Control of Citrus Thrips by Avermectin

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ABSTRACT

Two rates of Avermectin were mound-applied; one treatment of Avermectin B, and one of Carzol were applied by air to citrus in April for control of citrus thrips. Plots were sampled by beating new terminal growth and counting thrips. Ground applications had fewer thrips than applications made by air. Avermectin B1 treatments had significantly fewer thrips than Carzol at all sample dates.

INTRODUCTION

Citrus thrips, Scirtothrips citri, damage developing citrus by feeding on the outside of the fruit, which results in fruit scarring. This scarring causes a reduction in price paid for the fruit due to cosmetic injury; however, fruit quality and yield are not affected. Citrus thrips in Yuma County have also become resistant to some insecticides. In 1988 this problem was compounded because dimethoate was prohibited from use on bearing citrus from March 15 to April 15 in Yuma County east of Avenue 58E; the concern was that this insecticide would be present in nectar and affect bees and honey. Most growers were using formetanate hydrochloride (Carzol) by air during this period to control citrus thrips, but control was disappointing. Several factors, such as resistance and poor canopy penetration, may have contributed to this failure.

This study was initiated to evaluate the insecticide avermectin, a natural product pesticide (macrocyclic lactone) produced and isolated from the soil microorganism Streptomyces avermitilis, for control of citrus thrips.

METHODS AND MATERIALS

Two rates of avermectin (0.00625 and 0.0125 # ai/Acre) plus oil were applied by ground on April 10, 1988; in addition, 1 rate of avermectin (0.0125) plus oil was applied by air on April 9. Carzol at 1.5 # ai/Acre applied by air on April 9 served as the check comparison block. Each treatment block of Lisbon lemons treated on the Yuma mesa was approximately 11 rows by 21 rows. Treatments were sampled on April 12th and 19th by beating new terminal growth over a 5" X 7-1/2" black wooden box covered with 1/4 inch mesh screening; thrips were counted. Twenty samples were taken per block (5 trees x 4 sides per tree). All life stages were counted and data analyzed.
RESULTS

Citrus receiving Avermectin B₁ treatments had significantly fewer thrips per terminal at all sample dates than the Carzol check had (Table 1). The best thrips control was the high (0.0125) rate of Avermectin applied by ground with 0.5 and 1.1 thrips per terminal on April 12 and 19, respectively. This rate by air had significantly more thrips (2.25) on April 12 but was no longer statistically significant on April 19. Treatments applied by ground equipment had less thrips than those applied by air although no significant differences existed between the two ground treatments. The Carzol check had approximately twice as many thrips per sample than the other air treatment at each sample date, and 8 times and 5 times as many thrips on each sample date than the Avermectin B₁ treatment by ground.

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Table 1. A count of thrips per terminal on citrus after treatments with Avermectin B₁ plus oil or with Carzol.

<table>
<thead>
<tr>
<th>Chemical</th>
<th>Rate (# ai/A)</th>
<th>Type of Application</th>
<th>April 12 Mean + Std. Dev.</th>
<th>April 19 Mean + Std. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avermectin B₁ + oil</td>
<td>0.00625</td>
<td>Ground</td>
<td>0.8 + 1.24</td>
<td>1.45 + 1.76</td>
</tr>
<tr>
<td>Avermectin B₁ + oil</td>
<td>0.0125</td>
<td>Ground</td>
<td>0.5 + 1.0</td>
<td>1.1 + 1.21</td>
</tr>
<tr>
<td>Avermectin B₁ + oil</td>
<td>0.0125</td>
<td>Air</td>
<td>2.25 + 2.9</td>
<td>2.3 + 2.05</td>
</tr>
<tr>
<td>Carzol</td>
<td>1.5</td>
<td>Air</td>
<td>4.15 + 3.1</td>
<td>5.3 + 2.41</td>
</tr>
</tbody>
</table>

* Means in same column followed by the same letter are not significantly different at the 0.05 level (Student-Newman-Keuls test).