EFFICACY OF OPTIGARD® FLEX, TERMIDOR® SC, AND I MAXXPRO® 2F AGAINST SELECTED NUISANCE ANTS WHEN APPLIED AS PERIMETER TREATMENTS, 2008

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Odorous house ant (ODHA): *Tapinoma sessile* (Say)  
Pavement ant: (PA): *Tetramorium caespitum* (L.)  
Thief or Grease ant (TA): *Solenopsis molesta* (Say)

The objective of the study was to evaluate the biological activity of Optigard® Flex (thiamethoxam, 0.10% AI), Termidor® SC (fipronil, 0.06 % AI), and I MaxxPro® 2F (imidacloprid, 0.10% AI) as perimeter sprays against nuisance (ODHA, PA, and TA) ants around urban structures. Initially, ant traps were placed around homes to monitor the presence of PA, ODHA, or TA. A total of 16 homes were selected in Lincoln, NE with measurable numbers of worker PA, ODHA, or TA around the exterior foundation wall. The experimental design was a completely randomized design (CRD) with four homes for each insecticide treatment and four homes assigned as untreated checks. The untreated structures were used to assure that nuisance ants were still actively foraging in response to climate flux over the duration of the study. Pretreatment ant populations were assessed 1 day prior to treatments and used as baseline data for calculating the percent reduction following insecticide treatments. The insecticides used in this study, their concentrations, dilution rates, and application rates are specified in Table 1.

All insecticides were applied according to label directions. Optigard Flex and I MaxxPro 2F treatments were applied to the perimeter exterior using a 1 gal. B&G Compressed Air Sprayer (Jackson, GA). Optigard Flex and I MaxxPro 2F treatments were applied as band sprays approximately 1.5 feet out and 1.5 feet above the base of the structural foundation. Optigard Flex and I MaxxPro 2F treatments were also applied as spot sprays to areas where ants could enter a structure (i.e. cracks, plumbing and wiring entry points, around doors and windows) as well as to any ornamental landscaping around the structure that would harbor honeydew producing insects. Termidor SC treatments were applied to the structural foundation using a 1 gal. B&G Compressed Air Sprayer (Jackson, GA) as a band spray approximately one foot up and one foot out from the base of the foundation. In addition, all ant entry points into the structure (i.e. doorways, windows, etc.) were treated per label directions. All treatments were applied on the 21st July, 2008 in the morning/early afternoon. Ambient temperatures ranged from 76.8 to 86.3°F, soil temperatures were 80.4 to 90.2°F, relative humidity ranged from 62.7 to 79.6%, and wind speeds fluctuated between 4.1 and 7.9 mph. Soil moisture was variable between structures. Nuisance ant...
populations were monitored using traps made of cylindrical, plastic culture tubes (17 × 100 mm) (VWR, Chicago, IL) with 4 entrance holes on each side. Peanut butter was used as bait within each ant trap. Ants were monitored using traps at 0, 3, 10, 20, 30, and 60 days after treatment (DAT). For each collection interval, 8 traps were placed around perimeter of structure between 5:00 and 7:00 P.M. and then were collected the next morning between 8:00 and 10:00 A.M. Traps were stored individually in Ziploc® bags until the foraging number of each nuisance ant species was determined. Percent reduction in foraging ant populations were calculated using pre- and post-treatment nuisance ant populations with the equation: 

\[
\frac{(T0 - T1)}{T0} \times 100 = \%\text{ Reduction of nuisance ant population}
\]

where, T0 = Pretreatment nuisance ant population and T1 = Post treatment nuisance ant population. Mean % reduction in ant population for each treatment at each collection interval was analyzed by ANOVA with statistical significance tested by student’s t-test (P < 0.05).

The mean % reductions in nuisance ant population for each treatment are listed in Table 2. All three insecticides provided control of nuisance ant populations in comparison to untreated populations with overall nuisance ant population % reductions ranging from 16.2 to 87.6 % when compared to 6.32 % in untreated structures. Significant differences were observed between the Termidor SC and the Optigard Flex, I MaxxPro 2F, and untreated treatments at 3, 10, 20, 30, and 60 DAT collection intervals (all p < 0.001) (Table 2). Mean nuisance ant population % reductions were not significantly different when comparing Optigard Flex and I MaxxPro 2F treatments over all time intervals (all p > 0.1368). When comparing reduction in nuisance ant populations from Optigard Flex treated versus untreated structures, Optigard Flex significantly reduced nuisance ant populations at 10 DAT (p < 0.0017), and showed higher % reduction at 3, 20, 30, and 60 DAT although the differences were not significantly different (Table 2). When comparing % reduction in nuisance ant populations from I MaxxPro 2F treated versus untreated structures, I MaxxPro 2F was not significantly different than the untreated checks at any of the collection intervals. I MaxxPro 2F showed increased efficacy at both the 10 and 20 DAT collection intervals (p > 0.0807 at 10 DAT, p > 0.2005 at 20 DAT); however, it also averaged less % reduction in nuisance ants than the untreated treatment at both the 3 and 30 DAT collection intervals (Table 2).

<table>
<thead>
<tr>
<th>Insecticide</th>
<th>Concentration (% AI)</th>
<th>Dilution Rate</th>
<th>Application Rate</th>
<th>Replications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optigard Flex</td>
<td>0.10</td>
<td>0.54 fl oz / gal H2O</td>
<td>2 gal / 1000 sq ft</td>
<td>4</td>
</tr>
<tr>
<td>Termidor SC</td>
<td>0.06</td>
<td>0.8 fl oz / gal H2O</td>
<td>1.5 gal / 1000 sq ft</td>
<td>4</td>
</tr>
<tr>
<td>I MaxxPro 2F</td>
<td>0.10</td>
<td>0.54 fl oz /gal H2O</td>
<td>2 gal / 1000 sq ft</td>
<td>4</td>
</tr>
<tr>
<td>Untreated Check</td>
<td>na</td>
<td>na</td>
<td>na</td>
<td>4</td>
</tr>
</tbody>
</table>

\(a = \) thiamethoxam, \(b = \) fipronil, \(c = \) imidacloprid.

<table>
<thead>
<tr>
<th>Time</th>
<th>Optigard Flex (0.10% AI)</th>
<th>Termidor SC (0.06% AI)</th>
<th>I MaxxPro 2F (0.10% AI)</th>
<th>Untreated Check</th>
</tr>
</thead>
<tbody>
<tr>
<td>3d</td>
<td>7.3b</td>
<td>90.3a</td>
<td>4.5b</td>
<td>5.8b</td>
</tr>
<tr>
<td>10d</td>
<td>52.2b</td>
<td>89.4a</td>
<td>28.9bc</td>
<td>1.4c</td>
</tr>
<tr>
<td>20d</td>
<td>19.6b</td>
<td>94.5a</td>
<td>29.0b</td>
<td>9.0b</td>
</tr>
<tr>
<td>30d</td>
<td>28.8b</td>
<td>87.6a</td>
<td>0.0b</td>
<td>5.1b</td>
</tr>
<tr>
<td>60d</td>
<td>25.0b</td>
<td>76.3a</td>
<td>18.7b</td>
<td>10.3b</td>
</tr>
</tbody>
</table>

Mean 26.6b 87.6a 16.2bc 6.3c

\(1\) Means followed by the same letter in rows are not significantly different (p > 0.05).

\(a = \) thiamethoxam, \(b = \) fipronil, \(c = \) imidacloprid.