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Elizabeth T. Maynard

Purdue University - Main Campus, emaynard@purdue.edu

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Sugar-enhanced Sweet Corn Cultivar Evaluation for Northern Indiana, 2006.

Elizabeth T. Maynard, Purdue University, Westville, Indiana 46391

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 eighteen sweet corn cultivars with homozygous se or mixed se and sh2 (synergistic) genetics 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. Tefluthrin (Force 3G) was applied at planting at labeled rate for control of corn rootworm larvae. To control moth larvae in ears, permethrin (Pounce) was applied on 7 and 31 July 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 22, 2006 and later thinned to achieve a population of 35 plants per 25 ft of row (20,328 plants/A). Planter problems led to over- or under seeding in a few plots; these were reseeded by hand and data are included in this report except for one of plot Honey Select. That plot was planted later than others, so harvest date, yield, emergence, and early vigor data for that plot were not included in analysis. Emergence was recorded 9 and 14 days after planting (DAP), before thinning. Plant vigor was rated using a 9-point scale 18 DAP and shortly prior to harvest. Prior to harvest 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. One ear per plot was evaluated for flavor. 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 92%. Twelve varieties with emergence greater than 91% did not differ significantly from the highest, Applause, at 98%. Three varieties with emergence below 90% did not differ significantly from the lowest, Brocade, at 83%.

Marketable yield averaged 8.5 tons per acre. Montauk, a bicolor, produced the highest yield of 10.9 tons per acre. The next highest yielding cultivars included the white Mattapoisett, bicolors Brocade and Manitou, and yellows Honey Select and Honey Treat. These produced between 9.8 to 9.2 tons per

acre and did not differ significantly from one another. The number of ears ranged from 1549 to 1694 dozen per acre, and averaged 1629. Thirteen varieties produced more than 1610 dozen ears per acre and did not differ significantly, including the bicolors Revelation, Polka, Valor, Reflection, BC 0805, Cameo, Navajo, Montauk, Manitou and Monomoy, and the yellows Honey Treat, Honey Select and Applause. Seven of , along with 4 others, also did not differ significantly from the variety that produced the fewest ears. Yield and average weight per ear were strongly correlated with days to harvest: later-maturing varieties tended to produce higher yield and heavier ears. Honey Treat yielded a little more than would be expected based on its harvest date, and Monomoy, Kristine and Gateway yielded less than would be expected based on their harvest dates.

Ear length ranged from 7.2 to 8.4 inches and diameter from 1.68 to 2.09 inches. The yellows Honey Treat and Honey Select had the longest ears. The bicolors Gateway, Montauk, BC 0805, Renaissance and Cameo, and the white Mattapoisett ranged in length from 8.0 inches to 7.8 inches and did not differ significantly from one another. Seven other bicolor varieties did not differ significantly from Reflection, which was the shortest. The widest ears included bicolors Montauk, Reflection and Brocade, the white Mattapoisett, and yellow Honey Treat, all wider than 2.00 inches. Bicolors Polka and Monomoy produced the narrowest ears. Ear length and diameter were both strongly positively correlated with days to harvest. Relative to expectations based on harvest dates, Honey Treat produced longer and wider ears, Reflection had shorter and wider ears, Manitou had shorter ears, and Gateway, BC 0805, and Monomoy had narrower ears.

Husk cover ratings averaged 3.9. Seven varieties had an average rating of 4 or above, meaning at least 1.25 inches of husk covered the ear tip: bicolors BC 0805, Renaissance, Montauk, Gateway and Monomoy, the white Mattapoisett and the yellow Honey Select. Husk cover was correlated with harvest date: later varieties tended to have better husk cover. Exceptions were Renaissance, with better husk cover, and Honey Treat, with poorer husk cover, than expected based on their harvest dates. Tip fill ratings averaged 4.2. Thirteen varieties had kernels filled to within at least ½ inch of the ear tip (a rating of 4); only Honey Select averaged more than 1 inch of unfilled kernels.

Shank length ranged from 2.8 to 7.7 inches, averaging 4.9. Brocade had the longest shanks, but did not differ from Mattapoisett or Honey Select. Shank length was correlated with days to harvest: later varieties tended to have longer shanks. Brocade and Renaissance had shanks longer than expected, and Gateway, Kristine, Reflection and Monomoy had shanks shorter than expected, based on their harvest dates.

Plant height ranged from under 5 ft. to over 6 ft. Both plant height and late season plant vigor were correlated with maturity. Later-maturing varieties tended to be taller and receive higher vigor ratings. Mattapoisett and Reflection had higher vigor ratings, and Brocade and Navajo lower vigor ratings, than expected based on their harvest dates. Ear height, measured from the ground to mid-ear, ranged from 20.1 in. to 29.6 and was strongly correlated with harvest date: later varieties had higher ears. Ears of Brocade and Mattapoisett were higher, and those of Kristine and Cameo lower, than expected based on their harvest dates. Most varieties produced some tillers, and six produced enough tall tillers that they might interfere with harvest. Applause stood out because it produced very few tillers.

Varieties that received flavor ratings of very good, or good to very good, included Gateway, BC 0805, Kristine, Honey Select, Manitou and Monomoy. Honey Treat and Navajo received ratings of medium to poor for flavor.

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, and plant characteristics of synergistic and sugar-enhanced sweet corn in Northern Indiana, 2006.

Cultivar	Co.*	Color	Harvest (predicted)	Days to Harvest (actual)	GDD to Harvest ***	Yield of Marketable Ears (doz/A)	Average Ear Weight (lb)	Ear Length (in)	Ear Diameter (in)	Husk Cover (1-5)#	Husk Tightness (1-3)#	Tip Fill (1-5)#	Overall Emergence (%)	Early Vigor (1-9)#	Late Vigor (1-9)#	Plant Ht. (1-3)#	Ear Ht. (in)	Shank Length (in)	Flag Leaves Short, Medium or Long	Tillers (1-5)#	Flavor Poor, Medium, Good, Very Good		
																						(DAP)**	
Polka	CR	BI	70	67	1298	1678	6.6	0.65	7.3	1.68	3.3	2.0	3.9	7.0	92	6.3	4.0	2.0	20.1	4.7	M-S	3.0	M
Revelation	HM	BI	66	70	1379	1694	7.9	0.78	7.4	1.97	3.3	1.7	3.9	7.3	97	8.0	5.3	1.7	21.8	2.8	M	4.7	G-M
Navajo	ST	BI	67	70	1379	1629	8.4	0.86	7.5	1.97	3.7	1.3	4.4	5.0	88	7.7	4.0	2.3	24.1	4.5	L-M	5.0	M-P
Valor	CR	BI	72	70	1379	1678	7.6	0.75	7.4	1.88	3.6	1.7	4.8	8.0	90	7.3	5.3	2.7	20.7	4.1	M-L	4.7	M
Reflection	HM	BI	72	72	1434	1662	8.2	0.82	7.3	2.06	3.6	2.0	4.3	7.3	87	7.3	7.3	2.0	22.4	3.3	M	5.0	G
Monomy	RU	BI	76	72	1434	1613	6.6	0.68	7.4	1.76	4.2	2.0	4.9	8.0	97	8.0	6.0	2.0	22.6	3.3	M-S	3.7	G-VG
Renaissance	HM	BI	70	72	1434	1549	8.3	0.90	7.8	1.92	4.7	2.0	4.7	8.0	85	8.0	6.0	3.0	23.8	5.9	L-M	4.0	M
Kristine	CR	BI	80	72	1434	1597	7.5	0.78	7.4	1.92	3.8	1.3	4.0	7.5	96	8.0	6.0	2.0	21.9	3.7	S-M	3.7	G-VG
Cameo	CR	BI	84	72	1434	1629	8.5	0.86	7.8	1.94	3.7	2.0	4.1	7.3	95	8.3	6.3	3.0	21.6	5.2	L	2.7	G-M
Gateway	SY	BI	77	73	1461	1581	7.9	0.83	8.0	1.83	4.3	2.0	4.0	8.0	93	8.0	6.3	2.0	23.3	4.0	M-S	2.7	VG
Manitou	RU	BI	80	74	1479	1631	9.4	0.92	7.4	1.99	3.8	1.7	5.0	7.3	95	7.7	6.0	2.7	25.8	5.3	L-M	3.3	G-VG
Brocade	ST	BI	82	74	1479	1597	9.7	1.01	7.6	2.03	3.8	1.7	4.3	7.0	83	7.7	4.3	2.7	29.6	7.7	L	5.0	G
BC 0805	SY	BI	82	75	1499	1662	9.0	0.90	7.9	1.82	5.0	2.3	4.3	8.0	94	7.7	6.3	2.7	25.9	5.7	S	5.0	G-VG
Montauk	ST	BI	79	76	1522	1629	10.9	1.12	7.9	2.09	4.7	1.7	3.9	7.0	91	8.0	6.3	3.0	27.6	5.8	M	2.3	M-G
Mattapoisett	RU	W	80	75	1499	1581	9.8	1.03	7.8	2.03	4.8	2.3	4.7	7.5	92	8.0	7.7	3.0	29.4	6.9	M	2.3	M
Honey Treat	SY	Y	76	72	1434	1694	9.2	0.90	8.4	2.01	2.3	1.0	5.0	6.7	94	8.0	5.7	3.0	24.1	4.6	S-M	5.0	M-P
Applause	CR	Y	75	72	1434	1613	8.0	0.82	7.7	1.86	3.9	1.3	3.1	6.7	98	7.0	7.3	3.0	23.7	4.8	M	1.0	G
Honey Select	SY	Y	79	76	1522	1611	9.5	0.96	8.3	1.93	4.0	2.0	2.8	6.0	96	7.0	6.3	3.0	25.6	6.6	S-M	4.0	G-VG
Grand mean						1629	8.5	0.87	7.7	1.93	3.9	1.8	4.2	7.2	92	7.7	5.9	2.5	24.1	4.9	-	3.7	-
LSD .05†						84	0.80	0.07	0.3	0.08	-	-	-	-	6.8	-	-	-	2.5	1.0	-	-	-
r ² for regression vs DAP††						ns	0.6	0.66	0.31	0.23	0.34	-	ns	ns	ns	0.31	0.27	0.63	0.35	-	ns	-	-

*Seed Source: CR=Crookham, HM=Harris Moran, 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.