Suppression of Western Flower Thrips by Overhead Sprinkler Irrigation in Romaine Lettuce

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Western Flower Thrips in Romaine Lettuce

- No reliable sampling plan
- Lack of quantitative data on damage description
- Control is reliant on a few AI:
  - Lannate + pyrethroid
  - Success
- Resistance is a concern
- Lack of viable alternatives for organic romaine production
Biopesticides

- azadirachtin
- neem oil
- pyrethrum
- garlic extract
- Hot pepper wax
- Safer Soap
- Sulfur
Overhead Sprinkler Irrigation

- Dislodge thrips from plants
- Repel adults
- Drown immatures on plant
- Suffocate pupae in soil
Objectives

• Determine the influence of sprinkler duration, volume and frequency on thrips populations.

• Evaluate the use of insecticide spray regimes used in combination with sprinklers for suppressing thrips.
Overhead Sprinkler Treatments

Duration/Volume
- 2 hrs (0.3 cm)
- 4 hrs (0.7 cm)
- 8 hrs (1.2 cm)

Frequency
- Weekly - 9 hrs
- 2X weekly - 4.5 hrs
- 3X weekly - 3 hrs
Measurement of Thrips Abundance
Sprinkler Duration / Volume

- **Fall 2000**:
  - None: 30 units
  - 2 hr (0.3 cm): 20 units
  - 4 hr (0.7 cm): 20 units
  - 8 hr (1.2 cm): 10 units
  - Insecticide treated: 0 units
  - 45% reduction

- **Spring 2001**:
  - None: 14 units
  - 2 hr (0.3 cm): 9 units
  - 4 hr (0.7 cm): 9 units
  - 8 hr (1.2 cm): 6 units
  - Insecticide treated: 3 units
  - 40% reduction

- **Data**:
  - Fall 2000: 78% reduction
  - Spring 2001: 75% reduction

- **Sprinkler Duration**:
  - None: 0 units
  - 2 hr (0.3 cm): 2 units
  - 4 hr (0.7 cm): 2 units
  - 8 hr (1.2 cm): 1 unit
  - Insecticide treated: 0 units

- **Volume**:
  - None: 400 units
  - 2 hr (0.3 cm): 300 units
  - 4 hr (0.7 cm): 300 units
  - 8 hr (1.2 cm): 150 units
  - Insecticide treated: 0 units

- **Units**:
  - None: 15 units
  - 2 hr (0.3 cm): 10 units
  - 4 hr (0.7 cm): 10 units
  - 8 hr (1.2 cm): 5 units
  - Insecticide treated: 0 units
Romaine Harvest
Spring 2001

Trimmed Wt (g)

None  2 hrs  4 hrs  8 hrs  Sprayed

100  150  200  250  300  350  400

b  b  b  b  a

Romaine Harvest
Overhead Sprinkler Treatments

**Duration/Volume**
- 2 hrs (0.3 cm)
- 4 hrs (0.7 cm)
- 8 hrs (1.2 cm)

**Frequency**
- Weekly @ 9 hrs
- 2X weekly @ 4.5 hrs
- 3X weekly @ 3 hrs

@ 1.4 - 1.8 cm / week
Romaine Harvest
Spring 2002

Trimmed Wt (g)

Spray Frequency

None  3X   2X   1X   Sprayed

100  250  300  350  400  450  500

Spray Frequency
Interaction of Sprinkler and Insecticides for Thrips Suppression in Romaine

Alternated Sprays and Sprinkler Irrigation Runs at 5-6 d intervals

**Fall 2001 Trial**

<table>
<thead>
<tr>
<th>Rep I</th>
<th>Rep II</th>
<th>Rep III</th>
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<tbody>
<tr>
<td>Conventional</td>
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</table>
Interaction of Sprinkler and Insecticides for Thrips Suppression in Romaine

Seasonal Avg. Thrips / Plant

- Conventional
- Reduced-risk
- Organic
- Untreated

Fall 2001

- Sprinkler
- Furrow

* indicates statistical significance.
Interaction of Sprinkler and Insecticides for Thrips Suppression in Romaine

Seasonal Avg. Trimmed Wt (g)
Interaction of Sprinkler and Insecticides for Thrips Suppression in Romaine

**Spring 2002 Trial**

<table>
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<tr>
<th>Spray</th>
<th>Irrigation</th>
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<tr>
<td>Conventional</td>
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<td><em>Lannate ~ Succes</em> rotation</td>
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Arizona Crop Information Site
www.ag.arizona.edu/crops