

Report to the Oregon Processed Vegetable Commission  
1989

1. Title: Supersweet corn variety evaluations
2. Project Leaders: J. R. Baggett, Horticulture  
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3. Project Status: Terminating June 30, 1990
4. Project Funding by Commission for this Period:

Field trials (Baggett) - \$3,000.00  
Processing (Varseveld) - \$3,630.00

5. Objectives:

To determine the production and processing potential of new introductions of supersweet corn.

6. Report of Progress:

a) Multiple Harvest Date Trial

Five varieties of supersweet corn, considered promising for processing in Oregon, were grown in a replicated trial at Corvallis. These were Showcase (Rogers Brothers), GSS 3548 (Rogers Brothers), XPH 2659 (Asgrow), Supersweet Jubilee (Rogers Brothers), and Crisp 'n Sweet 710 (Crookham). Each variety was planted on May 31 in about 170 feet of row in each replication. Plants were thinned to approximately 10" apart. On six harvest dates (Table 1), 25 feet of each plot was harvested for field yield data and ear measurements.

Harvests were made once every two days, except that on weekends two days intervened between pickings for each variety. Thus, varieties picked on Friday were not picked Saturday and Sunday, and varieties picked on Saturday were not picked Sunday and Monday. First harvests were made as close to 78% moisture as could be achieved by early observation and preliminary moisture determinations. All moisture determinations were made by use of a microwave oven for sample drying.

Twenty ears from each replication, carefully selected for a uniform maturity typical for that harvest, were used for the field measurements, which included a measure of tenderness by means of a spring puncture gauge. The 20 ears were then delivered to the Food Science and Technology pilot plant for moisture and percent cut off determination and processing. All data on the processed samples will be presented in a supplementary report at a later date.

Patterns of moisture change for the five varieties are shown in Figure 1. Variations from the expected uniformly decreasing percent moisture can probably be attributed in part to changes in environmental conditions. Variation in selection of samples could also be involved even though there was great emphasis on selecting uniform samples representing typical maturity for the harvest day.

Although percent moisture generally decreased uniformly during the harvest period, most other factors were very erratic in the observed pattern of changes (Table 1). Sampling error, caused in part by variation in stands and other field conditions, was probably responsible for most deviation from expected patterns. Data for tons/acre, ear diameter, wt. per ear, percent cut off, and tenderness are graphically related to days from first harvest in natural form in Figures 2-6, and as regression lines which show general trends in Figures 7-11. Table 1 shows that good number of ears per acre increased through the harvest period in all varieties. At 78% moisture, there are usually some ears of supersweet corn varieties that are not mature enough to include as good ears. These ears become usable at lower moisture levels. Tip fill generally improves rapidly as moisture changes from 78% or above to about 76%. Yields increased by 2-4 tons/acre over the six harvests and the range of about 78% down to about 75% moisture.

Ear weight increased about .05 to .1 lb. except in Crisp 'n Sweet 710, which showed no increase at all over the six harvest dates. As in previous years, there was little or no increase in ear length, but ear diameter increased about 0.2 in. over the harvest period. Percent cut off typically increased by about 5%.

Tenderness measurements were quite inconsistent, showing distinct ups and downs. For example, varieties tended to have a peak of high readings (tougher pericarp) early in the harvest period and then show more tenderness later. This was probably due to changes in stress related to weather and/or irrigation. It has been observed that puncture test readings are higher in the afternoons than they are early in the morning.

#### Variety Behavior

Supersweet Jubilee was the highest yielding variety due to a large number of usable ears/acre. Individual ear weight was average, but percent cut off was highest in the trial. Tenderness readings were lower than those of Crisp 'n Sweet 710, but were not exceptional and were higher than in previous years.

Crisp 'n Sweet 710 had the heaviest ears and a percent cut off slightly lower than Supersweet Jubilee. Number of good ears/acre was lowest in the trial and this apparently resulted in some reduction in yield. Crisp 'n Sweet 710 had the highest pericarp puncture test readings.

XPH 2659 had the longest ears, good ear weight, percent cut off, and yield. Tenderness was fair. The long slender ears tended to be curved. In general performance, this variety appeared to deserve further trial unless the curved ears are considered to be a limiting factor.

Showcase appeared to be a variety which should be tried further. Yields were good at about 76% moisture (mean yield was lowered by the first harvest which was high in % moisture). Ear weight, ear diameter, and cut off percent were similar to Supersweet Jubilee, but ear length was slightly less. Tenderness scores were better than those of Supersweet Jubilee.

GSS 3548 did not perform as expected from 1988 preliminary observations. Although yield was acceptable, ear length appeared to be reduced by the cool season and is considered too short for processing use.

b) Observation Variety Trial

Two replications, 30 feet long, were planted for each of 37 supersweet varieties. At an estimated maturity of about 76% moisture, 22 feet of row was picked from each plot. In some cases, the two replications were picked on different days to better assure observation of the variety in the mid-maturity condition. Notes, yield estimates, and ear measurements are shown in Table 2. Ten of the varieties were processed for observation and panel evaluation. These are discussed below.

Only three of the processed varieties were yellow. These were FMX 280, FMX 284, and Sweet Season. FMX 280 had good tip fill and lacked taper but had only fair yield. FMX 284 yielded well, had good tip fill, and ear shape. FMX 284 and FMX 280 were both fairly tender. Sweet Season was fair in yield, not outstanding in appearance, and was tough.

Of the varieties observed, many of the best for ear type and yield were white or bicolor types. Seven of these were processed because of the possibility that their types may eventually be commercially canned or frozen in Oregon. Eating quality of some white and bicolors is known to be outstanding. For example, Honey 'n Pearl is now reputed to be the leading fresh market corn in Japan. Other promising bicolors were BSS 3378 (good yield, tender, good flavor and ear type), Sunre 2629 (average yield, tender, good ear type), and XPH 2687 (good yield, slightly coarse but otherwise good type, somewhat tough). Promising white varieties included How Sweet It Is (good yield, tender, good refinement, good flavor), WSS 3686 (better than average yield, variable type and maturity, good flavor, fairly tender), and WSS 3680 (late maturity, large ears, tender, good yield, good flavor). Most other varieties observed generally lacked refinement, yield, or uniformity.

7. Summary

Five supersweet corn varieties were compared in a replicated trial harvested five times over a period of 12 days. Yield in ears/acre and tons/acre, ear weight, ear diameter, cut off percent, and pericarp toughness increased steadily over the harvest period, but ear length remained constant. Supersweet Jubilee was the best overall variety. Performance of a new variety, Showcase, should justify further trial and XPH 2659 should be further trialed, with reservations because the long ears are frequently curved. Most of 37 lines grown in observation plots were poor prospects for processing because of low yield, poor ear type, or apparent poor quality. Ten varieties, including several white and bicolor types, were processed for panel evaluation.

8. Signatures:

Submitted by:

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Project number \_\_\_\_\_

Date \_\_\_\_\_

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Table 1. Yield and ear measurements of supersweet (sh<sub>2</sub>) corn varieties on six harvest dates, Corvallis, Oregon, 1989<sup>1</sup>.

Variety	Harvest date	Plants/25 ft.	Percent moisture	No. <sup>2</sup> good ears	T/A good ears	T/A culls	Lbs./good ear	Ear length (in.)	Ear diameter (in.)	Percent cut-off	Tender- <sup>3</sup> ness
Crisp 'n Sweet 710	9-8	28	77.5	16.4	6.0	0.2	0.73	8.4	2.08	62.9	152
	9-11	28	75.4	19.2	6.9	0.5	0.73	8.6	2.08	63.5	162
	9-13	28	76.2	21.9	7.8	0.6	0.72	8.7	2.20	63.6	162
	9-15	28	76.0	21.2	7.8	0.5	0.74	8.5	2.15	65.1	154
	9-18	29	75.0	26.1	9.5	0.7	0.73	8.4	2.20	66.9	205
	9-20	28	74.4	21.1	7.7	0.8	0.73	8.5	2.20	67.2	188
	mean	28	75.7	21.0	7.6	0.5	0.73	8.5	2.15	64.9	171
Super-sweet Jubilee	9-9	28	77.2	26.6	7.1	0.4	0.54	7.7	1.88	62.8	123
	9-12	28	75.9	32.0	9.2	0.1	0.57	7.7	2.00	64.2	150
	9-14	29	75.1	34.0	8.8	0.4	0.52	7.7	2.00	67.5	121
	9-16	28	75.7	36.5	10.6	0.3	0.58	7.7	2.08	68.1	116
	9-19	28	75.0	33.8	10.5	0.7	0.62	7.9	2.10	68.7	144
	9-21	29	75.4	31.8	10.2	0.7	0.64	8.0	2.12	68.3	144
	mean	28	75.7	32.4	9.4	0.4	0.58	7.8	2.03	66.6	132
Showcase	9-9	28	78.9	19.8	5.6	0.9	0.57	7.6	1.92	62.1	109
	9-12	26	77.4	24.4	7.3	0.4	0.60	7.4	2.00	62.5	146
	9-14	31	77.1	25.3	7.7	0.8	0.61	7.5	2.05	63.9	108
	9-16	28	76.7	28.5	8.9	0.5	0.62	7.6	2.05	67.2	116
	9-19	28	76.3	27.7	9.2	1.3	0.66	7.7	2.12	67.0	130
	9-21	29	75.4	28.6	9.7	1.1	0.68	7.5	2.15	69.4	128
	mean	28	76.9	25.7	8.0	0.8	0.62	7.6	2.05	65.3	123
GSS 3548	9-7	29	78.1	18.6	4.5	0.1	0.48	7.1	1.90	49.3	133
	9-9	28	77.6	22.2	5.4	0.4	0.49	6.9	1.88	62.0	146
	9-12	28	75.8	28.6	7.3	0.3	0.51	6.9	2.00	60.6	145
	9-14	28	75.3	32.7	8.4	0.5	0.51	7.0	1.98	65.8	130
	9-16	28	75.2	36.9	9.6	0.2	0.52	6.9	2.02	66.9	136
	9-18	28	74.9	32.6	9.1	0.6	0.57	7.0	2.00	68.0	179
	mean	28	76.1	28.6	7.4	0.4	0.52	7.0	1.96	62.1	145
XPH-2659	9-11	30	78.5	25.3	6.6	1.0	0.52	8.8	1.82	58.8	145
	9-13	30	77.4	23.5	7.0	1.2	0.60	8.8	1.90	61.0	135
	9-15	30	76.5	26.9	8.0	0.4	0.60	8.6	1.90	64.8	143
	9-18	28	76.4	29.9	9.1	1.3	0.61	8.7	1.70	67.6	150
	9-20	28	75.9	30.4	9.6	1.3	0.62	8.5	2.00	69.9	161
	9-22	30	75.8	32.1	10.2	0.9	0.64	8.8	2.00	69.3	146
	mean	29	76.7	28.0	8.4	1.0	0.60	8.7	1.89	65.2	147
LSD 5% for variety means				2.4	0.6	0.2	0.03	0.1	0.03	0.4	2

<sup>1</sup>All values except % moisture are average of four replications; for ear length, ear diameter, and tenderness, the value used for each replication was the mean of 20 individual ear measurements.

<sup>2</sup>Number of ears/acre divided by 1,000.

<sup>3</sup>Comparative scale, determined by a Chantillion spring puncture gauge.