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Sugar-enhanced Sweet Corn Cultivar Evaluation for Northern Indiana, 2003

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Twenty-two sweet corn cultivars including homozygous se, heterozygous se, and mixed se and sh2 genetics were evaluated at the Pinney-Purdue Ag Center, Wanatah, IN.

Materials and Methods. The trials were conducted on a Tracy Sandy Loam, fertilized in fall 2002 with 90 lb./A K₂O from 0-0-60 and before planting in spring 2003 with 100 lb./A N from urea. 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 19, 2003. Force 3G was applied at planting to control corn rootworm larvae. On June 5 seedling vigor was rated and on June 12 final emergence was recorded. Plants were thinned to achieve a population of 35 plants per 25 ft of row (20,328 plants/A). Weeds were controlled with a preplant application of Atrazine and Dual II, followed by a single cultivation and handweeding. Irrigation was applied through overhead sprinklers as needed. To control European corn borer Pounce 3.2EC was applied on Aug 1. Over 1.3 in. rain in mid-July followed by wind caused some leaning of corn plants. Lodging was rated on July 22. Each plot was harvested when corn reached marketable stage and the number and weight of marketable ears were determined. Three ears from each plot were used to evaluate degree of husk cover, degree of tip fill, overall attractiveness, and average ear diameter and length after husking. On August 11, plants were rated for height, ear height, tillering, and plant vigor. Quantitative data were analyzed using ANOVA followed by mean separation using Fisher's protected least significant difference at $P \leq .05$. The relationships between yield components and average days to harvest were analyzed using regression analysis. For other data means are presented.

Results and Discussion. Predation by thirteen-lined ground squirrels decreased plant stand by more than 60% in the first replication and so data from only two replications are presented here. Emergence ranged from 57% to 91%, but did not differ significantly among the varieties (Table 1). The number of marketable ears ranged from 895 to 1645 dozen per acre. Among the bicolors (bi), HMX 0351 and CSYBF1-27 were the two top-producing lines, followed by Providence and CSYBF1-24, which were also in the top 25%. CSYBF1-15 was the only yellow (y) in the top 25%, and none of the yellow lines differed from one another. Yield ranged from 72 to 162 cwt./A. CSYBF1-24, CSYBF1-27, Brocade and Providence (all bi) were in the top 25% and differed significantly from the eight lower-yielding bicolors. Incredible was the only yellow in the top 25% and yielded more than Welcome, but did not differ from other yellow varieties. Unhusked ear weight ranged from 0.51 to 0.88 lb., ear length from 6.9 to 8.6 in., and ear width from 1.6 to 2.1 in. Brocade (bi) was the only variety among the top 25% for all three ear size measurements. CSYBF1-24 and CSYBF1-27 (both bi) were among the top 25% for weight and width, and CSYBF1-27 (bi) was significantly wider than any other line. Incredible (y) was among the top 25% for length and width. Honey Select (y) was similar in size to Incredible. Tuxedo (y) was similar in length and weight to Incredible, but was significantly narrower. CSYBF1-16 (bi), CSYBF2-46 (bi) and Welcome (y) were among the bottom 25% for all size measurements. The number of ears per acre, yield, and ear size were related to maturity. Earlier varieties produced lower yield and fewer and smaller marketable ears. Several varieties performed better or worse than would be expected based on maturity dates. HMX 0351 (bi) produced more ears and greater yield, and Navajo (bi) produced fewer ears and lower yield than expected for an 81-day maturity. Mystique and Chippawa (bi) also produced fewer ears than expected, Colonial (bi) produced lower yield, and CSYBF1-15 (y) produced more ears than expected based on their maturity dates. Brocade (bi) was larger, wider and heavier, Mystique (bi) was longer and heavier, and Bon Appetit and CSYBF1-27 (bi) were wider than expected based on their maturity dates. Tuxedo (y) was both longer and narrower than expected for a 76-day maturity. Welcome (bi) was shorter and lighter, Colonial (bi), was narrower and lighter, CSYBF1-24 and Accord (bi) were narrower, and CSYBF1-16 (bi) was lighter than expected based on their maturity dates. Varieties differed in degree to which the husk covered the ear. Most of the bicolors had good to excellent cover; only CSYBF2-46 had less than acceptable husk cover. Among the yellows, CSYBF1-15 had excellent husk cover and Incredible had poor husk cover. The degree to which kernels at the ear tip filled also varied among varieties. Bicolors with excellent to good tip fill included CSYBF2-46, Bon Appetit, HMX0351, Navajo, Accord, Providence, CSYBF1-16, and Luscious. Ambrosia had exceptionally poor tip fill. Among the yellows, Welcome and Honey Select had excellent tip fill and Incredible had poor tip fill. Overall appearance ratings were above average for bicolors Bon Appetit, Luscious, Navajo, Mystique and Brocade. Ambrosia, Chippawa and Colonial received the lowest ratings. Yellow varieties were all rated as average or slightly below, except for Incredible which was not considered attractive. Considering yield and appearance, the most promising varieties or lines included bicolors Bon Appetit, HMX0351, Brocade and Providence. Among the yellows, Tuxedo, which was in the trial as a standard, looked the most promising, but Honey Select also looked good.

Table 1. Yield, ear size and quality, and plant characteristics of sugar-enhanced sweet corn in Northern Indiana, 2003.

Cultivar	Co.*	Color	Days to Harvest	GDD to Harvest**	Yield of Marketable Ears		Average Ear Weight	Ear Length	Ear Diameter	Husk Cover	Tip Fill	Overall	Emergence	Lodge	Plant Ht.	Ear Ht.	Tillers	Vigor, 8/11	Vigor, 6/5
			(DAP)**		(doz/A)	(cwt/A)	(lb)	(in)	(in)	(1-9)#	(1-9)#	(1-9)#	(%)	(1-9)#	(1-3)#	(1-6)#	(1-5)#	(1-9)#	(1-9)#
CSYBF2-46	CR	BI	78	1270	1283	79	0.51	7.0	1.60	4.0	9.0	5.0	80	1.0	1.0	1.0	2.0	5.0	5.5
Bon Appetit	MM	BI	81	1326	1404	120	0.71	7.0	1.88	9.0	9.0	7.5	64	3.0	2.8	2.3	1.0	4.5	3.5
CSYBF1-16	CR	BI	81	1326	1452	90	0.52	7.1	1.60	9.0	7.3	4.5	71	2.5	2.0	1.8	1.0	4.5	3.5
HMX0351	HM	BI	81	1326	1646	144	0.73	7.7	1.77	9.0	8.8	5.5	84	2.0	3.0	2.3	3.0	5.0	6.0
Navajo	ST	BI	81	1326	895	72	0.67	7.0	1.75	9.0	8.7	6.0	66	3.0	2.8	2.0	1.0	3.0	3.5
Luscious	MM	BI	84	1379	1210	112	0.76	7.4	1.85	9.0	7.2	6.5	57	2.5	3.0	2.3	1.0	4.5	2.5
Mystique	SW	BI	85	1397	1016	107	0.88	8.3	1.81	8.0	6.8	6.0	74	3.0	3.0	3.0	1.0	5.0	4.5
Ambrosia	CR	BI	88	1465	1355	121	0.74	8.2	1.92	7.7	2.8	3.0	62	2.5	3.0	3.0	1.0	5.0	4.0
Brocade	MM	BI	88	1465	1525	157	0.86	8.6	1.96	8.3	5.7	6.0	81	1.5	3.0	2.8	1.0	5.0	5.0
Chippawa	ST	BI	88	1465	1258	112	0.75	7.7	1.79	5.0	4.0	3.5	66	2.5	3.0	3.0	1.0	5.0	4.0
Accord	MM	BI	90	1507	1428	136	0.80	7.5	1.85	5.7	8.2	4.5	78	1.5	3.0	2.8	1.3	5.0	4.0
Colonial	SY	BI	90	1507	1331	109	0.69	8.2	1.71	8.8	5.5	3.5	79	4.0	2.3	2.8	1.3	6.0	5.5
Precious Gem	MM	BI	91	1542	1500	147	0.82	8.1	1.90	7.5	5.3	5.0	64	2.0	3.0	2.8	1.0	5.0	3.0
Providence	SY	BI	91	1542	1621	156	0.80	8.5	1.73	8.3	7.8	4.0	85	1.0	2.8	2.3	1.0	5.5	5.5
CSYBF1-12	CR	BI	92	1559	1452	130	0.75	8.0	1.94	6.5	6.8	4.0	58	1.0	2.0	2.3	1.0	5.0	4.0
CSYBF1-24	CR	BI	92	1559	1597	162	0.85	7.7	1.96	9.0	5.2	5.5	91	1.0	2.5	2.5	1.8	5.0	4.0
CSYBF1-27	CR	BI	92	1559	1646	161	0.82	8.3	2.13	6.5	5.8	4.0	69	2.0	3.0	3.5	2.3	6.0	4.5
Welcome	MM	Y	83	1355	1379	94	0.57	6.9	1.65	7.7	9.0	4.5	61	4.0	2.0	2.0	1.0	4.0	3.5
CSYYF1-15	CR	Y	84	1679	1621	131	0.67	7.9	1.67	9.0	5.3	4.0	71	1.5	3.0	2.8	1.0	5.0	4.5
Tuxedo	MM	Y	86	1416	1500	130	0.72	8.4	1.65	5.8	9.0	5.0	76	1.5	3.0	2.0	1.0	5.0	3.5
Honey Select	SY	Y	93	1578	1549	144	0.77	8.4	1.90	6.2	4.5	4.0	69	2.0	3.0	2.8	1.0	6.0	3.5
Incredible	RI	Y	94	1599	1525	147	0.81	8.5	1.98	3.2	2.5	2.5	67	2.5	3.0	4.0	1.0	6.5	3.5
Grand mean					1418	126	0.74	7.8	1.82	7.4	6.6	4.7	71	2.2	2.7	2.5	1.3	5.0	4.1
LSD .05†					312	33	0.10	0.5	0.11	-	-	-	NS	-	-	-	-	-	-
r ² for regression vs DAP††					0.18	0.54	0.48	0.54	0.45										

*Seed Source: CR=Crookham, HM=Harris Moran, MM=Mesa Maize, RI=Rispens Seeds, ST=Stokes, SW=Seedway, SY=Syngenta.

**DAP: days after planting.

***GDD: corn growing degree days.

#Husk cover, tip fill, overall, plant vigor: 1 to 9 scale; 2=poor (weak), 5=acceptable, 8=good (vigorous). Height: 1= <5 ft., 2=5-6 ft.; 3= > 6 ft.. Ear Ht. 1= < 12 in. to 6= >36 in.; Tillers: 1=no tillers to 5=many large tillers. Lodging: 1=no lodging; 9=maximum lodging.

†Means differing by more than this amount are significantly different at P≤.05. NS=Cultivar effect not significant.

††r² is the proportion of variability explained by harvest date.