ORNAMENTAL CHERRY: *Prunus x ‘SNOFOZAM’*

Use of unmanned aerial vehicles to apply insecticides to control white prunicola scale, 2023

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Cherry (all varieties) | *Prunus* spp.

White Prunicola Scale: *Pseudaulacaspis prunicola*

The ornamental cherry trees used in our experiment were field-grown, 5–6 m tall and 2 m wide. The soil was clay loam with a pH between 6.0 and 6.5. These trees were naturally infested and sustained a high population of *Pseudaulacaspis prunicola* scale. Buffer trees were used between treatments. Treatments were assigned to individual trees under an RCB design with 7 replicates. The treatments for our experiment were drone applications of 2 insecticides, Mainspring GNL and Talus 70DF, and an untreated control. Treatment applications were made on 22 May 2023 using a DJI 30 Drone, manufactured by DJI (https://www.dji.com) with 1 gallon/3.785 L applied per tree.

A pre-treatment evaluation conducted on 15 May 2023 by sampling a 15 cm section of 6 interior branches confirmed that a viable scale population was present. Before treatments, 4 ordinal branches per tree were tagged and had live scales on the basal portion but none on the ends. Treatment effects were evaluated on 10 July 2023. The 4 ordinal branches, previously flagged sections of each branch on each tree, identified as clean on the pre-treatment evaluation, were again checked visually for new scale crawlers. A Unitron ZoomHD dissecting microscope with a liquid crystal screen was used to determine the presence of live scales on collected samples. The scale numbers from individual branch sections were used to calculate the average number of live scales per tree for each treatment. Total crawlers from each section were totaled for a tree and then each treatment averaged across the seven trees. Analysis was made using a generalized linear model with a Poisson error distribution. Pairwise means comparisons were conducted using Tukey’s honestly significant difference (HSD).

Results showed that Mainspring GNL & Talus 70DF (check) treated trees showed significantly higher scale mortality rates than untreated control trees ($P < 0.001$; Table 1) but were not significantly different from one another. This project shows that translaminar neonicotinoid alternatives can be effective at controlling WPS populations.

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### Table 1.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Chemical</th>
<th>Rate/Liter</th>
<th>Average live scales per tree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Untreated</td>
<td>Water</td>
<td>n/a</td>
<td>299.6a</td>
</tr>
<tr>
<td>Talus 70DF (check)</td>
<td>Buprofezin</td>
<td>1.05 g/L</td>
<td>2.5b</td>
</tr>
<tr>
<td>Mainspring GNL</td>
<td>Cyantraniliprole</td>
<td>1.25 mL/L</td>
<td>1.5b</td>
</tr>
</tbody>
</table>

$P > F$

Means within columns followed by a common letter are not significantly different ($P < 0.001$, Tukey HSD).