Controlling San Jose Scale on Apple With Early Season Insect Growth Regulator Applications

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Can we achieve season long control of SJS with early season applications?

Potential problems:

- 3 generations of SJS in NY
- Infests both tree bark and fruit
- Populations in research orchard are very high (UTC - 78% fruit damage @ harvest 2013)
- Potential of infestation from untreated areas in research orchard
  - Every other row left unsprayed as border trees/insect refuge
Trial Design

- Applications made with air-blast equipment @ 100 gpa
- High gallon/A for bare trees to ensure coverage
- Replicated 3x in RCB design
- Treatments did not receive any other insecticide applications
- Applications were made at either ‘delayed dormant’ or ‘pink’ against overwintering ‘black cap’ stage
- Assessments made before and after applications and throughout the growing season
- 1st year wood examined under scope before apps to determine overwintering population survival
- Several wood samples taken after apps to determine efficacy
- Fruit damage assessments were made after the 1st and 2nd summer generations had emerged, as well as at fruit harvest
Treatments

- **Esteem 0.86 EC**
  - Applied at ‘pink’ (13 May)
  - 16.0 oz/A
  - Active ingredient – Pyriproxyfen

- **Centaur WDG**
  - Applied at ‘delayed dormant’ (24 Apr) and ‘pink’ (13 May)
  - Both treatments 34.5 oz/A
  - Active ingredient – Buprofezin

- Untreated Check
1st Yr Wood Pre-Application % SJS Overwintering Survival  24 Apr

<table>
<thead>
<tr>
<th>Type</th>
<th>% Survival</th>
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<tbody>
<tr>
<td>UTC</td>
<td>36.7a</td>
</tr>
<tr>
<td>Centaur pink</td>
<td>33.3a</td>
</tr>
<tr>
<td>Centaur DD</td>
<td>39.3a</td>
</tr>
<tr>
<td>Esteem pink</td>
<td>44.0a</td>
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</tbody>
</table>
1st Yr Wood Post application % SJS Survival  21 May

- UTC: 14.7a
- Centaur pink: 4.7b
- Centaur DD: 8.7ab
- Esteem pink: 8.0ab
1st Yr Wood Post Application % SJS Survival  29 May

UTC: 9.0a
Centaur pink: 3.3a
Centaur DD: 3.0a
Esteem pink: 6.0a
1st Yr Wood Post Application % SJS Survival  4 Jun

- UTC: 16.7a
- Centaur pink: 7.3a
- Centaur DD: 6.3a
- Esteem pink: 8.3a
1st Generation % SJS Fruit Damage  27 Jun

UTC: 10.0a
Centaur pink: 1.1b
Centaur DD: 0.0b
Esteem pink: 0.0b
2nd Generation % SJS Fruit Damage   29 Jul

- UTC: 34.6a
- Centaur pink: 8.0b
- Centaur DD: 3.9b
- Esteem pink: 5.0b
% SJS Fruit Damage at Harvest 10 Sep

UTC: 60.7a
Centaur pink: 7.0b
Centaur DD: 4.3b
Esteem pink: 4.0b
Can we achieve season long control of SJS with early season applications?

- Given the pressure in the research orchard – Yes.
- Both Centaur timings (DD and pink) and the Esteem (pink) controlled SJS at acceptable levels throughout the growing season.
- However, very few differences among 1st yr wood samples.
- All treatments were significantly better in controlling SJS for each date of fruit samples compared to the UTC.
- No statistical differences among insecticide treatments in fruit samples.
One Step Further?

- Fall IGR applications
  - Against pre-overwintered ‘black caps’
  - Pre-application samples – fall
  - Post application samples – spring
  - Fruit evaluations – summer and harvest

Applications were applied 14 Oct

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Rate</th>
<th>% Fruit Damage at Application</th>
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<tbody>
<tr>
<td>Esteem 35WP</td>
<td>5.0 oz/A</td>
<td>39.0a</td>
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<tr>
<td>Centaur</td>
<td>34.5 oz/A</td>
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<tr>
<td>UTC</td>
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<td>51.0a</td>
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Thanks

- Nichino America
- Valent
- Steve Gordner and Forrest Loeb - summer assistants