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Evaluation of Organic Corn Varieties

Kathleen Delate

Iowa State University, kdelate@iastate.edu

Vivian Bernau

Iowa State University

Kevin Van Dee

Iowa State University

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Evaluation of Organic Corn Varieties

Abstract

According to the USDA National Organic Program, certified organic farmers must source organic seed (seed from organically raised crops). The organic seed industry is currently growing in Iowa and the Midwest. With this growth, organic growers are looking for university-based recommendations on organic varieties to use in Iowa. The Organic Agriculture Program at Iowa State University has been using organic seed at the Southeast Research Farm for ten years with excellent results. There were four varieties selected for the 2009 organic corn variety trial. These included the following Blue River (Kelley, IA) 109 to 112-day maturity hybrid corn varieties: conventional, untreated BR64A50 was planted as a comparator against the three organic varieties, BR66H54, BR61F39, and BR62B57.

Keywords

RFR A9033, Horticulture, Agronomy

Disciplines

Agricultural Science | Agriculture | Agronomy and Crop Sciences | Horticulture

Evaluation of Organic Corn Varieties

RFR-A9033

Kathleen Delate, associate professor
Vivian Bernau, undergraduate research assist
Departments of Horticulture and Agronomy
Kevin Van Dee, farm superintendent

Materials and Methods

According to the USDA National Organic Program, certified organic farmers must source organic seed (seed from organically raised crops). The organic seed industry is currently growing in Iowa and the Midwest. With this growth, organic growers are looking for university-based recommendations on organic varieties to use in Iowa. The Organic Agriculture Program at Iowa State University has been using organic seed at the Southeast Research Farm for ten years with excellent results. There were four varieties selected for the 2009 organic corn variety trial. These included the following Blue River (Kelley, IA) 109 to 112-day maturity hybrid corn varieties: conventional, untreated BR64A50 was planted as a comparator against the three organic varieties, BR66H54, BR61F39, and BR62B57.

Plots measuring 20 × 185 ft were placed in a randomized complete block design with four replications of each variety. Corn was planted at 35,600 seeds/acre at a depth of 2 in. on May 7, 2009. Swine manure was injected on November 17, 2008, at 4,000 gallons/acre. Weed management included rotary hoeing on May 11 and 19 and row cultivation on June 1, 2009. Corn was harvested on November 3, 2009.

Plant stands were counted on June 10 and July 7. Because of an extremely wet summer, we were unable to collect weed population data in 2009. Harvest samples were collected from each plot for grain quality analysis, which was

conducted at the ISU Grain Quality Laboratory, Ames, IA.

Results and Discussion

Plant stands were excellent in 2009, and populations were similar among varieties, averaging 33,792 plants/acre (Table 1). Organic corn yields were also excellent in 2009, averaging 184 bushels/acre across all varieties (Table 1). Although there was no statistical difference in yield among varieties, organic BR62B57 yielded 201 bushels/acre compared with conventional BR65A50 at 163 bushels/acre. There was little correlation between corn stalk nitrate and yield, as the variety having 649 ppm nitrate-N yielded 201 bushels/acre, and BR61F39 with 2,791 ppm nitrate-N yielded 186 bushels/acre (Table 1).

Corn grain quality was good considering the excess levels of moisture during the growing season, with moisture content averaging 22% across all varieties (Table 2). Protein levels averaged 6.4% across all varieties (Table 2). Carbohydrate levels averaged 62%, with no differences among varieties (Table 2). Oil content averaged 3.6% across all varieties (Table 2). These results show great promise for organic seed.

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Table 1. Organic corn stands, yields, and stalk nitrate at the Southeast Research Farm.

Treatment	Corn stands (plants/acre)	Corn yield (bu/ac)	Corn stalk nitrate (ppm NO ₃ -N)	Corn borer damage (%)
Blue River 64A50 CNV	35,417	162.8	1,654	0.083
Blue River 66H54	34,167	187.0	1,151	0.000
Blue River 61F39	32,583	185.5	2,791	0.000
Blue River 62B57	33,000	201.1	648.5	0.083
LSD (0.05)	NS	NS	NS	N/A

Table 2. Organic corn grain quality at Southeast Research Farm.

Treatment	Grain quality (%)			
	<u>Carbohydrates</u>	<u>Oil</u>	<u>Protein</u>	<u>Moisture</u>
Blue River 64A50 CNV	61.75	3.85	6.38	22.88
Blue River 66H54	61.60	3.48	6.56	21.88
Blue River 61F39	62.13	3.35	6.38	20.70
Blue River 62B57	62.17	3.57	6.20	22.97
LSD (0.05)	NS	NS	NS	NS