CABBAGE: *Brassica oleracea* L., ‘Drago’

**IMPORTED CABBAGEWORM AND DIAMONDBACK MOTH CONTROL WITH INSECTICIDES ALLOWED FOR ORGANIC PRODUCTION, 2011**

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Imported cabbageworm: *Pieris rapae* (Linnaeus)  
Diamondback moth (DBM): *Plutella xylostella* (Linnaeus)

This trial was conducted to evaluate insecticides allowed for organic production. The trial at Cornell’s New York State Experiment Station in Geneva, NY was conducted on a field managed using practices allowed for organic production since 2008. Cabbage (‘Drago’) with 3-4 true leaves was transplanted on 2 Jun by hand into raised beds with 1.25 mil black polyethylene and drip irrigation. Annual ryegrass was seeded between the rows for weed control. Four treatments and an untreated control were arranged in a RCB design with four replications. Each plot consisted of five plants spaced 12 inches apart with 7 ft between rows and 2 ft between treatments. Sprays were applied with a CO2 pressurized backpack sprayer at 40 psi delivering 40 gpa through two TeeJet 8002VS flat fan nozzles spaced 19 inches apart. Treatments included Agree WG (Bt *aizawi*) at 2 lb/acre, Neemix 4.5 (azadirachtin) at 10 oz/acre, Pyganic 5.0 (pyrethrins) at 9 oz/acre, mixture of Neemix and Pyganic (10 and 9 oz/acre), and an untreated control. The first spray was applied 6 Jul after larvae were found to be well-distributed in the plots. Two more sprays were applied on 14 and 21 Jul. Larvae and pupae of both species were counted on each plant weekly, 13-27 Jul. Larval and pupal counts for the 3 wk were summed and the total number of both species per plant was analyzed using ANOVA with means separation by Tukey-Kramer HSD. Average maximum temperatures for Jun and Jul were 77 and 84.7°F; average minimum temperatures were 58.1, and 63.8 °F. Rainfall amounts (inch) were 2.2 and 0.72, respectively.

All treatments provided significant reduction of populations compared with the untreated control. DBM accounted for 44% of the insects in the untreated control and similar percentages in the treatments, with the exception of Agree (Table 1). No synergy was apparent from the combination of Neemix and Pyganic. Agree was numerically the best treatment, although not significantly different from other materials.
Table 1

<table>
<thead>
<tr>
<th>Treatment/formulation</th>
<th>Rate amt product/acre</th>
<th>Ave no. insects/plant&lt;sup&gt;a&lt;/sup&gt;</th>
<th>% DBM/ICW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Untreated check</td>
<td>8.25a</td>
<td>44/56</td>
<td></td>
</tr>
<tr>
<td>Neemix 4.5</td>
<td>10 oz</td>
<td>2.00b</td>
<td>43/57</td>
</tr>
<tr>
<td>Pyganic 5.0</td>
<td>9 oz</td>
<td>0.75b</td>
<td>50/50</td>
</tr>
<tr>
<td>Neemix 4.5 + Pyganic 5.0</td>
<td>10 oz</td>
<td>0.50b</td>
<td>66/33</td>
</tr>
<tr>
<td>Agree WG</td>
<td>2 lb</td>
<td>0.25b</td>
<td>100/0</td>
</tr>
</tbody>
</table>

Means not connected by the same letter are significantly different (Tukey-Kramer HSD, 0.05)

<sup>a</sup>Sum of larvae/plant for the three sampling dates