2002

Sweet Corn Variety and Pest Management Trial at the Neely-Kinyon Farm, 2001

Kathleen Delate
*Iowa State University*, kdelate@iastate.edu

Robert Burcham
*Iowa State University*

Heather Friedrich
*Iowa State University*

Noreen Wantate
*Iowa State University*

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Recommended Citation
Delate, Kathleen; Burcham, Robert; Friedrich, Heather; and Wantate, Noreen, "Sweet Corn Variety and Pest Management Trial at the Neely-Kinyon Farm, 2001" (2002). *Iowa State Research Farm Progress Reports*. 1570.
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Abstract
Because of Iowa agricultural resources and the extensive experience of Iowa farmers with field corn production, organic sweet corn can be grown successfully in Iowa. And because the U.S. organic consumer market continues to grow, premium prices can be obtained for Iowa organic sweet corn. The potential for major markets across the United States has been identified; research on production, harvesting, and processing protocols is needed to meet this demand. One of the key pests in organic sweet corn production is the corn earworm. Earworm control was improved through the addition of a certified organic spreader-sticker in preliminary tests in 2001. This project investigated variety selection for early markets as well as the efficacy of the naturally occurring soil bacterium, Bt (Bacillus thuringiensis), for improved pest management of the corn earworm.

Keywords
Horticulture, Agronomy

Disciplines
Agricultural Science | Agriculture | Agronomy and Crop Sciences | Horticulture

This armstrong research and demonstration farm is available at Iowa State University Digital Repository: http://lib.dr.iastate.edu/farms_reports/1570
Sweet Corn Variety and Pest Management Trial at the Neely-Kinyon Farm, 2001

Kathleen Delate, assistant professor
Departments of Horticulture and Agronomy
Bob Burcham, farm supervisor
Neely-Kinyon Research and Demonstration Farm
Heather Friedrich and Noreen Wantate, research associates
Departments of Horticulture and Agronomy

Introduction
Because of Iowa agricultural resources and the extensive experience of Iowa farmers with field corn production, organic sweet corn can be grown successfully in Iowa. And because the U.S. organic consumer market continues to grow, premium prices can be obtained for Iowa organic sweet corn. The potential for major markets across the United States has been identified; research on production, harvesting, and processing protocols is needed to meet this demand. One of the key pests in organic sweet corn production is the corn earworm. Earworm control was improved through the addition of a certified organic spreader-sticker in preliminary tests in 2001. This project investigated variety selection for early markets as well as the efficacy of the naturally occurring soil bacterium, \textit{Bt} (\textit{Bacillus thuringiensis}), for improved pest management of the corn earworm.

Materials and Methods
Compost (8 tons/acre) was applied to the field site April 27, 2001. On May 18, two varieties of sweet corn, Ambrosia and Incredible, were planted in 30-inch rows, at 26,000 plants/acre. Plots were harrowed May 21, then row cultivated June 11, July 8, and July 13. Stand counts were taken July 12. A split plot design permitted application of three treatments to two rows of each variety. The treatments were control (no spray), Dipel\textsuperscript{®} (\textit{Bt}), and Dipel\textsuperscript{®} (\textit{Bt}) plus soybean oil (to act as a surfactant). Dipel\textsuperscript{®} was applied using a backpack sprayer to the corn ears at silking. The ‘Ambrosia was sprayed July 31 and again August 6. Incredible was sprayed August 6 and August 13. Ambrosia was harvested August 13 and Incredible August 20. A sample from 100 feet of row was harvested from two rows of each treatment, and total number of ears was recorded. Numbers of corn earworm found, evidence of earworm damage, and incidence of corn smut were recorded for each harvested ear.

Results and Discussion
Fifty-four days after planting, no significant differences among varieties were found in stand counts (Table 1). Greater numbers of ears were harvested from Ambrosia rows than from Incredible rows (Table 2). Earworms were reduced from a 37\% infestation rate in the controls to 29\% with Dipel\textsuperscript{®} alone and 32\% with Dipel\textsuperscript{®} and oil (averaged over both varieties). \textit{Bt} alone appeared to reduce earworm populations in the Incredible planting, while \textit{Bt} plus oil appeared to offer greater protection to the Ambrosia planting. Earworm damage also was reduced with applications of \textit{Bt}: from 25\% in the controls, to 0\% with Dipel\textsuperscript{®}, to 3\% with Dipel\textsuperscript{®} plus oil. Greater smut populations were recorded in Ambrosia ears than Incredible ears, with no infestation found in Dipel\textsuperscript{®} sprayed rows.

Organic sweet corn can provide a lucrative market for Iowa growers. In another ISU–USDA trial (Treynor, Iowa, 2001), organic sweet corn yields averaged 6,000 ears/acre, an excellent yield compared to national standards. The Hy-Vee grocery store in Council Bluffs, Iowa, purchased this sweet corn for $3.00/dozen, a 100\% premium over...
conventional wholesale sweet corn prices. Neely-Kinyon organic sweet corn was served at field days and received many compliments on excellent taste. This trial will be repeated in 2002 with additional sweet corn varieties.

Table 1. Sweet corn stand count, 2001.

<table>
<thead>
<tr>
<th>Variety</th>
<th>Stand count (plants/acre) ± SE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambrosia</td>
<td>18,600 ± 1,503</td>
</tr>
<tr>
<td>Incredible</td>
<td>22,800 ± 2,289</td>
</tr>
<tr>
<td>LSD</td>
<td>NSD</td>
</tr>
</tbody>
</table>

Table 2. Sweet corn harvest, earworm damage and incidence of corn smut, Neely-Kinyon, 2001.

<table>
<thead>
<tr>
<th>Variety</th>
<th>Treatment</th>
<th>Mean number of ears harvested</th>
<th>Earworm (%)</th>
<th>Corn earworm damage (%)</th>
<th>Ears showing smut (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambrosia</td>
<td>Control</td>
<td>52</td>
<td>41.35</td>
<td>20.19</td>
<td>4.80</td>
</tr>
<tr>
<td></td>
<td>Bt</td>
<td>13.5</td>
<td>33.34</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td></td>
<td>Bt &amp; oil</td>
<td>55</td>
<td>25.45</td>
<td>2.72</td>
<td>7.27</td>
</tr>
<tr>
<td>Incredible</td>
<td>Control</td>
<td>29.5</td>
<td>32.20</td>
<td>5.08</td>
<td>1.69</td>
</tr>
<tr>
<td></td>
<td>Bt</td>
<td>32</td>
<td>25.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td></td>
<td>Bt &amp; oil</td>
<td>45</td>
<td>37.78</td>
<td>3.34</td>
<td>1.11</td>
</tr>
</tbody>
</table>