WELCOME TO
CONTROLLING MITES

GrowerTalks' GREENHOUSE EXPERIENCE 2007
Mites are the **KEY** pest in many systems.
In the United States, 34% of all pesticides applied to ornamentals were for mite control (1996).
Tenuipalpidae
Brevipalpus spp.
CHEMICAL CONTROL

Avid
ProMITE
Sanmite
Sulfur
Tarsonemidae
Broad Mite and Cyclamen Mite
Polyphagotarsonemus latus (Banks), Acari: Tarsonemidae

Photos: Dr. Jovicich

Egg  Motile Nymph ► Quiescent Nymph ► Adult

100 μm
How do broad mites get into the greenhouse?

- **Insects**
- **Air currents**
- **Crawling and contact**
- **Infested transplants**

Photos: Dr. Jovicich
Polyphagotarsonemus latus
Polyphagotarsonemus latus
CHEMICAL CONTROL

Akari
Avid
Pylon
Sanmite
Thiodan
Neoseiulus californicus McGregor (Acari: Phytoseiidae), a predatory mite

- Used for control of two-spotted spider mite (*Tetranychus urticae*)
- Can develop at high temperatures (33 ºC) and low humidity (60% RH)
- Can starve for a long time
- Can survive on pollen, mold, and nectar

- Bindweed (*Convolvulus arvensis*) leaflets (Castagnoli and Falchini, 1993)
- Lime (*Citrus aurantifolia*) seedlings (Peña and Osborne, 1996)

Effective density release ratios < 15:1

Photos: Dr. Jovicich
Banker System
(without a plant)

Amblyseius swirskii
“Food mites“ for predatory mites in the sachet.
Steneotarsonemus furcatus
Steneotarsonemus furcatus
Steneotarsonemus furcatus
CHEMICAL CONTROL

Avid
Pylon
Thiodan
Eriophyoidea
Purple Tea Mite
Purple Tea Mite
Purple Tea Mite
CHEMICAL CONTROL

Adept
Akari
Avid
Pylon
Tetranychidae
Bamboo Mite
Bamboo Mite
Lewis Mite
Eotetranychus lewisi

A known pest since 1950
CHEMICAL CONTROL

Akari
Avid
Floramite
Akari
TUMID MITE

*T. gloveri* = red eggs
*T. tumidus* = white & red eggs
TUMID MITE
GLOVER MITE
Twospotted Spider Mite
Twospotted Spider Mite
CHEMICAL CONTROL for Spider Mites
100% Reliance on Pesticides = RESISTANCE
<table>
<thead>
<tr>
<th>MANAGEMENT OPTION</th>
<th>LOW</th>
<th>MEDIUM</th>
<th>HIGH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pesticide Rotation</td>
<td>&gt; 2 Modes</td>
<td>2 Modes</td>
<td>1 Mode</td>
</tr>
<tr>
<td>Use of Same Mode of Action</td>
<td>Once</td>
<td>More than once</td>
<td>Many times</td>
</tr>
<tr>
<td>Infestation Level</td>
<td>Low</td>
<td>Medium</td>
<td>High</td>
</tr>
<tr>
<td>Control in Last 3 Cycles</td>
<td>Good</td>
<td>Declining</td>
<td>Poor</td>
</tr>
<tr>
<td>IPM System</td>
<td>All Tactics</td>
<td>Pesticide and limited others</td>
<td>Pesticide only</td>
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NEW MATERIALS STEWARDSHIP
PLAN

Identify All Pesticides Registered for the Pest and Crop
Determine Plant Safety
Determine Labeled Frequency
Determine Other Use Restrictions
Organize Treatments…
Don’t Forget Other Pests!
ORDER OF ROTATION

HEAVY POPULATION

1) CONTACT ONLY

2) 7 DAY RESIDUAL

3) GREATER THAN 21
<table>
<thead>
<tr>
<th>TRADE NAME</th>
<th>CLASSIFICATION</th>
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<tbody>
<tr>
<td>Akari</td>
<td>21</td>
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<tr>
<td>Avid</td>
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<tr>
<td>Conserve</td>
<td>5</td>
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<tr>
<td>Endosulfan</td>
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<td>Floramite</td>
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<tr>
<td>GC-Mite</td>
<td>M</td>
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<tr>
<td>Hexacide</td>
<td>M</td>
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<tr>
<td>Hexygon</td>
<td>10a</td>
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<td>Judo</td>
<td>23</td>
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# MITICIDES

<table>
<thead>
<tr>
<th>TRADE NAME</th>
<th>CLASSIFICATION</th>
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<tbody>
<tr>
<td>Oils, Soaps</td>
<td>M</td>
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<tr>
<td>Ovation</td>
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<tr>
<td>ProMITE</td>
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<tr>
<td>Pylon</td>
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<td>Pyrethroids</td>
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<td>Sanmite</td>
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<td>Shuttle</td>
<td>20</td>
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<tr>
<td>TetraSan</td>
<td>10b</td>
</tr>
<tr>
<td>Ultiflora</td>
<td>6</td>
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</table>
PHYTOTOXICITY

PESTICIDES CAN DAMAGE PLANTS
PHYTOTOXICITY
Biological Control
Predatory Mites

Combinations
Mite control with *Phytoseiulus persimilis* did not become economical for ornamental producers until their use in a large cropping system.
Phytoseiulus persimilis
N. californicus
N. californicus
N. californicus
N. californicus
N. californicus
N. californicus
N. californicus
QUALITY CONTROL
AVAILABILITY
Modified Banker Plants
Modified Banker Plants

- Uses alternate hosts
- Uses confined hosts
- Potential to sell entire system
- May be specific to region
Modified Banker Plants

- Used to evaluate quality
- Used to establish natural enemies
- Used to augment natural enemies
- Used to increase numbers
Mite Banker Plants

- Sorghum or corn is grown to produce the Banks grass mite.
Oligonychus pratensis