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Sweet Corn Variety and Pest Management Trial at Neely-Kinyon Farm, 2002

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Abstract
Organic sweet corn can be successfully grown in Iowa, based on our agricultural resources and our extensive experience with field corn production. With the continuing growth of organic consumers in the United States, premium prices can be obtained for organic sweet corn from Iowa. With the potential for major markets across the U.S., 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 and the efficacy of the naturally occurring soil bacterium, *Bacillus thuringiensis* (*Bt*), for improved pest management of the corn earworm at the Neely-Kinyon Farm.

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Horticulture, Agronomy

Disciplines
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Introduction

Organic sweet corn can be successfully grown in Iowa, based on our agricultural resources and our extensive experience with field corn production. With the continuing growth of organic consumers in the United States, premium prices can be obtained for organic sweet corn from Iowa. With the potential for major markets across the U.S., 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 and the efficacy of the naturally occurring soil bacterium, *Bacillus thuringiensis* (*Bt*), for improved pest management of the corn earworm at the Neely-Kinyon Farm.

Materials and Methods

Compost (8 tons/acre) was applied to the field site on April 4, 2002. Three varieties of sweet corn, 'Ambrosia' (Crookham Seeds, Caldwell, ID),'Incredible' (Crookham Seeds, Caldwell, ID), and 'Merlin' (Mesa Maize, Inc., Olathe, CO) were planted in 30 in. rows on May 14, 2002, at 26,000 plants/acre. The sampled area for each variety was 60 in. (2 rows) × 30 feet. Plots were harrowed on May 20 and row cultivated on June 6 and June 25. Corn earworm treatments were as follows: control (no spray); Dipel® (*Bt*); and Dipel® (*Bt*) plus soybean oil (to act as a surfactant). Dipel® was applied to the corn ears at silking and approximately one week later using a backpack sprayer. 'Merlin' ears were sprayed on July 17 and 22. 'Ambrosia' ears were sprayed on July 22 and 29. 'Incredible' ears were sprayed on July 29 and August 9. 'Merlin' was harvested on July 29 and 31. 'Ambrosia' was harvested on July 31 and August 7, and 'Incredible' on August 7 and 21, 2002. The number of ears was recorded and each ear was inspected and rated for earworms and earworm damage.

Results and Discussion

Over two harvests, 'Ambrosia' yields were greater than 'Incredible' and 'Merlin' yields (Table 1). There were no significant differences among varieties in earworm populations (Table 1) or variety × treatment interactions (Table 2). Over all varieties, earworm damage was not significantly decreased with organic treatments, although trends showed less damage in ears treated with *Bt* or *Bt* plus oil (Table 3). Results from this experiment demonstrate the potential for 'Merlin' sweet corn when earworm control is of primary interest. Greater yields (averaging 6,656 blemish-free ears/acre) in the 'Ambrosia' variety (7,794 ears/acre with an average of 14.6% earworm damage when *Bt* was applied) suggest that this variety will be preferred when total yield is paramount.

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Table 1. Sweet corn harvest by variety, Neely-Kinyon, 2002.

Variety	Ears/acre	Earworm damage (%)
Ambrosia	7,157 ± 490	14.2 ± 4.9
Incredible	3,529 ± 1002	34.3 ± 16.1
Merlin	5,098 ± 434	2.2 ± 1.4
LSD 0.05	2,083	NSD

Table 2. Sweet corn harvest and earworm damage by treatment and variety, Neely-Kinyon, 2002.

Variety	Treatment	Ears/acre	Earworm damage (%)
Ambrosia	*Bt*	7,794 ± 735	14.6 ± 14.6
Ambrosia	*Bt* + oil	6,618 ± 441	14.0 ± 9.8
Ambrosia	Control	7,059 ± 1471	14.0 ± 7.0
Incredible	*Bt*	3,235 ± 2353	33.3 ± 33.3
Incredible	*Bt* + oil	4,118 ± 2941	25.0 ± 25.0
Incredible	Control	3,235 ± 588	44.4 ± 44.4
Merlin	*Bt*	5,441 ± 735	2.4 ± 2.4
Merlin	*Bt* + oil	5,000 ± 588	0.0 ± 0.0
Merlin	Control	4,852 ± 1323	4.2 ± 4.2
LSD 0.05		NSD	NSD

Table 3. Earworm damage over all varieties and harvests, 2002.

Treatment	Earworm damage (%)
Bt	16.8 ± 11.0
Bt + oil	13.0 ± 8.3
Control	20.9 ± 14.0
LSD 0.05	NSD