# FIELD BEHAVIOR AND PROCESSING CHARACTERISTICS OF SWEET CORN HYBRIDS GROWN IN 1953-54

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Growing and processing sweet corn is an important Oregon industry, particularly in the Willamette Valley. Oregon farmers in 1954 planted 14,200 acres of sweet corn and harvested 36,000 tons for canning and 27,200 tons for freezing.

As most of the product is shipped to markets outside the State, yield must be high and quality good to maintain an economically sound industry. The hybrid seed used to plant the acreage is a main factor affecting yield and quality. A number of seedsmen offer various hybrids for use by the industry. These vary in their ability to produce from both the yield and the quality standpoint.

To aid in developing information concerning these points, the Oregon Agricultural Experiment Station regularly conducts trials of many sweet corn hybrids from various seedsmen. This is a report of results of the 1953 and 1954 trials. Several better known hybrids were planted in replicated plots to obtain detailed information, while others were planted in single plots. The latter trials are considered as observational in nature.

## EXPERIMENTAL METHODS
(Replicated Tests)

A. Raw Product.

The hybrids included in the replicated tests were: ~~Year~~ 1953: (1) F. M. Cross, (2) Rogers' Golden Cross, (3) Robson's Golden Cross, (4) Iochief, (5) Prosperity. Year 1954: (1) F. M. Cross, (2) Rogers' Golden Cross, (3) Robson Golden Cross, (4) Prosperity. Seed sources were as follows: for F. M. Cross, the Ferry Morse Seed Co.; for Rogers' Golden Cross and Iochief, the Rogers Bros. Seed Co.; for Robson Golden Cross, the Robson Seed Farms; for Prosperity, the Corneli Seed Co.

Plantings were made early in May during both years on Chehalis soil near Corvallis, Oregon. In 1953, 550 pounds per acre of 10-16-8 fertilizer were applied, at the time of planting, in a band $1\frac{1}{2}$ inches to the side and $2\frac{1}{2}$ inches deeper than the seed. A side dressing of 200 pounds of ammonium nitrate was made 2 months after planting. The 1954 program was identical except that 750 pounds of 10-16-8 were applied at planting time. Irrigations were made at appropriate 10-day intervals.

The plots were single row, 25 feet long. In 1953, 6 replications were planted, and all replications harvested on the same day. In 1954, 8 replications were planted and 4 harvested on each of 2 days.

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The 1953 season was characterized by cool temperatures in May. The corn was planted on May 5, 1953 and the days to harvest period varied from 120 to 129 days. The 1954 summer was generally cool and a period of from 128 to 142 days was required to bring the corn to harvest.

B. Processing Technique.

Upon receipt of the husked corn the ears were examined and all obviously overmature and immature ears were removed. A 3/16 inch chisel was used to remove 2 rows of kernels from each ear for moisture determinations and other tests made on the fresh material.

Each lot was blanched 5 minutes in boiling water, spray cooled, then cut with a No. 2 Sprague Sells Cutter. The cut corn was then cleaned on a small rod type washer and passed across a draining screen. Ten ounces of corn were filled intc cellophane liners, cartoned and sealed, then frozen at $-20^{\circ}$ F. and transferred to $-5^{\circ}$ F. storage the following day.

Corn to be canned was filled into 307x409 "C" enameled cans at the rate of $13\frac{1}{2}$ ounces to which 40 grains of salt were added. Cans were then filled with water at $180^{\circ}$ F., sealed at 18-inch vacuum and then processed 50 minutes at $240^{\circ}$ F. in a vertical retort. This technique was used both seasons.

C. Evaluation of Processing Characteristics.

1. Analytical Methods -- Moisture was determined by drying in a vacuum oven for 24 hours at 70-75° C. Color was determined on the Hunter Color and Color Difference Meter. Five readings from each sample were averaged and recorded. Succulometer readings were made from 100-gram samples and pressed at 500 pounds per square inch for 3 minutes. This sample was later used for pericarp determinations, by recombining the solid and liquid portions. Two hundred milliliters of water were added to 100 grams of this recombination and the resultant slurry was blended in a Waring Blender for 5 minutes. Two aliquots of 50 grams each of the blend were weighed and washed through tared 30-mesh Monel screens, followed by thorough washing. The screens were then dried at $100^{\circ}$ C. for 2 hours, cooled, and reweighed. The increase in weight, multiplied by 6, was recorded as percentage pericarp.

The Alcohol Insoluble Solids (A.I.S.) determinations were made according to the "Methods of Analysis" of the A.O.A.C. for this factor in peas. Kernel size (or width) is the total space, in centimeters, occupied by 20 kernels when placed together shoulder to shoulder. Total and reducing sugars, calculated as glucose, were determined by the Somogyi method.

Shear press determinations were made on the Maryland Shear Press. Forty-gram samples were used in 1953 and 150-gram samples in 1954; therefore, there is a difference in the readings due to this change in procedure.

The samples of canned corn were prepared for analysis by draining on an 8-mesh draining screen for 3 minutes. Frozen samples were thawed by cooking for 5 minutes in water salted at the rate of 40 grains per 250 milliliters, and then drained as above.

2. Human Evaluations -- The canned and frozen whole kernel corn was scored for (1) color and (2) tenderness and maturity, by graders from the Agricultural Marketing Service (A.M.S.). All samples were coded to conceal their identity.

Canned and frozen samples were also evaluated for eating quality and appearance by a panel of staff members and graduate students from the Horticulture and Food Technology Departments. Usually 12 people evaluated the samples. Eating quality was judged in darkened booths to minimize color differences between samples. Appearance was judged in a sample cutting room having good light exposure. A Macbeth "Daylight" lamp was also available for those who desired its aid.

Frozen samples were cooked for 10 minutes in water salted at the rate of 40 grains per 250 milliliters. Canned corn was heated before being served. Four or five samples were presented at each sitting, and the judges asked to rank the samples independently for appearance and for eating quality. Ranks were then converted to scores and subjected to statistical analysis. The scores are presented in tables 3 and 4.

## RESULTS
(Replicated Plots)

A. Field Evaluation.

It will be seen (Tables 1 and 2) that both years F. M. Cross was harvested earliest. Prosperity gave the highest total yield both years but the differences between the hybrids with respect to their yields of husked, marketable corn were not significant.

B. Quality Evaluation.

Four of the five hybrids planted in the replicated trials of 1953 were replanted in 1954 so that two seasons' results are available for the four hybrids. Iochief was grown only in the single row trials in 1954.

1. Color -- Results for the two seasons show that hybrids were considerably different in color (tables 3 and 4). This is best shown by comparison of "Rd", which measures lightness (higher "Rd" indicating lighter color). Fresh samples of Prosperity and F. M. Cross had high "Rd" values both years. F. M. Cross, however, darkened considerably when canned in 1953 and received a low score in appearance by the panel judges. The color of F. M. Cross in 1953 was also of low purity as compared to the other hybrids and fresh and canned samples showed lower dominant wavelength. These two factors indicate less yellowness, probably due to lower quantity of pigments. The frozen samples of F. M. Cross packed in 1953 received poor appearance ratings by the staff panel, but with the exception of 1 sample, averaged 9 out of a possible 10 in the A.M.S. score for color.

In 1954 F. M. Cross was sufficiently light in color when harvested, dropped but two points in "Rd" when canned, and was scored high by A.M.S. graders. Frozen samples were also scored high by A.M.S. inspectors and the color data indicated them to be of good yellow color of high purity.

The color of Prosperity was good both years of the test. The drop in "Rd" due to canning was 5 points in 1954 but since the "Rd" was above 35 when the corn was fresh, the canned product was still sufficiently light to receive an average score of 8.1 by the A.M.S. inspector and first rank by the panel judges (table 4).

Robson Golden Cross Bantam corn canned in 1953 received a high score from the A.M.S. inspector, while the frozen product received a score of 8.8 points. However, panel judgments gave this hybrid low rank as compared to the others. It is believed that the slightly lower dominant wavelength, indicating less yellow hue (toward grey), explains the reaction of the panel. In 1954, the color of Robson Golden Cross Bantam was particularly poor, being quite dark when canned. The "Rd" data indicate that the corn was rather dark when received ("Rd" - 31.91). Thus, when the corn was heat processed, the consequent darkening was critical. The canned product had an "Rd" of 28.12 and was graded "C" by the A.M.S. inspector and also was given a low preference rating by the panel (table 4). The frozen product did not darken as much and received a score of 8.6 from the A.M.S. grader. However, the preference of the panel for the frozen product was low.

The color of Rogers Golden Cross corn in 1953 was good, but the 1954 samples were rather dark when received, and thus the canned product received poor acceptance by the A.M.S. grader and the panel (table 4). The reduction in "Rd" when frozen was not so great, thus the corn was sufficiently light to receive a good score from the A.M.S. inspector. The panel rating of the frozen product, however, was third to Prosperity and F. M. Cross in 1954.

Seasonal effects on color were exhibited, thus making interpretation of the performance of the hybrids rather difficult. It would appear, however, that Prosperity gave the most consistently good color and Robson Golden Cross the most consistently poor color. The color of Rogers Golden Cross and F. M. Cross was markedly different during the two seasons.

2. Eating Quality-- The A.M.S. scores for "Tenderness and Maturity" for both the canned and frozen corn were high for all the hybrids both years of the test and differences between the scores for this factor were not significant. All were within the Grade A range (tables 3 and 4). Panel judgments of the eating quality of the hybrids, however, indicated significant differences among them. The two Golden Crosses, Rogers and Robson, ranked high in eating quality both years, both canned and frozen (tables 3 and 4). F. M. Cross was lowest in rank in both the canned and frozen state in 1953 and the frozen product was low in eating quality in 1954. The canned product of F. M. Cross was not significantly lower than the Golden Crosses (Rogers and Robson) in 1954.

Iochief ranked lower than the Golden Crosses in the 1953 canned samples. The frozen product ranked significantly lower than Rogers Golden Cross but the difference between Robson Golden Cross and Iochief was not quite large enough to be significant (table 3).

The differences between Prosperity and the Golden Crosses in 1953 were not quite great enough to be significant; but, in 1954, the eating quality of Prosperity was not equal to that of Robson Golden Cross and Rogers Golden Cross according to the panel judges.

In general Rogers Golden Cross and Robson Golden Cross received greater preference for eating quality for the 2 seasons of this work. Among the probable causes for this may be the percentage of pericarp. These two hybrids produce corn of lower pericarp content, according to the analytical data (tables 3 and 4). Prosperity and F. M. Cross have consistently shown high pericarp content in both the canned and frozen product (tables 3 and 4). Another possibility is the higher percentage of total sugars found in the two golden crosses during analyses made in 1953.

The remaining analytical determinations, which include Succulometer, Shear Press readings, and Alcohol Insoluble Solids, have not been of value in the rationalization of the differences in Panel evaluations of the hybrids. However, it will be noted that the Shear Press readings for frozen corn are consistently higher than those for canned corn (tables 3 and 4). This is due to the heat process in canning.

3. Cutoff Percentage -- These percentages were calculated on the basis of sorted, husked corn and are consequently high. It is not believed that any reproducible differences between the hybrids were indicated. The low cutoff percentage shown by Robson Golden Cross in 1953 did not recur in 1954, suggesting that the low condition in 1953 was related to harvest maturity.

## SINGLE PLOT TESTS

In addition to the hybrids on which detailed information was developed by the replication technique, a larger number of hybrids were grown in single plots for observational purposes. Since these were not in replicated plots, data on them are not as reliable as from the 4 or 5 hybrids discussed previously. It may, however, be indicative of the possibilities of these hybrids. In the Station's program, the single plot tests serve as a screening trial for new material, the most promising of which are planted in replicated plots later on.

The culture and processing technique used was the same as for the replicated plot material. Quality information was abridged in 1953 but expanded in 1954.

## RESULTS
(Single Plot Tests)

### A. Field Characteristics.

These data are presented in tables 5 and 6. Since these observation plots were not replicated, only rough comparisons for yielding ability should be made. The early varieties, as is usually the case, were lower yielding as a group than midseason or late types. The heaviest yielding and most promising of these new lines of corn will be planted again in 1955.

### B. Quality Evaluation.

1. Color -- In 1953 the only information on color was that obtained by grading by the A.M.S. Scores on the canned product were, in general, more variable than those on the frozen product, indicating that the color of some hybrids is particularly sensitive to canning (table 7).

In 1954 both A.M.S. grades for color and "Rd" readings from the Hunter instrument were taken. Though these data represent single plot observations, it appears that some of these hybrids may be too dark, especially when changes due to processing have been considered. On the other hand Victory Golden, NK 30715, NK Tons of Gold, Prospector, Seneca Crown, KVF 51-360, KVF 51-20, Iochief, and Iosquaw appear to be sufficiently light in color, and of such color stability to be promising enough for further conideration (table 8).

2. Eating Quality -- An A.M.S. inspector scored these samples for tenderness and maturity and most of them were also judged by the staff panel. The agreement between these judgments is only fair, since the A.M.S. score does not indicate flavor differences.

According to the staff panel judgments, certain of these hybrids produce corn of better eating quality than others (table 8). When favorable judgment for this factor coincides with good color rating to indicate good overall quality, then these hybrids merit special attention. Victory Golden, Golden Hybrid 1910, and KVF 51-20 show this possibility (table 8).

Table 1. Field Behavior of Sweet Corn Hybrids -- 1953 Replicated Trials

| Variety | Days to harvest | Tons per acre yield | | Marketable ears per acre (x 100) |
|---|---|---|---|---|
| | | Total | Husked marketable | |
| Iochief ...... | 128 | 8.90 | 4.98 | 187 |
| Prosperity ... | 129 | 10.83 | 5.02 | 220 |
| Golden Cross Bantam ..... | 125 | 9.41 | 5.00 | 223 |
| FM Cross ..... | 120 | 9.29 | 5.11 | 176 |
| Golden Cross Bantam ..... | 125 | 9.21 | 4.62 | 202 |
| L.S.D. .. .05 | | 1.05 | N.S. | 17 |
| L.S.D. .. .01 | | 1.44 | N.S. | 23 |

Table 2. Field Behavior of Sweet Corn Hybrids -- 1954 Replicated Trials

| Variety | Days to harvest | Tons per acre yield | | Marketable ears per acre (x 100) |
|---|---|---|---|---|
| | | Total | Husked marketable | |
| FM Cross ..... | 128 and 131 | 10.3 | 5.1 | 193 |
| Golden Cross Bantam ..... | 135 and 138 | 11.6 | 5.5 | 234 |
| Golden Cross Bantam ..... | 138 and 140 | 11.4 | 5.6 | 245 |
| Prosperity ... | 140 and 142 | 13.3 | 5.6 | 240 |
| L.S.D. .. .05 | | 1.3 | N.S. | 29 |
| L.S.D. .. .05 | | 1.7 | N.S. | 40 |

Table 3. Quality Evaluation of Fresh, Canned, and Frozen
Sweet Corn -- 1953
(Values are means of six replications)

FRESH

| Variety | Moisture | Pericarp | A.I.S.[1]* | Kernel[2] size | Shear[3] press | Succulo-meter | Cutoff | Hunter color readings | | | Reducing | total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Rd | Dominant** wave length | Purity | Sugars | Sugars |
| | Per cent | Per cent | Per cent | Cms. | Lbs. | Mls. | Per cent | | | Per cent | Per cent | Per cent |
| F. M. Cross... | 75.46 | 1.76 | 21.24 | 17.07 | 221 | 18.5 | 62.81 | 34.54 | 576.5 | 50.0 | 1.81 | 3.70 |
| G.C.B. Rogers | 73.33 | 1.47 | 21.39 | 19.01 | 202 | 20.3 | 58.71 | 34.81 | 577.0 | 52.6 | 2.16 | 5.78 |
| G.C.B. Robson | 75.78 | 1.30 | 20.27 | 19.32 | 265 | 18.9 | 46.38 | 37.59 | 577.0 | 52.0 | 4.02 | 5.44 |
| Iochief....... | 73.11 | 1.79 | 21.27 | 15.33 | 267 | 18.4 | 60.34 | -- | -- | -- | 1.64 | 4.15 |
| Prosperity.... | 70.79 | 1.78 | 21.01 | 15.63 | 242 | 18.0 | 60.77 | 36.43 | 577.0 | 53.2 | 0.84 | 3.91 |
| L.S.D. --.05 | 1.33 | 0.36 | N.S. | 0.75 | 22 | N.S. | 2.28 | 1.56 | -- | -- | 0.42 | 0.67 |

CANNED

| Variety | Moisture | Pericarp | A.I.S.* | Shear[3] press | Succulo-meter | Hunter color readings | | | P.M.A. score | | Eating† Quality | Appear-* ance |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Rd | Dominant** wave length | Purity | Color | Maturity | | |
| | Per cent | Per cent | Per cent | Lbs. | Mls. | | | Per cent | | | | |
| F. M. Cross... | 80.86 | 1.24 | 15.72 | 176 | 17.6 | 28.99 | 578 | 46.7 | 8.6 | 38.1 | 4.57 | 4.91 |
| G.C.B. Rogers | 78.89 | 1.02 | 17.08 | 153 | 18.8 | 29.80 | 578.5 | 50.7 | 9.0 | 38.5 | 2.14 | 2.94 |
| G.C.B. Robson | 80.67 | 0.86 | 17.03 | 154 | 19.7 | 32.01 | 577.8 | 49.5 | 9.8 | 39.0 | 2.11 | 3.63 |
| Iochief....... | 78.14 | 1.58 | 17.15 | 199 | 16.5 | 29.78 | 578.5 | 50.0 | 9.2 | 38.6 | 3.60 | 2.49 |
| Prosperity.... | 77.35 | 1.26 | 16.79 | 169 | 17.2 | 32.34 | 578.5 | 51.4 | 9.2 | 38.8 | 2.57 | 1.03 |
| L.S.D. --.05 | 1.25 | 0.13 | ‡ | 22 | 1.84 | 1.45 | -- | -- | N.S. | N.S. | 0.50 | 0.27 |

FROZEN

| Variety | Moisture | Pericarp | A.I.S.* | Shear[3] press | Succulo-meter | Hunter color readings | | | P.M.A. score | | Eating† Quality | Appear-* ance |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Rd | Dominant** wave length | Purity | Color | Maturity | | |
| | Per cent | Per cent | Per cent | Lbs. | Mls. | | | Per cent | | | | |
| F. M. Cross... | 81.06 | 1.44 | 16.49 | 207 | 20.7 | 36.41 | 578.0 | 46.0 | 8.8 | 47.1 | 4.51 | 3.80 |
| G.C.B. Rogers | 79.66 | 1.26 | 16.91 | 182 | 20.5 | 37.76 | 578.0 | 53.3 | 10.0 | 47.8 | 2.17 | 3.29 |
| G.C.B. Robson | 80.69 | 1.15 | 16.15 | 183 | 22.1 | 38.75 | 577.8 | 54.2 | 8.8 | 45.3 | 2.43 | 4.63 |
| Iochief....... | 78.73 | 1.70 | 17.79 | 205 | 20.7 | 39.03 | 578.2 | 53.6 | 9.6 | 48.3 | 2.94 | 1.91 |
| Prosperity.... | 77.57 | 1.62 | 17.42 | 211 | 20.5 | 38.31 | 578.5 | 54.5 | 10.0 | 48.1 | 2.94 | 1.37 |
| L.S.D. --.05 | 1.07 | 0.30 | N.S. | N.S. | N.S. | 0.94 | -- | -- | 0.76 | N.S. | 0.59 | 0.38 |

1 Alcohol Insoluble Soilds. 2. Cms. per 20 kernels. 3. Lbs. per square inch.
* Corrected for moisture. ** In millimicrons wave length † Ranked from 1, best, to 5, poorest.
‡ F. M. Cross and Prosperity are significantly lower in A.I.S. (canned) than the balance of the varieties.

Table 4. Quality Evaluation of Fresh, Canned, and Frozen Sweet Corn -- 1954 Replicated Plots
(values are means of eight replications)

FRESH

| Hybrid | Moisture Per cent | Cutoff Percent | Hunter color readings: Rd | Hunter color readings: Dominant wave length* | Hunter color readings: Purity Per cent |
|---|---|---|---|---|---|
| F. M. Cross | 72.44 | 59.89 | 35.38 | 577.0 | 48.5 |
| G.C.B. Rogers | 71.19 | 64.23 | 31.40 | 577.4 | 52.4 |
| G.C.B. Robson | 70.52 | 61.04 | 31.91 | 578.2 | 57.5 |
| Prosperity | 71.70 | 63.21 | 35.16 | 578.0 | 55.5 |
| L.S.D. .05 | | 2.52 | 2.15 | | |

CANNED

| Hybrid | Moisture Per cent | Pericarp Per cent | Shear press Pounds | Succulometer Mls. | Hunter color readings: Rd | Hunter color readings: Dominant wave length* | Hunter color readings: Purity Per cent | A.M.S. Color | A.M.S. T.& M.** | Panel score: Eating quality† | Panel score: Appearance† |
|---|---|---|---|---|---|---|---|---|---|---|---|
| F.M. Cross | 76.96 | 1.46 | 480 | 16.5 | 33.42 | 582.0 | 58 | 9.5 | 36.8 | +0.03 | +0.37 |
| G.C.B. Rogers | 77.42 | 1.15 | 544 | 22.6 | 29.57 | 582.4 | 49 | 6.8 | 38.0 | +0.36 | -0.57 |
| G.C.B. Robson | 77.99 | 1.21 | 544 | 19.8 | 28.12 | 582.6 | 50 | 6.3 | 37.6 | +0.31 | -0.76 |
| Prosperity | 76.30 | 1.51 | 513 | 19.8 | 30.15 | 582.5 | 49.8 | 8.1 | 36.6 | -0.80 | +0.90 |
| L.S.D. --.05 | | .12 | N.S. | 2.4 | 2.15 | -- | -- | 1.15 | N.S. | 0.57 | 0.31 |

FROZEN

| Hybrid | Moisture Per cent | Pericarp Per cent | Shear press Pounds | Succulometer Mls. | Hunter color readings: Rd | Hunter color readings: Dominant wave length* | Hunter color readings: Purity Per cent | A.M.S. Color | A.M.S. T.& M.** | Panel score: Eating quality† | Panel score: Appearance † |
|---|---|---|---|---|---|---|---|---|---|---|---|
| F. M. Cross | 73.73 | 1.53 | 542 | 11.7 | 32.57 | 581.0 | 60 | 10.0 | 47.4 | -0.59 | +0.31 |
| G.C.B. Rogers | 74.76 | 1.36 | 570 | 14.2 | 31.36 | 581.5 | 54 | 9.0 | 45.9 | +0.28 | -0.45 |
| G.C.B. Robson | 73.39 | 1.55 | 591 | 12.0 | 30.06 | 581.3 | 59.4 | 8.6 | 46.3 | +0.83 | -0.78 |
| Prosperity | 74.27 | 1.73 | 546 | 15.8 | 30.95 | 578.0 | 60 | 8.4 | 46.0 | -0.59 | +0.84 |
| L.S.D. --.05 | | .12 | N.S. | 2.3 | 2.15 | | | 0.7 | N.S. | 0.69 | 0.38 |

* In millimicrons wave length.
** Agricultural Marketing Service "Tenderness and Maturity" Score.
† In this table, the lower the panel score the lower the preference for that hybrid.

Table 5. Field Behavior of Sweet Corn Hybrids--Single Row Plots 1953 (2) (5)

| Variety | Source (1) | Days to full silk | Full silk plus 27 | Actual days to harvest (6) | (3) Ears per acre Total | (3) Ears per acre Mktble | Total yield tons/acre | Marketable yield husked tons/acre | Rows per ear | Ear length (inches) (4) | Ear width (inches) (4) | Stalk ht. (feet) | Tip fill (7) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 338x316........ | 2 | 90 | 117 | 118 | 290 | 223 | 8.8 | 4.6 | 10-12 | 5-1/2-7 | 1-3/4-2 | 6.5 | 3-1/2 | Ear shape similar to Golden Cross; only fair uniformity of maturity. |
| Seneca Arrow... | 1 | 91 | 118 | 118 | 389 | 290 | 12.0 | 6.8 | 12-14-16 | 6-7 | 1-3/4-2 | 7.0 | 4 | Good fill; ears slightly thick; slightly short; heavy yield. |
| Seneca Warrior. | 1 | 91 | 118 | 118 | 249 | 223 | 10.8 | 6.5 | 12-14 | 6-8 | 1-3/4-2 | 7.0 | 3 | Medium taper. |
| 8755-3......... | 3 | 92 | 119 | 119 | 290 | 213 | 9.1 | 4.9 | 12-14-16 | 6-7-1/2 | 1-3/4-2 | 3.0 | 2-1/2 | Weak suckers lodge badly; ears uniform appearance; only fair fill. |
| Golden Hybrid 53 N......... | 4 | 95 | 122 | 122 | 306 | 332 | 11.5 | 7.0 | 12-14 | 8 | 1.8 | 7.0 | 3 | Slightly immature; some color variability; otherwise uniform ear appearance; slight curving of ear. |
| 9746-10........ | 3 | 95 | 122 | 121 | 306 | 239 | 8.4 | 4.5 | 12-14 | 6.7 | 1-1/2-1-3/4 | 7.5 | 3 | Maturity okay. |
| Golden Hybrid 1910......... | 5 | 96 | 123 | 122 | 259 | 228 | 8.7 | 4.9 | 12-14-16 | 7.6 | 1.7 | 7.5 | 3 | Golden Cross appearance; maturity slightly under; uniform ear type; moderately deep kernels. |
| Golden Hybrid 52F.......... | 4 | 97 | 124 | 122 | 264 | 192 | 10.0 | 4.3 | 12-14-16 | 8.2 | 1.7 | 8.0 | 2.5 | Tip fill fair; color slightly variable; uniform appearance; slight taper; straight rows. |

Table 5. Field Behavior of Sweet Corn Hybrids--Single Row Plots 1953 (2) (5) (Continued)

| Variety | Source (1) | Days to full silk | Full silk plus 27 | Actual days to harvest (6) | (3) Ears per acre | | Total yield tons/acre | Marketable field husked tons/acre | Rows per ear | Ear length (inches) (4) | Ear width (inches) (4) | Stalk ht. (feet) | Tip fill (7) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Total | Mktble | | | | | | | | |
| White Silk Iochief..... | 4 | 97 | 124 | 128 | 306 | 239 | 13.4 | 6.6 | 16-18-20 | 7.6 | 1.9 | 8.0 | 2.5 | Rows straighter than Iochief; deep kernels; light color. |
| Golden Harvest | 6 | 98 | 125 | 125 | 239 | 202 | 8.6 | 4.8 | 12-14 | 7.8 | 1.75 | 8.25 | 3 | Uniform, straight, rows; good fill; large kernels. |
| Banquet....... | 3 | 98 | 125 | 128 | 280 | 270 | 8.6 | 5.5 | 12-14 | 7.7 | 1.7 | 7.5 | 3.25 | Tends to be crooked; not tapered; kernels medium large; straight rows. |
| Golden Harvest | 4 | 98 | 125 | 125 | 218 | 171 | 7.8 | 4.1 | 12-14 | 8. | 1.7 | 8. | 3 | Uniform straight rowed; uniform kernels; good general fill; average depth kernels. |
| 355x2604...... | 2 | 98 | 125 | 126 | 430 | 327 | 14.2 | 7.3 | 12 | 7.0 | 1.8 | 8. | 2.75 | Rows moderately irregular; broad kernels. |
| Frost Gold.... | 4 | 100 | 127 | 127 | 347 | 239 | 10.6 | 4.3 | 12-14 | 8. | 1.6 | 9 | 3 | Medium large kernels; straight rows. |
| K.V.F. 51-10.. | 7 | 100 | 127 | 127 | 327 | 233 | 11.0 | 4.8 | 14-16 | 7.8 | 1.7 | 9.25 | 3 | Uniform ear type; small neat kernels of fair depth; considerable ta per; straight rows; ear fill slightly poor, some ears have staminate tip. |

Table 5 (Continued).

(1) Key to seed sources:

1. Robson Seed Farms, Hall, New York
2. Univ. of Wisconsin, Madison, Wisconsin (R. H. Andrew)
3. Crookham Co., Caldwell, Idaho
4. Rogers Bros. Seed Co., Idaho Falls, Idaho
5. F. H. Woodruff & Sons, Toledo 1, Ohio
6. Joseph Harris Co., Moreton Farm, Rochester, New York
7. Corneli Seed Co., St. Louis, Missouri

(2) Planted May 5, 1953.

(3) Multiply figures in these columns by 100 to secure number of ears per acre.

(4) Early in season, several ears were measured to secure length and diameter, and the range of variability recorded; for later varieties the system was changed, with 10 ears being measured, and the <u>average</u> taken, of length and diameter, for these 10 ears.

(5) Culture: Fertilized with 550 lbs. per acre of 10-16-8 fertilizer in a band $1\frac{1}{2}$ inches to side of and $2\frac{1}{2}$ inches deeper than the seed, at time of planting. Plants were thinned to stand 10 inches apart in the row. A side dress of 200 lbs. per acre of ammonium nitrate was applied July 7. The plots were irrigated at approximate 10-day intervals.

(6) The early planting date and prolonged cool weather of May, 1953, with relatively cool temperatures throughout the season, are largely responsible it is believed, for the relatively long period from planting to harvest.

(7) Arbitrary classification based on 1, very poor fill, to 5, excellent fill.

Table 6. Field Behavior of Sweet Corn Hybrids--1954 Single Plot Trials (2)

| Variety | Source (1) | Days to full silk | Full silk plus 30 | Actual days to harvest | (3) Ears per acre Total | (3) Ears per acre Mktble | Total yield tons/acre | Marketable yield husked tons/acre (2) | Rows per ear | Ear length (inches) | Ear width (inches) | Stalk height (inches) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Asgrow Golden 25......... | Asg | 94 | 124 | 128 | 389 | 285 | 13.1 | 7.1 | 12-14-16 | 8.6 | 1.8 | 78 | Med. long ears; some irregular maturity. |
| Golden Hybrid 1910....... | W | 98 | 128 | 131 | 445 | 285 | 14.6 | 6.5 | --- | 7.2 | 1.8 | 84 | Somewhat Golden Cross appearance. |
| Tons O'Gold | NK | 99 | 129 | 140 | 347 | 254 | 14.2 | 7.6 | 12-14-16 | 7.0 | 2.1 | 100 | Rather short thick ear. |
| Iochief...... | Io | 100 | 130 | 140 | 378 | 228 | 13.0 | 6.5 | 14-16-18 | 7.2 | 2.0 | 92 | --- |
| Iosquaw...... | R | 100 | 130 | 140 | 176 | 145 | 8.5 | 4.4 | 14-16-18 | 7.3 | 1.9 | 87 | Only variety with poor stand. No suckers. Straight row Iochief type. |
| Seneca Crown.. | R | 101 | 131 | 135 | 321 | 254 | 11.2 | 6.0 | 12-14-16 | 7.7 | 1.9 | 73 | Golden Cross appearance. Slightly larger ear. |
| Golden Harvest | H | 102 | 132 | 135 | 249 | 176 | 9.1 | 4.5 | 12-14 | 7.7 | 1.9 | 90 | Golden Cross appearance. Kernels slightly wider. |
| NK 30715...... | NK | 102 | 132 | 140 | 295 | 202 | 11.5 | 5.6 | 14-16 | 7.6 | 2.1 | 100 | Slim stalks. Medium large ears. |
| Seneca Golden Cross....... | R | 102 | 132 | 138 | 269 | 192 | 9.3 | 4.5 | 12-14 | 7.8 | 1.8 | 80 | Long ear type. Golden Cross. |
| Asgrow Golden 50......... | Asg | 102 | 132 | 138 | 357 | 238 | 13.5 | 6.5 | --- | 7.2 | 2.0 | 84 | Ears slightly short and thick. Straight rows. |
| NK 195........ | NK | 102 | 132 | 138 | 518 | 316 | 16.4 | 8.2 | --- | 7.0 | 2.0 | 90 | Ears slightly short. Hard to remove from stalk. |

Table 6. Field Behavior of Sweet Corn Hybrids--1954 Single Plot Trials (2) (Continued).

| Variety | Source (1) | Days to full silk | Full silk plus 30 | Actual days to harvest | (3) Ears per acre | | Total yield tons/acre | Marketable yield husked tons/acre (2) | Rows per ear | Ear length (inches) | Ear width (inches) | Stalk height (inches) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Total | Mktble. | | | | | | | |
| Golden Cross Bantam...... | FM | 102 | 132 | 138 | 399 | 280 | 14.4 | 6.5 | --- | 7.8 | 1.8 | 87 | Long ear type. Golden Cross. |
| Fiesta........ | Cr | 103 | 133 | 138 | 264 | 181 | 8.7 | 4.5 | --- | 7.1 | 1.9 | 97 | Only fair uniformity, maturity. Straight rows. |
| KVF 51-20...... | Cor | 103 | 133 | 140 | 342 | 249 | 13.3 | 6.3 | 14-16 | 7.5 | 1.9 | 96 | Prosperity appearance. Deep yellow color. |
| Victory Golden | W | 103 | 133 | 140 | 347 | 228 | 14.0 | 6.5 | 12-14-16 | 7.3 | 2.1 | 96 | Medium large ear. |
| Prospector | R | 104 | 134 | 142 | 451 | 280 | 15.0 | 6.5 | 12-14-16-18 | 7.0 | 1.8 | 100 | --- |
| KVF 51-360 | Cor | 105 | 135 | 142 | 295 | 192 | 11.7 | 6.0 | 16-18 | 9.2 | 2.0 | 84 | Long, rather large ears. |

(1) **Key** to seed sources
- Asg - Associated Seed Growers, New Haven, Conn.
- Cor - Corneli Seed Co., St. Louis, Mo.
- Cr - Crookham Co., Caldwell, Idaho
- Io - Iowa State College, Ames, Iowa
- NK - Northrup, King and Co., Minneapolis, Minn.
- H - Joseph Harris Co., Moreton Farms, Rochester, N.Y.
- FM - Ferry-Morse Seed Co., Mountain View, Calif.
- W - F. H. Woodruff and Sons, Toledo, Ohio
- R - Rogers Bros., Seed Co., Idaho Falls, Idaho

(2) Since these observation plots are not replicated it must be clear that yield data should not be given major emphasis. Data are presented largely to show overall characteristics and possible promise of new introductions and breeders' lines.

(3) Multiply figures in these columns by 100 to secure total ears per acre.

Table 7. A.M.S. Quality Scores and Cutoff Percentages--
Single Replicate Sweet Corn Accessions 1953

| Hybrid and Source | Cutoff | P.M.A. quality scores | | | | Remarks |
|---|---|---|---|---|---|---|
| | | Frozen | | Canned | | |
| | Per cent | Color | Maturity | Color | Maturity | |
| Seneca Warrior (Robson)... | 59.0 | 8 | 47 | 6 | 37 | Poor color |
| Seneca Arrow (Robson)..... | 63.5 | 4-3 | 32 | 8 | 37 | Immature |
| Wisconsin Hybrid 338x316.. | 61.3 | 9 | 47 | 9 | 38 | -- |
| 8755-3 (Crookham)......... | 57.0 | 4 | 32 | 8 | 38 | Immature |
| 9746-10 (Crookham)........ | 54.0 | 9 | 48 | 9 | 38 | Small ears |
| Frost Gold (Woodruff)..... | 50.8 | 10 | 48 | 10 | 39 | Long slender ears |
| KVF 51-10 (Corneli)....... | 57.3 | 10 | 49 | 10 | 38 | Very good |
| Banquet (Crookham)........ | 59.0 | 10 | 46 | 9 | 37 | Trouble in cutting |
| White Silk Iochief (Rogers) | 55.5 | 10 | 49 | 9 | 38 | -- |
| Golden Harvest (Rogers)... | 57.8 | 10 | 47 | 9 | 38 | Large ear, big kernel |
| Golden Hybrid 53N (Rogers) | 59.0 | 9 | 48 | 9 | 38 | -- |
| Golden Harvest (Harris)... | 55.1 | 10 | 47 | 9 | 37 | Large ear, big kernel |
| Golden Hybrid 52F (Rogers) | 57.1 | 10 | 49 | 10 | 38 | -- |
| Golden Hybrid 1910 (Woodruff)............. | 59.7 | 9 | 48 | 10 | 39 | -- |
| Wisconsin Hybrid 355x2604 - | 58.5 | 10 | 48 | 9 | 37 | Rough appearance |

Of these accessions, only KVF 51 is indicated as having characteristics superior to Golden Cross Bantam.

Table 8. Quality Evaluation of Fresh, Canned, and Frozen Sweet Corn--Single Row Plots 1954

| Hybrid | Fresh | | | Canned | | | | | Frozen | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Per cent moisture | Per cent cutoff | Rd | Per cent pericarp | Rd | A.M.S. color score | A.M.S. maturity score | Eating quality | Per cent pericarp | Rd | A.M.S. color score | A.M.S. maturity score | Eating quality |
| Golden Harvest ... | 73.32 | 64.52 | 32.50 | 1.13 | 28.46 | 7 | 35 | * | 1.58 | 26.82 | 9 | 46 | * |
| T-Golden Cross ... | 68.33 | 62.71 | 31.02 | 1.40 | 25.18 | 4 | 35 | Poor | 1.55 | 29.52 | 8 | 48 | * |
| Victory Golden ... | 75.20 | 60.91 | 35.00 | 1.36 | 29.28 | 10 | 39 | Good | 1.79 | 28.16 | 9 | 48 | * |
| Golden Hybrid 1910 | 74.36 | 61.66 | --- | 1.16 | 31.40 | 10 | 39 | Good | 1.52 | 28.38 | 8 | 48 | Good |
| Fiesta .......... | 68.94 | 63.40 | 31.48 | 1.29 | 25.08 | -- | -- | -- | 1.40 | 31.34 | -- | -- | -- |
| NK 30715 ........ | 72.00 | 56.18 | 36.42 | 1.59 | 28.72 | 9 | 35 | Poor | 1.81 | 33.30 | 10 | 48 | Poor |
| NK Tons of Gold... | 69.65 | 57.20 | 34.18 | 1.55 | 31.86 | 9 | 36 | Poor | 1.50 | 29.54 | 9 | 48 | Poor |
| NK 195 .......... | 70.68 | 61.78 | 31.10 | 1.44 | 25.12 | 8 | 37 | * | 2.17 | 28.16 | 9 | 47 | * |
| Prospector ....... | 70.48 | 62.87 | 36.78 | 1.58 | 31.40 | 9 | 36 | -- | 1.61 | 29.36 | 8 | 45 | Poor |
| Asgrow 25 ....... | 72.75 | 56.57 | 33.56 | 1.34 | 26.06 | 7 | 37 | Good | 1.68 | 31.24 | 10 | 47 | Good |
| Asgrow 50 ....... | 71.75 | 57.84 | 34.14 | 1.59 | 26.60 | 4 | 36 | Poor | 2.14 | 30.60 | 10 | 48 | * |
| Seneca Crown ..... | 69.90 | 64.34 | 33.50 | 1.45 | 30.56 | 7 | 36 | * | 1.48 | 28.84 | 9 | 48 | -- |
| Seneca GCB-B ..... | 71.95 | 59.69 | 31.02 | 1.25 | 24.98 | 4 | 38 | O.K. | 1.29 | 30.36 | 8 | 48 | -- |
| KVF 51-360 ....... | 70.59 | 57.75 | 36.28 | 1.41 | 30.68 | 9 | 38 | -- | 2.12 | 29.68 | 9 | 48 | * |
| KVF 51-20 ........ | 69.90 | 60.75 | 32.64 | 1.64 | 32.60 | 9 | 36 | Good | 1.51 | 28.56 | 8 | 45 | * |
| Iochief .......... | 69.86 | 57.30 | 34.04 | 1.92 | 30.52 | 10 | 38 | O.K. | 1.98 | 30.40 | 9 | 46 | * |
| Iosquaw .......... | 69.21 | 57.75 | 32.62 | 1.54 | 30.68 | 9 | 35 | O.K. | 2.04 | 29.70 | 10 | 46 | -- |

* Satisfactory