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HYBRID SWEET CORN STRAINS AND OTHER VARIETIES

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In the last few years there has been considerable interest among seed breeders and commercial growers of sweet corn in hybrid strains of this vegetable, chiefly on account of the unusual uniformity of size, shape and maturity of the ears. These hybrids are the result of crossing inbred strains of certain varieties of sweet corn as in the case of the hybrid Golden Cross Bantam, which is a product of crossing two inbred strains.

This circular gives a summary of tests of some of these hybrid sweet corn strains grown on the Station grounds at Corvallis and discusses the relative value of them in the commercial production of sweet corn.

Inbred crosses. Inbred strains of sweet corn are produced as follows: a plant of superior appearance is selected in the field as a whole and paper bags are placed over the ear of each plant before the silk appears. After the silk emerges and the tassel is shedding pollen, another bag is tied over the tassel and allowed to remain over night. The next day the protected silk is fertilized with pollen from the same plant by transferring the pollen from the tassel to the ear on the same plant. Next year the superior plants in the inbred rows are selected and are inbred again. After this inbreeding and selection is continued for several years, the plants grown from any one inbred ear are much more uniform in all characters than any open-pollinated variety. Each inbred strain is also different from all others.

Crossing inbreds is the next step, particularly to find a combination of inbreds that will give the best results. Single crosses of inbred sweet corn are made by planting alternate rows of a field with two inbred strains. The plants of one strain are detasselled and seed is saved from the detasselled plant. For producing hybrid sweet corn seed, therefore, it is necessary that there be a yearly continuation of breeding single inbreds and also of crossing these inbreds so that the hybrid seed may be of the first generation cross between the two inbred strains.

Double crosses are produced by taking first generation hybrids resulting from two single crosses which are then crossed together; therefore, a double cross strain will have four inbreds entering into it.

Top crosses. Some of the new strains of sweet corn are offered as top crosses. In growing a top cross an inbred is used as a male parent and the regular variety as a female, instead of using two inbreds as in the case of the regular hybrids previously described. In the case of the top cross, therefore,

only one of the parents is an inbred strain; consequently, there is liable to be more variation in the top crosses than the hybrids in which two inbreds are the parents.

Obtaining seed of hybrids. Growers of sweet corn hybrids who would be inclined to save some of the attractive, uniform ears for seed from their fields should consider the fact that the seed from the hybrid is not pure for the different characters of it except those characters that are common to both parents and, therefore, the plants grown from the second generation seed are variable, usually less vigorous and less productive than those of the individual parents of the first generation hybrids. A grower can not select seed from a crop of an inbred cross and expect to reproduce the same results as in planting newly crossed seed. It is, therefore, necessary for the sweet corn grower to go back to his seedsman each year for the necessary supply of hybrid seed.

Ordinary sweet corn seed costs about 17¢ a pound, and if ten to twelve pounds of seed are planted per acre, the cost of seed per acre would be between \$1.70 to \$2.04. Hybrid sweet corn seed is expected to cost about 40¢ per pound in 1934, thus entailing a cost of \$4.00 to \$4.80 per acre. This, therefore, is but an increase of \$2.30 to \$2.76 per acre. It is more than probable that the pronounced uniformity of the hybrid sweet corn would more than make up for the difference between the cost of the two lots of corn.

Sweet Corn Varieties and Strains

Variety	Length of ear In.	Diam. of ear In.	No. Rows Kernels	Mean Wt. of husked cob with P.E.* Grams ²	Production per acre green corn Lbs.
Kingscrost ¹	7.00	1.50	8	150 ± 2.83	3906
Golden Bantam	7.10	1.56	8	157 ± 4.51	3775
Spanish Gold	7.00	1.50	9% 14 rows 49% 12 rows 42% 10 rows	166 ± 5.32	3351
Golden Sunrise	8.25	1.88	6% 16 rows 24% 14 rows 54% 12 rows 16% 10 rows	258 ± 5.96	6423
Golden Cross ¹ Bantam	8.00	1.76	68% 12 rows 30% 10 rows 2% 8 rows	260 ± 4.02	7560

* Probable Error which, when subtracted from or added to the computed mean, marks off the limits inside of which it is an even chance that the true value falls. Note that the P.E. for both the hybrids Kingscrost and Golden Cross Bantam is comparatively low, indicating the greater uniformity of the characters of the individual ears. The P.E. for Golden Sunrise is comparatively high. This is further brought out by the variation in the ears as indicated by the differences in percentages of corn having a certain number of rows of kernels.

¹ Hybrid

² Approximately 28.5 grams per oz.

Kingscrot. A typically good ear of this early hybrid measured from 7 to 7 1/2 inches in length, with a diameter of 1.5 inches at the butt; strictly 8 row, being very uniform in this respect. The weight of ears was uniformly about 5 1/2 to 6 ounces. The low probable error in the tabulated data indicates the pronounced uniformity of this hybrid strain. Season early, being several days earlier than Golden Bantam.

Spanish Gold. There was considerable variation in this variety as shown by the high probable error in the tabulated data. Ears short to medium, the best type of ear being 6 to 7 inches long with a diameter of 1 1/2 to 1 3/4 inches. The average weight of the ears observed was approximately 6 ounces. There was considerable variation in the length of the ears from 5 1/4 to 7 1/8 inches, with a diameter varying from 1 1/2 to 2 inches at the butt. There was likewise a variation in the number of rows of kernels varying from 10 to 14. Of the ears observed 42% were ten rowed, 49% were twelve rowed, and 9% were fourteen rowed. Spanish Gold is not a hybrid inbred corn.

Golden Bantam. Ear medium long, averaging slightly over 7 inches, comparatively narrow, about 1.5 inches at the butt, strictly eight rowed, although there were 11% or so of ten row ears but none smaller than eight rows and none larger than ten rows. Average weight of ears was approximately 5 1/2 ounces. The variability of the ears both in length and diameter was greater than in Kingscrot and Golden Cross Bantam. This standard variety was several days later than Kingscrot and Spanish Gold.

Golden Sunrise. Ear medium long to long, averaging 8 to 8 1/2 inches with a diameter of 1 3/4 inches. The number of rows of kernels varied considerably but there was a predominance of ears having twelve rows, the variation being from eight to sixteen. The average weight of ears was about 8 ounces. There was considerable variation in this variety which is not a hybrid, as shown by the high probable error in the tabulation of characteristics of the variety. In season slightly earlier than Golden Bantam.

Golden Cross Bantam. This is one of the newest and most productive of the inbred crosses. It is a single cross hybrid produced by crossing two inbred strains of yellow corn, both developed at Purdue University, Indiana. The ears vary from 7 1/2 to 8 inches in length, with a diameter of 1 3/4 to 2 inches at the butt end. In field tests on the Experiment Station grounds at Corvallis there was an unusual uniformity of height and vigor of plants as well as length and diameter of the ears. An excellent ear of this hybrid was 8 inches long, 2 inches in diameter at the butt end, 12 rows, and weighing approximately 9 to 10 ounces. There were comparatively few culls in the population of ears. The plants are unusually vigorous and uniform in growth, and there is greater uniformity of maturity of the ears than is ordinarily found in open pollinated varieties. Season later than the early varieties, being about twelve to fourteen days later than Golden Early Market and a week to ten days later than Golden Bantam. Valuable for main crop and for canning. Several commercial growers of sweet corn in Oregon had trials of this variety in 1933, reporting favorable yields and emphasizing the unusual uniformity of the well filled ears. This hybrid is not suitable for the marketing of early corn but can be planted in succession at intervals of 10 to 14 days so as to provide corn throughout the season.

Additional Literature Available

Golden Cross Bantam Sweet Corn. Circular No. 268, U.S.D.A. (Obtainable only from Superintendent of Documents, Washington, D. C. Price 5¢)