

PERFORMANCE OF SUPERSWEET CORN AND SWEET CORN VARIETIES FOLLOWING SEVERE HAIL

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Introduction

Sweet corn and supersweet corn varieties were evaluated for agronomic performance for processing in the Treasure Valley of Oregon.

Methods

Fourteen supersweet corn (Sh2) and 11 sweet corn (Su1) varieties were planted in separate trials. Each trial had a randomized complete block design with five replicates. The supersweet corn varieties were planted on April 29, 1998, and the sweet corn varieties on June 8 to avoid cross pollination between the two types. The seed had been treated with standard fungicide seed treatments applied by the respective companies. The two trials were conducted on an Greenleaf silt loam following soybeans. Twenty pounds of N and 100 lb of P₂O₅ were broadcast and plowed down in the fall of 1997. The field was worked into 30-in beds in the spring of 1998. Seed was planted at a 2-in depth using an Amalco Cone Seeder on a John Deere, 77 Flexi Planter. The trials were furrow-irrigated on alternate furrows immediately after planting to assure uniform emergence. Thereafter the field was irrigated as necessary.

A soil sample taken on April 30, 1998, showed a pH of 6.7, 2.2 percent organic matter and 110 lb/acre of available-N in the forms of nitrate and ammonium in the top two feet of soil. Nitrogen at 140 lb/acre was applied as water-run, urea-ammonium nitrate solution on June 25 to the supersweet corn and on July 17 to the sweet corn.

Emergence counts were made on May 6 and May 18 for the supersweet corn and on June 23 for the sweet corn. The supersweet corn plots were thinned on June 2 and the sweet corn plots were thinned on July 20 to 24,000 plants/acre (1 plant every 8.71 inches).

Starting on July 5, the silk stage was evaluated for 20 plants in one of the middle two rows of each plot in the first replicate. Varieties were considered to be at the mid-silk stage when 40 to 60 percent of the plants were silking. About 16 days after the mid-silk stage, ear samples from the border rows were taken and analyzed for moisture content to determine the stage of maturity. The target ear-moisture content for harvest was 78 percent for the supersweet corn varieties and 71 percent for the sweet corn varieties.

All ears in the central 15 ft of the middle two rows in each plot were picked and weighed. A 10-ear subsample was weighed, shucked, weighed, and evaluated for length, maximum diameter, diameter 6 in from the base, and kernel row number. Ear taper was calculated by the difference between the maximum diameter and the diameter at 6 in from the base. Ear taper is a descriptive measure of ear shape; the higher the ear taper, the less cylindrical the shape of the ear.

Degree-days were measured and calculated by a biophenometer (Omnidata International, Logan, UT) at the Malheur Experiment station.

Data were analyzed by analysis of variance. Means separation was determined by the protected least significant difference test.

Results and Discussion

Growing conditions in 1998 were unfavorable for crop growth. The season started with cool and wet weather. The month of May had 4.55 in of rainfall compared to the historic mean for the Malheur Experiment Station of 1.02 in. May had 29 percent fewer and June had 18 percent fewer growing degree days (50-86 °F) than the previous 10-year mean. On July 4 a severe hail storm caused heavy damage to crops at the Malheur Experiment Station. The supersweet corn was at the tasseling stage, suffered from shredded leaves and did not reach full stature. Total yields were reduced by 57 percent compared to the 1995 to 1997 average (Table 1). Before the hail the sweet corn was about 12- to 18- in tall. After the hail the sweet corn appeared to be 90 percent missing, yet it regrew from the stubs in the ground and made substantial growth despite the damage, but yields were reduced by 42.2 percent compared to the 1995 to 1997 average (Table 1). Plant populations for the sweet corn after the hail and after thinning averaged 23,830 plants/acre.

Supersweet corn. Emergence started on May 4. Varieties Assure and Sheba were among those with the highest stands on the first count, May 6 (Table 2). Final stand counts on May 16 ranged from 85 to 96 percent and averaged 93 percent. An experimental Asgrow variety (EXH8414657) and Marvel were among those with highest stands on May 18. Yields of unhusked ears ranged from 3 to 7 tons/acre (Table 3), down 57.1 percent from the 1995-1997 average (Table 1). Assure, XPH3084, and Trigger were among those with the highest yields. HMX3392, Assure, and HMX5375 were among those with ears with the least taper (most cylindrical ears).

Sweet corn. Emergence started on June 16, and plant stands ranged from 76 to 93 percent on June 23 (Table 4). Yields of unhusked ears ranged from 5 to 7 tons/acre, down 42 percent from the 1995 to 1997 average (Table 1). Beretta, GH 1861, and Golden Jubilee were among those with the highest yields. XPH8410357, Chase, GH 1861, and Golden Jubilee had ears among those with the least taper (most cylindrical ears).

Table 1. Total yield of unhusked ears over time for varieties entered in all years of the corn trial at the Malheur Experiment Station, Oregon State University, Ontario, OR, 1998.

Variety	Yield					Percent of 1995-1997 average
	1995	1996	1997	1995-1997 average	1998	
----- tons/acre -----						
Supersweet						
Sheba	11.0	10.4	10.3	10.6	4.8	45.4
Shaker	13.0	10.0	13.0	12	4.5	37.5
Marvel	13.1	11.0	12.0	12	5.1	42.4
Contender	11.2	9.9	11.5	10.9	5.1	46.9
Average	12.1	10.3	11.7	11.4	4.9	42.9
Sweet						
Excalibur	10.2	8.8	7.4	8.8	4.8	54.5
StylePak	9.9	7.5	7.6	8.3	5.1	61.2
Average	10.1	8.2	7.5	8.6	5.0	57.8

Table 2. Supersweet corn stand after April 29 planting with emergence starting on May 4, Malheur Experiment Station, Oregon State University, Ontario, OR, 1998.

Variety	Seed source	Stand count	
		May 6	May 18
----- % -----			
S.S. Jubilee	Novartis	1.4	87.4
GSS 9298	Novartis	29.0	94.9
HMX 5375S	Harris Moran	20.9	96.1
HMX 3392S	Harris Moran	20.4	84.8
Sheba	Asgrow	39.1	91.9
Shaker	Asgrow	6.6	91.5
EX 8414657	Asgrow	14.6	96.3
EX 8414667	Asgrow	14.5	95.1
XPH 3084	Asgrow	18.5	96.0
C & S 710A	Crookham	36.4	95.5
Assure	Crookham	42.4	90.8
Marvel	Crookham	22.3	96.4
Trigger	Crookham	36.4	94.0
Contender	Crookham	14.6	91.0
Average		22.7	93.0
LSD (0.05)		8.0	4.8

Table 3. Plant development, yield, and ear characteristics of supersweet corn varieties, Malheur Experiment Station, Oregon State University, Ontario, OR, 1998.

Variety	Seed source [†]	Days to mid-silk [‡]	Days to harvest [‡]	Degree-days to harvest [‡]	Yield [¶] tons/acre	Harvest date	Ear weight lb	Ear length ----- in -----	Ear diam.	Tapers [§]	Rows No.	Kernel moisture %
S.S. Jubilee	3	75	94	1535	4.1	Aug 6	0.48	7.7	1.9	0.39	16.7	76
GSS 9298	3	74	94	1535	3.3	Aug 6	0.46	6.9	1.9	0.36	17.1	77
HMX 5375S	2	71	94	1535	5.7	Aug 6	0.48	7.5	1.8	0.31	16.7	76
HMX 3392S	2	70	95	1564	5.8	Aug 7	0.49	8.2	1.8	0.23	15.3	77
Sheba	1	68	91	1454	4.8	Aug 3	0.42	7.7	1.9	0.73	14.4	76
Shaker	1	74	93	1505	4.5	Aug 5	0.41	7.7	1.8	0.47	16.0	74
EX 8414657	1	71	93	1505	6.3	Aug 5	0.43	7.2	1.8	0.39	16.2	75
EX 8414667	1	75	93	1505	5.6	Aug 5	0.40	7.4	1.8	0.38	16.2	73
XPH 3084	1	76	95	1564	6.6	Aug 7	0.44	7.3	1.8	0.46	16.7	79
C & S 710A	4	76	94	1535	4.0	Aug 6	0.48	7.6	1.9	0.39	16.6	76
Assure	4	68	95	1564	7.1	Aug 7	0.53	8.1	1.9	0.30	16.8	78
Marvel	4	70	93	1505	5.1	Aug 5	0.55	7.3	2.0	0.45	17.2	76
Trigger	4	67	95	1564	6.5	Aug 7	0.47	7.7	1.9	0.33	17.6	77
Contender	4	70	91	1454	5.1	Aug 3	0.50	7.4	2.0	0.53	15.9	76
Average		72	94	1523	5.3		0.47	7.6	1.9	0.41	16.4	76
LSD (0.05)					0.8		0.05	0.2	0.1	0.09	0.7	

[†]Sources: 1: Asgrow, 2: Harris Moran, 3: Novartis, 4: Crookham

[‡]From emergence.

[§]Maximum diameter minus diameter at 6 in from the base.

[¶]Yield of unhusked ears.

Table 4. Plant development, yield, and ear characteristics of sweet corn varieties, Malheur Experiment Station, Oregon State University, Ontario, OR, 1998.

Variety	Seed source [†]	Days to mid-silk [‡]	Days to harvest [§]	Harvest maturity	Stand on June 23	Plant population [¶]	Yield [#]	Harvest date	Ear weight	Ear length	Ear diam.	Taper [£]	Rows	Kernel moisture
				Degree-days	%	plants/acre	tons/acre		lb	---- in ----			No.	%
G. Jubilee	3	59	78	1,778	85.8	22,512	6.6	Sept. 1	0.47	8.8	1.6	0.12	14.2	69
GH 5023	3	57	74	1,683	89.2	24,463	5.6	Aug. 28	0.45	8.2	1.7	0.16	15.9	75
GH 1861	3	57	73	1,663	85.3	22,860	6.8	Aug. 27	0.55	8.6	1.8	0.12	15.5	67
Lumina	2	58	80	1,823	76.5	24,254	5.0	Sept. 3	0.76	9.0	1.9	0.17	17.9	74
Excalibur	2	57	81	1,847	90.2	23,766	4.8	Sept. 4	0.63	8.8	1.9	0.19	20.1	78
Beretta	2	57	74	1,683	76.8	23,000	7.0	Aug. 28	0.56	8.4	1.9	0.29	16.4	71
StylePak	2	59	80	1,823	87.3	23,697	5.1	Sept. 3	0.71	8.5	1.8	0.16	18.6	75
Chase	1	60	73	1,663	93.3	24,115	6.4	Aug. 27	0.60	9.3	1.9	0.12	16.4	68
Sequel	1	58	79	1,800	89.6	24,672	6.2	Sept. 2	0.80	8.6	1.9	0.17	15.7	74
XP8410377	1	57	78	1,778	81.2	24,742	6.5	Sept. 1	0.61	9.3	1.7	0.07	16.5	74
XP8410357	1	57	79	1,800	76.0	24,045	6.5	Sept. 2	0.74	8.3	1.9	0.22	16.0	73
Average		58	77	1,758	84.7	23,830	6.0		0.63	8.7	1.8	0.16	16.7	73
LSD (0.05)					13.6	NS	1.3		0.06	0.3	0.1	0.05	1.1	

[†]Seed sources: 1: Asgrow, 2: Harris Moran, 3: Novartis

[‡]From emergence.

[§]Degree-days (50 - 86 °F) from emergence.

[¶]After thinning

[#]Yield of unhusked ears.

[£] Maximum diameter minus diameter 6 inches from the base.