

STAND, YIELD AND OTHER CHARACTERISTICS OF sh2 HIGH SUGAR RETENTION SWEET CORN HYBRIDS PLANTED BY COMPENSATED RATE SEEDING¹

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Abstract. Seed of 'Iobelle' and 12 sh2 high sugar retention hybrids were drilled at varying distances in the row to compensate for different germinations (68 to 91%) to give projected plant populations of 22,800 per acre. Tests were planted in Rockdale, sandy and organic soils. Stands of the sh2 hybrids in Rockdale were equal to or better than from 'Iobelle' and yields of one sh2 hybrid, ES 505-2, was higher. Low vitality of 3 year old 'Florida-Sweet' seed which germinated in abnormally cold, wet sandy soil resulted in lower yield than 'Iobelle.' One experimental hybrid in this test also gave less yield. Although there were some differences in stand in the organic soil planting, there were no significant differences in yield in this test. Resistance of the experimental hybrids to Northern leaf blight was outstanding.

Sweet corn is a major vegetable crop in Florida with 57,400 acres harvested during the 1975-76 crop year (1). Over 32,000 of this came from the Everglades area and 13,600 from the lower southeast coast. The purpose of this study was to compare stands, yields, and other characteristics of several new high sugar retention hybrids on three different soils using compensated rate seeding.

Materials and Methods

Three experiments were conducted. The first was planted on Rockdale soil in the Homestead area on November 25, 1975. 'Iobelle,' the earliest hybrid, was harvested on March 2, 1976 and the rest on March 3. The second experiment was planted in sandy soil in the Delray area on January 12, 1976. 'Iobelle' was harvested in this experiment on April 11 and the rest on April 13. The third experiment was planted on February 5 and 6th on organic soil at the Belle Glade Agricultural Research and Education Center. 'Iobelle' was harvested on April 27 and the rest one day later. The experiments on Rockdale and sandy soils were located in commercial sweet corn fields with growers providing routine fertilization and culture.

On the Rockdale and organic soils, plots were single rows, 3 ft. apart and 20 ft. long with 15 ft. harvested for yields. On the sand, plots consisted of two rows one foot apart on beds 5.7 ft. from center to center with 7.5 ft. of each row being harvested for yields. Randomized complete blocks designs were used with 5 to 6 replications.

All seed were treated with a seed slurry treatment com-

prised of benomyl and captafol at 2 oz. a.i. each per hundred pounds (125 g per 100 kg). The 'Iobelle' and 'Florida-Sweet' seed had been previously treated commercially with captan-thiram.

Planting distances in the row (Table 1) were computed according to individual germination tests to give 22 plants per plot or approximately 22,800 plants per acre (2). This has been called "compensated rate seeding technique" (3).

Table 1. Germination, seed spacing and number of plants per plot at harvest for 3 sweet corn hybrid tests in south Florida, 1975-76 season.

Hybrid	Seed test germ. %	Seed spacing ins.	No. plants/plot*		
			Rockdale	Sandy	Organic
Iobelle	91	7.3	16.8 d	19.0 b	21.8 bcde
Fla. Sweet	80	6.4	19.0 cd	18.0 b	24.0 ab
ES 449F	81	6.5	20.2 bcd	17.8 b	24.7 a
ES 449H2	83	6.6	20.5 bcd	18.2 b	23.7 ab
ES 449H3	79	6.3	21.1 abcd	20.8 b	22.2 bcd
ES 449J	83	6.6	22.0 abc	18.4 b	22.2 bcd
ES 449K	86	6.9	22.6 abc	16.6 b	21.0 de
ES 449L	79	6.3	23.0 abc	19.2 b	23.8 ab
ES 449L2	93	7.4	25.8 a	17.4 b	21.8 bcde
ES 449M	78	6.2	23.7 abc	18.2 b	23.5 abc
ES 505-2 (A)	85	6.8	23.8 abc	—	—
ES 505-2 (B)	45	3/H-8 ^v	—	20.2 a	22.2 bcd
ES 506-2	80	6.4	24.4 ab	17.5 b	19.5 e
ES 507-2	68	5.4	24.4 ab	15.6 b	21.2 cde

*Means in each column followed by same letter are not significantly different from each other at 5% level (Duncan's multiple range test).

^vThree kernels per hill at 8 in. spacing and then thinned to one plant.

Germination of 'Iobelle' was taken from the tag on the commercial bag. Germinations for 'Florida-Sweet' and ES 449F were obtained from field emergence in an earlier fall test at Belle Glade. The 'Florida-Sweet' seed was 3 years old and the ES 449F 1 year old. The remaining hybrid seed lots were produced in Idaho in 1975 and their germination tests were based on the seed producing company tests on 8 50 kernel samples each. Because of insufficient seed of the 505-2 lot used for the Rockdale test, a different lot with low germination was used for the last two tests. In these tests it was planted at 3 kernels per hill and then thinned to one plant per hill after the plants were established.

All sh2 hybrids had one inbred parent line, 'Florida 56,' in common. This line is the seed parent for 'Florida-Sweet' and was used as the male parent for the experimental sh2 hybrids (4). All ES 449 hybrids were closely related line-cross or 3 way hybrids produced by crossing two closely related lines which show some hybrid vigor—Fa Ht 32B X Fa Ht 32C sublines—and using the resulting F₁ seed for seed parents.

Each hybrid was harvested once. Ears were graded U. S. Fancy (ears 6 inches or longer with less than one-fourth its length with unfilled tip) and U. S. No. 1 (5 to 6" with less than one-fourth its length with unfilled tip). Ear diam in the husk, husked ear length and diameter measurements were obtained from 10 marketable ears per plot.

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Results and Discussion

Stands of all hybrids were close to the desired 22 plants per plot or 22,800 plants per acre in the Rockdale and organic soils tests where soil temperatures and moisture were near optimum (Table 1). In the sandy soil, where soil moisture was high and soil temp much below optimum during the germination period, germination was lower than at the other 2 locations and stands below optimum. Cultivation also reduced some stands in this test and stand of 505-2, which had been planted at three kernels per hill and thinned to a single plant, was significantly better than for the remaining hybrids which had been planted to stand. There were no significant differences in stand between 'Iobelle' and 'Florida-Sweet' on the 3 soils and stands of almost all new hybrids were equal to or superior to both hybrids.

There were no significant differences in yields of U. S. Fancy grade and total marketable ears on the organic soil where yields were highest (Table 2). On Rockdale, yield of 505-2 was greater than from both 'Iobelle' and 'Florida-Sweet.' Yields of the 449 line-cross hybrids were equal to those from 'Iobelle' in both the sand and Rockdale tests with some exceeding those from 'Florida-Sweet.' Yield of Fancy grade ears from 'Florida-Sweet' tended to be lower than from 'Iobelle' on Rockdale soil and was significantly lower on the sand. Considering total yields, 'Florida-Sweet' yields were less than 'Iobelle' on both the sand and Rockdale.

'Florida-Sweet' ears were longest (Table 3) on the organic soil, 8.4", and about one inch longer than 'Iobelle' ears. There were no significant differences in length of ears from these two hybrids on the other two soils. Ears of the 505-2 hybrid were about a half-inch shorter than those from

Table 2. Yields of fancy and total marketable ears in crates per acre from 3 sweet corn hybrid tests in south Florida, 1975-76 season.*

Hybrid	Fancy yield/acre*			Marketable yield*		
	Rockdale	Sandy	Organic	Rockdale	Sandy	Organic
Iobelle	248 bcd	268 ab	393 ^y	255 bcde	268 ab	393 ^x
Fla. Sweet	176 d	156 d	393	176 b	156 d	395
ES 449F	297 ab	231 abcd	414	297 a	231 abc	414
ES 449H2	255 bcd	234 abcd	417	265 bcde	234 abc	425
ES 449H3	231 bcd	255 ab	384	235 bcdef	255 abc	385
ES 449J	268 abc	251 abc	395	268 bcd	251 abc	395
ES 449K	222 bcd	217 bcd	393	222 bcdef	217 abcd	393
ES 449L	209 cd	224 abcd	393	209 bcdef	224 abcd	393
ES 449L2	278 abc	217 bcd	395	278 abc	217 bc	395
ES 449M	180 d	214 bcd	414	180 e	214 bcd	417
ES 505-2 (A)	343 a	—	—	343 a	—	—
ES 505-2 (B)	—	292 a	390	—	292 a	393
ES 506-2	290 abc	177 cd	376	290 ab	177 cd	379
ES 507-2	215 cd	200 bcd	403	216 cdef	200 bcd	403
			N.S.			N.S.

*5 dozen/crate.

^yMeans in the same column followed by the same letter(s) are not significantly different at the 5% level by Duncan's multiple range test.

*N.S.: not significant.

Table 3. Average length and husked diam of marketable ears from three sweet corn hybrid tests in south Florida 1975-76 season.^y*

Hybrid	Ear length (ins.)			Ear diameter (ins.)		
	Rockdale	Sandy	Organic	Rockdale	Sandy	Organic
Iobelle	7.3 abc	7.7 ab	7.4 de	1.64 d	1.76 a	1.75
Fla. Sweet	7.7 a	7.8 a	8.4 a	1.78 a	1.56 b	1.82
ES 449E	7.3 ab	7.4 abc	7.5 de	1.70 abcd	1.70 ab	1.75
ES 449H2	7.1 bc	7.3 abc	7.5 de	1.74 abc	1.72 ab	1.78
ES 449H3	7.4 abc	7.3 abc	7.5 de	1.71 abcd	1.69 ab	1.76
ES 449J	7.1 bc	7.2 abc	7.6 cde	1.69 abcd	1.71 ab	1.75
ES 449K	7.2 abc	7.2 bc	7.8 bc	1.70 abcd	1.69 ab	1.76
ES 449L	6.9 c	7.5 abc	7.5 de	1.65 cd	1.71 ab	1.75
ES 449L2	7.0 bc	7.3 abc	7.5 de	1.70 abcd	1.66 ab	1.73
ES 449M	7.3 abc	7.3 abc	7.4 e	1.67 bcd	1.70 ab	1.76
ES 505-2 (A)	7.1 bc	—	—	1.74 ab	—	—
ES 505-2 (B)	—	7.0 c	7.5 de	—	1.66 ab	1.74
ES 506-2	7.3 abc	7.4 abc	7.9 b	1.72 abcd	1.72 ab	1.78
ES 507-2	7.3 abc	7.3 abc	7.7 bcd	1.66 bcd	1.65 ab	1.78

*Means in the same column followed by the same letter(s) are not significantly different at the 5% level by Duncan's multiple range test.

^yN.S.: Not significant.

'Florida-Sweet' on both Rockdale and on sand and about an inch shorter on organic soil. The 505-2 ear length was equal to 'Iobelle' ears on Rockdale and organic soils but three-fourths inch shorter on sand.

Husked ear diam of 'Florida-Sweet' was larger than 'Iobelle' on Rockdale, smaller than 'Iobelle' on sand, and equal on organic soil, but a trend to larger diam was noted on the organic soil. Ear diam of all ES 449 hybrids were similar to those of 'Florida-Sweet' in all three tests. A comparison of ear diam in the husk gave similar results except that there were no significant differences between hybrids on sandy soil and no differences between 'Iobelle' and 'Florida-Sweet' at any of the three locations.

Northern leaf blight infection, caused by *Helminthosporium turcicum* Pass., was light on the experimental hybrids and moderate to heavy on both the 'Iobelle' and 'Florida-Sweet' hybrids in both the Rockdale and sandy soil tests. No leaf blight infection was present on the organic soil test.

As of Mar. 1978, the U. S. Environmental Protection Agency has not yet approved the labeling request for benomyl on corn. Results of these tests indicate, however, that with an effective seed treatment, good stands and yields of sh2 hybrids can be obtained by the compensated rate seeding technique.

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