EFFECT OF STREPTOMYCIN APPLICATION TIMING ON WALNUT DROP

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ABSTRACT:

Preliminary data suggests Streptomycin applications on English Walnuts can cause nut drop. However, Streptomycin can be used safely if applications are properly timed. Spray application of 200ppm Streptomycin at pre-bloom, full bloom and post-bloom with and without the adjuvant Kinetic caused almost complete nut removal. Single applications at full bloom or post-bloom also caused nut drop although not as severe as the three spray treatment. A single application at pre-bloom appeared to have no effect on nut drop.

INTRODUCTION:

Fixed coppers mixed with Manex are currently the most effective tool for suppressing walnut blight. Unfortunately, disease control strategies based upon one type of chemistry can result in resistance and subsequent reduction in treatment efficacy. The goal is to evaluate alternative products that could be incorporated into a walnut blight disease control program. One product that shows promise is Streptomycin. Strep has been a very effective walnut blight control material in test plots (Buchner, Olson and Lindow 1995). The problem is, Strep applied at 200ppm results in excessive nut drop. This experiment was implemented to discover if application timing has an effect on nut drop severity.

OBJECTIVE:

Evaluate the effect of streptomycin spray timing on nut drop. If a “safe” spray time can be identified, Strep may have a place in a spray program designed to manage walnut blight resistance.

PROCEDURE:

The experiment was conducted in Tehama County in 1996 on mature Ashley Walnuts. The plot consisted of half-tree treatments in a randomized compete block design, five treatments with two replicates. Treatments were applied by handgun to simulate a dilute application (400gpa). Treatments included: Strep applied at pre-bloom full bloom, and post-bloom, Strep plus Kinetic at the previous timing, Strep applied at pre-bloom, Strep applied at full bloom and Strep alone applied at post-bloom. Strep rate was 200ppm and the Kinetic rate was 8oz/100 gallons. Nut drop was evaluated using nut counts on selected branches within each treatment. Typically 3-7 locations were selected such that initial count was about 100 walnuts. Final counts were made 6/19/96. The non-replicated control tree differed in that 112 individual nuts were tagged and monitored for presence/absence. The control tree was adjacent to treated trees and thought to be representative of typical nut drop within the experiment. The control tree was not included in the statistical analysis.

RESULTS AND DISCUSSION:

All treatments (Table 1) applied at or following full bloom caused excessive nut drop. Single applications at full bloom or post-bloom had less nut drop compared to the triple spray treatments but were still unacceptable.
TABLE 1

Percent dropped walnuts resulting from Streptomycin Treatments applied during the spring of 1996.

| Treatment              | Rate                | Percent Drop
<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>STREP@Pre-B+Full-B+Post-B</td>
<td>STREP 200ppm</td>
<td>98.97 a³</td>
</tr>
<tr>
<td>STREP+Kin@Pre-B+Full-B+Post-B</td>
<td>STREP 200+kin 8oz/100g</td>
<td>98.52 a</td>
</tr>
<tr>
<td>STREP@Post-BL</td>
<td>STREP 200ppm</td>
<td>78.59 b</td>
</tr>
<tr>
<td>STREP@Full-BL</td>
<td>STREP 200ppm</td>
<td>73.40 b</td>
</tr>
<tr>
<td>STREP@Pre-BL</td>
<td>STREP 200ppm</td>
<td>38.12 c</td>
</tr>
<tr>
<td>Control</td>
<td></td>
<td>35.71 4</td>
</tr>
</tbody>
</table>

1 Pre-B indicates pre-bloom application on 4/2/96. Full-B indicates full bloom application on 4/8/96 and Post-B indicates post-bloom application on 4/15/96. All Strep rates were 200ppm.

2 Percent drop represents the number of nuts gone from all causes as of 6/19/96 from selected branches.

3 Duncan's multiple range test for treatment means at the 1% level. Untreated drop was measured on an adjacent tree and not replicated.

4 The control is a reference index only and is not included in the statistical analysis due to lack of replication.

The spray adjuvant Kinetic had no apparent effect as nut drop was severe whether or not it was in the mix. Most of the nut drop occurred during early May when nut size was 1/2 - 3/4 inch diameter.

The single strep (200ppm) application at pre-bloom shows promise. Nut drop for the pre-bloom spray was similar to the untreated control tree. Although additional work is necessary for verification, these preliminary results suggest Strep at a relatively high rate can be safely used on walnut trees if applied pre-bloom. It is possible that a lower rate of strep (100ppm) could be applied as the first pre-bloom spray in a walnut blight disease control program followed by conventional copper products.

Also encouraging is that repeated applications of lower rates of strep (100ppm) have resulted in excellent walnut blight control with no apparent nut drop (Buchner, Olson and Lindow 1995). These results need to be investigated further. However, it is possible that strep at 100ppm could be applied as the first pre-bloom spray in a walnut blight disease control program followed by conventional copper products with or without Manex. If proven safe, a second strep spray could be included following a copper application as a strategy to manage copper tolerant walnut blight bacteria.

REFERENCES