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Supersweet Sweet Corn Cultivar Evaluation for Northern Indiana, 2007

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The Indiana Agricultural Statistics Service reported sweet corn for fresh market sales was harvested from 5,200 acres in Indiana in 2006 and had a total value of \$7.6 million. Sweet corn fields are located throughout the state. In northern Indiana, bicolor corn is most commonly grown. Varieties with improved eating quality are of interest to both producers and consumers. Producers are also interested in yield, ear size, appearance, and agronomic characteristics. This paper reports on 12 sh2 sweet corn entries that were evaluated at the Pinney-Purdue Agricultural Center in Wanatah, Indiana.

Materials and Methods

The trial was conducted on a Tracy sandy loam with 2.4% organic matter and 57 ppm phosphorus (P), 139 ppm potassium (K), 180 ppm magnesium (Mg), 750 ppm calcium (Ca), and pH 6.7. It was set up as a randomized complete block design with three replications. Cultivars were assigned to individual plots one row (30 inches) wide by 30 feet long. Corn was seeded May 9, 2007 with a finger pick-up planter set to drop 23,200 seeds per acre and later thinned to 35 plants per 30 feet of row (20,328 plants per acre). Nitrogen (N) (20.3 lbs./A) and P (18.2 lbs./A of P₂O₅) were applied at planting from 19-17-0 (10 gal. /A) and an additional 70 lbs./A N from urea ammonium nitrate was injected in mid-June. Tefluthrin (Force 3G) was applied at planting to control corn rootworms. Permethrin (Pounce 3.2 EC, 4 oz./A) was applied on June 8 to control cutworms. Weeds were controlled with atrazine and s-metolachlor applied after seeding, cultivation, and hand weeding. Irrigation was applied to incorporate herbicides and during the growing season as needed. Emergence was recorded 7, 14, and 21 days after planting (DAP), before thinning. Prior to harvest, height from the soil to middle of the ear was measured for three ears per plot and plant vigor and tillering were rated. Each plot was harvested when corn reached marketable stage. The weight and number of marketable ears were recorded. Three ears from each plot were used to evaluate degree of husk cover, husk tightness, degree of tip fill, overall attractiveness, average ear diameter, length after husking, and shank length. Two people rated the flavor of each entry. Rating scales are described below and in footnotes to Table 1. Quantitative data were analyzed using ANOVA followed by mean separation using Fisher's protected least significant difference at $P \leq 0.05$. Relationships between yield components, ear and plant characteristics, and average days to harvest were analyzed using linear regression. One variety was omitted from ANOVA for length and ear diameter because measured values were the same in all reps.

Characteristic	Rating Scale
Husk Cover	5: > 2-inch cover, 4: 1.25-2 inches, 3: 0.75-1.25 inches, 2: < 0.75 inch, 1: ear exposed
Husk Tightness	3: tight, 2: firm, 1: loose
Tip Fill	5: kernels filled to tip of cob, 4: < 0.5 inch unfilled, 3: 0.5 to 1 inch unfilled, 2: > 1 inch unfilled, 1: > 2 inches unfilled

Emergence 7 and 14 DAP averaged 48% and 95% of the seeding rate, respectively (data not shown). On the earlier date, Gourmet Sweet Brand (GSB) 2281 had the highest emergence at 85%. Garrison, Fantastic, Surpass, GSB 274A, Optimum and GSB 2171 averaged between 63% and 50%, but did not significantly differ. Optimum Recip. and CSAWP5-202 averaged between 40% and 50%. BSS 0982, at 10% emergence, was the lowest, but not significantly different from Cascade or Holiday which both averaged close to 25%. By two weeks after planting, emergence ranged from 79% for Cascade to 105% for Fantastic, but varieties did not differ significantly.

Results for yield and ear quality are presented in Table 1. Marketable yield averaged 6.6 tons per acre. Garrison produced the highest yield of 8.2 tons per acre, but did not differ significantly from GSB 2281, Fantastic, or Holiday (7.9 tons, 7.3 tons, and 7.1 tons per acre, respectively). Those varieties did not differ from any of the lower yielding varieties except Cascade. The number of marketable ears ranged from 1,291 dozen (GSB 274A) to 1,646 dozen per acre (Garrison), and averaged 1,499. Varieties did not differ significantly. Average weight per ear ranged from 0.84 pound (GSB 274A) to 0.64 pound (CSAWP5-202). Four varieties averaged more than 0.8 pound per ear, significantly more than the other eight.

Ear length ranged from 6.6 to 8.0 inches and diameter from 1.78 to 2.02 inches. The longest ears were produced by Holiday, BSS 0982, GSB 274A, Garrison and GSB 2281 (8.0 to 7.6 inches); the remaining varieties were between 7.1 and 7.5 inches except for the shortest, CSAWP5-202 at 6.6 inches. The widest ears included Holiday, Fantastic, GSB 274A, and GSB 2281, all greater than 1.94 inches. Surpass was the narrowest at 1.78 inches, but not significantly narrower than Cascade, BSS 0982 or Optimum. Shank length averaged 3.6 inches. GSB 2281 and Garrison had the longest shanks, more than 4.4 inches. Optimum had the shortest shanks at 2.9 inches, but did not differ from six other varieties with shanks up to 3.8 inches.

Husk cover ratings averaged 3.6. Surpass averaged 5.0, indicating more than 2 inches of husk cover. Cascade, Optimum, Optimum Recip., CSAWP5-202 and Holiday averaged between 4.0 and 4.4, indicating more than 1.25 inches of husk cover. BSS 0982, Fantastic, GSB 274A and GSB 2171 ranged from 2.3 to 2.9, indicating less than 0.75 inch of cover. The husks of Cascade, Surpass and BSS 0982 were tight around the ear tip. Husks of GSB 274A were loose around the ear tip. Tip fill was generally good to excellent: seven varieties received ratings of 4.9 or 5.0 and all others received ratings of 4 or higher. For overall ear appearance, Fantastic and BSS 0982 received the highest ratings followed by Optimum and Optimum Recip. Other varieties ranged from 6.0 to 6.7, except for CSAWP5-202 which received the lowest rating of 3.3.

Ear height, measured from the ground to mid-ear, ranged from 23.7 inches for Surpass to 31.1 inches for 'Holiday.' 'Holiday' and 'CSAWP5-202' produced few tillers; 'BSS 0982' and 'Optimum' produced many large tillers (data not shown). 'GSB 2281' received the highest rating for plant vigor followed by 'Holiday' and 'Garrison,' while 'Cascade' received the lowest rating for vigor, just behind 'Optimum' and 'Optimum Recip.' (data not shown).

Holiday, Optimum and CSAWP5-202 received flavor ratings of very good to excellent or better, and GSB 273A, Fantastic, Optimum Recip. and Surpass received ratings of very good. Pericarp was rated as no more than 'somewhat tough' for GSB 274A, Cascade, Fantastic, Optimum,

Surpass, and Holiday. GSB 2171 and Garrison received the highest ratings for pericarp toughness.

Many varieties in this trial performed well. Careful evaluation of results presented in Table 1, combined with results from other locations and years should aid producers in selecting varieties best suited to their operations.

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Table 1. Yield, ear size, and quality of supersweet sweet corn in Northern Indiana, 2007.

Cultivar	C ₀ ^z	Color	Days to Harvest ^y		GDD to Harvest ^x	Yield of Marketable Ears		Avg. Ear Weight (lbs.)	Ear Length (in.)	Ear Dia. (in.)	Husk Cover ^w	Husk Tightness ^w	Tip Fill ^w	Overall ^w	Ear Ht. (in.)	Flavor ^v	Pericarp Toughness ^u
			Pred.	Actual		doz/A	ton/A										
GSB 274A	ST	BI	74	81	1502	1,291	6.5	0.84	7.9	2.00	2.6	1.0	4.9	7.0	23.9	VG	ST
GSB 2171	ST	BI	71	81	1502	1,500	6.2	0.69	7.5	1.92	2.3	1.6	5.0	6.3	26.6	M-VG	ST-VT
Fantastic	ST	BI	75	82	1522	1,613	7.3	0.75	7.4	2.00	2.8	1.6	5.0	7.7	28.0	VG	N-ST
Cascade	CR	W	78	83	1543	1,355	5.3	0.65	7.1	1.83	4.4	2.9	5.0	6.7	25.1	G-VG	ST
Optimum	CR	BI	78	83	1543	1,517	6.2	0.68	7.2	1.86	4.4	2.3	5.0	7.3	24.8	VG-E	N-ST
Optimum R.	CR	BI	78	83	1543	1,565	6.7	0.71	7.3	1.88	4.2	2.4	4.9	7.3	25.1	VG	N-T
BSS 0982	SY	BI	82	84	1565	1,500	6.4	0.71	7.9	1.85	2.9	2.8	4.1	7.7	27.2	G-E	ST-T
Surpass	CR	BI	78	85	1588	1,484	6.2	0.70	7.4	1.78	5.0	2.9	4.3	6.0	23.7	VG	N-ST
GSB 2281	ST	BI	81	86	1614	1,581	7.9	0.83	7.6	1.94	3.1	2.6	4.9	6.7	30.8	G	ST-T
Garrison	SY	Y	79	88	1651	1,646	8.2	0.83	7.8	1.90	3.7	1.6	4.1	7.0	30.0	M	VT-T
CSAWP5-202	CR	W	82	89	1676	1,533	5.9	0.64	6.6	1.87	4.2	2.4	4.2	3.3	25.8	VG-E	ST-T
Holiday	CR	BI	84	90	1704	1,404	7.1	0.84	8.0	2.03	4.0	2.2	4.3	6.3	31.1	E-G	ST
Grand mean						1,499	6.6	0.74	7.5	1.91	3.6	2.2	4.6	6.6	26.8	—	—
LSD .05 ^t						ns	1.3	0.06	0.5	0.09	—	—	—	—	2.8	—	—
r ^{2s}						ns	ns	ns	ns	ns	—	—	.56	—	ns	—	—

^zSeed Source: CR=Crookham, ST=Stokes, SY=Syngenta.

^yDays from planting to harvest. Predicted number is from seed supplier.

^xGDD: corn growing degree days.

^wHusk cover, tip fill: 1 (worst) to 5 (best). Husk tightness: 1 (loose) to 3 (very tight). Overall: 1 (worst) to 9 (best).

^vFlavor: M=Medium, G=Good, VG=Very Good, E=Excellent.

^uPericarp toughness: N=Not Tough; ST=Somewhat Tough; T=Tough; VT=Very Tough.

^tMeans differing by more than this amount are significantly different at P≤.05. — AOV not performed.

^sr² for regression vs actual days to harvest is the proportion of variability explained by days to harvest. ns=regression not significant at P<.05.