

Supersweet Sweet Corn Cultivar Evaluation for Northern Indiana, 2005

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The Indiana Agricultural Statistics Service reports that sweet corn for fresh market sales was harvested from 5,400 acres in Indiana in 2004 and had a total value of \$11 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. Fertilization, insect, and weed management followed standard recommendations for the area. 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 23, 2005 and later thinned achieve a population of 35 plants per 25 ft of row (20,328 plants/A). Irrigation was applied through overhead sprinklers as needed. Each plot was harvested when corn reached marketable stage. Emergence was recorded on June 7 and 16, before thinning. Plant vigor and uniformity of plant age were rated using a 9-point scale on June 20. At harvest, 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. One ear per plot was evaluated for flavor and pericarp toughness. On Aug. 15 plants were rated for height, ear height, and tillering. 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 $P \leq .05$. Relationships between yield components, ear and plant characteristics, and average days to harvest were analyzed using linear regression.

Characteristic	Rating Scale				
Husk cover	5	4	3	2	1
	> 2 in. cover	1.25 – 2 in.	.75 – 1.25 in.	< .75 in.	ear exposed
Husk tightness around ear tip			3	2	1
			tight	firm	loose
Tip fill	5	4	3	2	1
	completely filled to tip of cob	filled nearly to tip (<.5 in. unfilled)	.5 to 1 in. unfilled	> 1 in. unfilled	> 2 in. unfilled
Flag leaf length			L	M	S
			8 to 12 in.	4 to 8 in.	< 4 in.

Results and Discussion. The 2005 growing season was unusually hot and dry. Irrigation did not entirely prevent drought stress. Results are presented in Table 1.

Emergence of sweet corn by June 16 ranged from 95% to 66%. Cultivars with the lowest emergence were Optimum, 726BC and Mirai 117Y. Varieties that appeared the most vigorous as seedlings included Double Up, 726BC, 274A and ACR 4033BC. Varieties that looked the least vigorous at that stage were Surpass and Mirai 002.

Yield of sweet corn ranged from 4.9 to 7.6 tons per acre and 1097 to 1484 dozen ears per acre. Most bicolor varieties did not produce significantly fewer ears than Obsession, the top-yielding variety. Exceptions were Fantastic and 726BC. Several yellow varieties produced yields lower than Obsession: Mirai 117Y, Vision, and Mirai 002. Yields were not correlated with days to maturity.

Ear length ranged from 7.6 to 8.5 in. and ear diameter ranged from 1.81 to 2.03 in. 726BC had the shortest, narrowest ears. 274A had the widest, and among the longest ears. Holiday, and the yellow varieties Mirai 131Y and Mirai 130Y had the largest ears at 8.5 in. long and a little less than 2 in. wide.

Husk cover ranged from poor (ear showing) to excellent (over 2 in. of cover). Tip fill ranged from 1 in. unfilled (rating of 3) to completely filled (rating of 5). Two varieties received ratings of 4 or better for both husk cover and tip fill: Surpass and Mirai 421W. Varieties that received ratings of 3 or better for both included bicolors Mirai 301BC, Optimum and Holiday, and the yellow GSS 0966. Overall ear quality ratings were high for Mirai 301BC, Optimum, and Mirai 421W. Varieties that received low overall ratings included bicolors Fantastic and 726BC and the yellow Vision.

Plant height ranged from under 5 ft. to over 6 ft, and was variable within plots. 274A was the shortest and Obsession and GSS 0966 were the tallest. Ear height, measured from the ground to mid-ear, ranged from 21 in. for 274A to 34 in. for Mirai 301BC, Mirai 421W, and GSS 0966. No varieties were rated as hard to pick. Shank length, measured from stalk attachment to base of the ear, varied from 3.5 in. for Mirai 130Y to 7.1 in. for Surpass. Most varieties produced some tillers, with the exception of Double Up and ACR 4033BC. Mirai 334 BC, Mirai 421W and Mirai 002 occasionally had tillers large enough that they might interfere with harvest.

Varieties that received flavor ratings of very good included the bicolors Fantastic, 726BC, and Optimum and yellows Vision and Mirai 002. Of these, Vision and Mirai 002 received the lowest ratings for pericarp toughness. All of these are augmented supersweets.

Few varieties in this trial performed well for all criteria. Of the bicolor varieties harvested within 75 days of planting, Fantastic had the best flavor but lowest yield and ear quality. Mirai 308BC had a good yield and better ear quality but flavor wasn't rated as high. In the next maturity group, 274A produced high yield of large ears. but ear quality was not high. Mirai 301BC had better ear quality, with smaller ears. Optimum was notable for good-tasting ears, decent yield and ear quality, but low emergence. Obsession had good emergence, yielded well and had acceptable ear quality, but husk cover was poor. Holiday had a high yield and long ears of reasonable quality, but flavor was not ranked as high as others. The lone white variety, Mirai 421W, performed quite well compared to others. Among the yellows, Mirai 131Y performed the best in terms of yield, producing large ears with good to very good flavor but only fair husk cover. Growers can use this information to inform their selection of varieties that are suited to their production system and markets.

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Table 1. Yield, ear size and quality, and plant characteristics of supersweet (sh2 and augmented sh2) corn in Northern Indiana, 2005.

Cultivar	Co.*	Color	Days to Harvest (predicted)	Days to Harvest (actual)	GDD to Harvest**	Yield of Marketable Ears	Average Ear Weight	Ear Length	Ear Diameter	Husk Cover	Husk Tightness	Tip Fill	Overall	Emergence	Early Vigor	Uniformity	Plant Ht.	Ear Ht.	Ease of Pick	Shank Length	Flag Leaves	Tillers	Flavor	Pericarp	
			(DAP)**			(doz/A)	(lb)	(in)	(in)	(1-5)#	(1-3)#	(1-5)#	(1-9)#	(%)	(1-9)#	(1-9)#	(1-3)#	(in)	Easy or Medium	(in)	Short, Medium or Long	(1-5)#	Poor, Medium, Good	Soft, Tough, Tough, Very Tough	
Double Up	SY	BI	73	73	1536	1436	6.4	0.75	8.1	1.81	2.2	1.1	4.4	3.0	92	5.7	8.7	2.7	28	E-M	3.9	S	1.0	P-M	T-V
Fantastic	SI	BI	73	73	1536	1178	5.6	0.80	7.9	1.92	1.6	1.0	4.4	2.7	87	4.7	5.7	2.0	26	M	4.1	M	3.0	VG	N-T
Mirai 308BC	CE	BI	71	74	1562	1404	6.2	0.74	7.7	1.92	2.6	1.3	4.7	4.7	83	4.0	7.7	2.0	27	E-M	5.5	M	2.7	G	S-V
726BC	AC	BI	72	75	1579	1242	5.4	0.72	7.6	1.82	1.0	1.0	3.4	1.3	72	6.0	5.0	2.0	23	M	5.2	M-L	3.0	VG	S-V
Mirai 334BC	CE	BI	73	76	1601	1291	5.9	0.76	7.8	1.99	4.7	1.3	2.7	4.3	85	5.3	7.3	2.0	24	E-M	3.8	M-L	3.3	G-VG	S-V
ACR 4033BC	AC	BI	-	77	1623	1420	6.6	0.77	8.0	1.86	1.9	3.0	5.0	5.3	95	5.7	8.0	2.5	29	E-M	6.5	M-L	1.0	G	T-V
274 A	ST	BI	74	77	1623	1436	7.6	0.89	8.3	2.03	2.7	1.0	2.9	3.0	88	6.0	8.0	1.8	21	E-M	5.6	M	1.7	G-VG	N-V
Mirai 301BC	CE	BI	76	78	1647	1291	6.1	0.78	7.8	1.97	3.4	1.33	4.7	7.0	92	4.0	5.7	2.5	34	M	4.8	M	2.3	G-VG	S-V
ACR 4034BC	AC	BI	-	78	1647	1307	6.4	0.81	8.1	1.90	2.3	3.0	5.0	5.3	94	4.7	6.7	2.7	30	E-M	5.2	M	1.7	G-VG	V
Optimum	CR	BI	78	79	1673	1387	6.3	0.76	7.8	1.97	3.9	1.3	5.0	7.3	66	4.7	4.7	2.7	25	E	4.2	M	2.3	VG	S-T
Obsession	SI	BI	79	79	1673	1484	7.2	0.81	8.1	1.94	1.4	1.7	5.0	4.0	93	5.0	8.3	3.0	32	E-M	3.7	M	2.7	G-VG	T-V
Holiday	CR	BI	84	80	1696	1420	7.1	0.83	8.5	1.90	3.1	2.0	3.8	6.0	89	5.0	6.3	2.0	31	E-M	4.4	M	2.0	G-M	T-V
Surpass	CR	BI	78	80	1696	1323	6.2	0.78	8.2	1.85	4.0	1.7	4.2	5.7	81	3.3	7.7	2.7	25	E-M	7.1	M	1.7	G-VG	S-T
Mirai 421W	CE	W	72	80	1696	1339	6.8	0.85	8.0	1.97	4.0	2.0	4.8	7.0	95	4.0	5.7	2.3	34	E-M	4.5	M-L	3.3	VG-G	N-S
Mirai 117Y	CE	Y	71	73	1536	1113	5.0	0.76	8.1	1.92	2.0	2.0	4.7	3.7	73	4.7	7.0	2.0	28	M	4.7	M	2.3	G	T-V
Mirai 131Y	CE	Y	71	74	1562	1420	6.4	0.76	8.5	1.90	1.8	1.0	4.0	3.0	90	5.3	6.3	2.0	30	E-M	3.8	S-M	2.3	VG-G	N-T
Mirai 130Y	CE	Y	72	75	1579	1291	5.7	0.74	8.5	1.96	2.2	1.7	4.4	4.3	76	4.3	4.7	2.2	30	E-M	3.5	S-M	2.0	VG-G	S-T
Vision	ST	Y	75	76	1601	1097	5.2	0.80	7.9	1.98	1.2	2.0	4.6	1.7	89	4.0	6.3	2.2	25	E	3.9	M-L	2.7	VG	S
Mirai 002	CE	Y	76	78	1647	1097	4.9	0.75	7.6	1.86	2.8	1.3	4.8	6.3	80	2.3	4.0	2.7	31	M	4.0	L	3.3	VG	N-S
GSS 0966	SY	Y	78	81	1717	1258	5.6	0.75	7.7	1.83	3.0	2.0	5.0	6.0	86	4.0	5.3	3.0	34	E-M	5.2	M	2.3	M-G	V
Grand mean						1312	6.1	0.78	8.0	1.91	2.6	1.6	4.4	4.6	85	4.6	6.5	2.3	28	-	4.7	-	2.3	-	
LSD .05†						197	0.9	0.07	0.3	0.11	-	-	-	-	7	-	-	-	2.6	-	1.0	-	-	-	
r ² for regression vs DAP††						ns	ns	ns	ns	0.27	-	ns	0.49	ns	ns	ns	ns	ns	ns	ns	ns	-	-	-	

*Seed Source: AC=Abbott & Cobb, C=Centest, CR=Crookham, SI=Stegers, ST=Stokes.

**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, plant vigor, uniformity: 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.