

Sweet Corn Variety and Pest Management Trial

Neely-Kinyon Farm, 2006

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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 U.S., premium prices can be obtained for organic sweet corn from Iowa. With the potential for major markets across the U.S. 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 and the efficacy of the naturally occurring soil bacterium, *Bt* (*Bacillus thuringiensis*), 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 10, 2006. Three varieties of sweet corn, 'Ambrosia' (Crookham Seeds, Caldwell, ID), 'Merlin' (Mesa Maize, Inc., Olathe, CO), and a certified organic variety, 'Luscious' (Mesa Maize, Inc., Olathe, CO), were planted on May 16 at 32,000 seeds/acre in 30 in. rows. The unit area sampled was 30 in. (1 row) by 70 feet. Four replications of each variety/treatment were planted. Weed management included two rotary hoeings on May 26 and June 1, and two row cultivations on June 6 and 21, 2006. Plant population counts were taken on June 8.

Corn earworm treatments were as follows: control (no spray); Dipel® (*Bt*); and Dipel® (*Bt*) plus vegetable oil (to act as a surfactant). Treatments consisted of 1) 4 oz Dipel® to 3 gallons of water, and 2) 4 oz Dipel® plus 2 oz of vegetable oil to 3 gallons of water. Treatments were applied using a backpack CO₂ sprayer to the corn ears when 50% were silking, and 2 to 4 days later. 'Ambrosia' and 'Luscious' ears were sprayed on July 13 and 18, and 'Merlin' ears were sprayed on July 18 and 20, 2006. Sweet corn was harvested on July 27, August 1, and August 4, 2006. Ten ears per plot were collected from randomly selected plants and rated for total earworm number and percentage of ears exhibiting earworm damage.

Results and Discussion

Organic sweet corn yields were excellent in 2006, ranging from 12,894 to 20,790 ears/acre (Table 1). 'Merlin' yielded a significantly greater number of ears compared to 'Ambrosia' and 'Luscious.' The organic seed, 'Luscious,' produced an average yield of 13,833 ears/acre (Table 1). Plant populations were also high at 16,917 to 20,806 plants/acre, with a higher stand in the 'Merlin' crop (Table 1).

Earworm damage was greater in 2006, ranging from 21 to 66%, compared to 0–10% damaged ears in previous years (Tables 1–3). There were higher numbers of earworms in the 'Merlin' ears (Table 1). There was a trend toward less earworm damage in the Dipel® and Dipel® plus oil treatments (Table 2), but the damage was not significantly less than the control (no spray). There was an overall trend towards a lower percentage of damage in the 'Ambrosia' variety treated with Dipel® (Table 3). This experiment will be repeated in 2007.

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Table 1. Sweet corn performance by variety, Neely-Kinyon, 2006.

Variety	Stand (plants/ acre)	Yield (ears/acre)	Earworm damage (%)
Ambrosia	16,917b	12,894b	20.57a
Luscious	18,861ab	13,883b	28.26a
Merlin	20,806a	20,790a	66.51b
LSD 0.05	1,978	2,523	10.60

Table 2. Sweet corn data by pest management treatment, Neely-Kinyon, 2006.

Treatment	Stand (plants/ acre)	Yield (ears/acre)	Earworm damage (%)
Control	18,472	16,553	40.32
Dipel®	18,694	15,800	36.68
Dipel® and oil	19,417	15,215	38.32
LSD 0.05	NS	NS	NS

Table 3. Sweet corn performance by variety and treatment, Neely-Kinyon, 2006.

Variety and Treatment	Stand (plants/ acre)	Yield (ears/acre)	Earworm damage (%)
Ambrosia, Control	16,333d	13,591b	16.72a
Ambrosia, Dipel®	17,500bcd	13,939b	14.98a
Ambrosia, Dipel® and oil	16,917cd	11,151b	30.00ab
Luscious, Control	18,083abcd	15,159b	35.89b
Luscious, Dipel®	18,167abcd	11,848b	23.92ab
Luscious, Dipel® and oil	20,333abc	14,636b	24.95ab
Merlin, Control	21,000a	20,909a	68.35c
Merlin, Dipel®	20,417ab	21,606a	71.14c
Merlin, Dipel and oil	21,000a	19,863a	60.02c
LSD 0.05	3,483	2,569	18.12