

TITLE OF PROJECT: Processing SH₂ sweet corn cultivar evaluations - Pillsbury 2006.

NAME OF CONTRIBUTOR(S) AND THEIR AGENCY: J.W. Zandstra and R.C. Squire, University of Guelph, Ridgetown Campus, Ridgetown, Ontario, NOP 2CO.

METHODS: Seven supersweet Pillsbury sweet corn cultivars were seeded on 19 May, and 16 June, 2006 on a Brookston clay loam soil on the Ridgetown College research farm. The corn was seeded at a population of 117,500 seeds/ (47,000 seeds/acre) and thinned to 58,750 plants/ha (23,500 plants/acre) when the corn was in the five leaf stage.

Weeds were controlled with a preplant incorporated tank mix of Dual plus Aatrex 480. Weed escapes were controlled with a post-emergent application of Accent and oil. Further weed escapes were controlled with cultivation and hand hoeing.

Nitrogen fertilizer was applied preplant at a rate of 110 kg/ha actual N. Phosphorous and potassium applications were based on soil analysis.

Corn insects were controlled with sprays of Sevin, Matador, Pounce, and Decis. There were a total of 6 insecticide sprays applied.

DATA COLLECTION: Four weeks after seeding, the number of plants per plot were counted to determine the percent plant stand, and ten plants were measured for extended leaf height.

Disease ratings were completed just prior to harvest. Smut incidence was low, so the number of infected plants per plot (70 plants) are given. Date of 80% silking was determined daily by counting the cobs with silks emerged. A rough harvest date was determined to be 18 days after 80% silk, which was fine tuned by determining the moisture content with a CEM Model AVC 80 moisture/solids analyser. The target moisture was 74-78%. From this data the number of days to maturity and the corn heat units were determined.

At harvest the following data was collected using the methodology described:

- a) Plant height - average height of 5 plants measured to the tip of the tassel.
- b) Cob height - average height of 5 plants measured to the base of the cob.
- c) Tillers - the number of tillers per plot (70 plants) taller than 30 cm.
- e) Tip cover - mean of 5 cobs evaluated on a scale of 1-5 where:
 - 1 = exposed 4 = 2.5 cm
 - 2 = just covered 5 = greater than 5.0 cm
 - 3 = up to 2.5 cm
- f) Shank - mean of 5 cobs rated on a scale of 1-5 where
 - 1 = 0-2.5 cm 4 = 7.5 to 10 cm
 - 2 = 2.5 to 5.0 cm 5 = greater than 10 cm
 - 3 = 5.0 to 7.5 cm
- g) Cob weight (husk on) = average weight of 10 marketable cobs with the husk on.
- h) Cob weight (husk off) = average weight of 10 marketable cobs with the husk off.

- i) Fresh kernel weight = average fresh weight of cut kernels from 10 marketable cobs.
- j) Husking percentage = husk weight/cob weight (husks on) * 100
- k) Processing recovery = kernel weight/marketable cob weight (husks on) * 100.
- l) Field recovery = processing recovery * % marketable cobs.
- m) Marketable yield - weight of cobs from the 2 centre rows which were greater than 5 cm diameter expressed as t/ha or T/ac
- n) Percent moisture

EXPERIMENTAL DESIGN AND DATA ANALYSIS: The trials were established in a randomized complete block design with four replications. A single plot consisted of 4 rows, 8 m in length with 75 cm between the rows. Prior to harvest, a 7.0 m section of the centre 2 rows was marked and used for harvest in order to eliminate the effect of edge plants. Data was collected on only the centre 2 rows.

The data was statistically analysed using analysis of variance for a randomized complete block design. A protected LSD was used to separate the treatments with significant differences. Means followed by the same letter do not differ significantly ($P \leq 0.05$, Duncan's New MRT). Data is sorted by descending marketable yields.

Trial	Tables	Planting Date
SWCN06-3	1-4	May 19
SWCN06-4	5-8	June 16

DISCUSSION:

Growing conditions in the summer of 2006 were very good for sweet corn production. Warm weather with timely rains resulted in good quality and yields. Insect pressure at Ridgeway was managed well with timely insecticide sprays, which was made easier due to OMAFRA insect traps near the plots. Weed control was poorer than previous years due to the rains and our reluctance to use herbicides with the potential for carryover. Raccoon and skunk damage was not present due to the use of electric fences.

Table 1. Plant stand, 4 week plant height, and maturity of supersweet processing sweet corn cultivars - Pillsbury early planting. University of Guelph, Ridgetown Campus, 2006.

Cultivar	Percent Plant Stand	Plant Height (cm)	Days to Harvest	Corn Heat Units
C 177	82 ab	31 a	82	1938
C 702	70 c	24 b	88	2066
C 703	81 ab	29.8 a	82	1938
C 707	75 bc	29.3 a	83	1961
C 107	86 a	32.2 a	83	1961
C 39	67 c	27.6 ab	83	1961
LSD	9.9	4.43	-	-
CV	8.53	10.15	-	-
P-value (0.05)	0.0054	0.0197	-	-

Table 2. Plant and cob characteristics of supersweet processing sweet corn - Pillsbury early planting. University of Guelph, Ridgetown Campus, 2006.

Cultivar	Plant Height (m)	Cob Height (cm)	Tillers per Plot (70 plants)	Tip Cover (1-5)	Shank (1-5)
C 177	2 bc	63 b	0.1 b	3 ab	3.1
C 702	2.1 ab	78 a	0.2 a	3.5 a	3.0
C 703	1.7 d	44 c	0 c	2.6 b	2.6
C 707	1.8 cd	61 b	0.1 bc	3.1 ab	3.4
C 107	2.0 bc	74 a	0.1 bc	2.7 b	2.8
C 39	2.2 a	81 a	0.2 a	3.4 ab	2.5
LSD	0.21	7.7	0.05	-	-
CV	6.94	7.62	34.69	-	-
P-Value (0.05)	0.0007	0.0001	0.0001	-	-

Table 3. Cob and processing characteristics of supersweet processing sweet corn - Pillsbury early planting. University of Guelph, Ridgetown Campus, 2006.

Cultivar	Cob Weight Husks On (g)	Cob Weight Husks Off (g)	Husking Percentage	Fresh Kernel Weight (g/cob)	Processing Recovery (%)	Field Recovery (%)
C 177	387 ab	283 bc	26.9 b	150.9 bc	39.0 bc	36.8 a
C 702	420 a	308 ab	26.5 b	178.3 a	42.6 a	38.8 a
C 703	404 ab	315 a	22.1 c	161.7 b	40.1 b	38.6 a
C 707	378 bc	269 cd	28.8 b	151.0 bc	39.9 b	37.1 a
C 107	346 c	250 d	27.7 b	142.2 c	41.1 ab	39.3 a
C 39	380 abc	256 cd	32.5 a	141.4 c	37.3 c	30.7 b
LSD	37.4	27.9	2.62	14.74	2.05	3.44
CV	6.43	6.62	6.35	6.34	3.41	6.2
P-Value (0.05)	0.0157	0.0006	0.0001	0.0007	0.0014	0.0009

Table 4. Yield parameters of supersweet processing sweet corn - Pillsbury early planting. University of Guelph, Ridgetown Campus, 2006.

Cultivar	Yield				Percent	Percent
	t/ha		t/ac		Marketable	Moisture
	Total	Marketable	Total	Marketable	Yield	
C 177	20.2 ab	19.1 a	9.0 ab	8.5 a	94.4 a	77.8
C 702	20.7 a	18.8 ab	9.2 a	8.4 ab	91.1 a	76.2
C 703	19.3 bc	18.5 ab	8.6 bc	8.3 ab	96.2 a	76.0
C 707	18.8 cd	17.5 ab	8.4 cd	7.8 ab	92.7 a	76.4
C 107	17.7 de	16.9 b	7.9 de	7.5 b	95.4 a	76.7
C 39	17.3 e	14.3 c	7.7 e	6.4 c	82.3 b	78.1
LSD	1.29	2.00	0.58	0.89	6.79	-
CV	4.51	7.58	4.51	7.58	4.9	-
P-Value (0.05)	0.0002	0.0011	0.0002	0.0011	0.0059	-

Table 5. Plant stand, 4 week plant height, and maturity of supersweet processing sweet corn cultivars - Pillsbury late planting. University of Guelph, Ridgetown Campus, 2006.

Cultivar	Percent Plant Stand	Plant Height (cm)	Days to Harvest	Corn Heat Units
C 39	74	20.7	89	2189
C 177	81	26.1	81	2018
C 702	73	22.5	84	2084
C 107	88	24.1	84	2084
C 703	84	28.1	76	1923
C 707	68	27.8	77	1944
LSD	-	-	-	-
CV	-	-	-	-
P-Value (0.05)	-	-	-	-

Table 6. Plant and cob characteristics of supersweet processing sweet corn - Pillsbury late planting. University of Guelph, Ridgetown Campus, 2006.

Cultivar	Plant Height (m)	Cob Height (cm)	Tillers per Plot (70 plants)	Tip Cover (1-5)	Shank (1-5)
C 39	2.0 a	74.4 a	0.1 a	4.0 b	2.3
C 177	2.0 a	61.8 c	0.1 ab	2.5 d	2.8
C 702	2.0 a	69.0 ab	0.1 a	4.8 a	2.1
C 107	1.9 a	64.8 bc	0.1 ab	3.3 c	2.0
C 703	1.7 b	39.3 d	0.0 b	2.5 d	2.6
C 707	1.9 ab	65.3 bc	0.0 b	1.6 e	2.5
LSD	0.20	6.40	0.09	0.58	0.53
CV	6.82	6.8	90.43	12.47	14.74
P-Value (0.05)	0.0222	0.0001	0.0309	0.0001	0.0703

Table 7. Cob and processing characteristics of supersweet processing sweet corn - Pillsbury late planting. University of Guelph, Ridgetown Campus, 2006.

Cultivar	Cob Weight Husks On (g)	Cob Weight Husks Off (g)	Husking Percentage	Fresh Kernel Weight (g/cob)	Processing Recovery (%)	Field Recovery (%)
C 39	411 a	304 a	25.9 bc	178.1 a	43.4 ab	38.3 a
C 177	377 ab	284 ab	24.9 c	157.9 b	41.8 bc	38.2 ab
C 702	408 a	294 a	28.1 ab	165.9 ab	40.7 c	33.8 bc
C 107	339 cd	260 c	23.5 c	152.3 b	44.8a	36.7 ab
C 703	371 bc	264 bc	28.7 ab	151.0 b	40.8 c	35.4 abc
C 707	322 d	226 d	29.8 a	128.9 c	40.0 c	31.8 c
LSD	33.5	22.3	2.99	14.45	2.18	4.06
CV	5.98	5.44	7.4	6.16	3.45	7.54
P-Value (0.05)	0.0002	0.0001	0.0029	0.0001	0.0021	0.0254

Table 8. Yield parameters of supersweet processing sweet corn - Pillsbury late planting. University of Guelph, Ridgetown Campus, 2006.

Cultivar	Yield				Percent	Percent
	t/ha		t/ac		Marketable	Moisture
	Total	Marketable	Total	Marketable	Yield	
C 39	19.2 a	17.0 a	8.6 a	7.6 a	88.3 ab	76.8
C 177	16.7 ab	15.2 ab	7.5 ab	6.8 ab	91.2 a	78.2
C 702	17.9 a	14.8 ab	8.0 a	6.6 ab	82.8 abc	78.8
C 107	16.3 ab	13.4 bc	7.3 ab	6.0 bc	81.8 bc	76.4
C 703	14.3 b	12.4 bc	6.4 b	5.5 bc	87.0 abc	78.2
C 707	14.2 b	11.3 c	6.3 b	5.0 c	79.0 c	78.3
LSD	2.83	3.17	1.27	1.42	7.76	-
CV	11.46	15.02	11.46	15.02	6.06	-
P-Value (0.05)	0.0108	0.0190	0.0108	0.0190	0.0402	-