

HEALTHY FOOD SYSTEMS • HEALTHY ENVIRONMENTS • HEALTHY COMMUNITIES • HEALTHY CALIFORNIANS

**University of California**  
Agriculture and Natural Resources

*Making a Difference for California*



# Chemical, Botanical, and Microbial Solutions for Managing Spider Mites

**Surendra Dara**

**Strawberry and Vegetable Crops Advisor and Affiliated IPM Advisor**

**University of California Cooperative Extension**

**Santa Barbara and San Luis Obispo Counties**

[skdara@ucdavis.edu](mailto:skdara@ucdavis.edu)

strawberriesvegetables   @calstrawberries @calveggies

# Twospotted spider mite



# Spider mite damage



Symptoms progress from yellow mottling, scarring to bronzing and drying out of leaves. Stunted growth and plant death can also be seen.



# Spider mite damage in Benicia

Purplish dark coloration of the upper leaf surface corresponding to the damaged underside is specific to the cultivar, Benicia



# 2011 field trial

## Treatments

1. Untreated control
2. Nealta (cyflumetofen) 13.7 fl oz/ac in 100 gal
3. Agri-Mek 0.15 EC (abamectin) 16 fl oz/ac in 100 gal

## Plot size

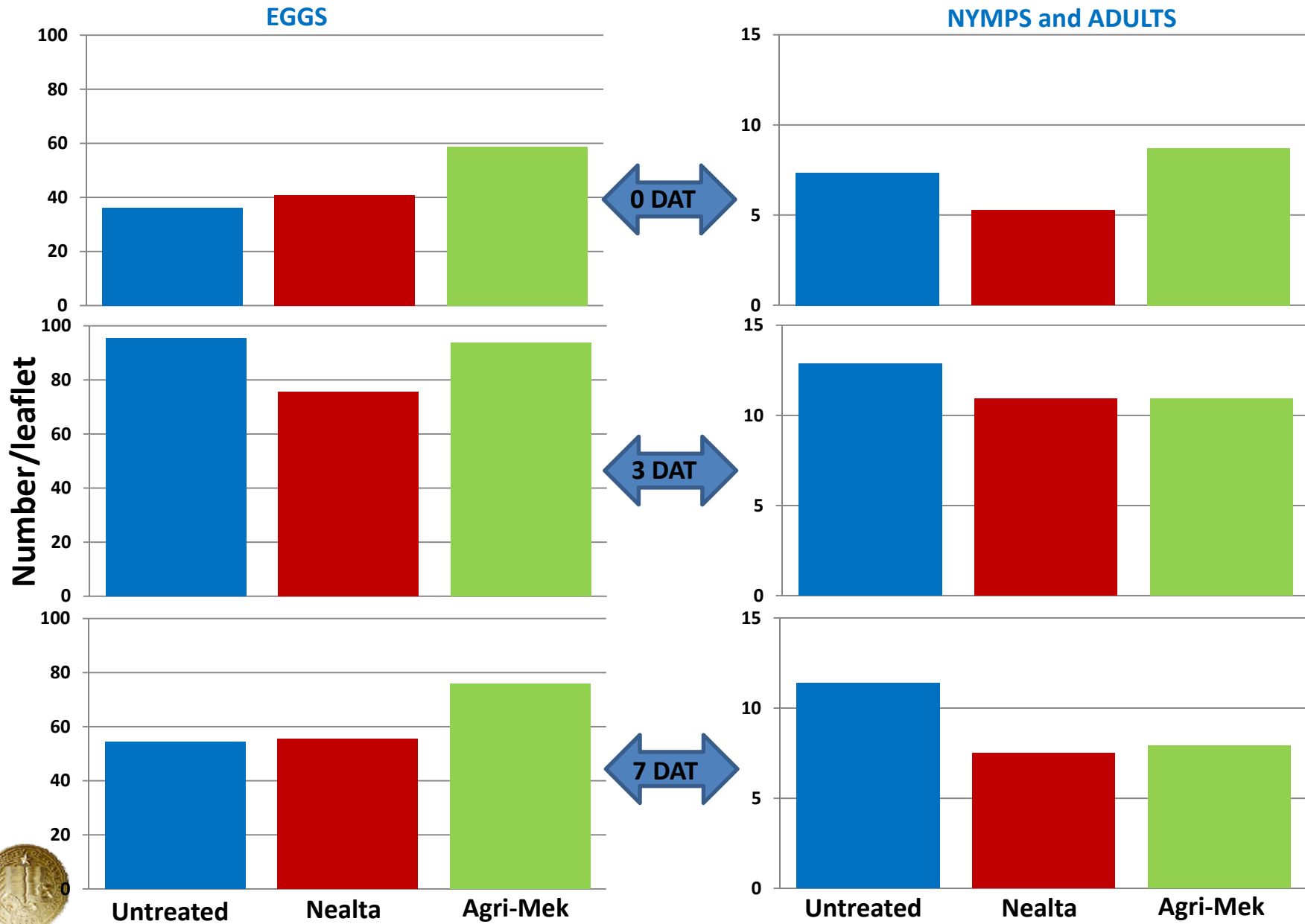
20' long bed replicated 4 times

## Design

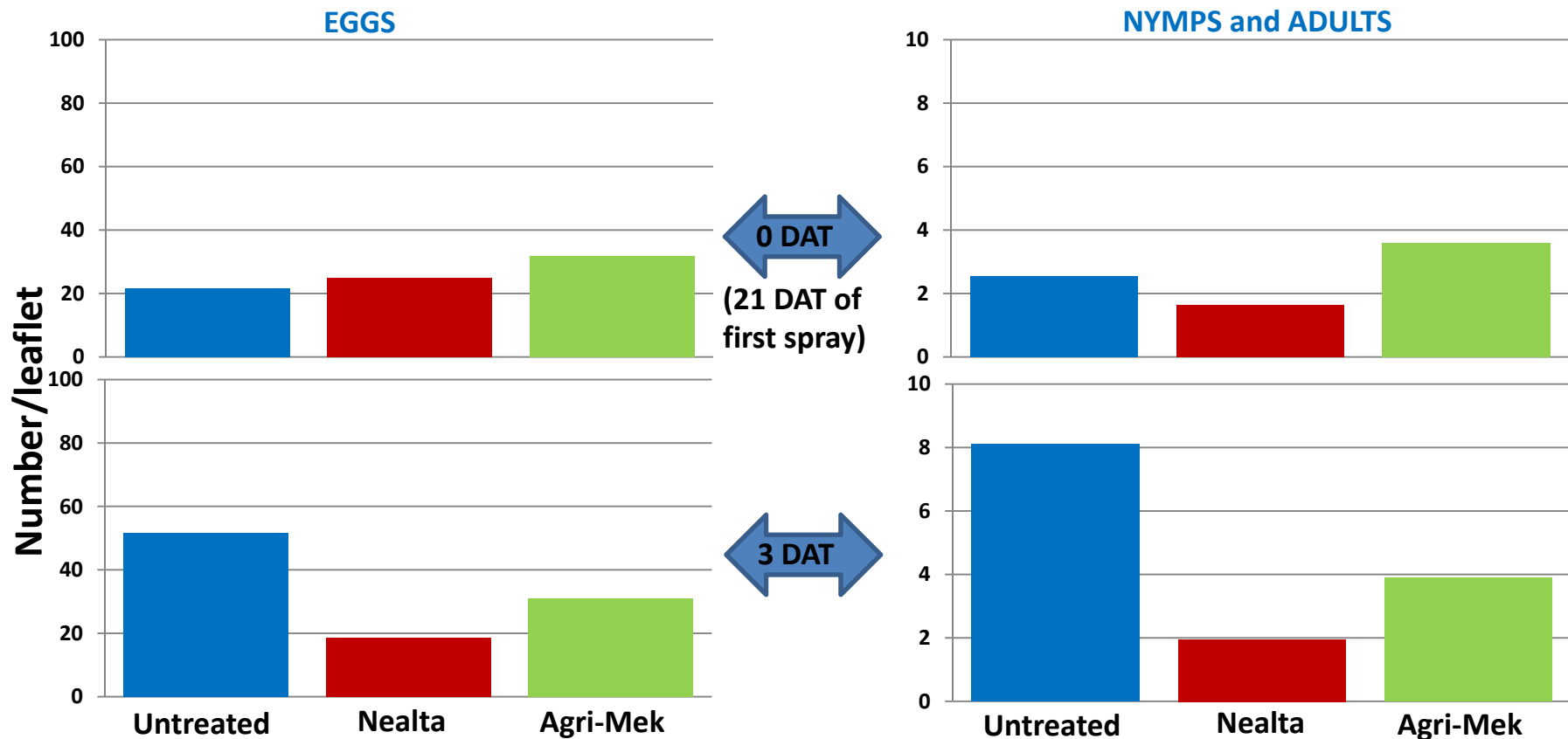
Randomized complete block



# 2011 field trial-First spray



# 2011 field trial-Second spray



# 2012 field trial

## Treatments

- 1 Untreated
- 2 Agri-Mek EC (abamectin) 16 fl oz/ac in 150 gal
- 3 Acramite 50 WS (bifenazate) 1 lb/ac in 150 gal
- 4 BotaniGard 22WP (*Beauveria bassiana*) 4 lb/ac in 200 gal
- 5 BotaniGard 4 lb + Fujimite (fenpyroximate) 2pt in 200 gal
- 6 Nealta SC (cyflometofen) 13.7 fl oz/ac in 150 gal
- 7 Fujimite 5 EC 2 pt/ac in 150 gal
- 8 Movento 240 SC (spirotetramat) 5 fl oz/ac in 150 gal

## Plot size Design

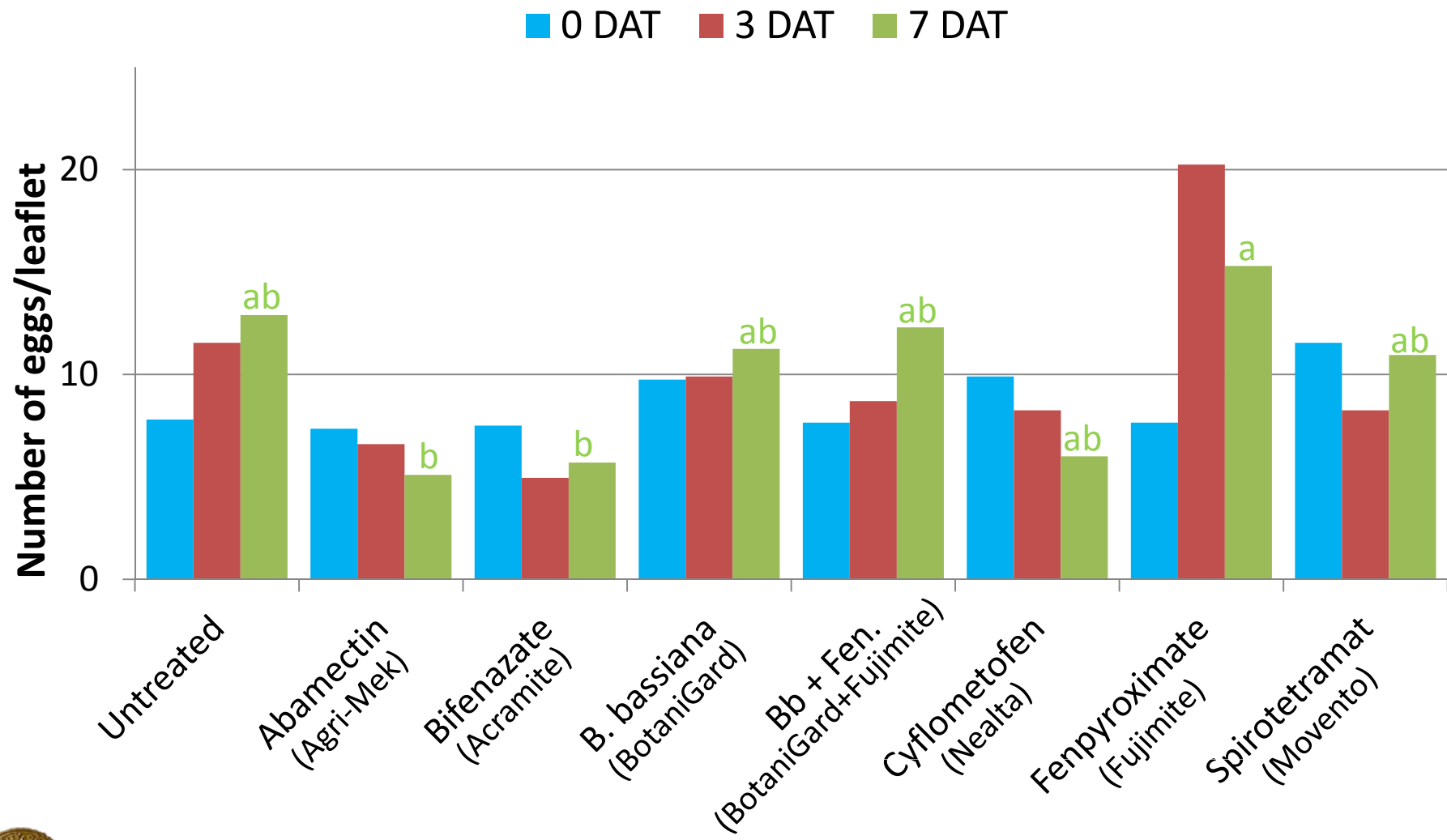
- 20' long bed replicated 4 times  
Randomized complete block





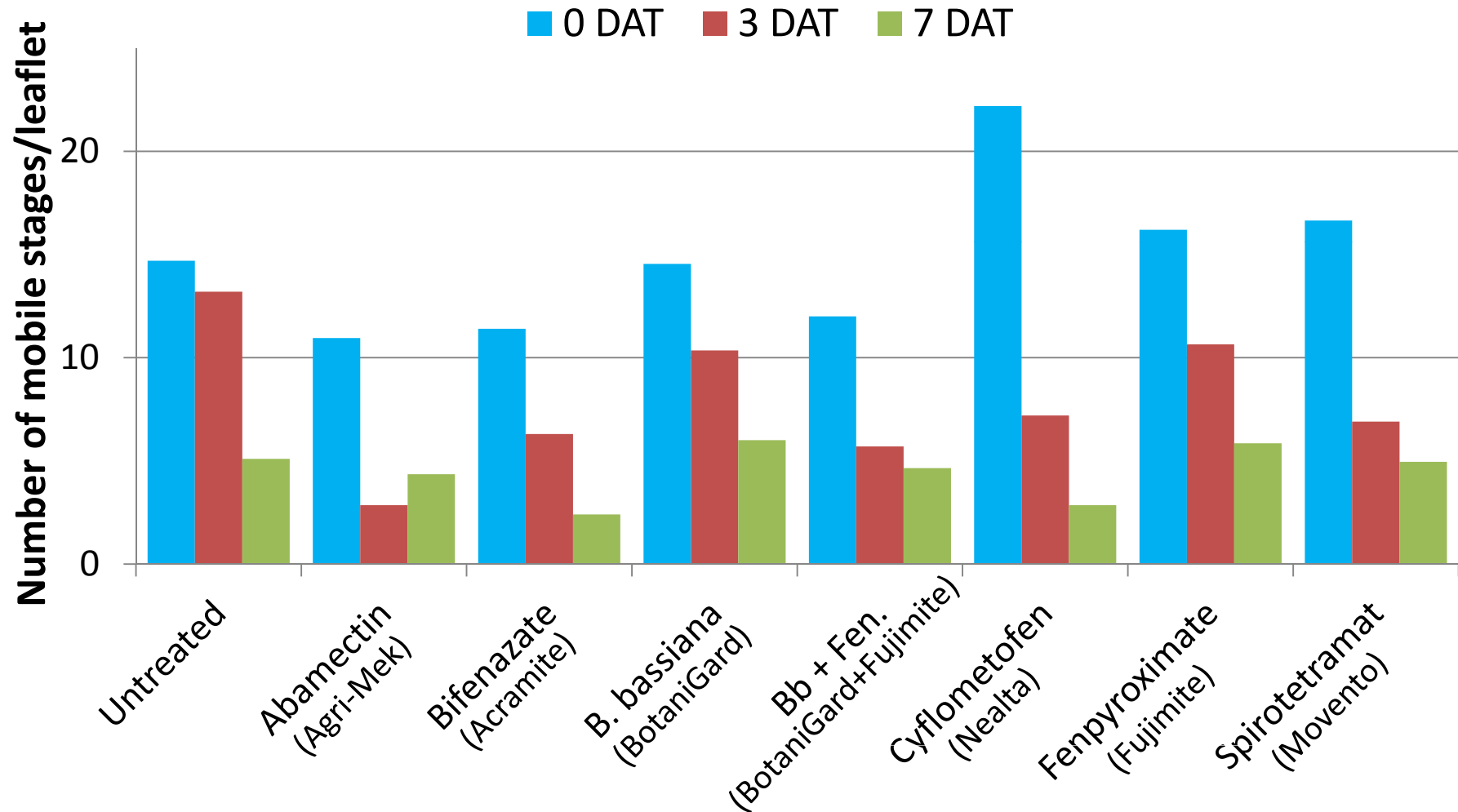
# 2012 field trial

Eggs



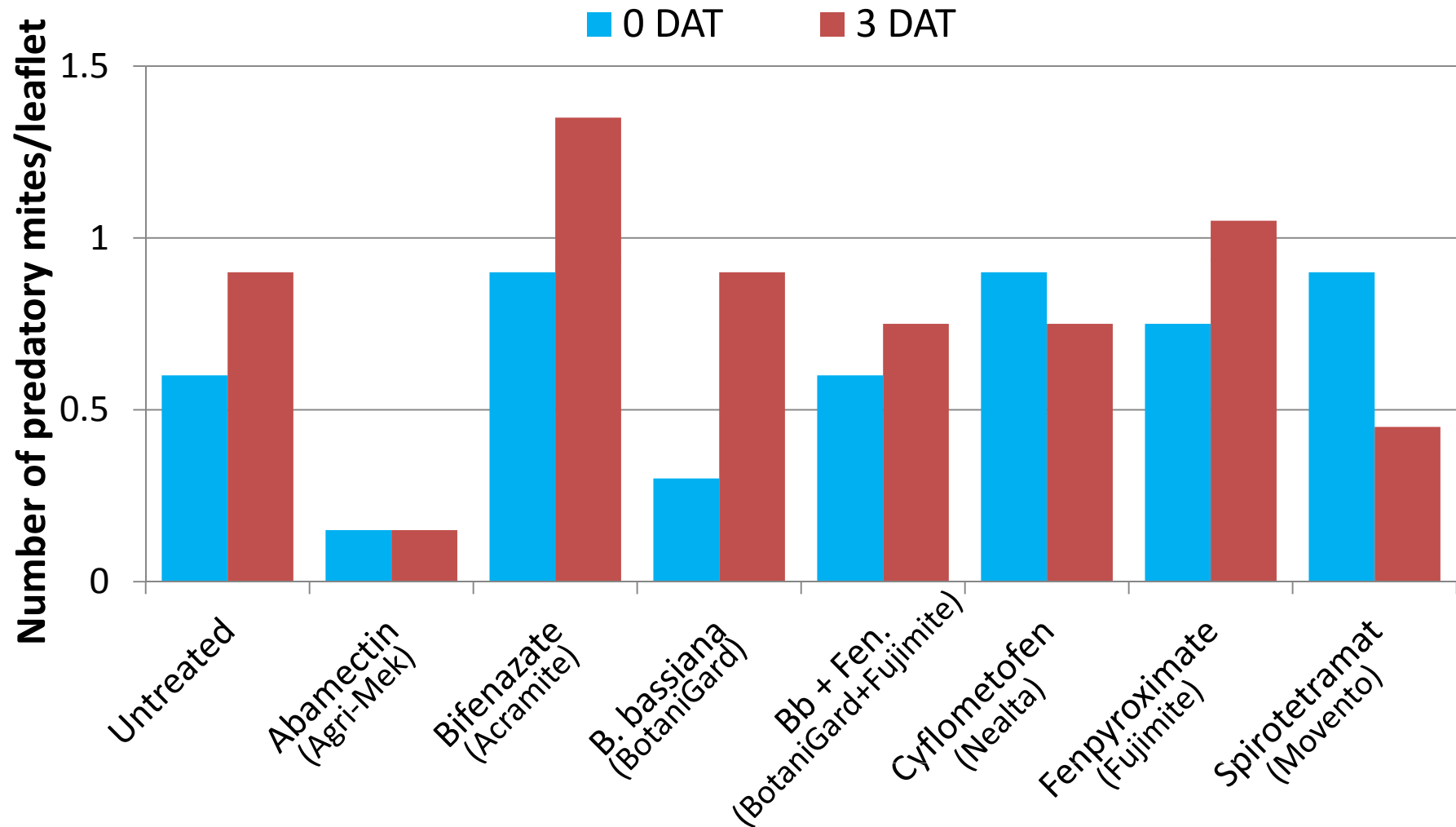
# 2012 field trial

Nymphs and adults



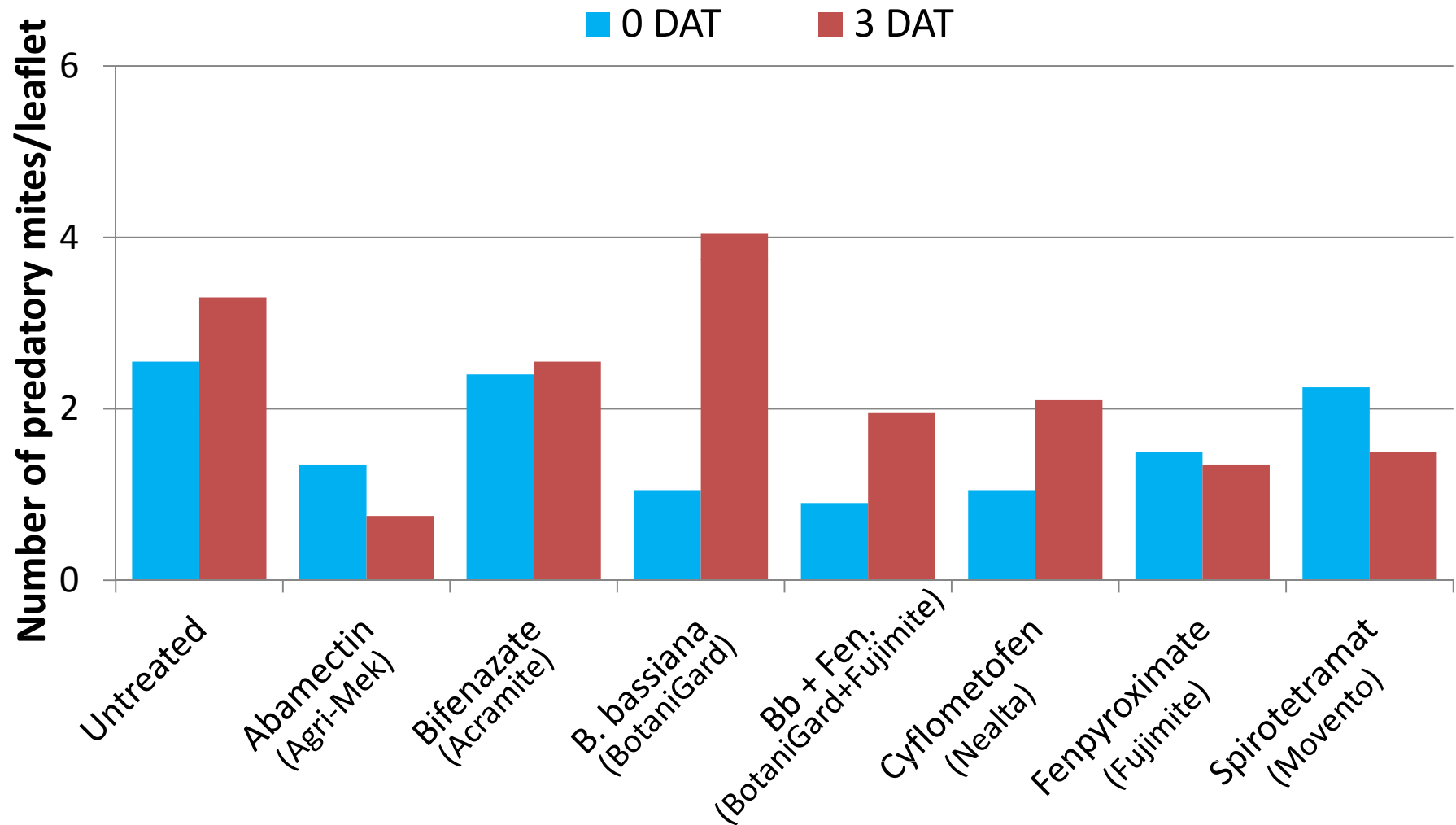
# 2012 field trial-Predatory mites

Eggs-*Neoseiulus* spp.



# 2012 field trial-Predatory mites

Nymphs and Adults-*Neoseiulus* spp.



# 2013 field trial

## Treatments

- 1 Untreated
- 2 Acramite 50 WS (bifenazate) 1 lb/ac
- 3 Agri-Mek SC (abamectin) 4.29 fl oz/ac
- 4 BotaniGard ES (*B. bassiana*) 1qrt/ac +  
Agri-Mek SC 3.5 fl oz/Acramite 0.75 lb/ac
- 5 Eco-Mite (rosemary and cottonseed oils) 1%
- 6 Fujimite 5 EC (fenpyroximate) 2 pt
- 7 Fujimite XLO 2 pt
- 8 Grandevo (*Chromobacterium subtsugae* strain PRAA4-1) 2 lb
- 9 MBI 206 2 gal
- 10 Nealta (cyflumetofen) 13.7 fl oz – all in 150 gal

## Plot size

15' long bed replicated 4 times

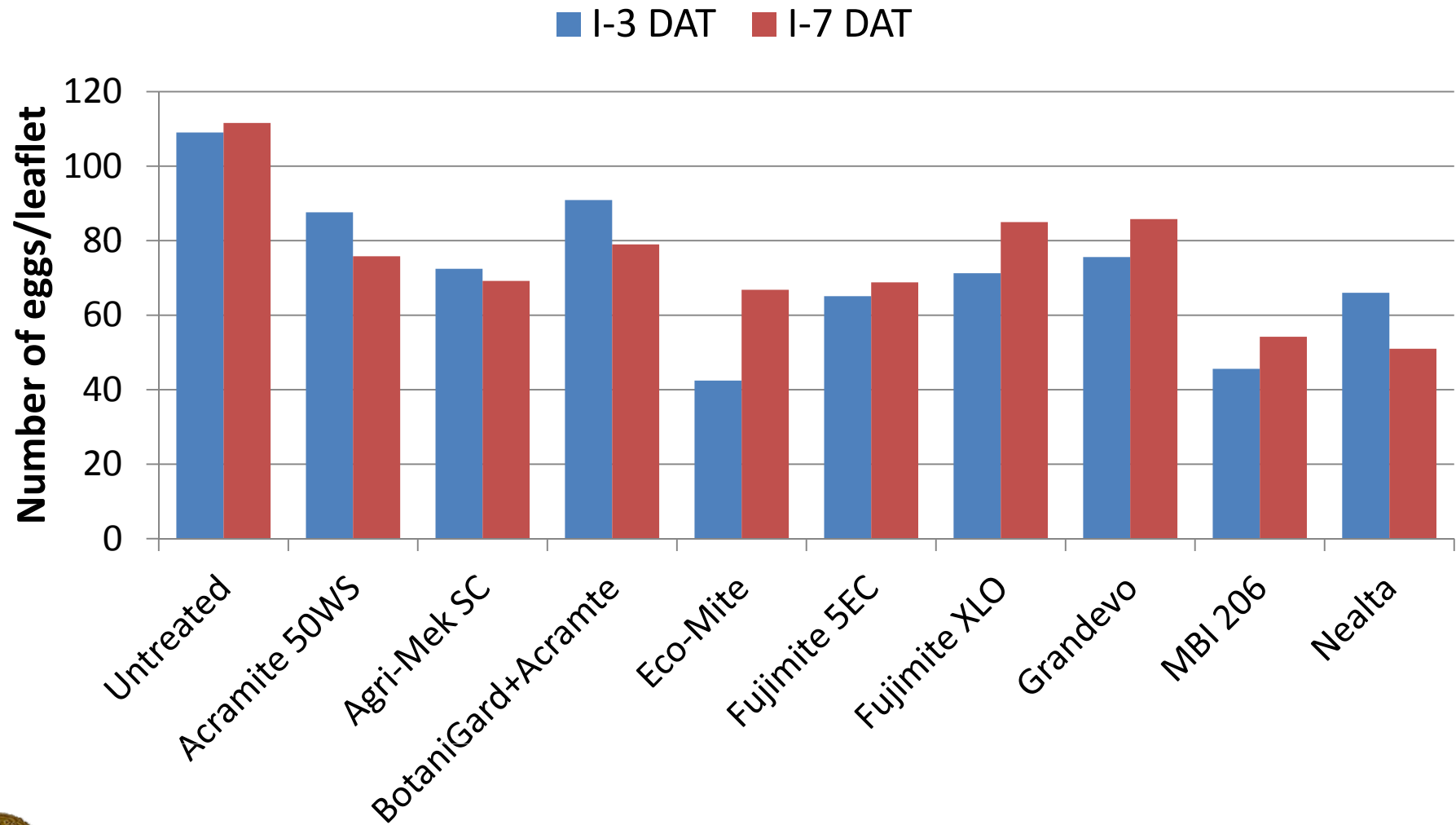
## Design

Randomized complete block



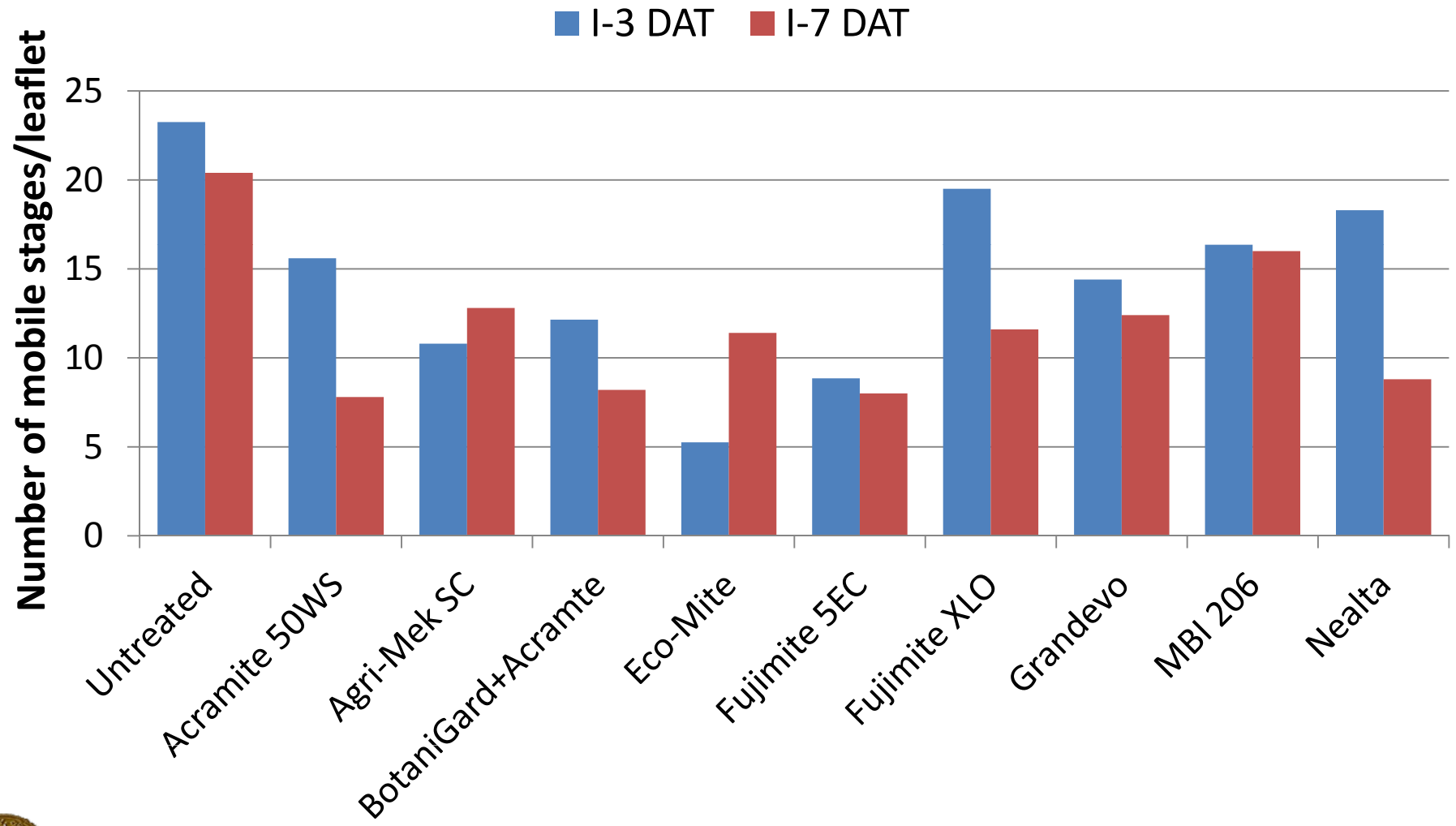
# 2013 field trial-first spray

Eggs



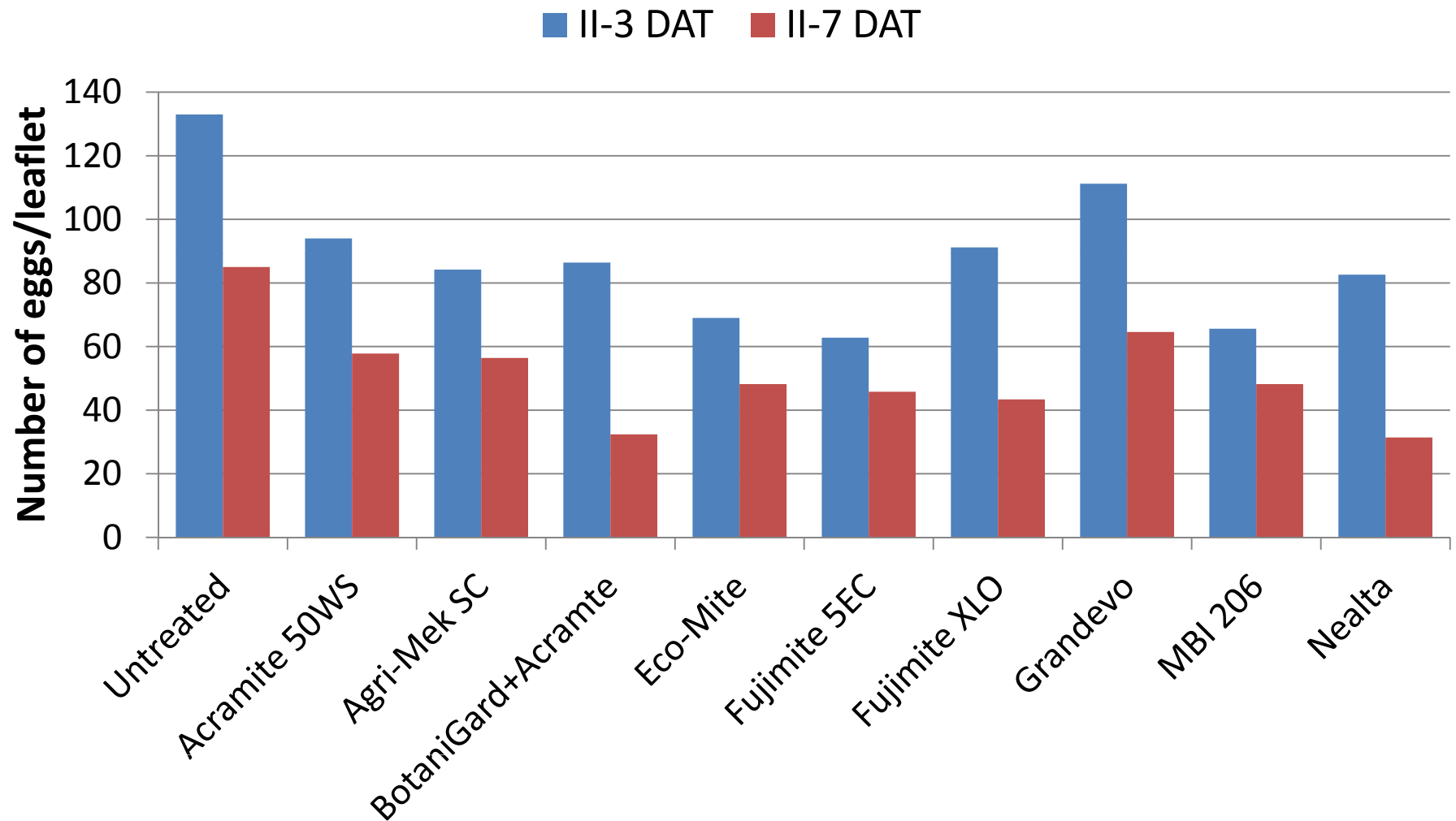
# 2013 field trial-first spray

Nymphs and adults



# 2013 field trial-second spray

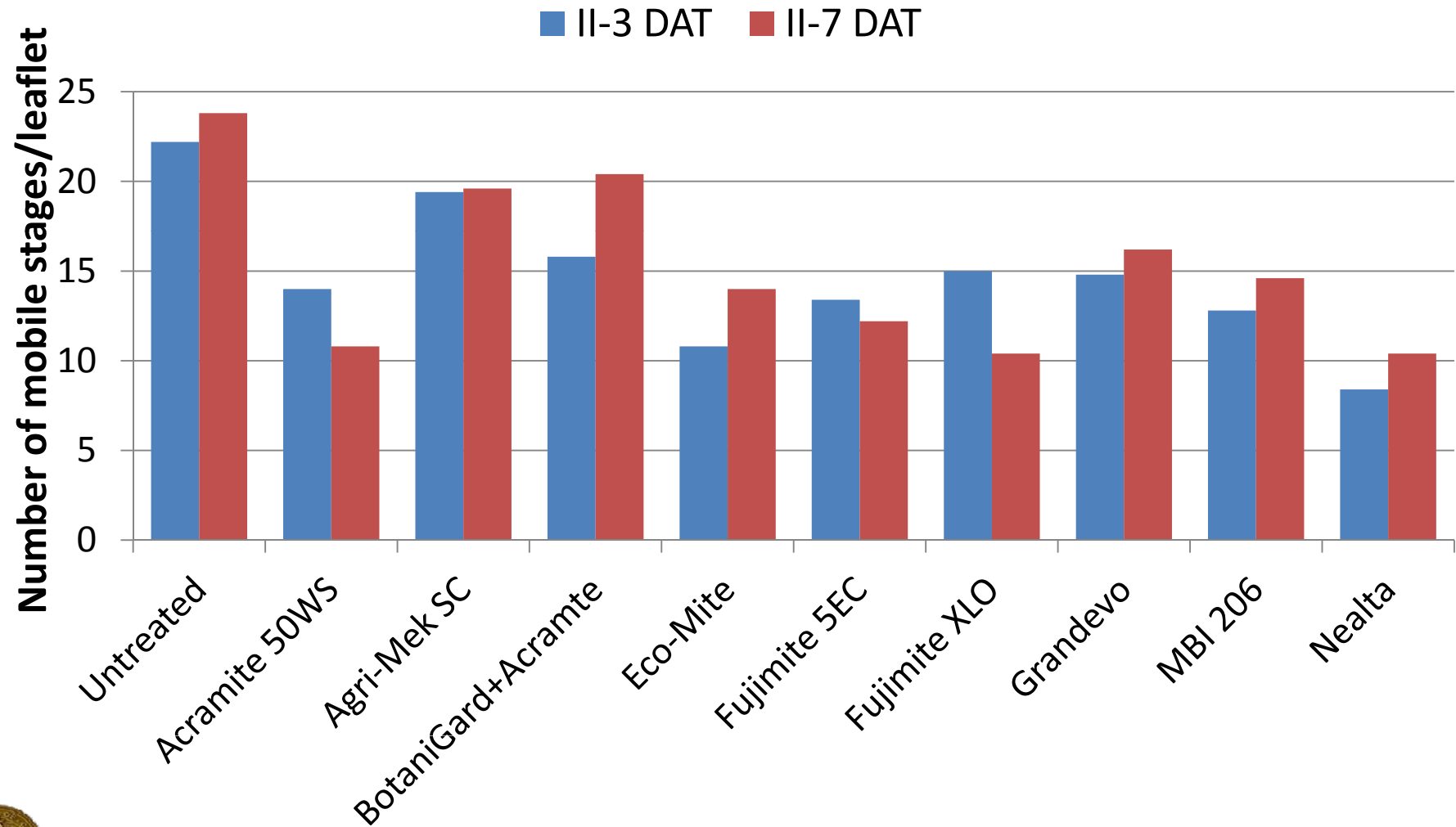
Eggs



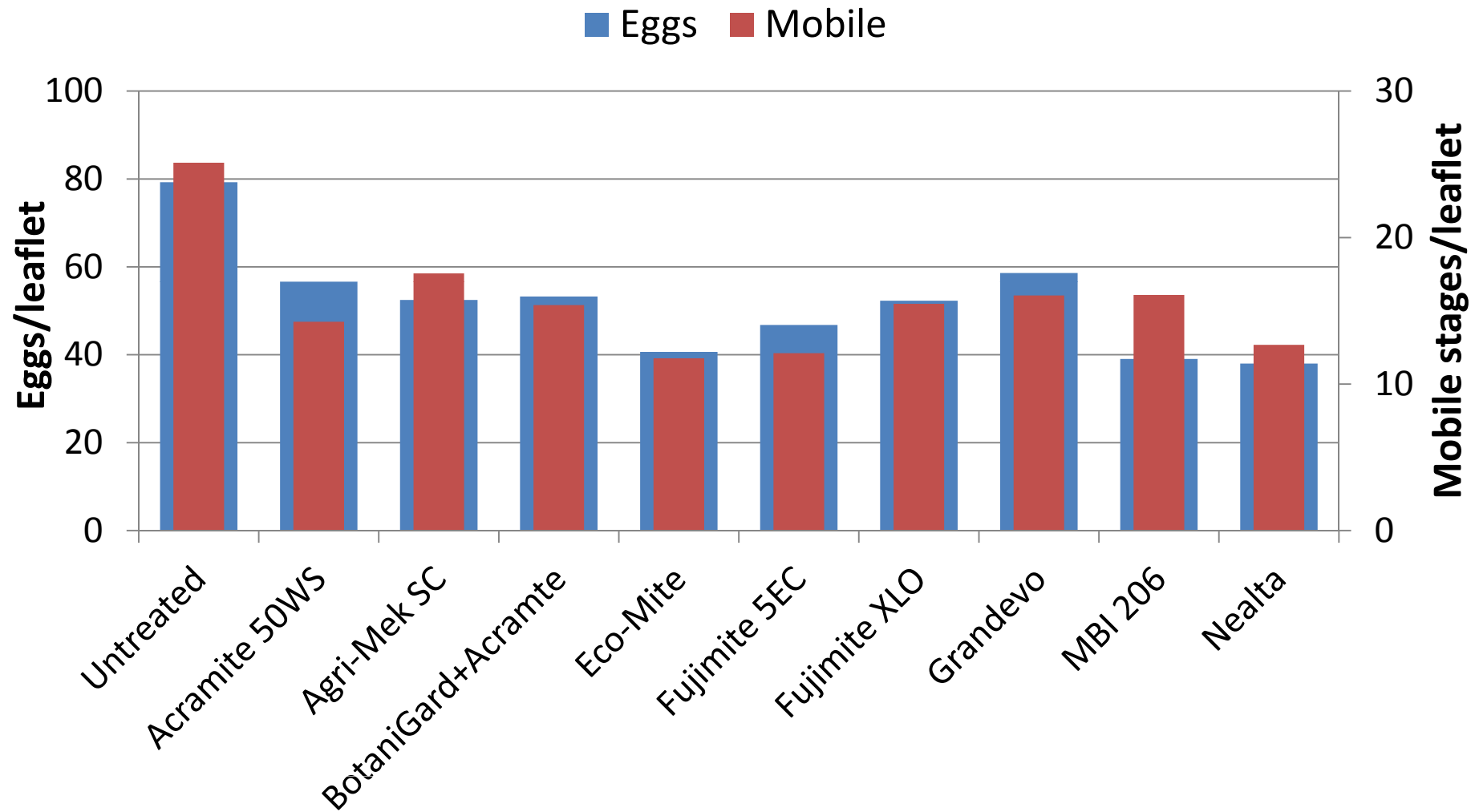


# 2013 field trial-second spray

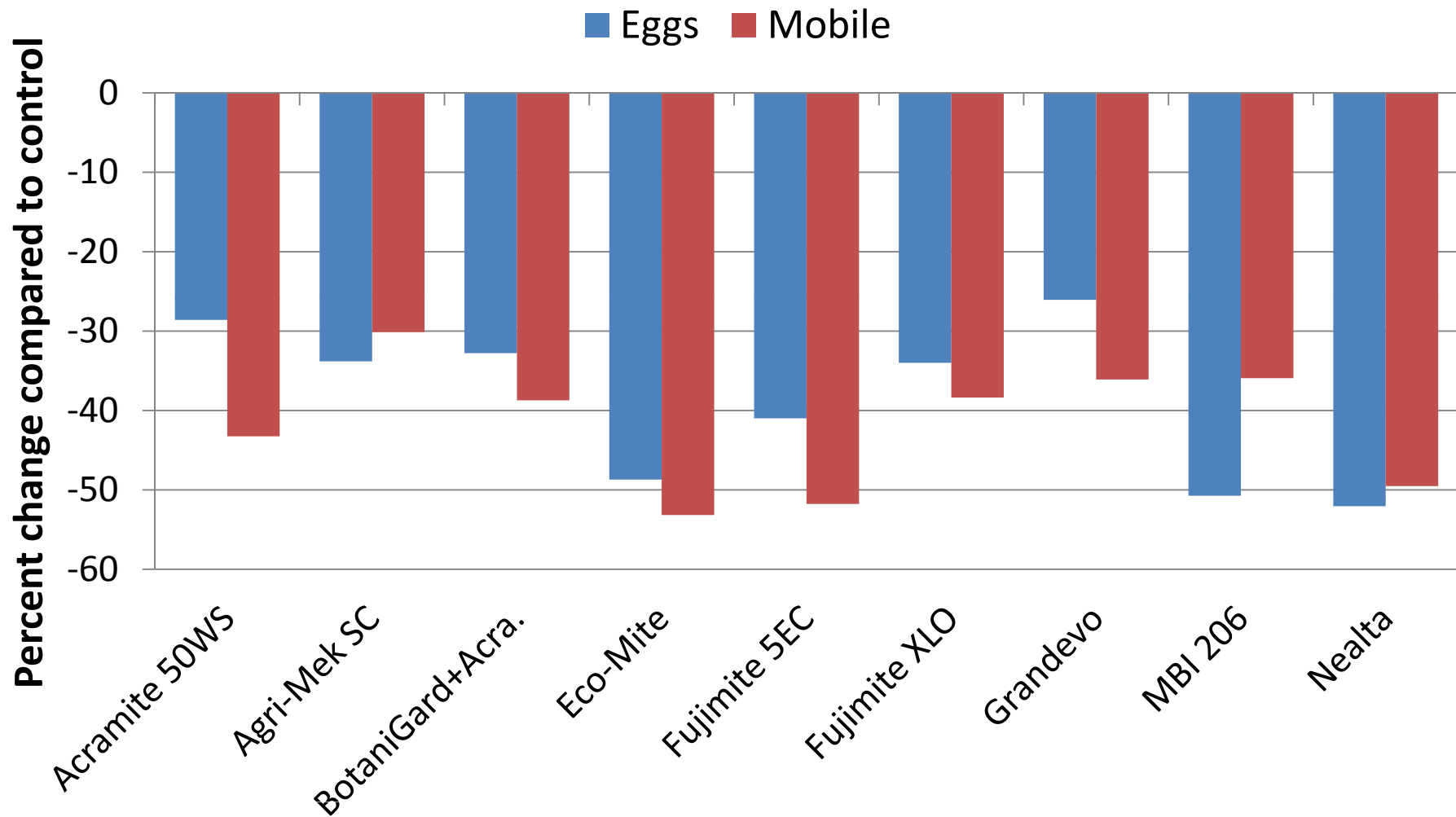
Nymphs and adults



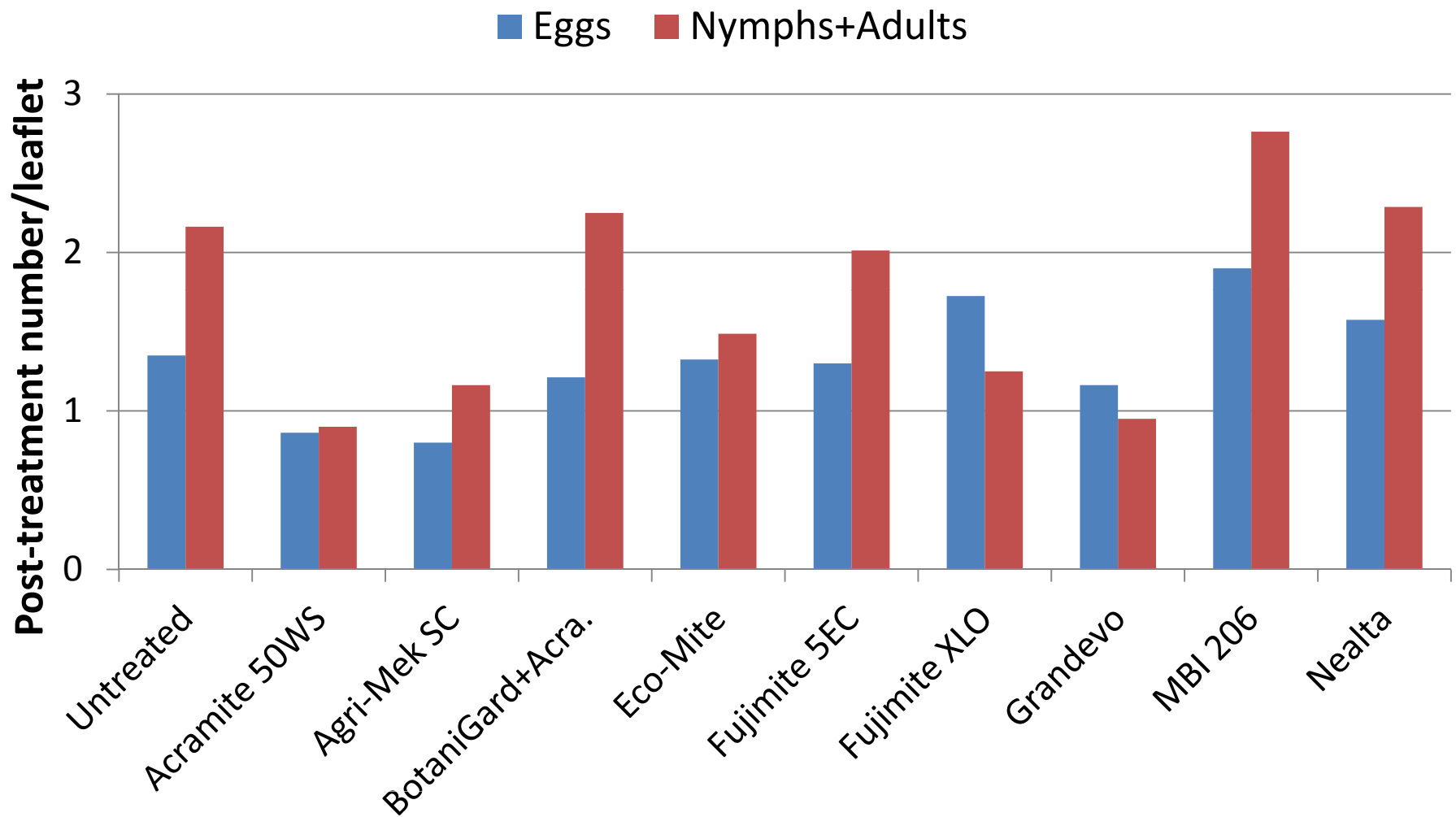
# 2013 field trial-post-treatment average



# 2013 field trial-post-treatment average



# 2013 field trial-Predatory mites



# Conclusions

- Some new and existing miticides have good activity against twospotted spider mites.
- Microbial and botanical options have a good potential and comparable to chemical miticides in some instances. They also appear to be safer to predatory mites.
- Consider combinations of reduced rates of chemicals and other options for good IPM



# Spider mite management

Regularly monitoring  
and making right  
treatment decisions

Adequate chilling,  
nitrogen and water  
management for  
healthy plant growth

Rotating chemicals  
from different classes

Conserving natural  
enemies through dust  
control and using softer  
pesticides

Judiciously using  
effective chemicals

Releasing predatory  
mites and proper  
timing and quantity

Using microbial and  
botanical pesticides



# Acknowledgments

## **Growers and Team**

Daren Gee

Daniel Ibarra

Dave Peck

J Cardenas & Sons

Joe Coelho

## **Technical assistance**

Thomas Crottogini

Sumanth Dara

Suchitra Dara

## **Pesticide Industry**

Casey Butler, Syngenta

Joe Docola, Arborjet

Kate Walker and Sanjeev Bangarwa, BASF

Luis Solari, Marrone Organic Innovations

Pedro Hernandez, Nichino America

Phil McNally, Bayer

Randy Martin and John Francis, Bioworks

