Sweet Corn Worm Control Study

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Summary: The Bt hybrid, BC 0801, provided excellent corn earworm control with no insecticide sprays. Applying bifenthrin to a conventional sweet corn hybrid, Precious Gem, at a rate of 4.2 ounces per acre every three days from row tassel until silks dried resulted in 97% of harvested ears being worm-free. Using the high rate of 6.4 ounces bifenthrin per acre and increasing the time between sprays to five or seven days also provided good worm control (92% and 89% clean ears, respectively), but did result in picking more wormy ears than using a three day schedule. Permethrin was not as effective for controlling corn earworm as bifenthrin.

Trial Description and Results

Sweet corn cultivars Precious Gem and BC 0801 were planted on June 26 in field plots arranged in a randomized complete block design with three replications. Each plot consisted of three rows 22 feet long. All insecticide treatments were started at “row tassel” (when tassels have just emerged from whorl) stage of growth. Treatments on a three day spray schedule were applied six times on August 10, 13, 16, 19, 22 and 25. Spray dates for the five day schedule were August 10, 15, 20 and 25. The seven day spray schedule resulted in three applications, August 10, 17 and 25. Insecticides were applied with a CO2 back-pack sprayer at a pressure of 35 PSI in volume of water to equal 38 gallon of spray material per acre. A flat fan nozzle directed spray at the ear zone from each side of the row. All marketable-sized ears from the center row of each plot were harvested on September 5. There were no differences between treatments for number of ears or ear weight.

Harvested ears were evaluated for worm damage - a ‘clean’ ear contained no worms or apparent worm damage to corn kernels. Of the ears harvested from the control plots (Precious Gem, no insecticide) 53% were infested with corn earworm. Pheromone insect traps located in the plots indicated the presence of both corn earworm and european corn borer moths. The corn earworm trap captured an average of 8.1 moths per night from August 9 (row tassel) through September 6 (harvest). These trap counts indicated a steady and continuous potential for corn earworm infestation and this was confirmed by finding corn earworms of all sizes (age) in the harvested ears. On the other hand, trap catches of european corn borer moths were much smaller, averaging only 1.4 moths per night and hardly any corn borers were found in picked ears.

The Bt insect-protected hybrid, Attribute BC 0801, performed well with 97% of harvested ears graded worm free. And the few worms found were quite small, less than 1/8” long, and confined to the very tip of the ear where there was little apparent kernel damage.

The best insecticide treatment for corn earworm control, resulting in 97% clean ears, was bifenthrin used at 4.2 fluid ounces per acre on a three-day spray schedule. Confirming that proper insecticide rates are critical, applying bifenthrin at 2.1 ounces per acre resulted in lesser control with 17% of harvested ears being wormy. In an effort to evaluate the residual control properties of bifenthrin, spray treatments were also included that used the high rate of 6.4 fluid ounces per acre applied on five and seven day schedules. Results from these
treatments indicate that bifenthrin does provide better residual control of corn earworm than has been previously available but under conditions of this trial 8% to 11% of harvested ears were still wormy. These numbers aren’t bad but may not be acceptable for some markets.

Permethrin applied every three days at a rate of 7.0 ounces per acre resulted in 23% of harvested ears being infested with corn earworms. Back in 1996 we evaluated several insecticides on sweet corn and found permethrin provided excellent control of european corn borer, the primary insect pest during that study. These findings agree with a few other reports that permethrin has been, at times, less effective against corn earworm than against european corn borer.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Spray Interval</th>
<th>Insecticide Rate</th>
<th>% Clean Marketable Ears</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Bt” hybrid</td>
<td>none</td>
<td>none</td>
<td>97</td>
</tr>
<tr>
<td>Conventional hybrid</td>
<td>none</td>
<td>none</td>
<td>43</td>
</tr>
<tr>
<td>Permethrin</td>
<td>3 days</td>
<td>7.0 fl oz/acre (.175 lb ai)</td>
<td>77</td>
</tr>
<tr>
<td>Bifenthrin</td>
<td>3 days</td>
<td>2.1 fl oz/acre (.033 lb ai)</td>
<td>83</td>
</tr>
<tr>
<td>Bifenthrin</td>
<td>3 days</td>
<td>4.2 fl oz/acre (.066 lb ai)</td>
<td>97</td>
</tr>
<tr>
<td>Bifenthrin</td>
<td>5 days</td>
<td>6.4 fl oz/acre (.1 lb ai)</td>
<td>92</td>
</tr>
<tr>
<td>Bifenthrin</td>
<td>7 days</td>
<td>6.4 fl oz/acre (.1 lb ai)</td>
<td>89</td>
</tr>
</tbody>
</table>

*LSD 5% 11*

1. Bt hybrid = BC 0801, Rogers Brand Seed.
   Conventional hybrid (used for all insecticide treatments) = Precious Gem, Mesa Maize, Inc.
   Permethrin = Pounce 3.2 EC, FMC Corp., Philadelphia, PA 19103.
   Bifenthrin = Capture, FMC Corp., Philadelphia, PA 19103.

2. Insecticide treatments started at “row tassel” stage of growth (8/10).

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