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
<table>
<thead>
<tr>
<th></th>
<th>Lewis</th>
<th>TSSM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spots</td>
<td>Multiple</td>
<td>One large spot on each side</td>
</tr>
<tr>
<td>Size</td>
<td>0.36mm</td>
<td>0.5mm</td>
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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...
Lewis ONLY

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*)
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: $p = 0.715$
No sig. difference between treatments
Repeated measures ANOVA: \( p = 0.926 \)
Graph showing the change in avg mite mobiles per leaf over weeks for N. californicus + Lewis mite + TSSM.
No sig. difference between treatments
Repeated measures ANOVA: $p = 0.972$
P. persimilis

N. fallacis

A. andersoni

N. californicus

TSSM ONLY
Lewis **ONLY**

![Image of mites](image)

- **P. persimilis**
- **N. fallacis**
- **A. andersoni**
- **N. californicus**
- 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

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