

# Biocontrol of Lewis & Twospotted spider mite: Field study



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# Spider Mites

- Major recurring pest during both plantings in Ventura County
- Problems associated with chemical control
  - \*Resistance to miticides
  - Difficulty of applying miticides
  - Miticide residues on fruit



# Twospotted spider mite (*Tetranychus urticae*)

- Usually the most abundant & damaging mite pest on strawberry
- Present in summer & fall berries
- >100 hosts
- Hibernates (Diapause) in the winter



# Lewis spider mite (*Eotetranychus lewisi*)

- Populations increasing in some fields
  - Raspberry
  - Strawberry
- Multiple hosts, including weeds like castor bean
- No diapause known



## Lewis

## TSSM

Spots

Multiple

One large spot on  
each side

Size

0.36mm

0.5mm



Lewis adult



Twospotted adult

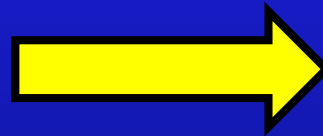


# Damage

- Feed on the underside of leaves
- Yellow mottling on topside
- Necrosis on underside



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



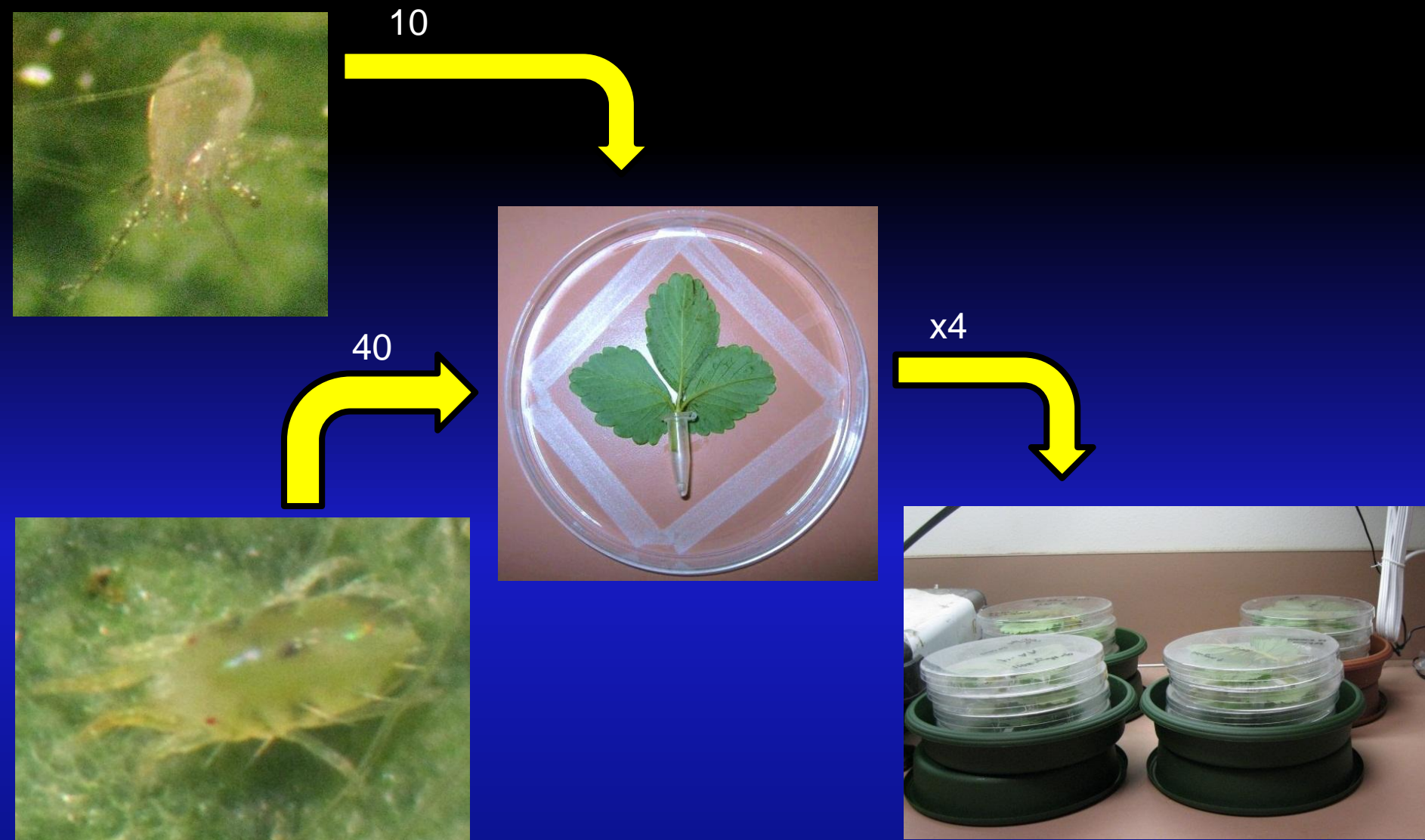


- Reduction in fruit size & yield
- Heavy infestations cause stunting & leaf drop
- Can kill a stressed plant





# Previous lab predatory mite biocontrol results...



# TSSM ONLY



*P. persimilis*



*N. fallacis*



*A. andersoni*



~~*N. californicus*~~



# Lewis ONLY



~~*P. persimilis*~~



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*N. fallacis*



*A. andersoni*



*N. californicus*



University of Florida

Elena M. Rhodes



Lewis



+

TSSM



~~*P. persimilis*~~



*N. fallacis*



*A. andersoni*



~~*N. californicus*~~





# How will they behave in the field?

- Environmental variability
- Spatial variability



# Methods

- Sampled fields with both mite species present
  - Organic field (fall berries)
- 4 replications per treatment (1 bed per rep)
  - *A. andersoni*
  - *N. californicus*
  - *N. fallacis*
  - Grower Standard (*P. persimilis* + *N. californicus*)

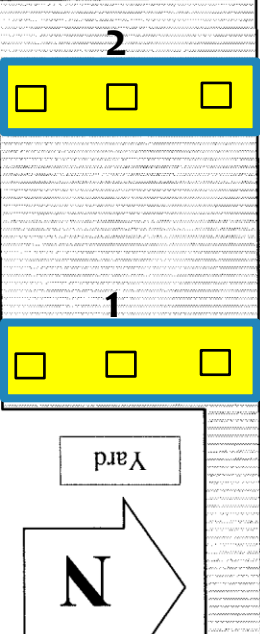
Lemons

Treeline

Lemons

Residential Area

Reservoir Area  
GPS 34°16'21.44"N 119°00'48.51"W



1 bed per treatment (AVG size: ~300ft x 4ft wide)

Each treatment separated by 4 beds

3 subplots

All beds were treated with Grandevo (MBI)





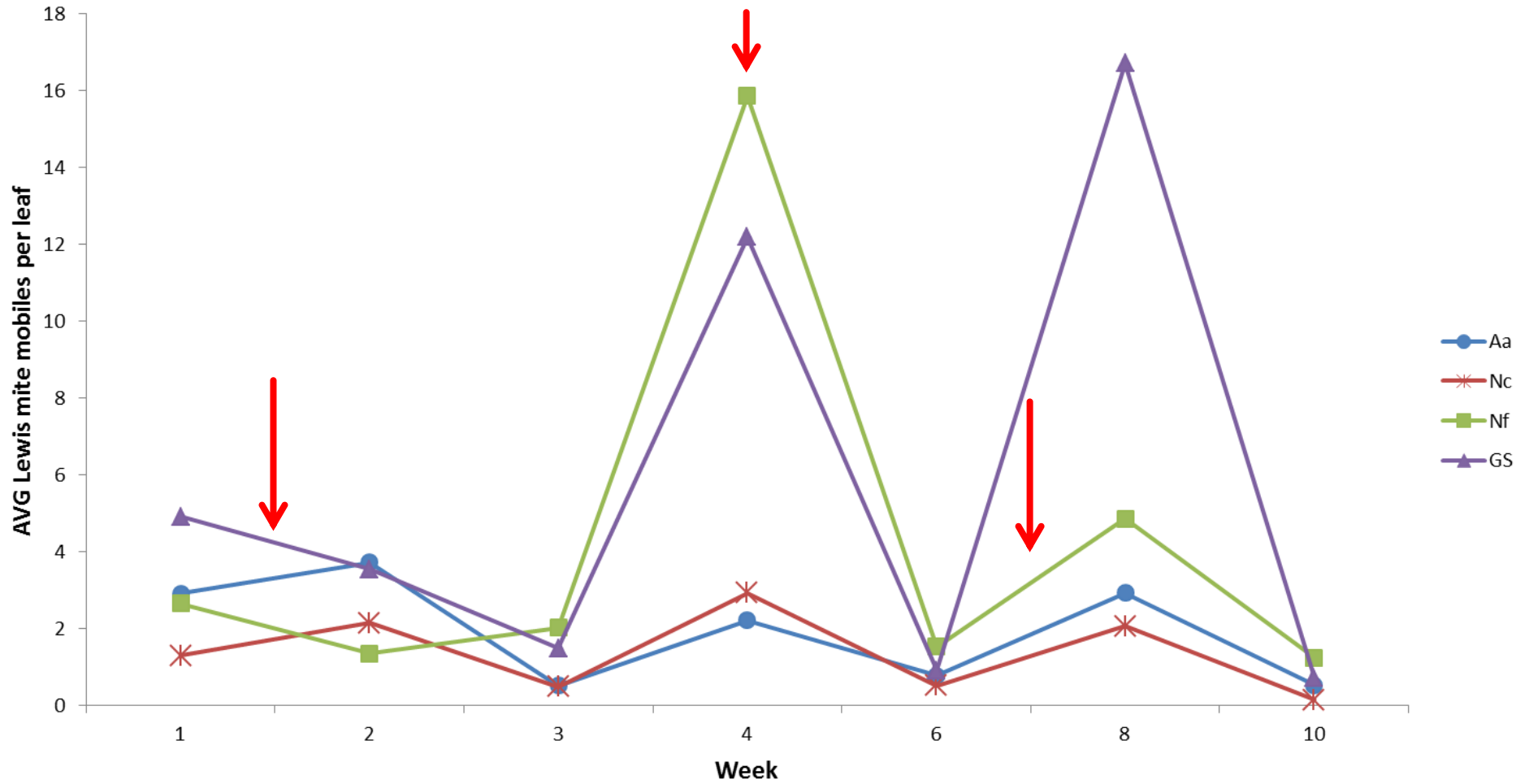






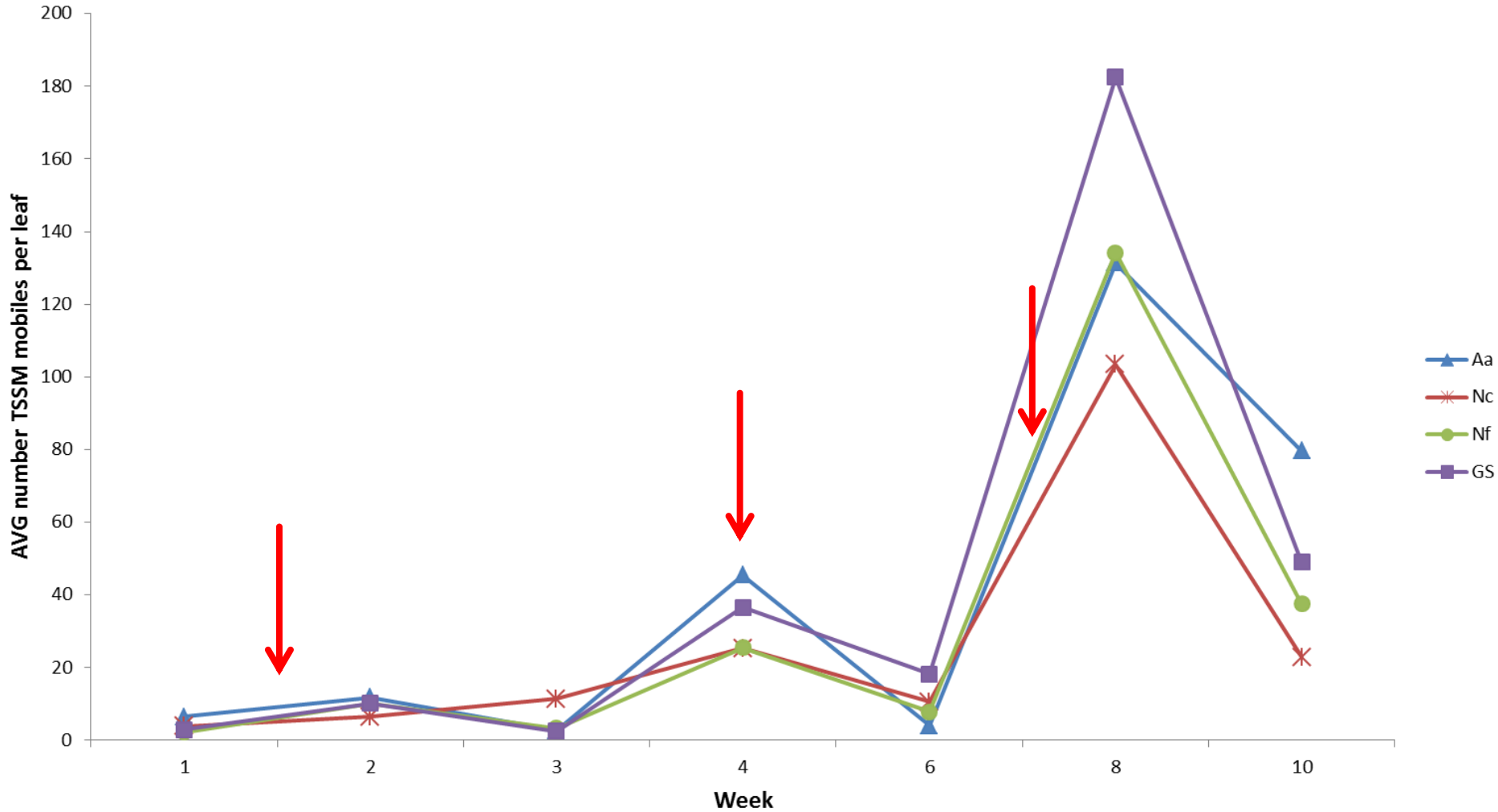
- Baseline Count of Lewis & TSSM mobiles
- Collected 6 mid-tier trifoliates from each subplot per rep
  - 72 trifoliates per treatment = 288 total
- Counted number of Lewis & TSSM mobiles & eggs every week for 10 weeks (Feb – April 2013)
- Counted the number of predators
- Released at a rate of 25,000 per acre

# Lewis spider mite + predators



No sig. difference between treatments  
Repeated measures ANOVA:  $p = 0.715$

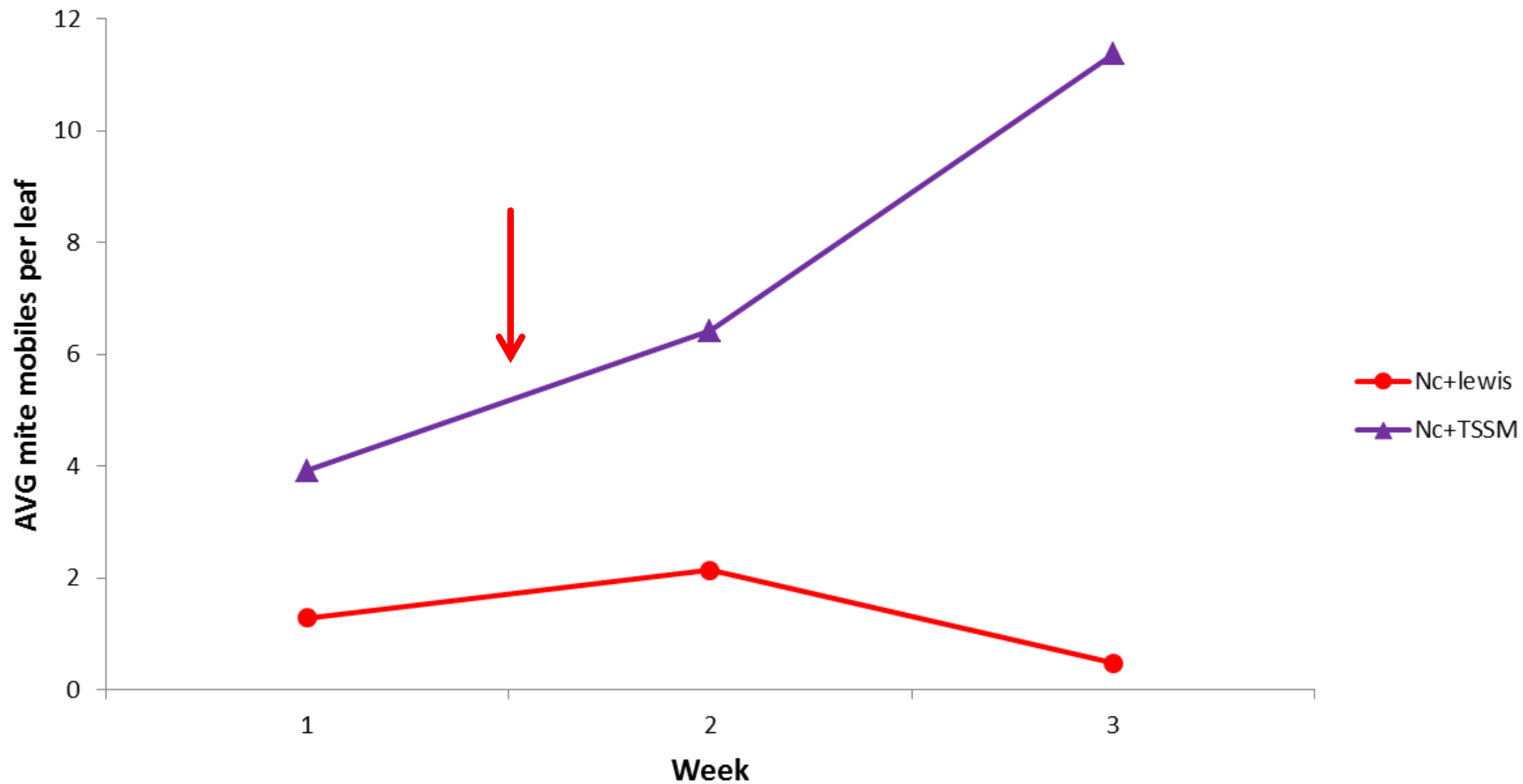
# TSSM + Predators

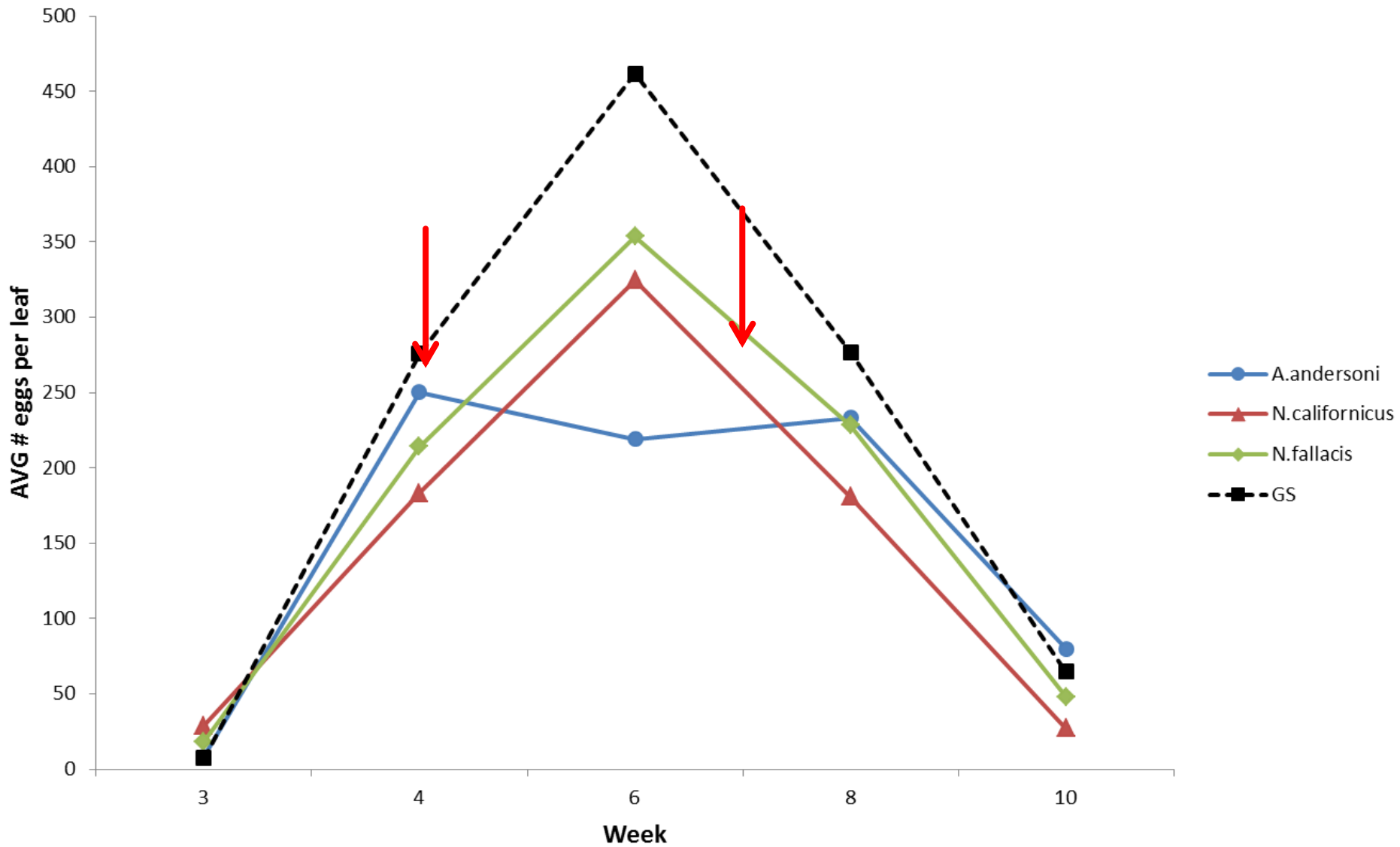


No sig. difference between treatments  
Repeated measures ANOVA:  $p = 0.926$



# *N. californicus* + Lewis mite + TSSM





No sig. difference between treatments  
Repeated measures ANOVA:  $p = 0.972$

# TSSM ONLY



*P. persimilis*



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*N. fallacis*



*A. andersoni*



*N. californicus*



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# Lewis ONLY



~~*P. persimilis*~~



© Photo courtesy  
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*N. fallacis*



*A. andersoni*



*N. californicus*



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Lewis



TSSM



*N. fallacis*



*A. andersoni*



*P. persimilis*



*N. californicus*



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Elena M. Rhodes

- To implement the best IPM program
  - Scout your fields
  - Properly ID your mites
  - Apply the best control for your situation





*Total spider mites counted:*

99,261

*Total eggs counted:*

250,843

# Acknowledgements

Frank Zalom & his lab (UC Davis)

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