

Sweet Corn Variety and Pest Management Trial

Neely-Kinyon Farm, 2005

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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

Chicken litter compost (4 tons/acre) was applied to the field site on March 18, 2005. Two varieties of sweet corn, 'Ambrosia' (Crookham Seeds, Caldwell, ID), and 'Merlin' (Mesa Maize, Inc., Olathe, CO) were planted on May 16, 2005, and a certified organic variety, 'Luscious' (Mesa Maize, Inc., Olathe, CO), was planted on June 7. All varieties were planted at 26,000 seeds per acre in 30 in. rows. The sampled area for each variety was 30 in. (1 row) by 230 feet. Weed management included one rotary hoeing on June 2, and cultivations on June 7, June 22, and July 1. Plant population counts were taken in the 'Merlin' and 'Ambrosia' varieties on June 13.

Corn earworm treatments were as follows: control (no spray); Dipel® (*Bt*); and Dipel® (*Bt*) plus vegetable oil (to act as a surfactant). Dipel® was applied using a backpack sprayer to the corn ears at silking and approximately 4 days later. The Dipel® treatment consisted of 4 oz Dipel® to 3 gallons of water, Dipel® and oil was 4 oz Dipel® plus one-quarter cup of vegetable oil to 3 gallons of water. 'Merlin' ears were sprayed on July 21 and 25. 'Ambrosia' ears were sprayed on July 25 and 28. 'Luscious' corn was not sprayed to evaluate pest resistance under a no-spray condition. 'Ambrosia' was harvested on August 4, and 'Merlin' was harvested on August 2 and 4. 'Luscious' was harvested on August 9 and 11. Ten ears per plot were collected and inspected/rated for earworm numbers and earworm damage.

Results and Discussion

First sweet corn planting

Organic sweet corn quality was excellent in 2005. A significantly higher plant population (9,562 plants/acre) was found in the 'Merlin' plots compared with 'Ambrosia' (Table 1). A total of 10,319 ears/acre were harvested from 'Merlin' plots over two harvests.

Earworm populations at the time of this experiment were low overall, ranging from 0–3% damaged ears (Tables 1–3). As a result, there were no significant differences in earworm damage among treatments or varieties (Tables 1–3). There was a trend toward higher numbers of earworms in the 'Merlin' ears, however (Table 1). There were no significant differences in yield, stand, or earworm damage between the interaction of variety and treatment.

suspected that the late planting date had a large influence on this data.

Second sweet corn planting

There were no significant differences among varieties at the second harvest date, with ‘Ambrosia’ producing 3,561 ears/acre and ‘Merlin’ at 3,009 ears/acre. Because of late seed arrival, ‘Luscious’ was not planted until 3 wk later than ‘Merlin’ and ‘Ambrosia.’ There was a notable difference (Table 4) in earworm damage in ‘Luscious’ ears (27%), but it is unknown if planting date was more critical than variety in pest attack. In addition, there was a notable difference in yield between the ‘Luscious’ (3,851 ears/acre) and ‘Merlin’ varieties, but it is

Acknowledgments

We would like to thank the Leopold Center for Sustainable Agriculture for their support of the Neely-Kinyon LTAR site. We thank the Neely-Kinyon Farm Association for their input and support. Thanks also go to Greg Lilly, Daniel Rosmann, Alzbeta Novotna, and Mark Rosmann for their help on production, data collection and analytical aspects of this project. We also thank Mesa Maize, Inc. (Olathe, CO) and Crookham Seeds, Inc. (Caldwell, ID) for their support and seed trade.

Table 1. Sweet corn performance by variety, first planting, Neely-Kinyon, 2005.

Variety	Stand (plants/ acre)	Yield (ears/ac)		Earworm damage (%)
		August 2, 2005	August 4, 2005	
Ambrosia	5,062b	0.0	3,560.6	0.83
Merlin	9,562a	7,310.5	3,008.6	2.19
LSD 0.05	2,539	N/A	NS	NS

Table 2. Sweet corn data by pest management treatment, first planting, Neely-Kinyon, 2005.

Treatment	Stand (plants/ acre)	Yield (ears/ac)		Earworm damage (%)
		August 2, 2005	August 4, 2005	
Control	7,833	7,424.1	3,181.8	1.91
Dipel®	6,000	7,159.0	3,428.0	1.18
Dipel® and oil	8,000	7,348.4	3,198.6	1.67
LSD 0.05	NS	N/A	NS	NS

Table 3. Sweet corn performance by variety and treatment, first planting, Neely-Kinyon, 2005.

Variety and Treatment	Stand (plants/ acre)	Yield (ears/ac)		Earworm damage (%)
		August 2, 2005	August 4, 2005	
Ambrosia, Control	5,167	0.0	3,825.7	1.11
Ambrosia, Dipel®	5,000	0.0	2,935.6	1.43
Ambrosia, Dipel® and oil	5,000	0.0	3,920.4	0.00
Merlin, Control	10,500	7,424.1	2,666.6	2.50
Merlin, Dipel®	7,000	7,159.0	3,920.4	1.00
Merlin, Dipel and oil	11,000	7,348.4	2,621.2	3.00
LSD 0.05	NS	N/A	NS	NS

Table 4. Sweet corn performance, second planting, Neely-Kinyon, 2005.

Variety	Yield (ears/ac)		Earworm damage (%)
	August 9, 2005	August 11, 2005	
Luscious	2,575.7	1,275.2	26.67
LSD 0.05	N/A	N/A	N/A

