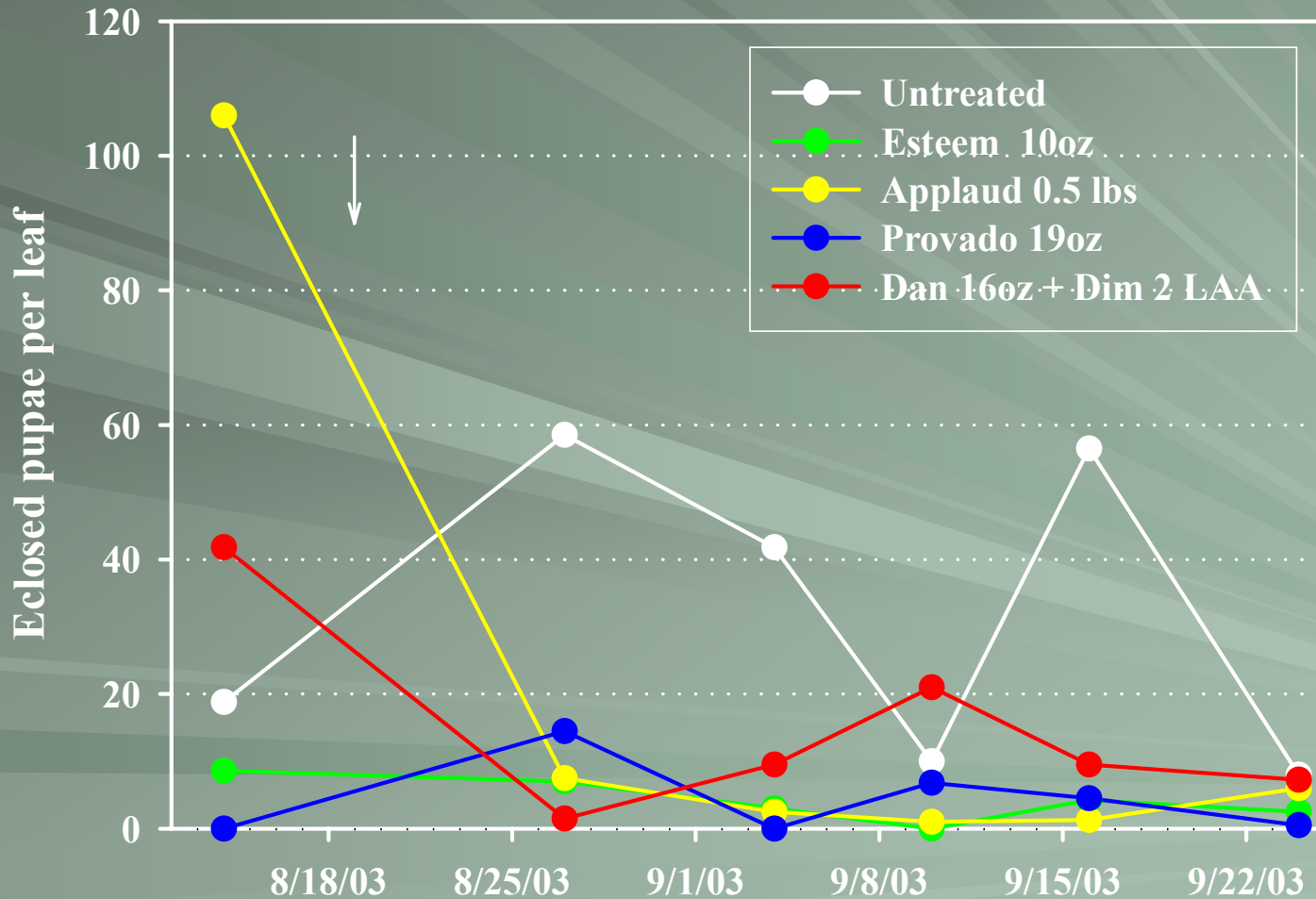
Impact on Eggs



Impact on Nymphs



Impact on Eclosed Pupae

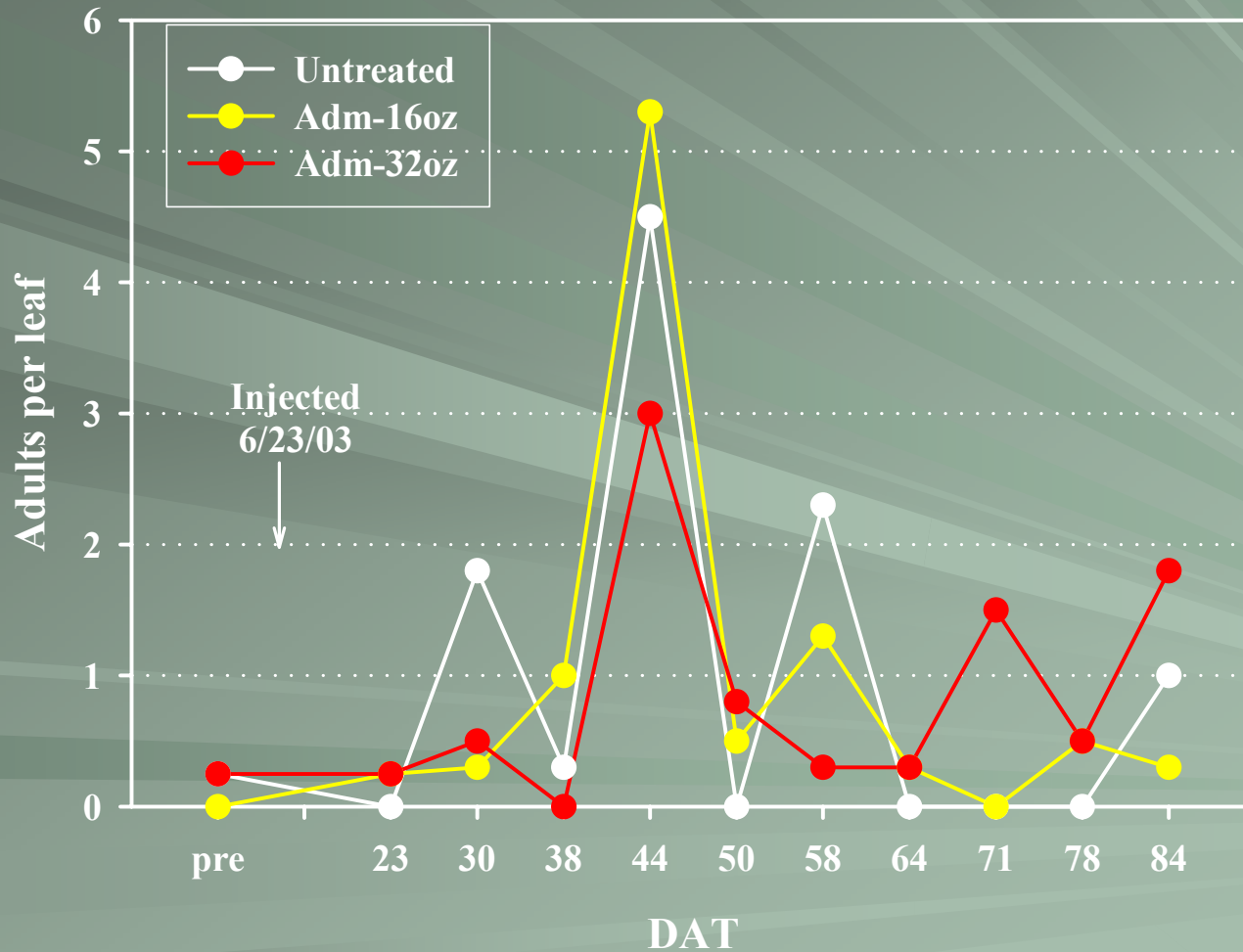


Admire for Woolly Whitefly

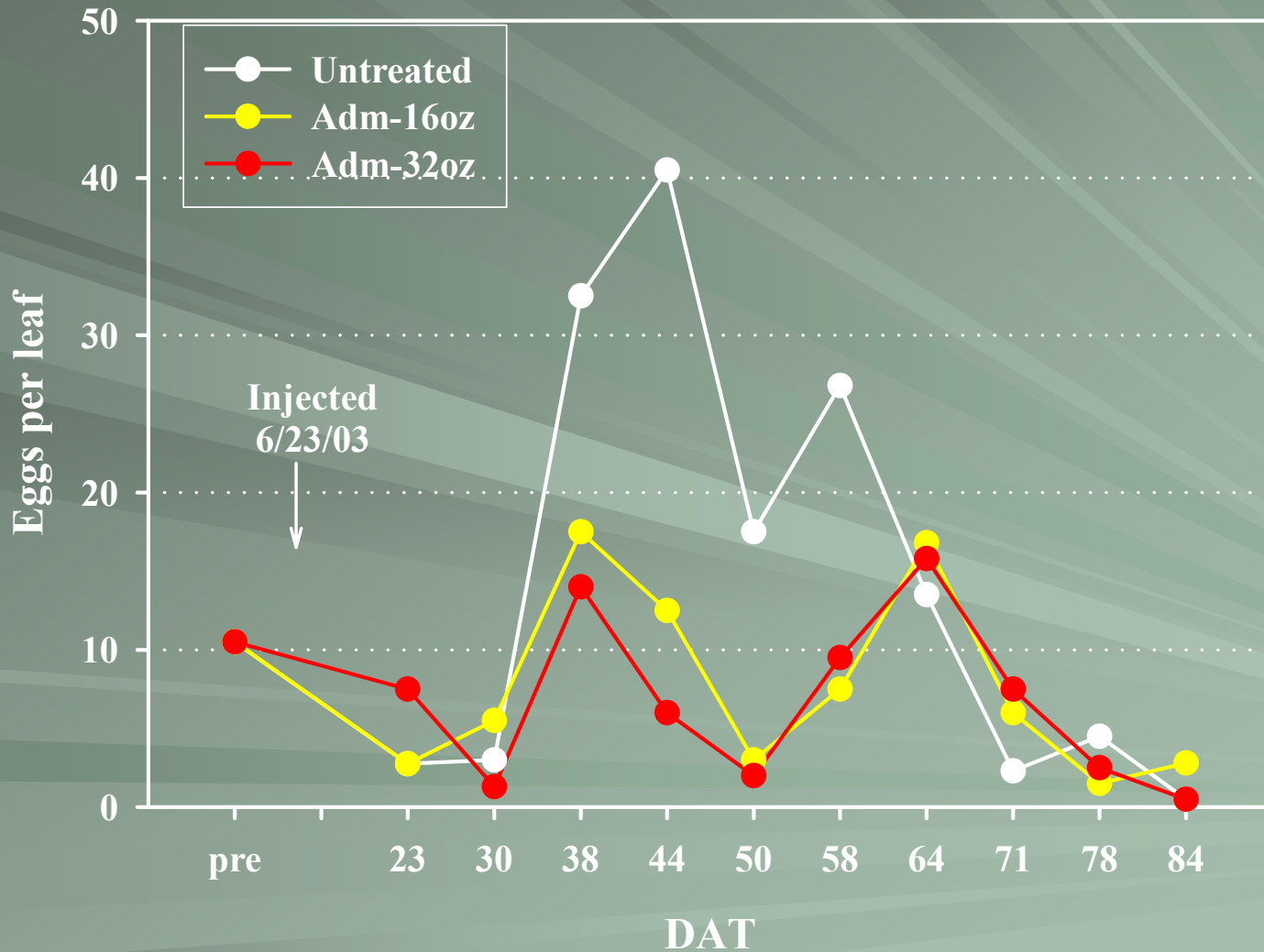


Admire at 16 & 32 oz/ac injected 8 inches at 9 gal/ac volume

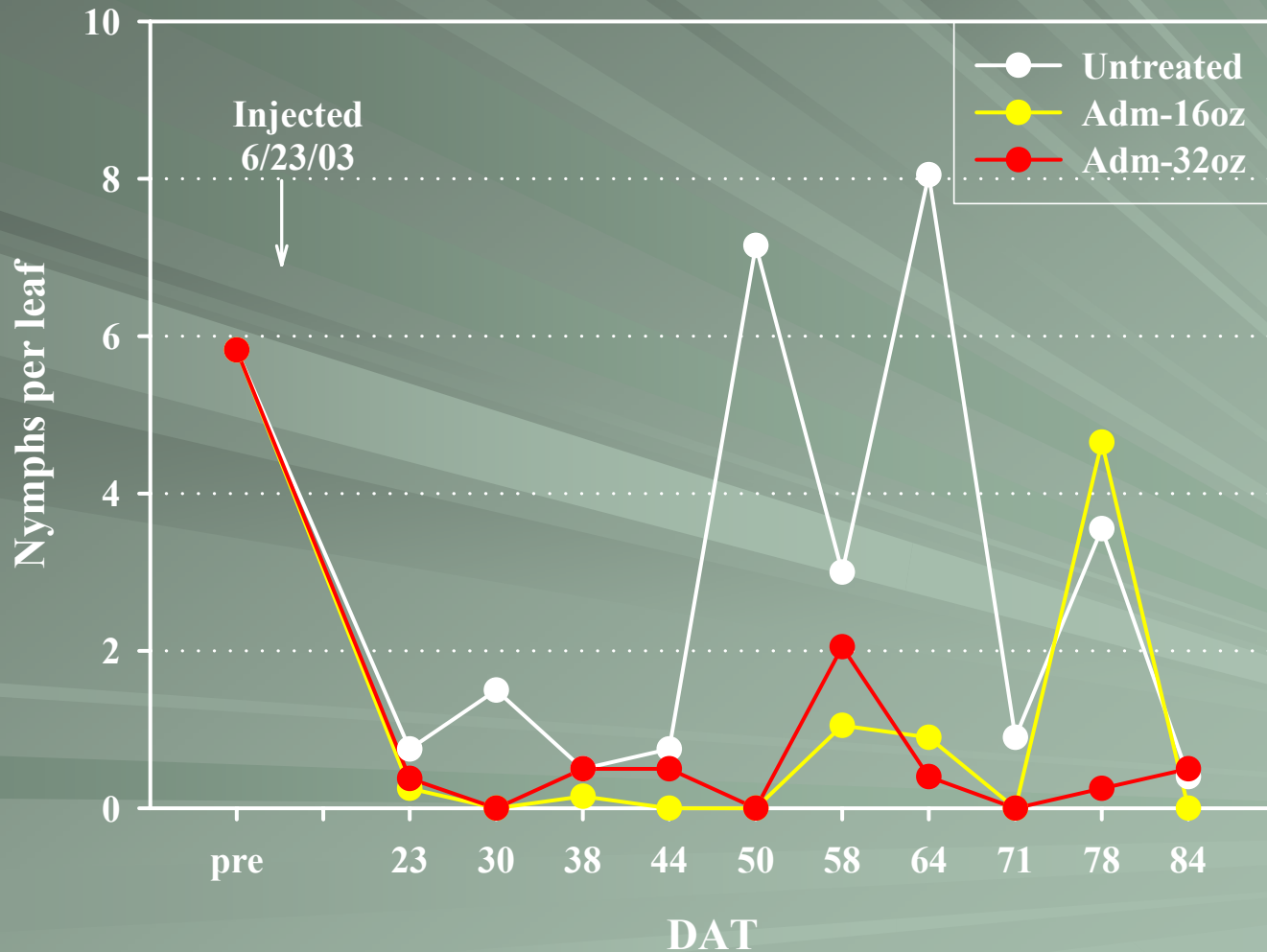
Impact on Adults



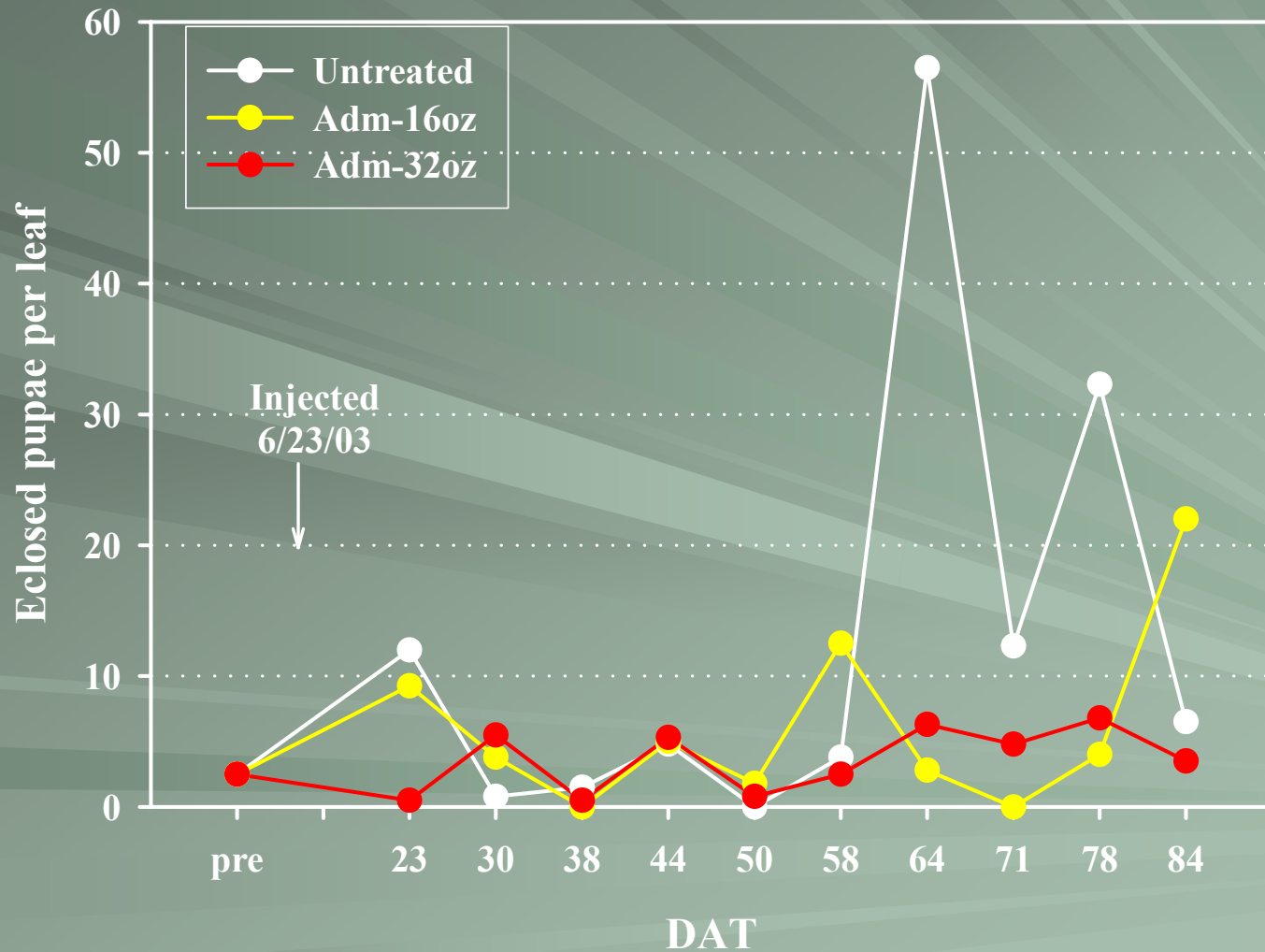
Impact on Eggs



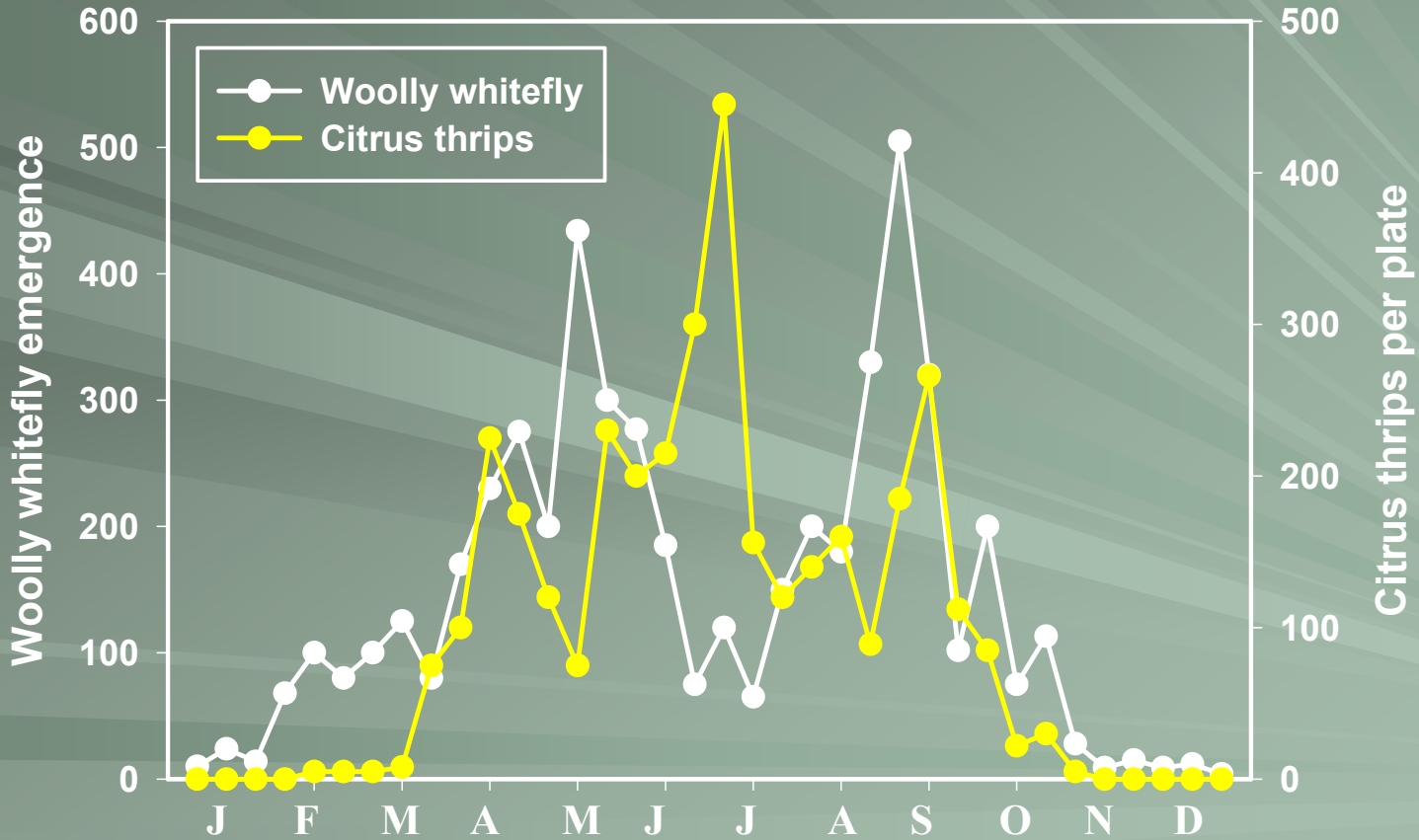
Impact on Nymphs



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

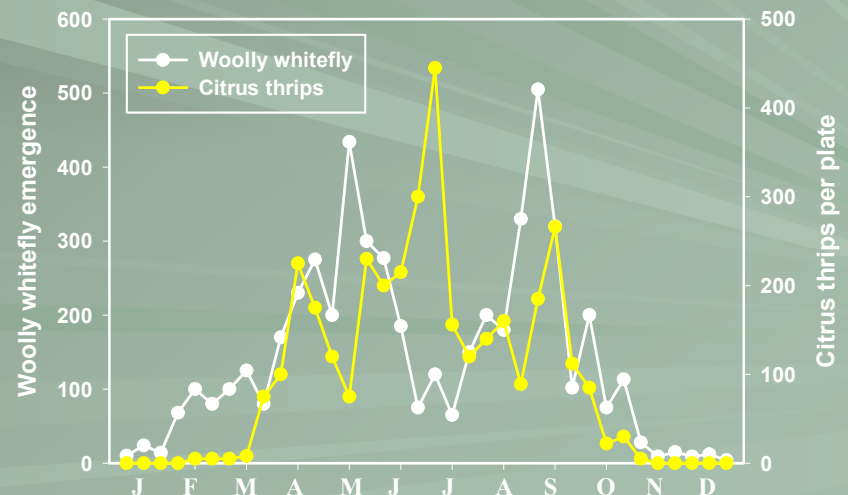
- use oils to suppress WWF populations.
- avoid harsh insecticides for thrips when WWFs are present, ie use Success.

■ 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
 - *Anagrapus* 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

