

Miticide Efficacy & Compatibility with *P. persimilis*

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Spider Mites

(Acari: Tetranychidae)



- Main pest in coastal California production
- Winter & Summer berries

Damage

- Feed on the underside of leaves
- Yellow mottling or dark spots on the topside
- Necrosis on underside



- Webbing
 - Spreads mites
 - Attracts dust on the underside
 - Can change transpiration



- Reduction in fruit size & yield
- Heavy infestations cause stunting & leaf drop
- Can kill a stressed plant





Two major mite pests

Twospotted spider mite



- No. 1 pest in Ventura Co. strawberry production
- Has >1,000 hosts
- Known to be resistant to >90 unique insecticide/miticide active ingredients in over 367 cases world wide
- Present in winter & summer berries

Two major mite pests

Lewis spider mite

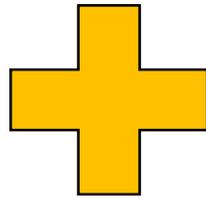
- Increasing as a pest on strawberry & raspberry
- Found on raspberry, poinsettias, lemon, & castor bean
- Present in fall & summer berries



Spider mite control methods

Sprays

Miticides (conventional)
Organic sprays, oils (Organic)



Predator mite releases (Phytoseiidae)

Phytoseiulus persimilis
Neoseiulus californicus
N. Fallacis
Amblyseius andersoni

Efficacy of newest miticide

Nealta (BASF)

- BASF Experimental (Cyflumetofen)
- MOA:
MET II electron transport inhibitor
- IRAC #25
- Bioassays to evaluate efficacy against Lewis spider mite

Methods

Treatments

BASF experimental	13.7 fl. oz/acre
Acramite 50 WS	1 lb/ acre
DiWater	-

**DyneAmic was added to ALL treatments at a rate of 0.375% v/v

- Mid-Tier strawberry leaves were sprayed with each treatment & allowed to dry



Laboratory conditions

Bench top (RCBD)

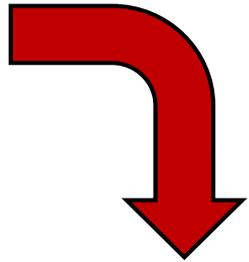
24°C ± 1°C

18:6 L/D

50 – 55% RH



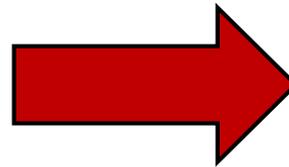
15 adult ♀



Lewis spider mite



x4



Percent Mortality:

Schneider-Orelli's corrected mortality:

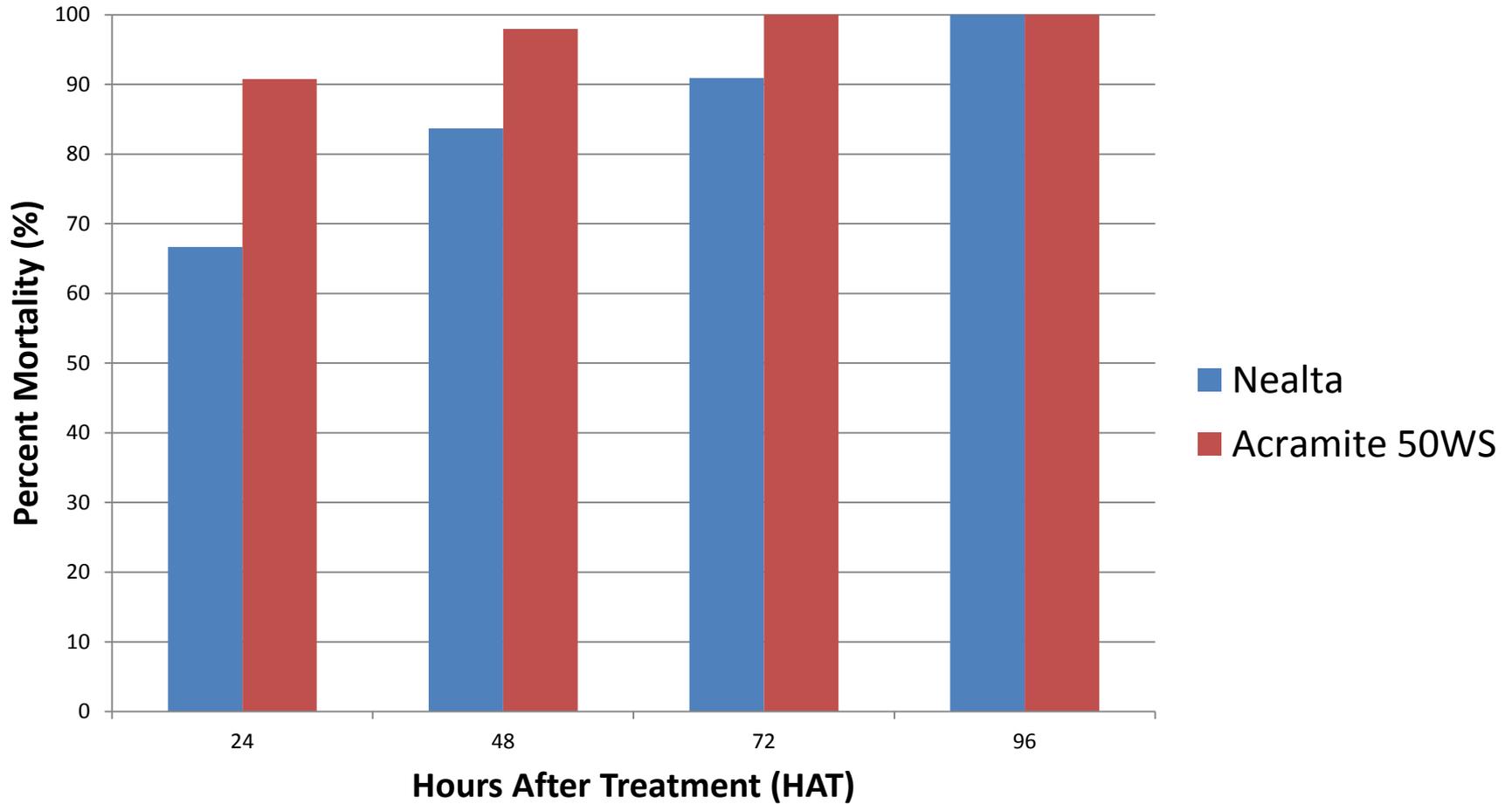
$$= [(T - C) / (100 - C)] * 100$$

Where:

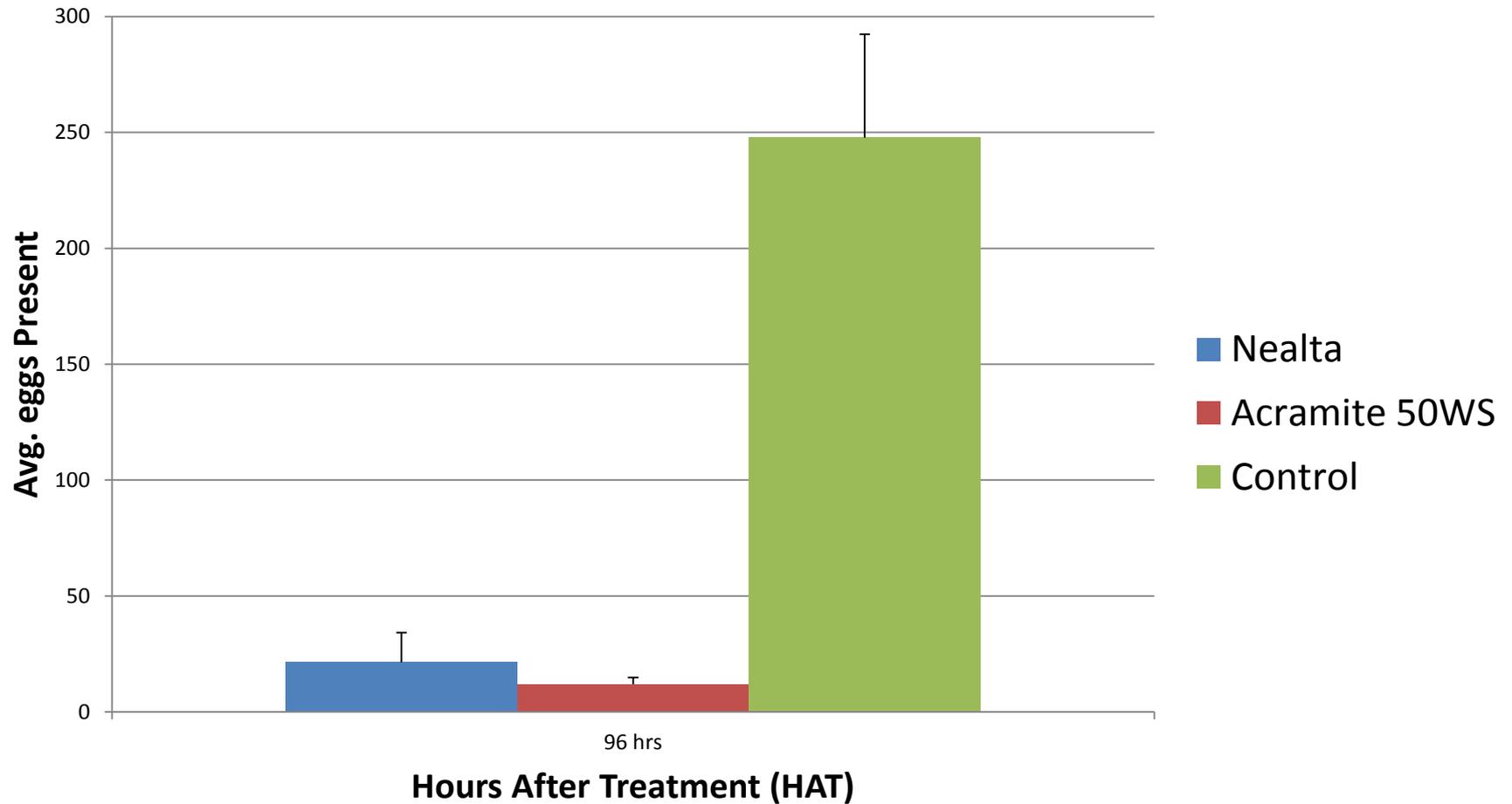
T = % mortality in treated

C = % mortality in control

Lewis Spider Mite Mortality



Lewis Spider Mite Eggs



2015 Field Study

Treatment	Active Ingredient	Product Rate (per acre)	pH
Acramite 50WS	Bifenazate	16 oz	6.5
Acramite 50WS + Buffering agent*	Bifenazate + buffering agent	16 oz	5.5
Agri-Mek	Abamectin	16 fl. oz	6.5
Nealta	Cyflometofen	13.7 fl. oz	6.5
Untreated Control	---	---	6.5

*Buffering agent: Phosphorous acid (H_3PO_3)



Methods

- 50 ft. x 4ft. Beds with 2 plots per bed
 - 20 plants per plot (var San Andreas)
 - 40 plots total (2 reps per block)
- Collected 4 mid-tier leaves per plot each sampling date
- Treatments established in RCBD with four blocks

Data Collected:

No. live spider mites*

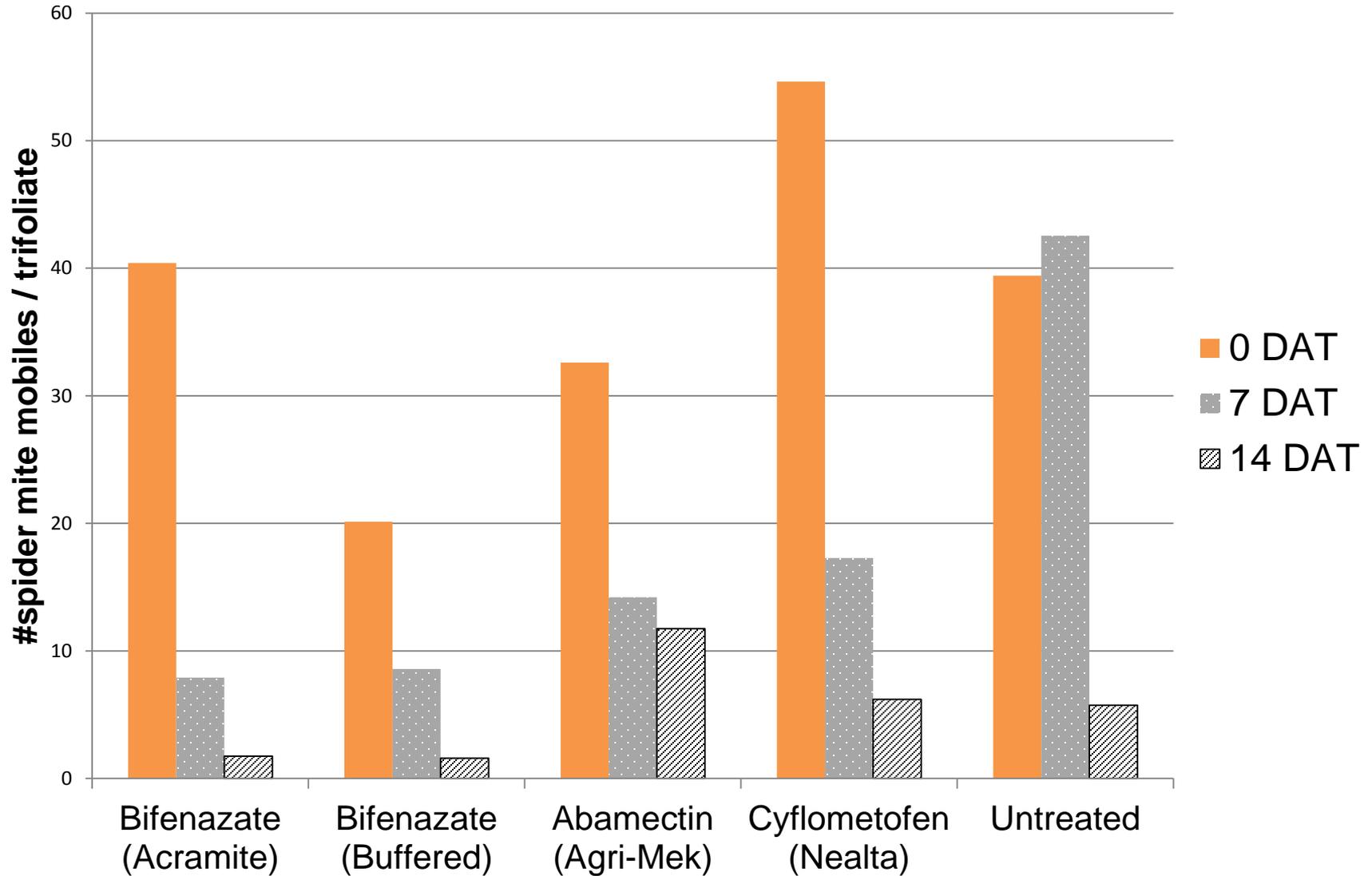
No. spider mite eggs

No. *P. persimilis* motiles*

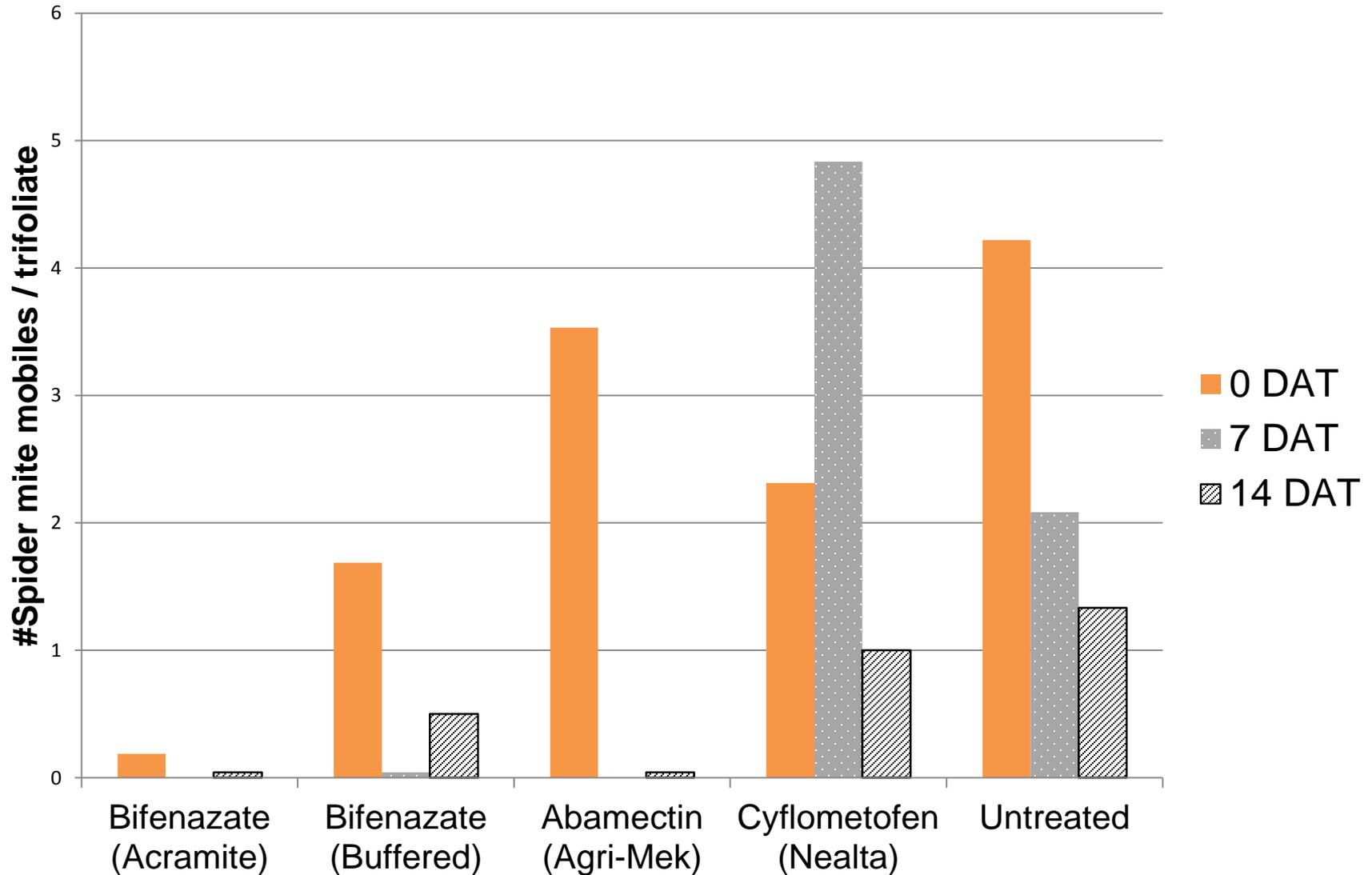
No. *P. persimilis* eggs*



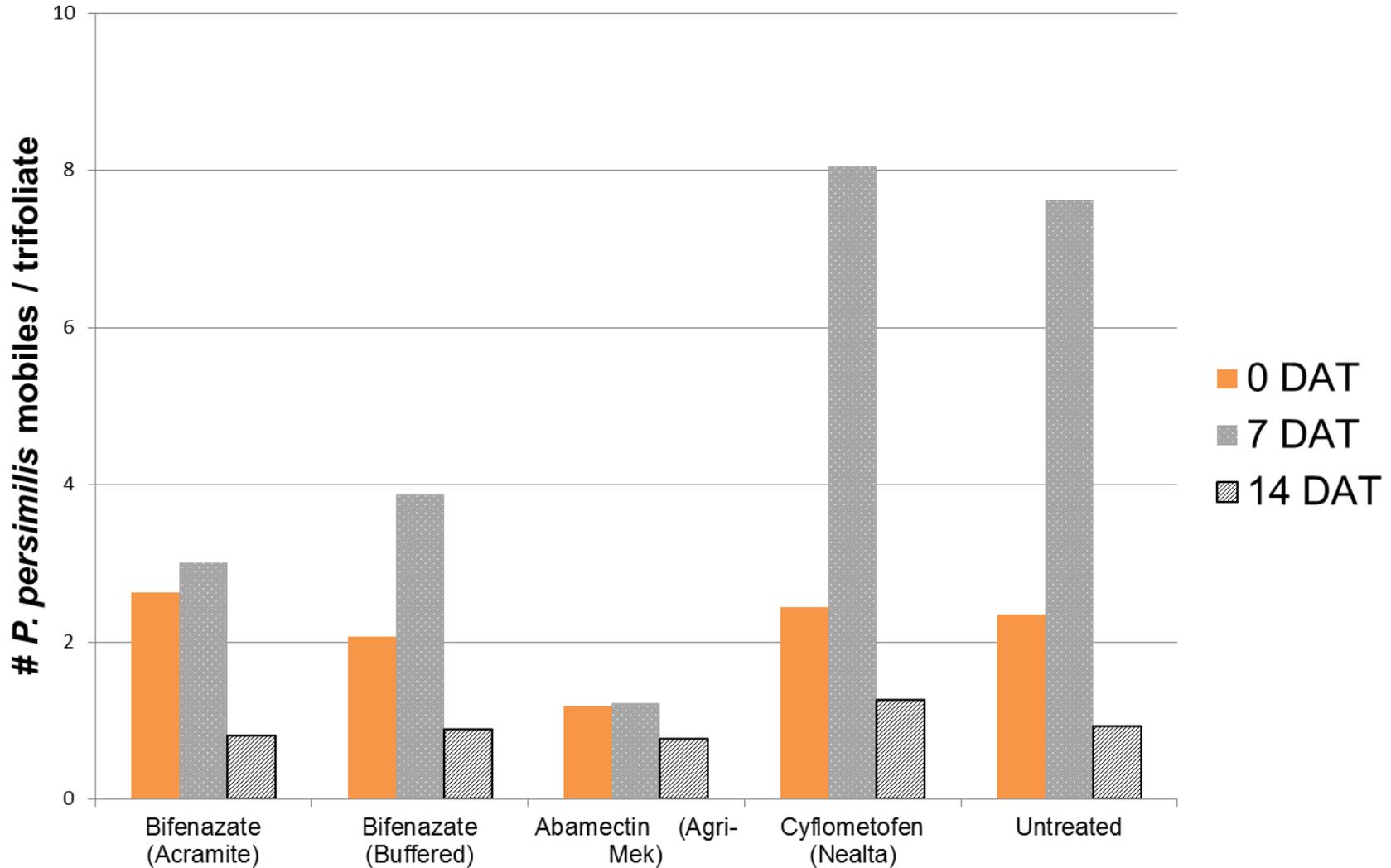
Twospotted spider mite motiles



Lewis spider mite motiles



P. persimilis motiles



How do miticides
affect predators?

Methods

- Leaf (1" disc) dip at the label rate & allowed to dry
- Treated leaf placed inside a petri dish with wet filter paper
 - Filter paper moistened daily



Methods

- 7 adult *P. persimilis* are placed onto the leaf (♀ & ♂'s)
- > 35 TSSM motiles & eggs placed on the leaf for food
 - TSSM replenished every day



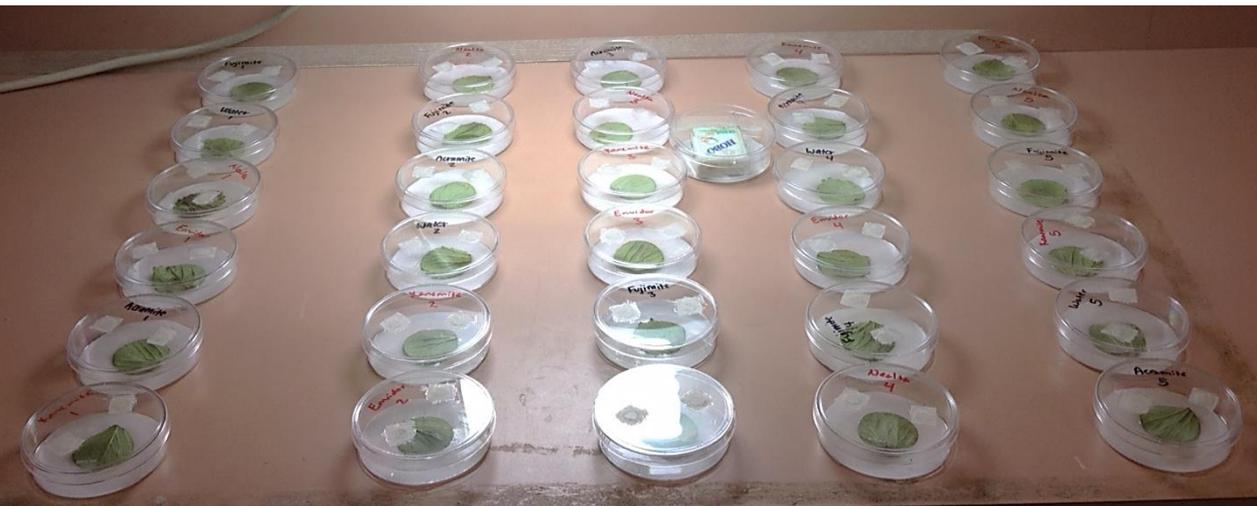
Lab Conditions

Temp: $82.4\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$

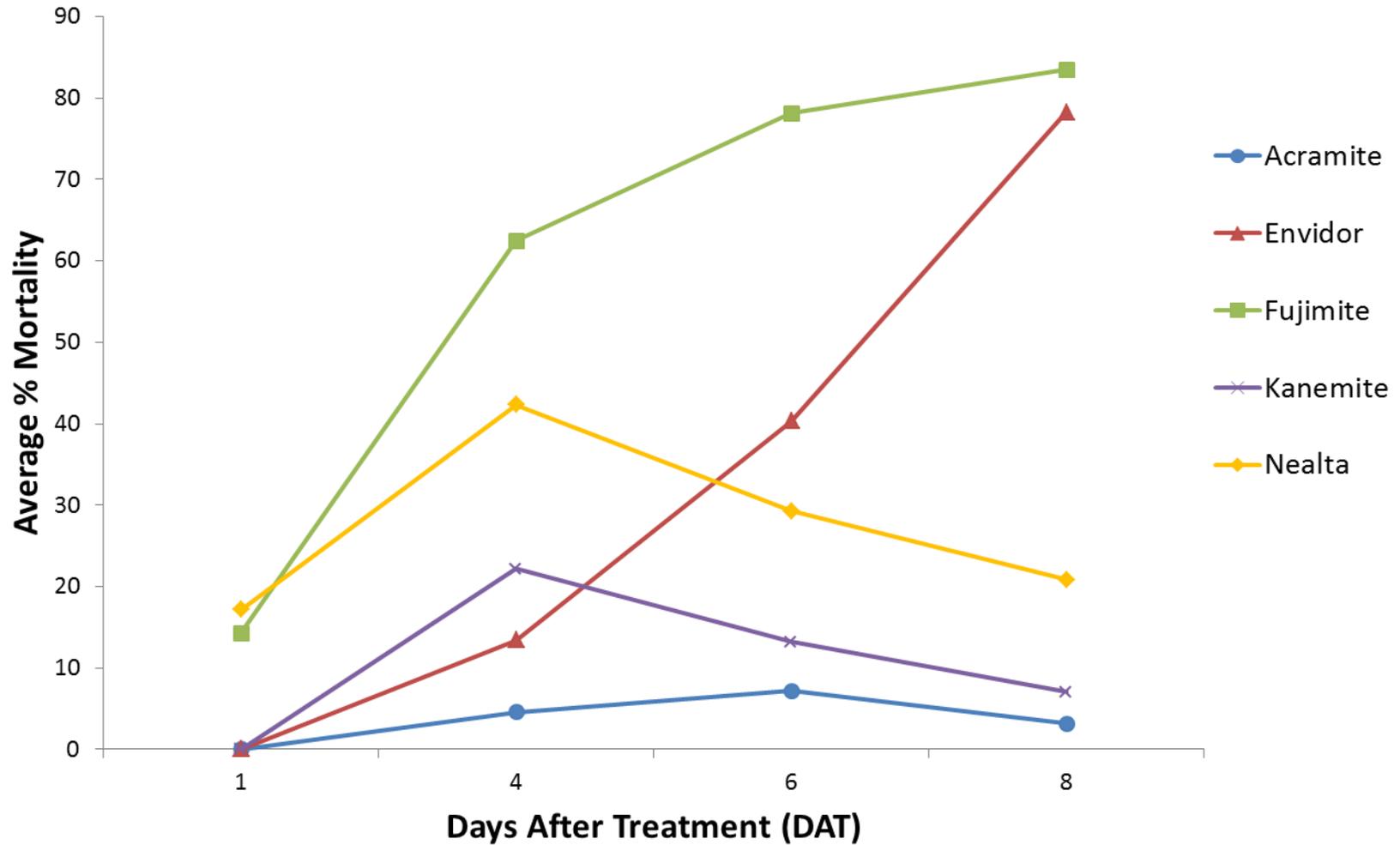
% RH : 60-65%

16:8 hr (L/D)

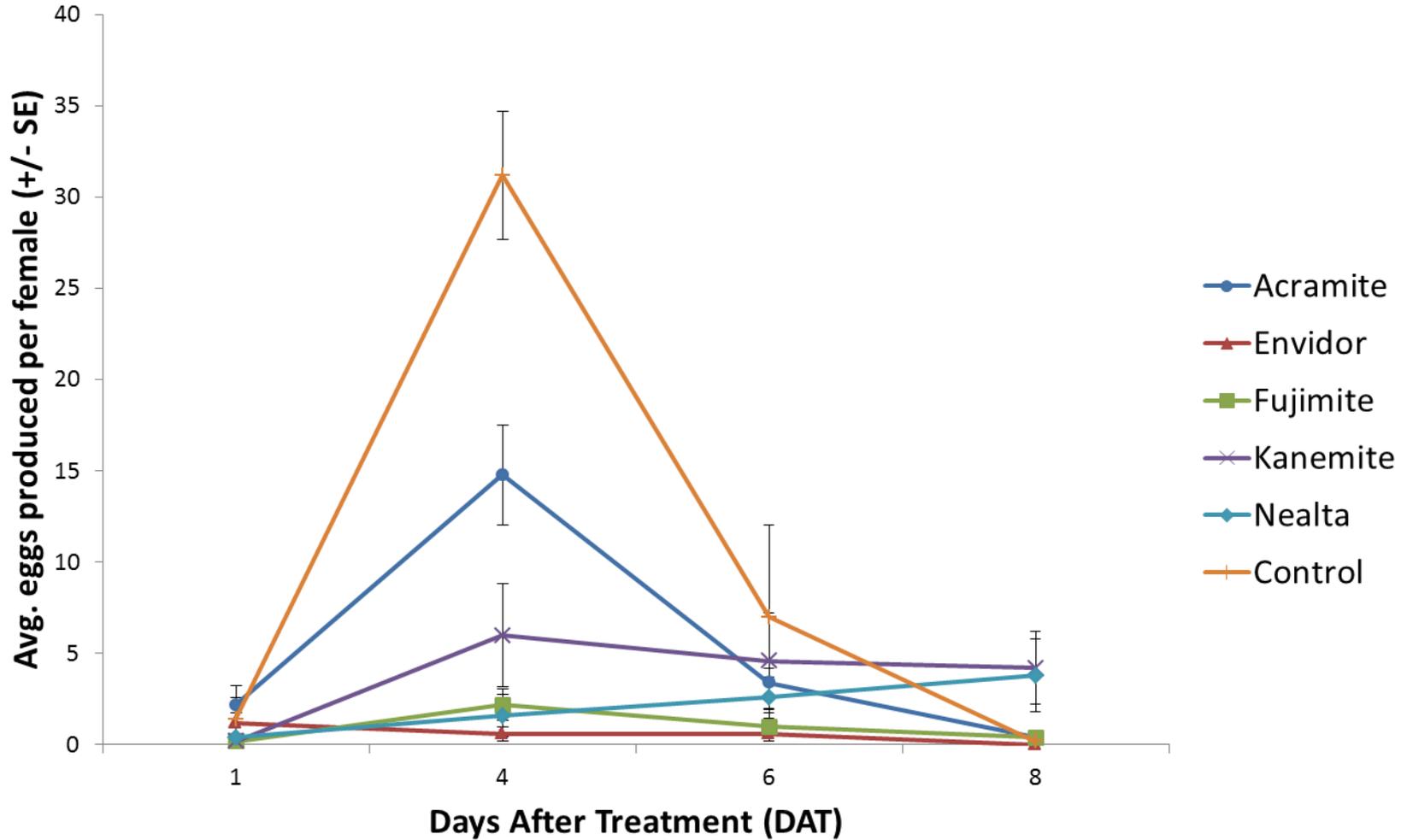
RCBD on benchtop, 5 reps



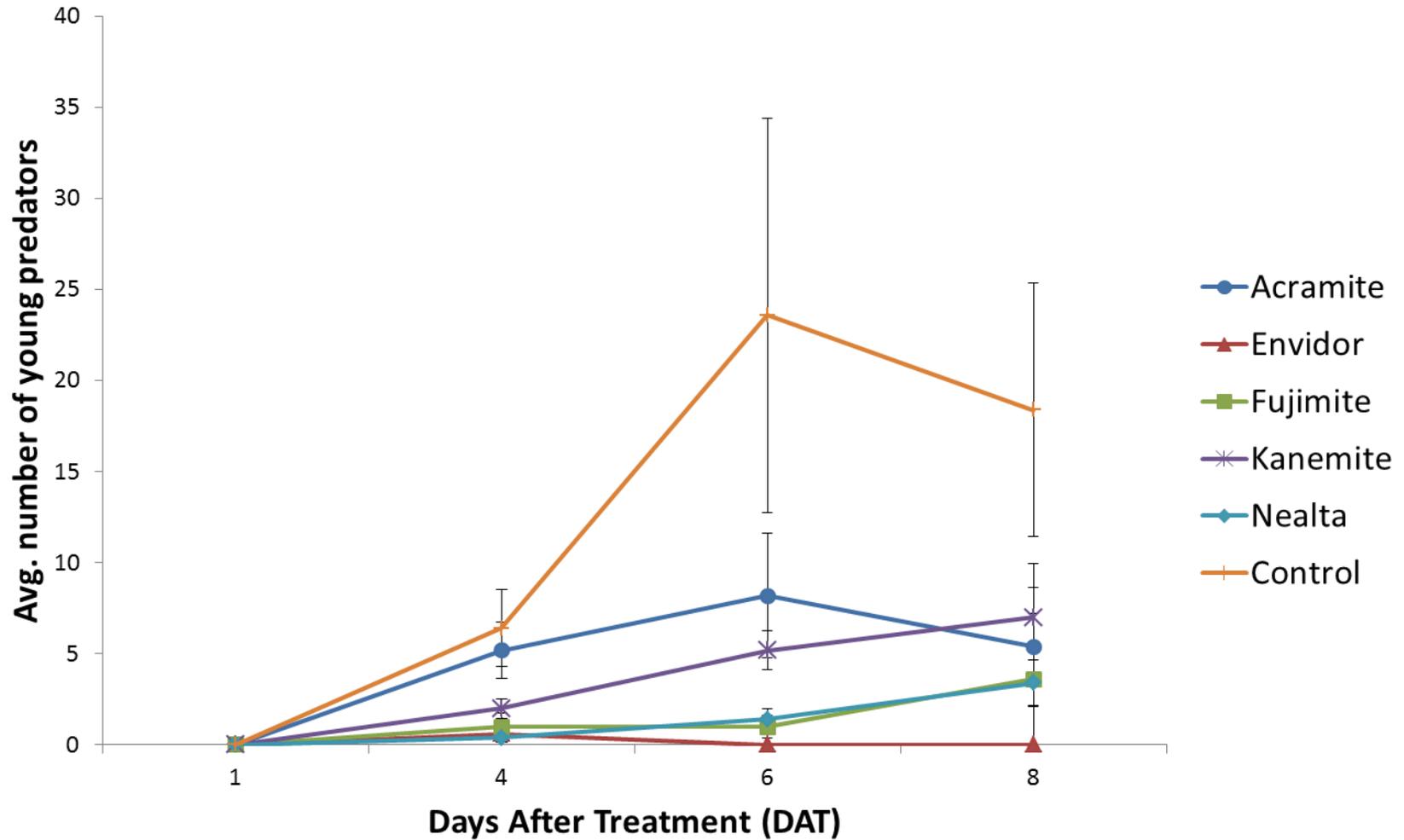
Corrected Percent Mortality



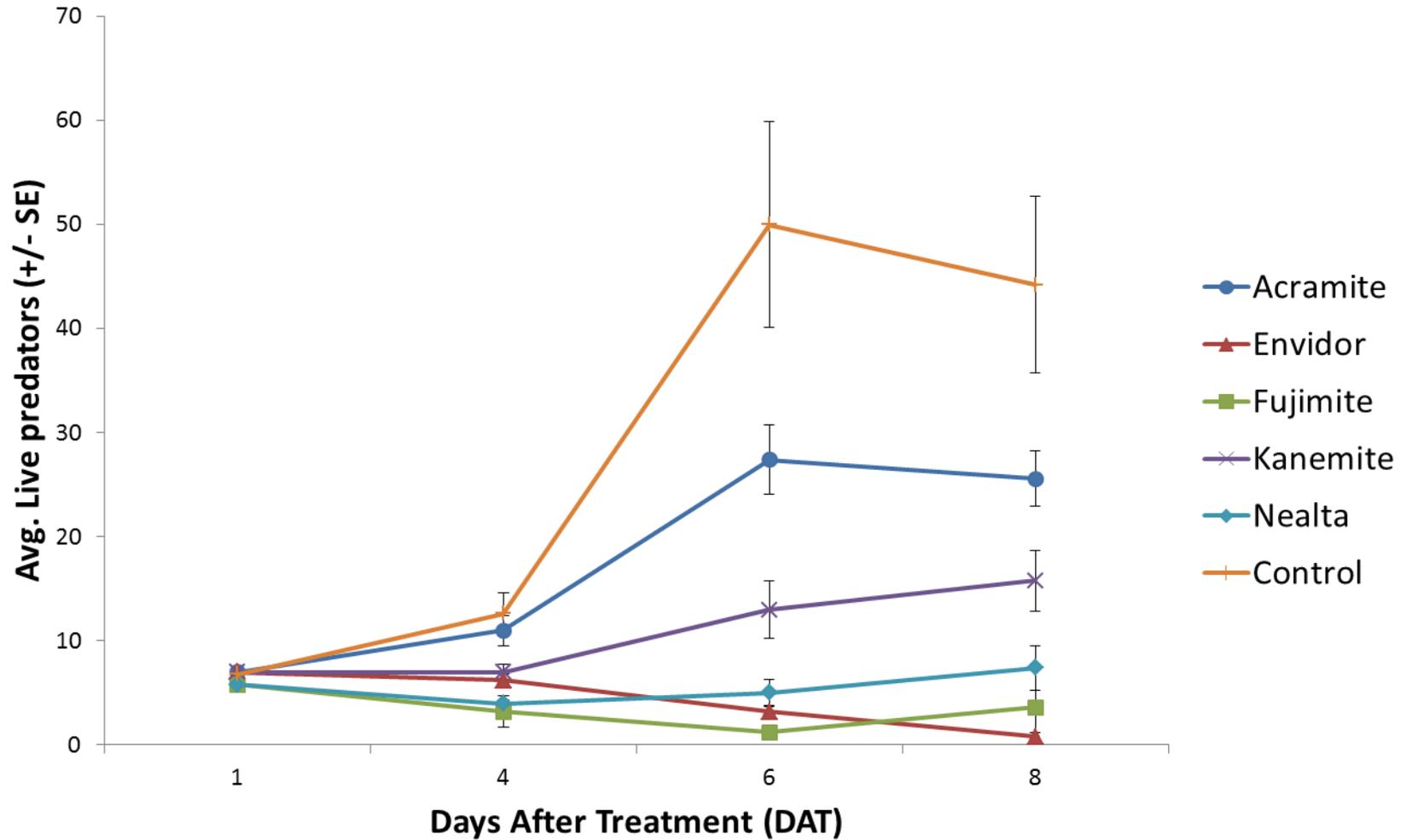
Fecundity (# eggs produced)



Fertility (# young produced)



Total live predators



Summary

- Nealta is a new miticide that can be added to the rotation in strawberry
- Miticides differ in efficacy depending on the species of spider mites
- Effects of miticides on *P. persimilis* should be considered before spraying and releasing

Guidelines

Harsh on *P. persimilis*:

Fujimite & Envidor

"Soft" on *P. persimilis*:

Nealta

"Softer" on *P. persimilis*:

Acramite & Kanemite

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