INSECTICIDE TRIAL FOR ONION THRIP CONTROL IN DRY BULB ONIONS

AND

ONION THRIP SURVEY AND RESISTANCE

Lynn Jensen,

Malheur County Extension Agent
Ontario, Oregon

1986
INSECTICIDE TRIALS FOR ONION THRIp CONTROL
IN DRY BULB ONIONS

Lynn Jensen,
Malheur Extension Agent, Ontario, Oregon 97914

I. PURPOSE

A combination of parathion and toxaphene has been the standard insecticide for onion thrip control in the Treasure Valley for a number of years. With the decision of the EPA to rescind Toxaphene registration, it became necessary to find other insecticides that would be effective. Some organo-phosphate materials were identified as being effective, but were ineffective in parts of Treasure Valley in 1985 and throughout most of the valley in 1986. Some growers sprayed 5 or 6 times without getting good thrip control. Also, increased onion acreage near alfalfa seed fields necessitated finding insecticides effective on onion thrip, yet relatively safe when used near fields where leafcutter bees are working.

II. PROCEDURES

Two sites were used for the evaluation, one at the Malheur Experiment Station at Ontario and the other on the Dwayne Bennett farm near Adrian, Oregon. The plots were treated according to standard cultural practices for the area with regards to planting, fertilization, onion maggot control, irrigation and cultivation.

Plots at the Experiment Station were 4 single rows wide by 30 feet in length and those at Adrian were 4 double rows wide by 30 feet long. The insecticides were applied with a CO₂ type plot sprayer equipped with a five foot boom, LF3 nozzles apply 25 G.P.A. at 30 p.s.i. L1-700, a penetrating surfactant was applied at a rate of 2 pints per 100 gallons of water plus the water was buffered appropriately.

The thrip counts at both sites averaged 25 thrip per plant at the time of spraying. All spraying was done in the morning although 1985 spraying trials did not show any difference in control between morning and evening applications. There were both adults and nymphs present at both sites at the time the materials were applied.

Thrip counts at the Experiment Station were made on July 14 and 22 and on July 22 at the Adrian site. The treatments were made on July 11 at the Experiment Station with the second application of the double treatments on July 18. The Adrian site was also sprayed on July 18.

III. RESULTS

All thrip control was lower than expected for 1986 except the double treatments 7 days apart (see Table 2). These were the
only treatments that gave satisfactory thrip control. This would indicate that probably the best method of control will be to spray two times about 7 days apart. It is possible that we are missing those thrip that are pupating in the soil on a one application schedule, where a second application 7 days after the first will control many of these emerging adults, lessening the need for insecticide applications later in the season. The adults that emerge from the soil are ready to begin a new cycle, so controlling them will delay the cycle build up. The organo-phosphate insecticides generally performed about as well as the synthetic pyrethroids (Table 6) at the 3 day counts, but did not give any residual control whereas the synthetic pyrethroid materials continued to give as good or better control at the end of 10 days as they did at 3 days.

One of the problems which was evident from past years and which continued to manifest itself is the variability of control with the organo-phosphate insecticides. Neither Pennacap M, methyl parathion nor Guthion did well at either site, but Lorsban and ethyl parathion showed good control at Adrian and poor control at the Experiment Station (Table 5). This may explain why growers in one area can have good control with one particular insecticide while his neighbor a few miles away is not getting any results. Growers experiencing problems may in some cases increase their thrip control by switching to an ethyl parathion formulation. The synthetic-pyrethroid insecticides appear to be much more consistent in their control throughout the different areas of the valley (see Table 4).

This year has given us enough use information to apply for a section 18 registration on Ammo (cypermethrin). Hopefully, that request will be granted in time to help control the thrip.

IV. CONCLUSIONS

1. The ethyl parathion formulation may be more effective than other parathion formulations in some areas of the Treasure Valley.

2. The synthetic pyrethroid insecticides give much longer residual control of onion thrip.

3. Two spray applications 7 days apart appear to give the best control.

4. Two applications of Baythroid (we would expect Ammo to give similar control since it did as well or better in other tests) gave significantly better control than two applications of Pennacap M + methyl parathion.

5. A Section 18 request (emergency registration) has been applied for with Ammo. If granted, growers will be notified immediately.


<table>
<thead>
<tr>
<th>Treatment</th>
<th>Rate lbs. a.i./A</th>
<th>Ave. Number thrips/plant</th>
<th>% Control</th>
<th>Thrip Populations Log10 1,2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammon 2.5 E.C.</td>
<td>0.06</td>
<td>7.1</td>
<td>75.1</td>
<td>.81 a</td>
</tr>
<tr>
<td>Baythroid 2 E.C. + Vydate L (2)</td>
<td>0.05</td>
<td>7.4</td>
<td>74.2</td>
<td>.82 a-b</td>
</tr>
<tr>
<td>Pounce 3.2 E.C.</td>
<td>0.15</td>
<td>7.5</td>
<td>73.8</td>
<td>.86 a-c</td>
</tr>
<tr>
<td>Spur + Vydate L (2)</td>
<td>0.15</td>
<td>8.2</td>
<td>71.1</td>
<td>.87 a-d</td>
</tr>
<tr>
<td>Ammon 2.5 E.C.</td>
<td>0.08</td>
<td>8.6</td>
<td>69.9</td>
<td>.93 a-e</td>
</tr>
<tr>
<td>Baythroid 2 E.C.</td>
<td>0.05</td>
<td>9.8</td>
<td>65.5</td>
<td>.94 a-e</td>
</tr>
<tr>
<td>Pounce 3.2 E.C.</td>
<td>0.2</td>
<td>9.7</td>
<td>66.1</td>
<td>.96 a-e</td>
</tr>
<tr>
<td>Penncap M + ethyl parathion 4 E.C.</td>
<td>0.5</td>
<td>9.7</td>
<td>66.0</td>
<td>.97 a-e</td>
</tr>
<tr>
<td>Penncap M + methyl parathion 5 E.C.</td>
<td>0.5</td>
<td>10.2</td>
<td>64.4</td>
<td>.99 a-e</td>
</tr>
<tr>
<td>Lorsban 4E</td>
<td>1.0</td>
<td>11.1</td>
<td>61.0</td>
<td>1.03 a-e</td>
</tr>
<tr>
<td>Baythroid 2 E.C.</td>
<td>0.025</td>
<td>11.7</td>
<td>59.1</td>
<td>1.06 b-e</td>
</tr>
<tr>
<td>Penncap M + Guthion 2S + Sulfur-flowable</td>
<td>0.5</td>
<td>12.3</td>
<td>57.1</td>
<td>1.07 c-e</td>
</tr>
<tr>
<td>Lorsban 4E + methyl parathion 5 E.C.</td>
<td>1.0</td>
<td>12.3</td>
<td>57.1</td>
<td>1.07 c-e</td>
</tr>
<tr>
<td>Penncap M + Guthion 2S</td>
<td>0.5</td>
<td>13.2</td>
<td>53.8</td>
<td>1.08 c-e</td>
</tr>
<tr>
<td>Penncap M + ethyl parathion 4 E.C.</td>
<td>0.5</td>
<td>13.9</td>
<td>51.4</td>
<td>1.11 d-e</td>
</tr>
<tr>
<td>Vydake L(2)</td>
<td>0.5</td>
<td>16.00</td>
<td>44.0</td>
<td>1.15 e</td>
</tr>
<tr>
<td>Control</td>
<td>-</td>
<td>28.6</td>
<td>-0-</td>
<td>1.44 f</td>
</tr>
</tbody>
</table>

**LSD**

.24

1. Ratings with the same letter are not significantly different at the 5% level using Fisher's LSD Test.

2. The thrip population index was calculated by taking the Log10 of the mean number of thrips per plant. Hartley's test for homogeneity of population variances was used to determine whether to transform the data to Log10. The extreme variations in population means made this type of analysis necessary to show true treatment differences.
Table 2.  
SUMMARY OF INSECTICIDE TREATMENTS ON ONION THRIPI  
(thrips tabaci Lindeman) CONTROL - 10 day counts.  
Malheur Experiment Station, Ontario, Oregon, 1986

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Rate lbs.a.i./A</th>
<th>Ave.Number thrips/plant</th>
<th>% Control</th>
<th>Thrip Population Log10</th>
<th>1,2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baythroid 2 E.C. (2 applications 7 days apart)</td>
<td>0.05</td>
<td>2.0</td>
<td>95.5</td>
<td>.25 a</td>
<td></td>
</tr>
<tr>
<td>Penncap M + methyl parathion 5 E.C. 0.5 (2 applications 7 days apart)</td>
<td>0.5</td>
<td>7.3</td>
<td>83.3</td>
<td>.77 b</td>
<td></td>
</tr>
<tr>
<td>Ammo 2.5 E.C. (2 applications 7 days apart)</td>
<td>0.08</td>
<td>11.3</td>
<td>72.1</td>
<td>1.02 c</td>
<td></td>
</tr>
<tr>
<td>Baythroid 2 E.C. + Vydate L(2)</td>
<td>0.05</td>
<td>10.9</td>
<td>72.8</td>
<td>1.03 c</td>
<td></td>
</tr>
<tr>
<td>Pounce 3.2 E.C.</td>
<td>0.02</td>
<td>11.9</td>
<td>70.6</td>
<td>1.06 c</td>
<td></td>
</tr>
<tr>
<td>Baythroid 2 E.C.</td>
<td>0.025</td>
<td>12.1</td>
<td>60.0</td>
<td>1.08 c-d</td>
<td></td>
</tr>
<tr>
<td>Baythroid 2 E.C.</td>
<td>0.05</td>
<td>12.7</td>
<td>68.7</td>
<td>1.08 c-d</td>
<td></td>
</tr>
<tr>
<td>Ammo 2.5 E.C.</td>
<td>0.06</td>
<td>13.8</td>
<td>65.9</td>
<td>1.12 c-e</td>
<td></td>
</tr>
<tr>
<td>Spur + Vydate L(2)</td>
<td>0.15</td>
<td>15.0</td>
<td>62.7</td>
<td>1.16 c-f</td>
<td></td>
</tr>
<tr>
<td>Pounce 3.2 E.C.</td>
<td>0.15</td>
<td>19.4</td>
<td>51.9</td>
<td>1.27 d-g</td>
<td></td>
</tr>
<tr>
<td>Lorsban 4 E</td>
<td>1.0</td>
<td>22.8</td>
<td>43.6</td>
<td>1.21 e-g</td>
<td></td>
</tr>
<tr>
<td>Penncap M + Guthion 2S</td>
<td>0.50</td>
<td>22.1</td>
<td>45.4</td>
<td>1.34 f-g</td>
<td></td>
</tr>
<tr>
<td>Sulfur</td>
<td>1.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lorsban 4 E methyl parathion 5 E.C. 0.5</td>
<td>1.0</td>
<td>24.8</td>
<td>38.8</td>
<td>1.37 g</td>
<td></td>
</tr>
<tr>
<td>Penncap M + Guthion 2S</td>
<td>0.5</td>
<td>24.6</td>
<td>39.1</td>
<td>1.38 g-h</td>
<td></td>
</tr>
<tr>
<td>Vydate L(2)</td>
<td>0.75</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Penncap M + methyl parathion 5 E.C. 0.5</td>
<td>0.5</td>
<td>29.7</td>
<td>26.5</td>
<td>1.45 g-h</td>
<td></td>
</tr>
<tr>
<td>Penncap M + ethyl parathion 4 E.C. 0.5</td>
<td>0.5</td>
<td>30.1</td>
<td>25.4</td>
<td>1.47 g-h</td>
<td></td>
</tr>
<tr>
<td>Penncap M + ethyl parathion crop oil</td>
<td>0.5</td>
<td>30.7</td>
<td>23.9</td>
<td>1.47 g-h</td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>-0-</td>
<td>40.4</td>
<td>-0-</td>
<td>1.58 h</td>
<td></td>
</tr>
</tbody>
</table>

LSD .20

1. Ratings with the same letter are not significantly different at the 5% level using Fisher's LSD Test.

2. The thrip population index was calculated by taking the Log10 of the mean number of thrips per plant. Hartley's test for homogeneity of population variances was used to determine whether to transform the data to Log10. The extreme variations in population means made this type of analysis necessary to show true treatment differences.
Table 3.  
SUMMARY OF INSECTICIDE TREATMENTS ON ONION THРИP (thrips tabaci Lindeman) CONTROL - 3 day counts
Dwayne Bennett Farm, Adrian, Oregon, 1986.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Rate lbs.ai./A</th>
<th>Ave. Number thrip/plant</th>
<th>% Control</th>
<th>Thrip Population Log$_{10}$ 1,2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lorsban 4E + methyl parathion 5 E.C.</td>
<td>1.0</td>
<td>1.6</td>
<td>89.9</td>
<td>1.47 a</td>
</tr>
<tr>
<td>Lorsban 4E</td>
<td>1.0</td>
<td>1.8</td>
<td>89.0</td>
<td>1.53 a-b</td>
</tr>
<tr>
<td>Penncap M + ethyl parathion 4 E.C.</td>
<td>0.5</td>
<td>2.8</td>
<td>82.7</td>
<td>1.54 a-b</td>
</tr>
<tr>
<td>Spur + Vdate L(2)</td>
<td>0.15</td>
<td>2.4</td>
<td>85.0</td>
<td>1.55 a-b</td>
</tr>
<tr>
<td>Pounce 3.2 E.C.</td>
<td>0.15</td>
<td>2.1</td>
<td>87.0</td>
<td>1.56 a-b</td>
</tr>
<tr>
<td>Pounce 3.2 E.C.</td>
<td>0.20</td>
<td>2.0</td>
<td>87.3</td>
<td>1.58 a-b</td>
</tr>
<tr>
<td>Ammo 2.5 E.C.</td>
<td>0.08</td>
<td>2.1</td>
<td>86.8</td>
<td>1.61 a-b</td>
</tr>
<tr>
<td>Baythroid 2 E.C.</td>
<td>0.05</td>
<td>3.4</td>
<td>78.8</td>
<td>1.80 a-c</td>
</tr>
<tr>
<td>Ammo 2.5 E.C.</td>
<td>0.06</td>
<td>4.2</td>
<td>74.2</td>
<td>1.89 b-c</td>
</tr>
<tr>
<td>Baythroid 2 E.C. + Vdate L(2)</td>
<td>0.05</td>
<td>4.6</td>
<td>71.3</td>
<td>1.91 b-c</td>
</tr>
<tr>
<td>Baythroid 2 E.C.</td>
<td>0.025</td>
<td>4.9</td>
<td>69.5</td>
<td>1.92 b-c</td>
</tr>
<tr>
<td>Vdate L(2)</td>
<td>0.5</td>
<td>5.0</td>
<td>69.2</td>
<td>1.93 b-c</td>
</tr>
<tr>
<td>Penncap M + methyl parathion 5 E.C.</td>
<td>0.5</td>
<td>7.6</td>
<td>53.2</td>
<td>2.06 c-d</td>
</tr>
<tr>
<td>Penncap M + Guthion</td>
<td>0.5</td>
<td>8.0</td>
<td>50.6</td>
<td>2.20 c-e</td>
</tr>
<tr>
<td>Penncap M + ethyl parathion 4 E.C.</td>
<td>0.5</td>
<td>12.9</td>
<td>21.9</td>
<td>2.40 d-e</td>
</tr>
<tr>
<td>crop oil</td>
<td>0.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>-0-</td>
<td>16.2</td>
<td>-0-</td>
<td>2.48 e</td>
</tr>
</tbody>
</table>

LSD .41

1. Ratings with the same letter are not significantly different at the 5% level using fisher’s LSD Test.

2. The thrip population index was calculated by taking the Log$_{10}$ of the mean number of thrip per plant. Hartley’s test for homogeneity of population variances was used to determine whether to transform the data to Log$_{10}$. The extreme variations in population means made this type of analysis necessary to share true treatment differences.
Table 4.
CONTROL OF ONION THRIp WITH SYNTHETIC PYRETHROID INSECTICIDES, 1986

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Rate</th>
<th>% Control</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lbs.a.i./A</td>
<td>MES - 3 day</td>
</tr>
<tr>
<td>Baythroid 2 E.C.</td>
<td>0.025</td>
<td>59.1</td>
</tr>
<tr>
<td>Baythroid 2 E.C.</td>
<td>0.05</td>
<td>65.5</td>
</tr>
<tr>
<td>Amno 2.5 E.C.</td>
<td>0.06</td>
<td>75.1</td>
</tr>
<tr>
<td>Amno 2.5 E.C.</td>
<td>0.08</td>
<td>69.9</td>
</tr>
<tr>
<td>Pounce 3.2 E.C.</td>
<td>0.15</td>
<td>73.8</td>
</tr>
<tr>
<td>Pounce 3.2 E.C.</td>
<td>0.20</td>
<td>66.1</td>
</tr>
</tbody>
</table>

Table 5.
COMPARISON OF ORGANO-PHOSPHATE INSECTICIDES FOR ONION THRIp
AT TWO DIFFERENT LOCATIONS - 1986

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Rate</th>
<th>% Control</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lbs.a.i./A</td>
<td>Adrian</td>
</tr>
<tr>
<td>Lorsban 4E + methyl parathion 5 E.C.</td>
<td>1.0</td>
<td>89.9</td>
</tr>
<tr>
<td>Lorsban 4E</td>
<td>1.0</td>
<td>89.0</td>
</tr>
<tr>
<td>Penncap M + ethyl parathion 4 E.C.</td>
<td>0.5</td>
<td>82.7</td>
</tr>
<tr>
<td>Penncap M + methyl parathion 5 E.C.</td>
<td>0.5</td>
<td>53.2</td>
</tr>
<tr>
<td>Penncap M + Guthion 2S</td>
<td>0.5</td>
<td>50.6</td>
</tr>
</tbody>
</table>

Table 6.
COMPARISON OF ORGANO-PHOSPHATE AND SYNTHETIC PYRETHROID
INSECTICIDE ON RESIDUAL THRIp CONTROL - MAlHEUR EXPERIMENT STATION - 1986

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Rate</th>
<th>% of Control</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lbs.a.i./A</td>
<td>3 days</td>
</tr>
<tr>
<td>Amno 2.5 E.C.</td>
<td>0.08</td>
<td>69.9</td>
</tr>
<tr>
<td>Baythroid 2.0 E.C.</td>
<td>0.05</td>
<td>65.5</td>
</tr>
<tr>
<td>Pounce 3.2 E.C.</td>
<td>0.2</td>
<td>66.1</td>
</tr>
<tr>
<td>Penncap M + methyl parathion 5 E.C.</td>
<td>0.5</td>
<td>64.4</td>
</tr>
<tr>
<td>Penncap M + Guthion 2S</td>
<td>0.5</td>
<td>53.8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Rate</th>
<th>% of Control</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lbs.a.i./A</td>
<td>10 days</td>
</tr>
<tr>
<td>Amno 2.5 E.C.</td>
<td>0.08</td>
<td>72.1</td>
</tr>
<tr>
<td>Baythroid 2.0 E.C.</td>
<td>0.05</td>
<td>68.7</td>
</tr>
<tr>
<td>Pounce 3.2 E.C.</td>
<td>0.2</td>
<td>70.6</td>
</tr>
<tr>
<td>Penncap M + methyl parathion 5 E.C.</td>
<td>0.5</td>
<td>26.5</td>
</tr>
<tr>
<td>Penncap M + Guthion 2S</td>
<td>0.5</td>
<td>39.1</td>
</tr>
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</table>