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1945 DRY-LAND HYBRID CORN TESTS IN COLORADO

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Three dry-land hybrid corn tests were carried out in 1945, using several of the same hybrids in all three tests. One of these tests was on the U. S. Dryland Field Station[2] located near Akron on what is known locally as "hard land," the soil being classified as Weld silt loam.

The second test was in Kit Carson County, 4 miles east and 8 miles north of Stratton, Colo. The third test was located in northeastern Colorado near the Sedgwick-Phillips County line.

The soil on which the Kit Carson tests were conducted is classified as the Ascalon sandy loam. The surface soil is a brown, non-calcareous, sandy loam 6 to 10 inches thick. The subsoil is non-calcareous and ranges from a sandy clay loam to a light sandy clay, 6 to 14 inches thick. This layer merges into a calcareous loam or heavy sandy loam layer which remains uniform to a depth of 30 inches. The thickness of the different layers and the relative proportions of coarse sand and of clay rang considerably within short distances. The surface and internal drainage is good.

The soil on which the Sedgwick County test was conducted is classified as Haxtun sandy loam. The surface soil is a dark grayish-brown sandy loam 16 to 24 inches thick. The subsoil is 12 to 20 inches thick and ranges from a heavy sandy loam to light sandy clay loam in texture. This layer is brown to light grayish-brown and merges into a light gray, limy, sandy loam to light clay loam layer which continues to depths exceeding 5 feet.

The soil on the Kit Carson County test plot is more sandy and has a somewhat less favorable plant moisture relationship than that of the Sedgwick County test.

The test in Kit Carson County was conducted for the first time in 1945. A similar test was conducted in Yuma County in 1944, being carried on land quite similar in structure and classification to the Kit Carson test plot. Both soils are classified as a sandy loam ranging from a heavy sandy loam to a light sandy clay loam in structure.

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2. The U.S. Dry Land Field Station, located in Northeastern Colorado at an altitude of about 4,600 feet is operated by the Division of Soils, Fertilizers and Irrigation of the Bureau of Plant Industry, Soils, and Agricultural Engineering, Agricultural Research Administration, U.S.D.A., in full cooperation with the Colorado Agricultural Experiment Station.

The 1945 tests were located on two general soil classes found on the dry-land, namely "hard land" and "sandy land." The results of these tests should give a comparison of the adaptability and yielding capacity of hybrids tested. The local strain was a different selection in each test.

The results of these tests make available to purchasers and producers alike the performance record of the different hybrids tested.

Many of these hybrids are offered for sale to Colorado farmers. If these performance tests are studied, they should help the purchaser to select the corn best adapted for his locality and conditions.

Hybrids are entered in the various tests by the commercial firms, each picking its own hybrid varieties to be tested. Entry blanks for corn to be tested are obtained from the Agronomy Section, Colorado Agricultural Experiment Station. A fee of 6 dollars for each entry at each location is charged. A firm or subsidiary thereof may enter three hybrids in each test. Two of these hybrids must be in commercial production, and for which seed is available to farmers of Colorado for next years crop. The Station reserves the right, however, to determine the size of the test and the number of varieties included.

AKRON TESTS

Some of the varieties have been tested at Akron for several years. The 1945 season at Akron was short and of the varieties tested few fully matured, as is indicated by the bushel weight (Table 3).

Comparison of the "days to silk," "moisture in corn at harvest," and the "bushel weight" indicate the maturity of the hybrids at harvest time. When the days to silk were greater than 83 in 1945 we find that, with one exception (Kingscrost KS6), the moisture of the corn was 25 percent or higher. Akron White, while it silked in 83 days, had 31.12% moisture at harvest, although the bushel weight was above average for the varieties tested. The date of the first killing frost at Akron in 1945 was September 12.

In considering the yields, the tables showing the largest number of years in which the same varieties were tested give a better idea of the performance of the hybrids and, therefore, should receive the greatest attention. Summary tables are given for varieties tested for varying numbers of years. The tables include the acre yield of shelled corn, bushel weight, days to silk, percent smut, percent suckers, and percent lodged and broken stalks.

The days to silk and the weight per measured bushel together give a good indication of the adaptability and maturity of the hybrid or variety.

Comparison of time to silk should not be made between varieties grown at different localities.

Table 1. FIVE-YEAR AVERAGE YIELDS AND AGRONOMIC DATA OF HYBRID AND OPEN-POLLINATED CORN VARIETIES TESTED AT THE U.S. DRY-LAND FIELD STATION, AKRON, COLO., FROM 1941 to 1945 inclusive.

HYBRID or VARIETY	Acre yield of shelled corn*	Weight per measured bushel	Days to silk	Moisture in corn at harvest	Plants with suckers	Smutted plants	Broken or lodged stalks
	Bushels	Pounds	Number	Percent	Percent	Percent	Percent
Colorado 176	32.13	51.68	75	24.91	7.9	5.3	15.8
Colorado 175	29.52	52.84	76	24.71	12.1	3.7	17.8
Akron White**	28.68	54.76	69	20.63	16.8	8.5	25.3
Colorado 151	28.58	52.16	73	21.50	8.6	5.3	15.4

*Shelled corn on basis of 15.5 percent moisture
**Open-pollinated variety
Mean yield of all varieties = 30.21 bushels per acre
Difference to be statistically significant = 4.70 bushels per acre

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Table 2. TWO-YEAR AVERAGE YIELD AND AGRONOMIC DATA OF HYBRID AND OPEN-POLLINATED CORN VARIETIES TESTED AT THE U.S. DRY-LAND FIELD STATION, AKRON, COLO., FROM 1944 to 1945 inclusive.

Rank	HYBRID or VARIETY	Acre yield of shelled corn*	Weight per measured bushel	Days to silk	Moisture in corn at harvest	Plants with suckers	Smutted plants	Broken or lodged stalks
		Bushels	Pounds	Number	Percent	Percent	Percent	Percent
1	Funk G-1	38.78	54.75	77	22.78	6.2	10.1	0.4
2	Colorado 152	34.46	51.31	80	28.48	15.5	2.8	4.9
3	Colorado 176	34.17	51.06	80	29.04	8.6	6.4	0.6
4	Colorado 125	34.02	52.51	76	21.56	8.8	6.6	1.2
5	DeKalb 65	33.10	54.95	79	25.00	29.2	8.6	1.0
6	Colorado 221	32.77	50.14	84	38.98	19.8	6.6	3.2
7	Colorado 175	32.36	53.04	80	31.28	12.6	3.1	3.4
8	Colorado 151	32.00	51.08	80	28.98	6.6	4.2	2.1
9	Pioneer 353	31.06	51.36	82	30.47	19.9	5.4	2.4
10	Colorado 153	29.12	53.44	81	23.78	30.8	7.0	4.0
11	Akron White**	27.46	53.76	74	26.04	13.4	8.4	5.7

*Shelled corn on basis of 15.5 percent moisture
**Open-pollinated variety
Mean yield of all varieties = 32.63 bushels per acre
Difference to be statistically significant = 6.82 bushels per acre

In Table 1 it will be noted that all the varieties tested for a 5-year period yield about the same. The bushel weights of all the varieties are below standard. "Akron White," a local open-pollinated corn, has the highest bushel weight and the least number of days to silking.

The varieties are the same for the 3-, 4-, and 5-year tests and results are comparable to the 5-year test.

Table 2 which includes several more varieties than Table 1, shows the performance of the varieties for a 2-year period at Akron. None of the varieties may be considered significantly higher in yield over the average yield of the varieties in the test.

Table 3 includes the varieties tested at Akron in 1945. In the Akron test, as in all tests conducted this year, where the percent moisture in the corn at harvest was over 30% the bushel weight of the corn was exceptionally low.

It should be noted that several of the varieties have high moisture contents at harvest which indicates that considerable drying is necessary for safe storage.

Some of the hybrids tested in previous years have been dropped from the Akron test because sufficient data have been obtained regarding their adaptability and performance record. Results may be obtained from previous years' records.

KIT CARSON COUNTY TEST

The results of the Kit Carson County test are presented in Tables 4 and 5. The 1945 test (Table 5) was damaged by hail; however, the yield and other data may be considered as comparable to the other dry-land tests for similar varieties. There is only one variety significantly high in yield per acre, Colorado 152, while two varieties are significantly below the mean yield of all varieties tested. As in most tests conducted this year, many varieties are high in moisture percent at harvest.

Table 4 shows a comparison of the 1944 test conducted in Yuma County as compared to the 1945 test grown on a similar area for 1945 in Kit Carson County. The Yuma County test of 1944 was heavily damaged by hail. Further tests are necessary before final recommendations can be made for this area.

SEDGWICK COUNTY TEST

The test in Sedgwick County was conducted on a sandy loam soil typical of the soil in the corn-growing areas of Northeastern Colorado. Many of the varieties showed considerable moisture at harvest and, as shown by the bushel weights, few varieties were fully matured at the time of the first killing frost on September 12, 1945. The 2-year table (Table 6) gives the performance record of 12 varieties tested in 1944 and 1945. This table will give an indication of the probable performance of the various hybrids and varieties but further tests are necessary before final recommendations can be made.

TABLE 3. AVERAGE YIELD AND AGRONOMIC DATA OF CORN HYBRIDS AND OPEN-POLLINATED VARIETIES TESTED AT THE U.S. DRY-LAND FIELD STATION, AKRON, COLO., 1945.

RANK	HYBRID OR VARIETY	Average yield shelled corn*	Weight per measured bushel	Days to silk	Moisture in corn at harvest	Plants with suckers	Smutted plants	Broken or lodged stalks
		Bushels	Pounds	Number	Percent	Percent	Percent	Percent
1	Kingscrost KS2	35.06	54.6	84	21.68	10.4	10.8	5.4
2	Funk G-1	32.75	52.2	86	28.00	2.3	12.5	0.7
3	Colorado 125	32.33	50.8	84	28.52	5.6	9.6	1.2
4	DeKalb 65	32.30	53.2	85	27.50	11.3	12.4	1.5
5	DeKalb 240	32.21	52.0	86	33.45	19.1	12.6	1.1
6	Funk G-177	31.83	54.6	83	20.69	1.6	7.4	3.9
7	Colorado 152	31.71	47.8	87	35.20	9.0	2.4	8.2
8	DeKalb E69	31.54	51.0	87	41.90	15.5	10.6	9.3
9	Colorado 176	31.34	48.2	87	37.25	4.2	7.7	1.2
10	Wisconsin 531	31.27	52.0	84	30.26	3.9	5.9	4.3
11	Funk G-3	30.66	52.0	84	30.58	5.1	9.8	1.1
12	Colorado 151	30.60	48.2	86	36.62	4.2	6.2	4.2
13	Colorado 153	29.24	50.6	87	31.67	25.7	8.7	7.5
14	Colorado 175	28.61	49.9	86	37.55	3.2	3.6	6.0
15	Kingscrost KE1	28.57	56.1	83	19.10	3.8	17.6	5.3
16	Pfister 299	28.10	45.7	89	49.37	9.5	7.2	3.0
17	Colorado 221	27.54	44.8	90	49.79	9.5	9.5	4.4
18	Pioneer 353	27.53	47.0	88	40.70	23.7	7.1	4.3
19	Kingscrost KF1	26.31	58.0	83	20.37	20.4	28.4	5.4
20	Pfister 75	25.22	47.8	90	38.09	7.1	1.9	1.9
21**	Akron White	25.22	53.6	83	31.12	6.8	10.4	8.4
22	Pioneer 341	25.12	43.8	89	49.01	6.4	1.6	4.6
23	Pfister 4897	22.49	43.7	92	52.92	6.0	3.7	5.2
24	Pioneer 330	22.46	39.7	92	55.87	4.7	1.9	2.7

*Shelled corn on basis of 15.5% moisture

**Open-pollinated variety

Mean yield of all varieties = 29.25 bushels per acre

Difference to be statistically significant = 5.48 bushels per acre

Table 4. AVERAGE YIELD AND AGRONOMIC DATA OF CORN HYBRIDS AND OPEN-POLLINATED VARIETIES TESTED IN YUMA COUNTY, COLO., in 1944 and in KIT CARSON COUNTY, COLO., in 1945

Hybrid or variety	Rank in Kit Carson County 1945	Rank in Yuma County 1944	ACRE YIELD OF SHELLED CORN*		WEIGHT PER MEASURED BUSHEL		MOISTURE IN CORN AT HARVEST		SMUTTED PLANTS	
			Kit Carson County 1945	Yuma County 1944	Kit Carson County 1945	Yuma County 1945	Kit Carson County 1945	Yuma County 1944	Kit Carson County 1945	Yuma County 1944
			Bushels	Bushels	Pounds	Pounds	Percent	Percent	Percent	Percent
Colorado 152	1	7	33.82	12.20	52.10	49.02	29.46	14.20	2.0	0.4
Pioneer 353	2	6	30.73	12.60	50.10	50.12	34.59	13.60	5.8	0.8
Colorado 175	3	12	28.89	11.80	51.20	50.90	33.84	15.66	5.0	3.7
Local Strain**	4	1	28.24	18.20	49.80	51.97	44.62	19.86	7.1	7.0
Colorado 151	5	13	26.86	11.20	51.00	48.62	27.63	11.86	8.0	2.8
DeKalb 458	6	4	26.83	13.00	50.40	54.10	36.40	22.13	2.2	3.7
DeKalb 65	7	2	26.35	13.80	55.20	52.68	23.77	12.44	16.2	3.5
Colorado 125	8	14	26.04	9.40	51.90	49.15	23.32	12.45	4.2	7.9
Colorado 221	9	11	26.00	12.00	48.60	50.62	39.85	16.84	10.0	2.5
Colorado 153	10	3	25.95	13.60	51.60	51.45	27.08	12.72	8.0	1.5
Funk G-1	11	8	25.50	12.10	52.40	52.78	24.31	12.03	4.4	0.9
Pioneer 340	12	9	22.37	12.00	47.30	51.70	44.20	20.42	6.1	0.4
DeKalb 404A	13	5	21.62	12.60	50.00	51.05	33.09	14.50	6.4	2.7
Colorado 176	14	10	21.42	12.00	48.80	49.02	29.18	13.33	4.0	6.4

*Shelled corn on basis of 15.5% moisture

**Open-pollinated variety (local selection)

Mean yield of all varieties: Kit Carson County, 1945 = 24.69 bushels; Yuma County, 1944 = 12.4 bushels

Difference to be statistically significant: Kit Carson County, 1945 = 6.56 bushels per acre

Yuma County, 1944 = 2.8 bushels per acre

Table 5. AVERAGE YIELD AND AGRONOMIC DATA OF CORN HYBRIDS AND OPEN-POLLINATED VARIETIES TESTED IN KIT CARSON COUNTY, COLO., in 1945.

RANK	HYBRID OR VARIETY	Average yield of shelled corn*	Weight per measured bushel	Days to silk	Moisture in corn at harvest	Plants with suckers	Smutted plants	Broken or lodged stalks
		Bu per acre	Pounds	No.	Percent	Percent	Percent	Percent
1	Colorado 152	33.82	52.1	86	29.46	3.5	2.0	0
2	Pioneer 353	30.73	50.1	90	34.59	24.0	5.8	0
3	Kingscrost KS2	30.12	54.4	84	18.98	10.4	16.0	1.6
4	Colorado 175	28.89	51.2	90	33.84	5.9	5.0	0
5**	Local Strain	28.24	49.8	88	44.62	10.0	7.1	0
6	Colorado 151	26.86	51.0	88	27.63	12.2	8.0	1.7
7	DeKalb 458	26.83	50.4	89	36.40	7.8	2.2	1.1
8	DeKalb 65	26.35	55.2	87	23.77	32.9	16.2	1.2
9	Colorado 125	26.04	51.9	84	23.32	3.1	4.2	1.0
10	Colorado 221	26.00	48.6	91	39.85	11.0	10.0	1.0
11	Colorado 153	25.95	51.6	88	27.08	5.6	8.0	1.0
12	Funk G-1	25.50	52.4	84	24.31	4.4	4.4	1.0
13	Pioneer 341	22.50	46.2	93	42.60	15.1	6.8	1.0
14	Wisconsin 531	22.47	51.2	87	21.35	12.2	4.9	0.8
15	Pioneer 340	22.37	47.3	92	44.20	17.8	6.1	0.6
16	DeKalb 404A	21.62	50.0	91	33.09	16.5	6.4	1.6
17	Colorado 176	21.42	48.8	88	29.18	20.0	4.0	0
18	Funk Ex.4409	21.10	49.7	92	48.10	8.1	3.2	2.7
19	Kingscrost KFI	20.73	60.0	80	18.92	42.9	13.2	5.4
20	Funk G-177	19.80	53.2	82	19.75	6.3	2.5	0
21	Colorado 321	18.38	45.4	96	51.90	14.8	1.2	2.6
22	Kingscrost KE1	17.76	56.8	81	18.18	4.6	11.8	2.0

*Shelled corn on basis of 15.5 percent moisture

**Open-pollinated variety (selected by Geo. Zogg)

Mean yield of all varieties = 24.69 bushels per acre

Difference to be statistically significant = 6.56 bushels per acre.

Table 6. TWO-YEAR AVERAGE YIELD AND AGRONOMIC DATA OF HYBRID AND OPEN-POLLINATED CORN VARIETIES TESTED IN SEDGWICK COUNTY, COLO., in 1944 and 1945.

RANK	HYBRID OR VARIETY	Acre yield of shelled corn*	Weight per measured bushel	Days to silk	Plants with suckers	Smutted plants	Broken or lodged plants
		Bushels	Pounds	Number	Percent	Percent	Percent
1	Colorado 152	28.33	52.22	78	1.1	0.6	0.6
2	Funk G-1	25.64	54.46	75	0.2	7.6	0.1
3	Pioneer 353	25.00	52.32	82	2.6	3.0	0.2
4	Local Strain**	24.86	52.92	80	1.0	5.5	4.4
5	Colorado 125	24.82	52.25	75	2.6	5.4	0.2
6	Colorado 151	24.32	51.09	76	2.0	3.3	1.3
7	DeKalb 65	24.22	55.86	76	5.5	3.3	1.4
8	Colorado 176	23.92	51.96	79	0.2	3.6	0.4
9	Colorado 175	23.84	53.00	82	2.6	1.9	1.2
10	Colorado 153	23.30	54.21	79	5.1	3.2	0.4
11	Colorado 221	22.60	50.96	78	2.1	2.4	1.4
12	Pioneer 334	21.45	48.08	83	2.4	1.3	1.0

*Shelled corn on basis of 15.5% moisture

**Open-pollinated variety (selected by J. N. Skold)

Average yield of all varieties = 24.40 bushels per acre

Difference to be statistically significant = 3.60 bushels per acre

Table 7. AVERAGE YIELD AND AGRONOMIC DATA OF CORN HYBRIDS AND OPEN-POLLINATED VARIETIES TESTED IN SEDGWICK COUNTY, COLO., in 1945.

Rank	Hybrid or variety	Average yield of shelled corn*	Weight per measured bushel	Days to silk	Moisture in corn at harvest	Plants with suckers	Smutted plants	Broken and lodged stalks
		Bu. per acre	Pounds	Number	Percent	Percent	Percent	Percent
1	DeKalb E62	29.09	54.0	78	23.78	11.0	2.5	1.3
2	DeKalb 240	28.56	52.8	78	28.91	7.7	2.9	0
3	Colorado 152	27.86	49.8	81	27.84	1.8	0.4	0.9
4	Colorado 176	25.14	48.8	81	32.48	0.4	2.0	0.8
5**	Local Strain	24.71	50.2	85	38.26	2.1	5.5	4.2
6	DeKalb 65	24.34	54.4	80	21.91	3.4	3.9	0.6
7	Colorado 125	23.55	50.4	79	22.89	3.2	5.9	0.4
8	Pioneer 353	23.51	49.4	85	31.23	3.7	4.6	0.5
9	Funk G-1	22.69	52.0	79	23.05	0.5	7.7	0
10	Kingscrost KS2	22.26	54.2	73	20.39	3.0	10.4	0
11	Colorado 175	22.08	49.4	88	32.69	4.9	2.6	0.9
12	Kingscrost KF1	21.90	59.4	73	15.93	9.3	18.2	0
13	Colorado 153	21.80	51.6	81	25.45	9.1	4.6	0.5
14	Colorado 151	21.13	48.2	78	28.42	3.4	3.9	1.9
15	Colorado 221	20.01	46.8	80	41.43	3.7	2.1	0.5
16	Wisconsin 531	19.74	51.2	81	25.50	2.8	8.5	0
17	Pioneer 341	19.72	43.4	91	47.40	2.5	1.2	0.8
18	Funk G-177	19.25	53.3	77	20.04	2.1	7.7	1.0
19	Funk G-3	19.22	52.2	79	22.92	2.8	4.5	0.6
20	Colorado 321	18.09	42.2	92	52.29	2.7	0.8	17.4
21	Pioneer 334	16.30	42.3	85	51.33	4.5	1.7	1.7
22	Kingscrost KE1	15.13	54.3	73	14.81	2.1	28.0	4.2

*Shelled corn on basis of 15.5 percent moisture
**Open-pollinated variety (selected by J. N. Skold)
Mean yield of all varieties = 22.09 bushels per acre
Difference to be statistically significant = 5.09 bushels per acre