Control of codling moth by postharvest application of Ethephon 2SL and insecticide

Chuck Ingels, UCCE Sacramento County
Bob Van Steenwyk, UC Berkeley
Rachel Elkins, UCCE Lake/Mendocino Counties
Lucia Varela, UCCE North Coast

Funding:
UC IPM Program, PPMRF
Previous Research
(R. Van Steenwyk et al.)

- Bartlett harvest July thru mid Aug.
- Substantial fruit remains in trees after harvest
- CM larvae that complete development:
  - End of July: enter pupal stage → adults
  - End of August: enter overwintering stage
- Postharvest fruit removal reduced overwintering CM 75%
- Larvae that infest ripe pears do not complete development (6.5 kg/cm²)
Applications of Ethephon 2SL
Sacramento and North Coast

10-20 acres each:

   (2008) Replaced Lorsban – other insecticides

2. Untreated

<table>
<thead>
<tr>
<th>Year</th>
<th>Location (Number)</th>
<th>Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>Sacto (4)</td>
<td>Aug. 4-9</td>
</tr>
<tr>
<td></td>
<td>NC (1)</td>
<td>Aug. 14</td>
</tr>
<tr>
<td>2008</td>
<td>Sacto (5)</td>
<td>Aug. 12-15</td>
</tr>
<tr>
<td></td>
<td>NC (5)</td>
<td>Aug. 22-Sept. 5</td>
</tr>
</tbody>
</table>
Measurements

- Measured fruit firmness weekly after spray
  - 25 normal fruit and 10 rat tail fruit
- Monitored trap counts in spring (1st gen.)
  - 5 bait pan traps, 1 in center of block
  - 1 pheromone trap (10X), in center
- Measured yield and fruit size
Fruit Pressures – 2007
Mendocino, 2 wks. after Aug. 14 spray

![Graph showing fruit pressures comparison with two categories: Normal and Rattail. The x-axis represents the categories, and the y-axis represents pressure in kg/cm². The untreated group is shown in blue, and the Ethephon treated group is shown in pink. The graph indicates a significant difference in pressures between the two categories.](https://example.com/graph.png)
Fruit Pressures – 2008
Sacramento, 1 wk. after Aug. 12-15 spray

Pressure (kg/cm²)

- Untreated
- Ethephon

Normal
Rattail

Pressure values:
- Normal: Untreated (a), Ethephon (a)
- Rattail: Untreated (a), Ethephon (a)
Fruit Pressures – 2008
Sacramento, 2 wks. after Aug. 12-15 spray

Pressure (kg/cm²)

- Normal
  - Untreated: a
  - Ethephon: b

- Rattail
  - Untreated: a
  - Ethephon: b

Legend:
- Untreated
- Ethephon
Fruit Pressures – 2008
Sacramento, 3 wk. after Aug. 12-15 spray

Pressure (kg/cm²)

Normal  Rattail

Untreated

Ethephon
Fruit Pressures – 2008
Lake/Mendo, 1-2 wks. after 8/22 - 9/5 spray

Pressure (kg/cm²)

<table>
<thead>
<tr>
<th>Normal</th>
<th>Rattail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Untreated</td>
<td></td>
</tr>
<tr>
<td>Ethephon</td>
<td></td>
</tr>
</tbody>
</table>

Legend:
- Untreated
- Ethephon

The graph shows the fruit pressures for Normal and Rattail varieties, with different treatments indicated by 'a'.
Bait Pan Trapping
Trap Catches – 1st Generation (Sacto.)
% Reduction with Ethephon

10X Pher.  Bait Pan  Total  Bait Pan  Center

55%  25%  38%
Trap Catches – 1st Generation (Mendo.) % Reduction with Ethephon

Number of Moths

10X Pher. Bait Pan Total Bait Pan Center

Untreated Ethephon
Conclusions to Date

- Typical decline of fruit pressure to 6.5 kg/cm² after treatment:
  - Normal fruit: 1-2 weeks
  - Rattail fruit: 2-3 weeks
- **Yield** (avg. # trees to fill one bin)
  - No differences
- **Fruit size** (weight of 400 fruit/block)
  - No differences