

Supersweet Sweet Corn Cultivar Evaluation for Northern Indiana, 2006.

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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 2005 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 and appearance, and agronomic characteristics. This paper reports on twenty sh2 sweet corn cultivars known as ‘supersweet’ or ‘enhanced’ or ‘augmented supersweet’ that were evaluated at the Pinney-Purdue Ag Center, Wanatah, IN.

Materials and Methods. The trials were conducted on a Tracy Sandy Loam. In Fall 2005, 24 lb./A N, 96 lb./A P₂O₅, and 47 lb./A K₂O were applied prior to seeding wheat. In Spring 2006, 97 lb. N/A was applied to the wheat. Wheat was killed with glyphosate in mid-April and incorporated. Prior to planting sweet corn 20 lb./A N from urea was applied and incorporated. An additional 25 lb. N/A from UAN was sidedressed when sweet corn was in the whorl stage. Weeds were controlled with atrazine (4L) and s-metolachlor (Dual II Magnum) applied preplant incorporated at 2 pt./A of each product, cultivation, and handweeding. Force 3G was applied at planting at labeled rate for control of corn rootworm larvae. To control moth larvae in ears, permethrin (Pounce) or cyfluthrin (Baythroid) was applied on 7, 18, and 31 July and 4 Aug. based on trap counts for European corn borer and corn earworm. Irrigation was applied through overhead sprinklers as needed. The trial was arranged as a randomized complete block design with three replications. Cultivars were assigned to individual plots 1 row (36 in.) wide by 25 ft. long. Seventy seed per plot were seeded May 24, 2006 and later thinned to achieve a population of 35 plants per 25 ft of row (20,328 plants/A). Emergence was recorded 7 and 14 days after planting (DAP) before thinning. Plant vigor was rated using a 9-point scale 15 DAP and shortly prior to harvest. Prior to harvest, plant height and tillering were rated, and height from the soil to middle of the ear was measured for 3 ears per plot. Each plot was harvested when corn reached marketable stage. 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 and length after husking, and shank length. Two people each evaluated one ear per plot for flavor and pericarp toughness. 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.

Characteristic	Rating Scale
Husk Cover	5: > 2 in. cover; 4: 1.25 – 2 in.; 3: 0.75 – 1.25 in. ; 2: < 0.75 in.; 1: ear exposed
Husk Tightness	3: tight; 2: firm; 1: loose
Tip Fill	5: kernels filled to tip of cob; 4: < 0.5 in. unfilled; 3: 0.5 to 1 in. unfilled; 2: > 1 in. unfilled; 1: > 2 in. unfilled
Flag Leaf Length	L: 8 to 12 in. ; M: 4 to 8 in.; S: < 4 in.

Results and Discussion. Results are presented in Table 1. Emergence 14 DAP averaged 75%. Ten varieties with emergence greater than 76% did not differ significantly from the highest, Fantastic, at 90%. Optimum did not differ significantly from the lowest, Mirai 131Y, at 46%.

Marketable yield averaged 7.0 tons per acre. Mirai 301BC, a bicolor, produced the highest yield of 8.6 tons per acre. The bicolors Obsession, 274A and Mirai 302BC did not significantly differ from Mirai 301BC. The number of ears ranged from 1162 to 1613 dozen per acre and averaged 1470 dozen per acre. Surpass produced the most ears, but 15 other cultivars did not differ significantly. MX350 BC and Mirai 131Y produced the fewest ears.

Ear length ranged from 7.2 to 8.4 inches and diameter from 1.74 to 2.03 inches. The longest ears included yellows MX 148Y, Mirai 131Y and the bicolors Double Up, Mirai 334BC and Mirai 302BC. The shortest varieties were bicolors Optimum, BSS 0977, Cavalry, Triumph and Fantastic, and the yellow Vision. The widest ears included bicolors Mirai 301BC, 274A, Mirai 302BC, Holiday, and Mirai 334BC, and the yellow Mirai 131Y. Bicolors Surpass and BSS 0977 were the narrowest.

Husk cover ratings averaged 3.3. Surpass, Optimum and 274A had an average rating of 4 or above, meaning at least 1.25 inches of husk covered the ear tip. Eight varieties averaged less than 0.75 inch of husk cover (rating of less than 3). Husks were tight around the ear tip for MX 350BC, Surpass, Optimum, Obsession and Holiday. Tip fill ratings averaged 4.1. Fantastic and Triumph consistently had kernels filled to the tip of the ear (a rating of 5), and 9 other cultivars had kernels filled to within at least inch of the ear tip (a rating of 4). Shank length ranged from 3.1 for Xtra-Tender 270A to 6.0 inches for Mirai 301BC. Most varieties had shanks between 4 and 6 inches long.

Early and late ratings for plant vigor, plant height ratings, and ear height were all correlated with harvest date. Early varieties tended to have higher early plant vigor, and later varieties tended to have higher late plant vigor, taller plants, and greater ear height. BSS 0977 had greater early and late vigor than expected based on its harvest date. Other varieties with good early vigor included Fantastic, Xtra-Tender 270A, Mirai 334BC and Triumph. Ear height ranged from 19 inches for Xtra-Tender 270A to 34 inches for Mirai 302BC, and averaged 26 inches. Most varieties produced few small, or no tillers. Mirai 334BC produced many large tillers that could interfere with harvest.

Varieties that received the highest flavor ratings included bicolors Fantastic, Surpass, Obsession, and Holiday, followed by 274A and MX 350BC. Varieties rated as having the most tender pericarp were bicolors Triumph, Vision, Fantastic, Surpass, and MX 350BC, and yellows MX 148Y and Mirai 131Y. Varieties with the lowest flavor ratings included Cavalry, GSS 3186 and Double Up. Varieties rated as having the toughest pericarp were Cavalry and BSS 0977, followed by GSS 3186 and Double Up.

Many varieties in this trial are promising. Among the bicolors harvested 70 to 73 DAP, Fantastic ranked highest in tip fill, overall appearance, emergence and early vigor, and shared with 274A a flavor rating of very good. For bicolors harvested 74 to 76 DAP, Mirai 302BC stood out with the longest ears, Mirai 301BC with the best emergence, Surpass with the largest number of ears, attractive appearance, very good flavor and tender pericarp, and Optimum with very good overall appearance but low emergence. Of the bicolors harvested 77 to 78 DAP, Holiday had the largest ears, and ranked highest for overall appearance, and had a very good flavor. Obsession produced the most ears and also had very good flavor. Of the yellow varieties trialed, Vision had the best overall appearance and flavor. 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, and plant characteristics of supersweet (sh2 and augmented sh2) sweet corn in Northern Indiana, 2006.

Cultivar	Co.*	Color	Days to	Days to	GDD to	Yield of Marketable		Average	Ear	Ear	Husk	Husk	Tip Fill	Overall	Emergence	Early	Late	Plant Ht.	Ear Ht.	Shank	Flag	Tillers	Flavor	Pericarp
			Harvest (predicted)	Harvest (actual)	Harvest ***	Ears	(ton/A)	Ear Weight (lb)	Length (in)	Diameter (in)	Cover (1-5)#	Tightness (1-3)#	(1-5)#	(1-9)#	(%)	(1-9)#	(1-9)#	(1-3)#	(in)	(in)	Length (in)	Leaves Short, Medium or Long	(1-5)#	Poor, Medium, Good, Very Good
			(DAP)**			(doz/A)	(ton/A)	(lb)	(in)	(in)	(1-5)#	(1-3)#	(1-5)#	(1-9)#	(%)	(1-9)#	(1-9)#	(1-3)#	(in)	(in)				
Xtra-Tender270A	JS	BI	71	70	1416	1452	6.0	0.69	7.7	1.92	2.1	1.0	3.7	4.7	74	7.7	5.3	1.0	18.9	3.1	M-L	2.3	M	ST
Double Up	SY	BI	73	72	1461	1581	7.7	0.81	8.4	1.89	2.3	1.0	4.3	5.7	77	7.0	5.3	2.0	23.7	4.8	M	1.0	M	T-VT
274A	ST	BI	74	72	1461	1533	8.1	0.88	7.7	1.99	4.3	1.3	3.5	6.7	65	6.7	7.0	1.0	21.8	5.7	L	1.3	VG	ST
Fantastic	ST	BI	75	72	1461	1533	6.9	0.75	7.4	1.90	3.0	1.0	5.0	7.3	90	8.0	6.7	1.7	23.1	4.6	L	1.3	VG	ST-NT
Mirai 334BC	CE	BI	73	73	1481	1484	7.2	0.80	8.1	1.96	3.7	1.3	4.3	7.0	87	7.7	5.7	1.7	21.9	4.2	L	4.7	G	T
Triumph	ST	BI	77	73	1481	1468	7.2	0.82	7.4	1.82	2.7	1.7	5.0	7.0	87	7.7	7.0	1.3	24.3	5.2	L	1.3	G-VG	N-ST
Mirai 308BC	CE	BI	71	74	1504	1468	6.6	0.75	7.6	1.92	3.0	1.0	4.7	6.5	75	6.0	5.7	1.7	24.6	5.6	M	1.7	G	T
Mirai 302BC	CE	BI	74	75	1529	1452	7.7	0.89	8.1	1.97	3.6	1.3	3.2	6.5	72	4.7	6.3	3.0	33.9	4.2	S-M	2.7	G-VG	ST-T
Mirai 301BC	CE	BI	76	75	1529	1549	8.6	0.93	7.7	2.03	3.9	1.3	4.4	7.0	83	6.7	6.0	2.7	28.7	6.0	M	1.7	G-M	ST-T
Optimum	CR	BI	78	75	1529	1387	6.4	0.77	7.2	1.90	4.8	2.0	4.3	8.0	56	5.0	6.0	2.3	22.7	4.7	L-M	2.3	G	ST
Surpass	CR	BI	78	76	1550	1613	7.6	0.79	7.5	1.77	4.9	2.0	3.8	8.0	70	5.7	6.3	2.0	22.1	5.9	M	2.0	VG	ST-NT
MX 350BC	CE	BI	78	76	1550	1162	5.6	0.80	7.7	1.83	3.9	2.3	3.8	6.7	62	5.3	7.7	2.3	25.8	3.6	M	1.7	VG	ST
BSS 0977	SY	BI	78	77	1569	1484	6.2	0.70	7.2	1.74	3.2	1.0	3.6	6.3	84	8.0	8.3	3.0	31.3	5.5	M	1.3	G-M	VT
Cavalry	HM	BI	82	77	1569	1484	6.4	0.72	7.4	1.83	2.8	1.3	4.3	7.0	77	6.3	7.3	3.0	32.1	4.3	S-M	3.3	M	VT
Obsession	RU	BI	79	78	1591	1581	8.4	0.89	7.9	1.90	2.8	2.0	3.6	7.3	79	6.0	7.3	3.0	28.6	4.9	M	1.7	VG	ST
Holiday	CR	BI	84	78	1591	1404	7.0	0.84	8.0	1.96	3.3	2.0	4.1	7.5	79	6.0	6.7	2.7	30.1	5.1	M	1.0	VG	T-ST
Vision	ST	Y	75	72	1461	1468	6.8	0.77	7.3	1.90	3.6	1.0	4.8	8.0	82	6.7	5.3	1.7	22.3	5.1	L	1.7	G-VG	N-ST
Mirai 131Y	CE	Y	71	74	1504	1307	6.3	0.80	8.3	1.97	2.3	1.0	4.0	6.3	46	5.7	6.0	1.3	25.3	4.2	M-S	3.0	G	ST
MX 148Y	CE	Y	72	74	1504	1565	7.5	0.80	8.4	1.89	2.4	1.0	3.9	6.7	86	7.3	7.3	1.7	26.4	4.6	S-L	1.7	G	ST
GSS 3186	SY	Y	79	77	1569	1420	6.7	0.78	7.5	1.82	2.8	1.0	3.6	6.7	75	5.0	7.3	3.0	31.8	5.0	M	1.7	M	T-VT
Grand mean						1470	7.0	0.80	7.7	1.90	3.3	1.4	4.1	6.8	75	6.5	6.5	2.1	26.0	4.8	-	2.0	-	-
LSD .05†						196	0.9	0.07	0.3	0.07	-	-	-	-	14	-	-	-	2.5	1.1	-	-	-	-
r ² for regression vs DAP††						ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	0.26	0.41	0.72	0.59	ns	-	ns	-	-

*Seed Source: CE=Centest, CR=Crookham, HM=Harris Moran, JS=Johnny's Selected Seeds, RU=Rupp, ST=Stokes, SY=Syngenta.

**DAP: days after planting. Predicted maturity is from seed supplier.

***GDD: corn growing degree days.

#Husk cover, tip fill: 1 (worst) to 5 (best). Husk tightness: 1 (loose) to 3 (very tight). Overall and plant vigor: 1 to 9; 2=poor (weak), 5=acceptable, 8=good (vigorous). Plant height: 1= <5 ft., 2=5-6 ft.; 3= > 6 ft. Tillers: 1=no tillers to 5=many large tillers.

†Means differing by more than this amount are significantly different at P<0.05. - AOV not performed.

††r² is the proportion of variability explained by harvest date. NS=regression not significant at P<0.05.