

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



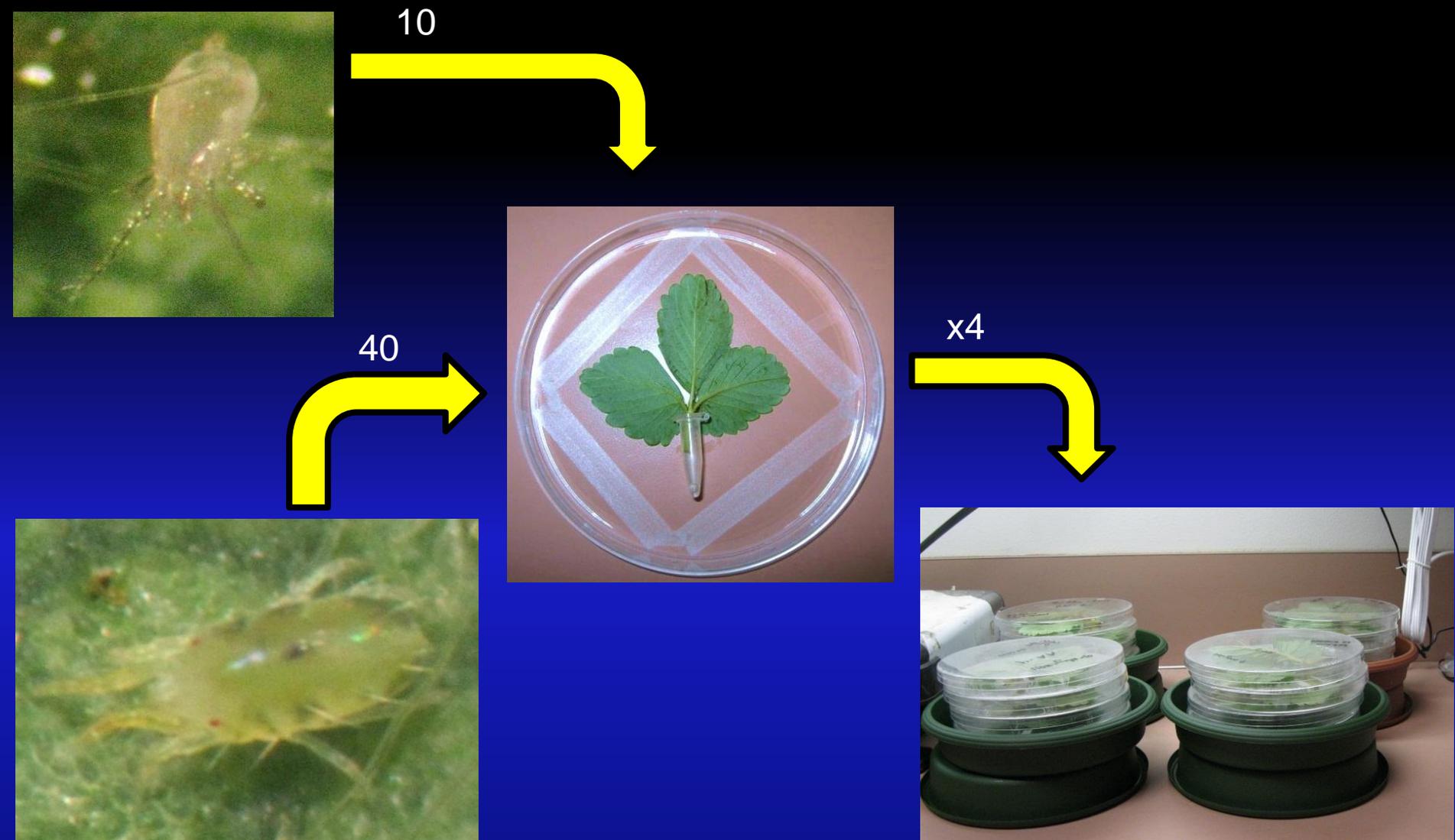
- Webbing
 - Spreads mites
 - Attracts dust on the underside
 - Can change transpiration



- 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



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N. fallacis



A. andersoni



~~*N. californicus*~~



University of Florida

Elena M. Rhodes

Lewis ONLY



~~*P. persimilis*~~



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N. fallacis



A. andersoni



N. californicus



University of Florida

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Lewis



+

TSSM



~~*P. persimilis*~~



N. fallacis



A. andersoni



~~*N. californicus*~~



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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*)

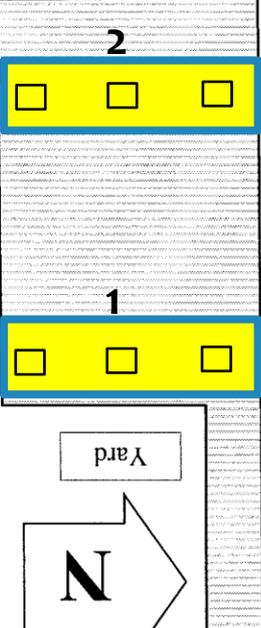
Lemons

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

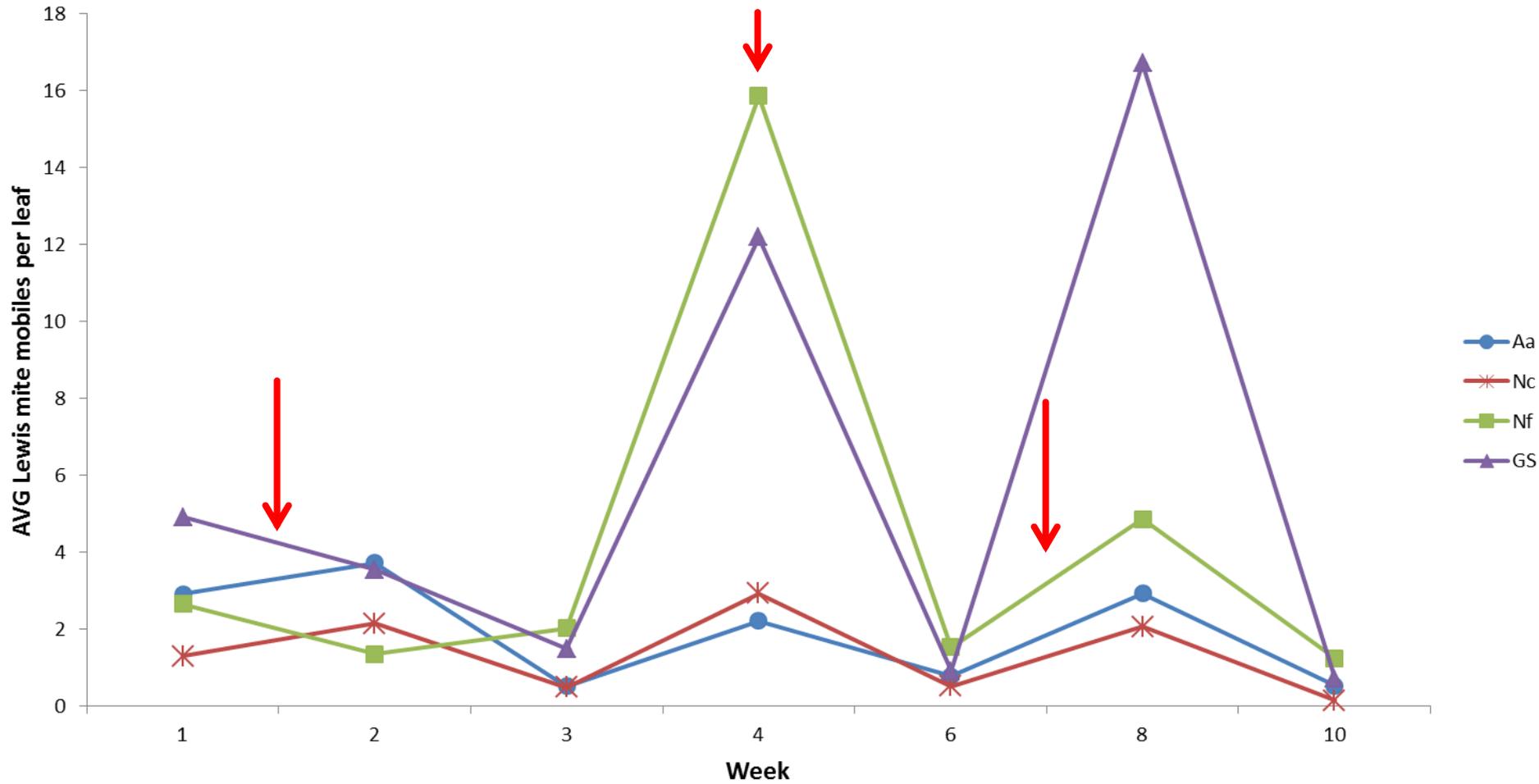
All beds were treated with Grandevo (MBI)





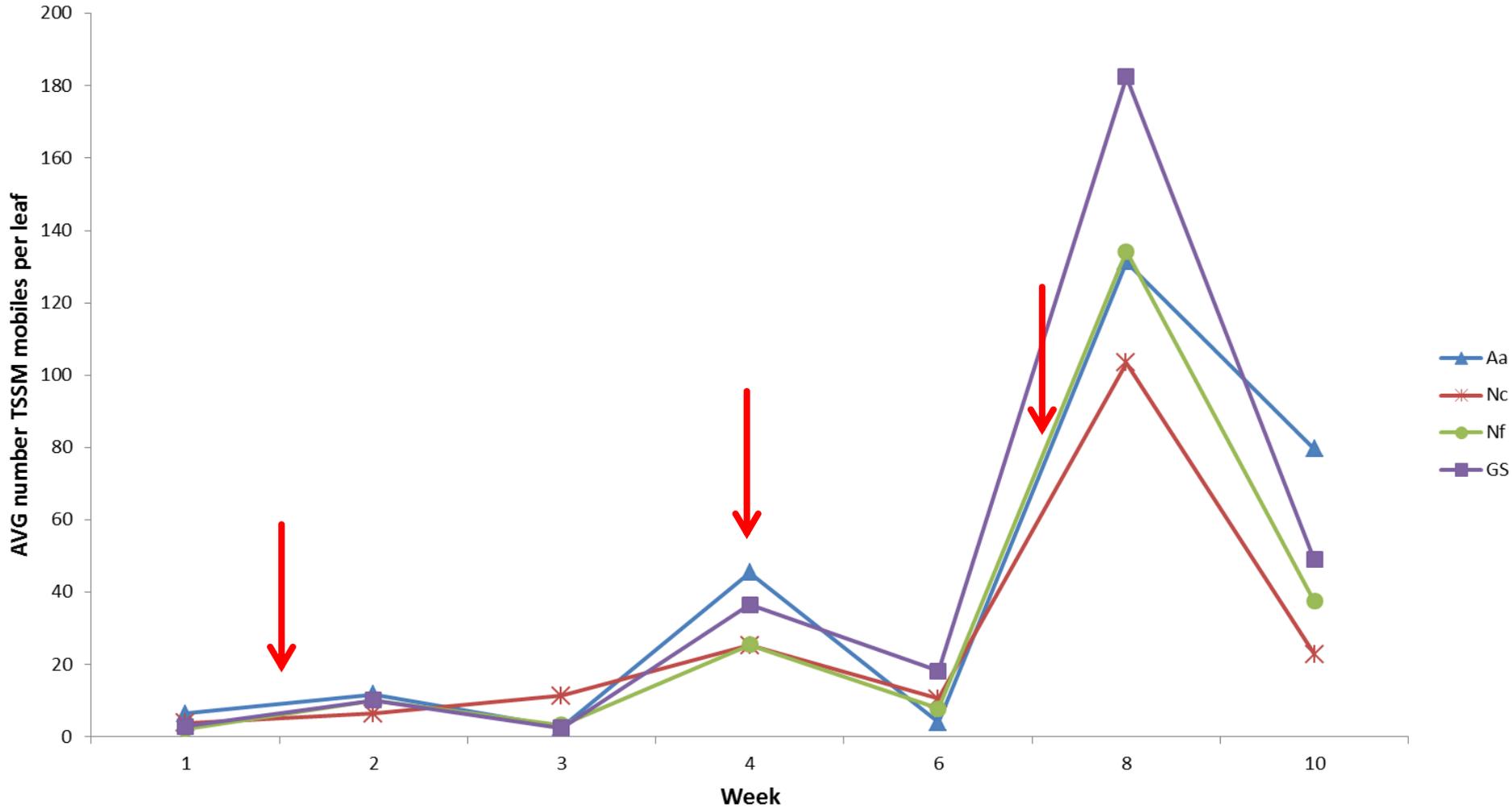
- Baseline Count of Lewis & TSSM mobiles
- Collected 6 mid-tier trifoliates from each subplot per rep
 - 72 trifoliates per treatment = 288 total
- Counted number of Lewis & TSSM mobiles & eggs every week for 10 weeks (Feb – April 2013)
- Counted the number of predators
- Released at a rate of 25,000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

Lewis spider mite + predators



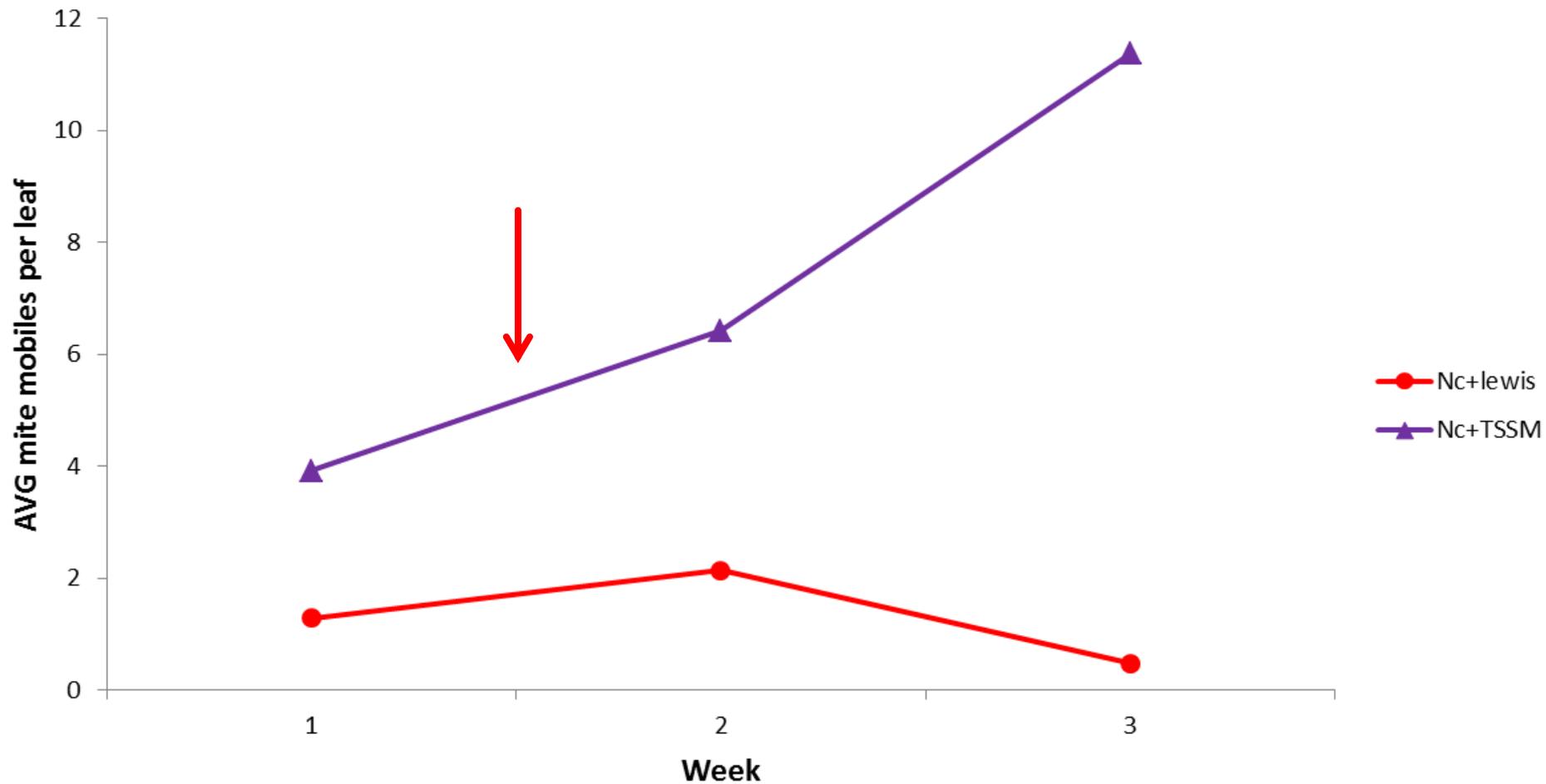
No sig. difference between treatments
Repeated measures ANOVA: $p = 0.715$

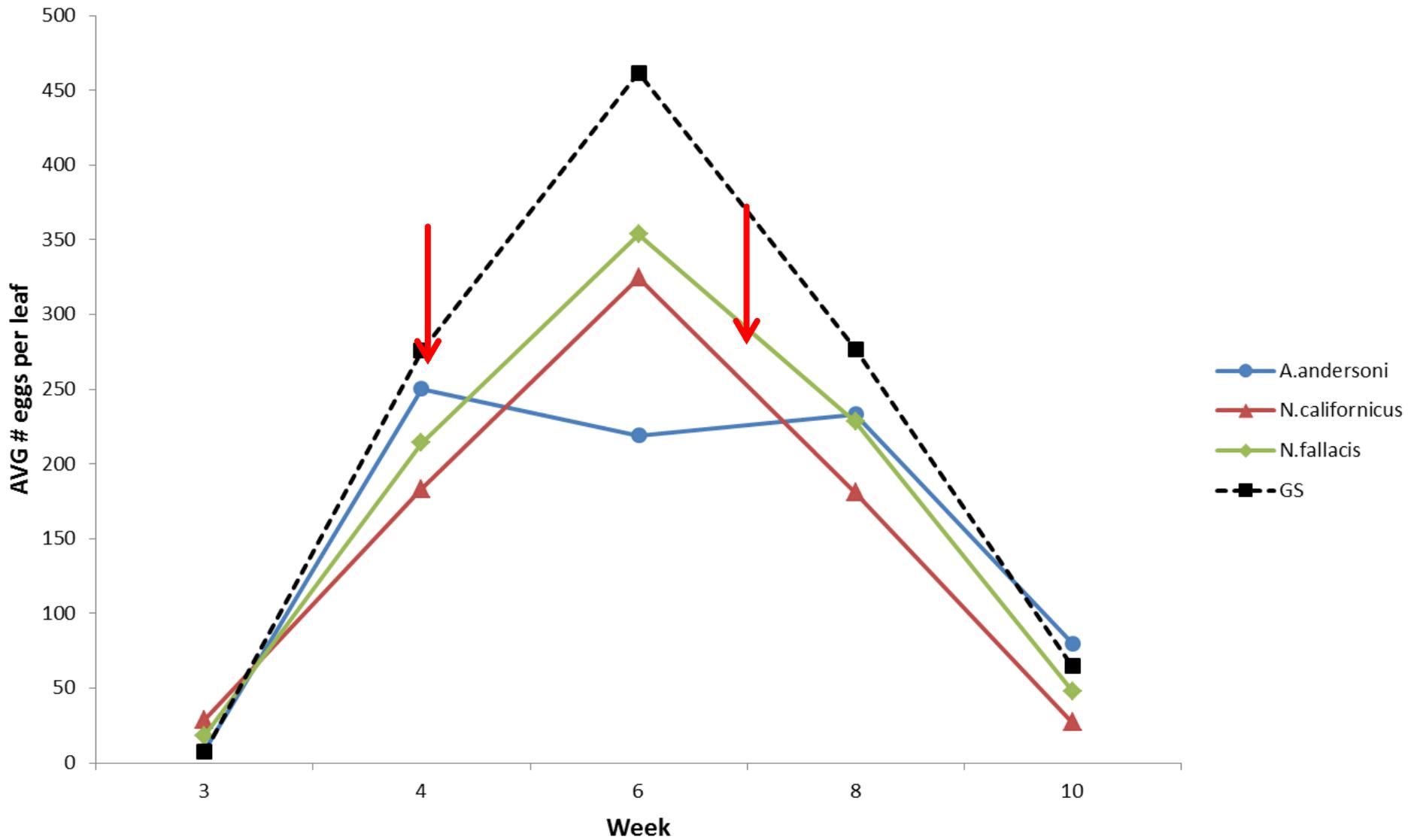
TSSM + Predators



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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- 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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