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SOUTH DAKOTA

corn
performance
tests

AGRONOMY DEPARTMENT
AGRICULTURAL EXPERIMENT STATION
SOUTH DAKOTA STATE COLLEGE, BROOKINGS

What Is Its Maturity Rating?

The number of days it takes a corn variety to mature is often listed by those who handle hybrid seed corn. Maturity can vary a great deal, depending on where the hybrid is grown. One that matures in 85 to 90 days in Minnehaha County may require 95 days further north. For this reason a hybrid's maturity should be determined in the area or areas where it is recommended.

Days required to reach maturity, when determined in areas where the seed is produced, are often not valid in large areas where the seed is sold. This publication lists the moisture percent at harvest rather than trying to rate a variety on length of time (days) to maturity. When trials over several years show a hybrid has a low enough moisture percent to keep safely in the crib, it is believed this better indicates its suitability to the area than to say it has a maturity of a certain number of days.

South Dakota Corn Performance Tests, 1956

D. B. SHANK, D. E. KRATOCHVIL, AND R. A. MOORE¹

Yield trials on those corn hybrids currently most popular among farmers are conducted each year by the Agronomy Department of the South Dakota Agricultural Experiment Station. The purpose is to supply farmers and ranchers with information on the relative performing ability of the various hybrids when they are subjected to similar environmental conditions such as rainfall, soil moisture, and fertility level. Such information, when used as a guide in selecting hybrids for planting, can aid the farmer in obtaining maximum yields under his field conditions.

In 1956, fourteen tests were planted throughout South Dakota. Each contained from 20 to 40 entries planted in replicated plots. Yields, moisture percentages at harvest, and in some cases lodging and dropped ears, were obtained and are presented in the tables in this publication.

Most areas of the state entered the 1956 season with low reserves of subsoil moisture. Temperatures approached long time averages in May but June was exceedingly warm at all locations, averaging several degrees above normal. Rapid and succulent early growth of corn resulted. This, coupled with severe drought conditions throughout the season caused an extremely poor corn crop in the usually productive southeastern part of the state, even though July and August were unusual in that their temperatures were below those of June. Elsewhere in the state, such as at Brookings and Watertown, above average rainfall in July and August, coupled with the relatively cool temperatures, resulted in excellent yields of corn in spite of the low springtime soil reserves.

An early frost on September 6 killed the corn prematurely in some areas, such as the test at Claremont. This, coupled with high winds during much of September and October, caused a great deal of stalk lodging and dropped ears by the time the trials were harvested.

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Location of the 1956 Trials

Tests were conducted in the eight agricultural areas into which the state has been divided (see figure 1). These eight areas have been established on the basis of soil types, rainfall, temperature, and elevation as they affect crop production. At least one test was located in each area. Two trials were in areas 2, 3, 5, and 8 and three in area 1. The exact location of these trials, the cooperator, soil type, and dates of planting and harvesting are presented in table 1. Anyone evaluating and selecting hybrid varieties should refer to the trials conducted nearest the area in which the hybrid is to be planted.

Selection of Entries

To select entries for the tests, a survey was conducted to determine the hybrids most farmers buy in the agricultural area represented by each test. Information was obtained on the hybrids of companies that registered their corn with the South Dakota State Department of Agriculture. The survey included recommendations by representatives of the corn companies producing and registering the hybrids, lists submitted by county agents located in the areas where the tests were conducted, information from the Livestock and Crop Reporting Service, and variety preference as expressed by farmers in general. Facilities permitted testing only the most widely used hybrids.

Method of Planting and Harvesting

Planting. Each group of entries in each test was planted in four or five replications. Within these replications, plots of individual hybrids were located at random. Each plot consisted of 2 rows of 10 hills each, or the equivalent if the corn was drilled rather than checked. Planting was done at the rate of 3 kernels per hill for the checked plots, 1 per hill for the drilled plots (except under irrigation where planting rate was increased). Tests located with farmer-cooperators received the same fertilizer applications and cultural treatments as did the farmer's corn. Planting dates are given in table 1.

Harvesting. The test plots were picked at the time general harvesting was going on in the surrounding area. The corn from each plot was picked separately and weighed. After weighing, samples for moisture determination were taken on three replications of the plots. This was accomplished by selecting 12 ears at random, taking a 1-inch cross section from the middle of each ear by means of a machine built for this purpose, and placing the 12 cross sections in a paper bag. The samples were weighed when taken in the field, then they were oven-dried at 102° C. in the laboratory, reweighed, and the moisture percentages determined. Harvesting dates are given in table 1.

Table 1. Location of the 1956 Tests

District	County	Cooperator	Post Office	Soil Type	Date Planted	Date Harvested
1	Butte	Newell Irrigation and Dry Land Field Station	Newell	Pierre clay (irrigated)	May 22	Oct. 9 & 10
1	Butte	Newell Irrigation and Dry Land Field Station	Newell	Pierre clay (dryland)	May 21	-----†
1	Butte	Al Sheeler	Vale	Vale sandy loam	May 18	Oct. 8 & 9
2	Fall River	Jim Varvel	Oral	Anselmo sandy loam	May 16	Oct. 17 & 18
2	Jackson	Range Field Station*	Cottonwood	Pierre clay loam	May 24	-----†
3	McPherson	North Central Station*	Eureka	Williams loam	May 18	Oct. 8
3	Hyde	Central Station*	Highmore	Williams loam	May 25	Oct. 23
4	Brown	Robert Schuller	Claremont	Very fine sandy loam	May 18	Oct. 10
5	Codington	Northeast Exptl. Farm*	Watertown	Kranzburg silt loam	May 22	Oct. 11
5	Brookings	Agri. Expt. Station	Brookings	Vienna loam	May 22	Oct. 25
6	Brule	Dale Cook	Chamberlain	Reliance silty clay loam	May 24	Oct. 22
7	Hutchinson	Southeast Exptl. Farm*	Menno	Bonilla loam	May 16	Oct. 19
8	Minnehaha	Walter Nordstrom	Garretson	Moody silt loam	May 21	Oct. 15
8	Clay	Clarence Dose	Wakonda	Waubay silty clay loam	May 14	Oct. 18

*Substations of the South Dakota Agricultural Experiment Station.
 †Tests not harvested.

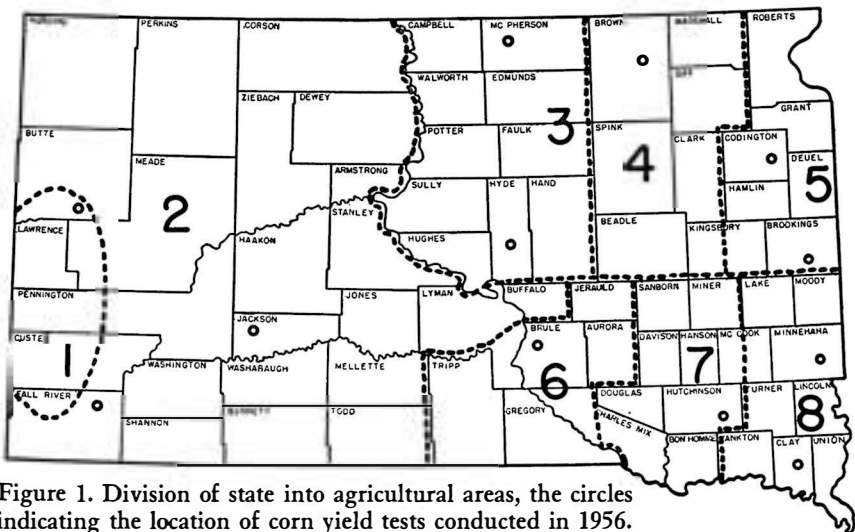


Figure 1. Division of state into agricultural areas, the circles indicating the location of corn yield tests conducted in 1956.

Temperature and Rainfall

The information presented in table 2 on climatic conditions at the various stations nearest the corn trials is based on reports of the Monthly Climatological Data, U. S. Department of Commerce, Weather Bureau, Huron, South Dakota. Anyone wishing to know the weather conditions under which the corn test for the area in question was grown should check the information listed closest to his area.

Table 2. Temperature and Precipitation for the 1956 Corn Growing Season*

Station and District	Temperature in Degrees F.				Precipitation in Inches				
	Month	Average	Departure From Normal	Average Departure	Month Total	Season Total	Departure From Normal	Total Departure	Frost-Free Days†
Newell (1)	May	56.1	+0.7		2.58		0.00		
	June	70.8	+6.6		2.32		-0.91		
	July	71.9	-1.6		1.58		-0.17		
	Aug.	69.5	-1.7		1.08		-0.19		
	Sept.	59.8	-0.8	+0.64	1.51	9.07	+0.38	-0.89	126
Vale (1)	May	55.4	-1.2		2.50		-0.19		
	June	71.0	+5.8		1.85		-1.63		
	July	70.5	-3.5		1.95		+0.07		
	Aug.	67.1	-4.3		1.73		+0.46		
	Sept.	57.9	-3.0	-1.24	1.55	9.58	+0.38	-0.91	132
Hot Springs (2)	May	57.1	+0.3		3.50		+0.46		
	June	71.1	+4.8		1.73		-1.28		
	July	71.6	-3.7		1.22		-0.90		
	Aug.	69.0	-4.2		1.38		-0.33		
	Sept.	61.5	-1.4	-0.84	0.61	8.44	-0.72	-2.77	161
Cottonwood (2)	May	58.6	+1.0		2.75		+0.18		
	June	75.2	+8.4		0.73		-2.17		
	July	74.0	-1.9		3.08		+1.69		
	Aug.	71.0	-2.7		3.21		+1.96		
	Sept.	63.2	+0.2	+1.00	0.83	10.60	-0.16	+1.50	143
Eureka (3)	May	55.6	-0.7		3.26		+ .86		
	June	69.9	+4.8		2.96		-1.06		
	July	68.1	-4.7		3.93		+1.56		
	Aug.	67.8	-2.8		4.30		+2.10		
	Sept.	58.8‡	-1.4	-0.96	0.51	14.96	-0.79	+2.67	123
Highmore (3)	May	57.7	+0.5		1.39		-0.79		
	June	73.7‡	+7.0		1.23		-2.48		
	July	70.5‡	-4.4		5.10		+3.30		
	Aug.	70.3	-2.5		1.99		0.00		
	Sept.	61.1‡	-1.7	-0.22	0.84	10.55	-0.37	-0.34	123
Aberdeen (4)	May	55.9	-1.6		2.01		-0.23		
	June	71.5	+4.7		3.06		-0.98		
	July	69.2	-4.7		2.95		+0.34		
	Aug.	68.5	-3.1		2.87		+0.71		
	Sept.	57.4	-3.6	-1.66	0.82	11.71	-0.61	-0.77	123
Watertown (5)	May	55.2	-0.9		2.88		+0.08		
	June	70.5	+4.7		6.56		+2.75		
	July	67.6	-4.9		4.02		+1.18		
	Aug.	68.5	-1.6		6.25		+3.60		
	Sept.	56.6	-3.5	-1.24	0.70	20.41	-1.23	+6.38	146
Brookings (5)	May	57.8	+0.2		2.74		+0.09		
	June	71.9	+4.5		4.06		+0.07		
	July	67.9	-5.8		6.03		+3.97		
	Aug.	67.8	-3.5		3.77		+0.87		
	Sept.	58.2	-3.4	-1.60	0.40	17.00	-1.70	+3.30	123
Pukwana (6)	May	59.4‡	-0.2		1.92		-0.44		
	June	74.3‡	+5.0		1.41		-1.90		
	July	71.7	-5.7		3.71		+1.95		
	Aug.	70.4	-4.4		7.02		+5.00		
	Sept.	62.1‡	-2.6	-1.58	0.64	14.70	-0.76	+3.85	123
Menno (7)	May	61.4	+1.4		2.42		-0.82		
	June	76.9	+6.8		1.00		-3.28		
	July	73.0	-3.7		2.22		-0.16		
	Aug.	72.4	-1.6		3.19		+0.13		
	Sept.	62.9‡	-1.9	+0.20	0.55	9.38	-1.43	-5.56	140
Sioux Falls (8)	May	60.1	+2.0		1.31		-2.07		
	June	75.1	+7.1		6.86		+2.61		
	July	70.8	-4.0		4.02		+1.02		
	Aug.	71.0	-1.4		4.09		+0.81		
	Sept.	61.2	-1.2	+0.50	0.29	16.57	-2.64	-0.27	146
Vermillion (8)	May	63.1	+1.4		1.93		-1.16		
	June	77.1	+5.6		1.45		-2.89		
	July	73.5	-4.0		2.33		-0.81		
	Aug.	74.5	-0.8		2.27		-0.86		
	Sept.	65.8	-0.4	+0.36	0.75	8.73	-1.93	-7.65	147

*From *Monthly Climatological Data*, U. S. Department of Commerce, Weather Bureau, Huron, South Dakota.

†Number of days between the last spring temperature of 32° F. or lower and the first fall temperature of 32° F. or lower.

‡One or more days of record missing.

Measuring Performance

Yield. The yield reported for each hybrid or variety in each test is the average obtained for all replications, expressed in bushels per acre on the basis of 15.5 percent moisture. All yields were computed from the field weights, which had been corrected according to the moisture content of the individual entries. At the bottom of tables 3 through 16 is given the minimum amount for each test by which two entries must differ in yield for that difference to be considered statistically significant.

A slight amount of variation can occur between entries of equal performance potential due to field conditions, such as variations in soil fertility, slope, and stand differences. Therefore, mathematical determinations have been made to establish how great a difference between two entries is necessary before it can be said that it is a true difference rather than a chance variation. For example, in Brookings County (table 12), a difference of 6 bushels per acre in the yield of two entries is required before it can be said that one has a superior yielding ability over the other. This difference, required for significance, varies from test to test depending upon the amount of chance variation within each.

The average yield of all entries appears at the bottom of the yield column in each table.

Moisture content. The moisture content at harvest is given for each entry in the tables. This is the amount of moisture in the ear corn expressed in percentage. At the bottom of the moisture percentage column appears the average moisture percent of all entries. Moisture content is directly related to maturity, and because maturity is of primary consideration in South Dakota, these figures are very important when an evaluation of the various entries is made.

Performance rating. Yields for each entry in each test were converted to percentages by comparing them with the average yield of all entries. Similar calculations were made for moisture at harvest time after first subtracting each moisture content from 100 so that the varieties would be ranked according to their ability to produce sound, rather than soft, corn. The performance rating which appears in the tables for each entry was then found as follows:

$$\frac{6(\text{Yield percentage}) + 4(\text{moisture percentage})}{10}$$

Stand. A reduction in the number of hills below 100 percent may indicate several things—either that the seed of an entry was unable to produce a good stand under the environmental conditions prevailing for the test or that something destroyed either the kernels before germination or the young plants. Thin stands reduce yields, and since this work is designed

primarily to test yielding potential of the various entries, corrections in yield were made for missing hills according to the formula:

$$CW = FW \left(\frac{H-0.3M}{H-M} \right)$$

where CW = corrected weight, FW = field weight, H = number of hills planted per plot, and M = number of missing hills. No yield corrections were made for minor variations in stand, that is, less than three stalks per hill. Also no corrections were attempted for poor stands in drilled plots.

Lodging. In some tests information is given on lodging. Root lodging is expressed as the percentage of stalks that leaned 30 degrees or more from the perpendicular at the ground level. Stalk lodging is the percentage of plants broken below the ear at harvest time.

Dropped ears. Where information is given on dropped ears it represents the percentage of the plants whose ears were on the ground when the corn was harvested.

Average yields over a period of years. Many of the entries included in the 1956 trials were also tested in previous years. This makes possible the calculation of 2-, 3-, 4-, and 5-year averages in some cases. Averages involving the greater number of years are shown first in the tables, as this data gives more information than only 1 year's results. In any one year an entry may fluctuate in its relative value because of specific environmental conditions under which the test was conducted. Averages for a period of years will tend to iron out these environmental variations.

In the table for any one area test, a hybrid is shown with only two yields no matter how many years it has been included in the trials. The average yield for the total number of years the hybrid has been tested and the results from the current year are shown. These yields are shown in comparison to the average yield of all entries for the current year and total years in which the hybrid was included. A hybrid or variety was included in the averages only when it was the same variety each year and secured from the same source.

Black Hills Area

Butte County.² Two trials, one irrigated and one on dryland, were carried on at the Newell Irrigation and Dry Land Field Station in 1956. In addition, another irrigated test, located on the Al Sheeler farm near Vale, was run so that results might be obtained on Vale sandy loam soil as well as on the Pierre clay soils of the Newell Station.

²The work in Butte County (tables 3, 4, 5) and Fall River County (table 6) was conducted by Joseph J. Bonnemann, Agricultural Research Service, USDA, U. S. Irrigation and Dry Land Field Station, Newell, South Dakota, in cooperation with the South Dakota Agricultural Experiment Station.

Black Hills Area

The dryland field on the Pierre clay at Newell produced flax in 1955. Following the harvest of flax the plot was duckfooted and kept black until winter. The corn was planted May 21, 1956, and subsequently thinned to 8,000 plants per acre. A poor reserve of subsoil moisture, extremely hot weather in early June, and below normal rainfall prevented normal plant growth. The plants "burned-up" and only a few of the earliest maturing varieties even tasseled. In no instance did silking begin.

The irrigated plot at Newell had been in alfalfa since 1950. It was fall plowed in 1955. Prior to discing in 1956 approximately 70 pounds of available nitrogen in the form of urea and 40 pounds of available P_2O_5 as treble superphosphate were applied broadcast. Planting was completed on May 22 and harvesting on October 10. The plant population was 18,000 per acre. Irrigations were made July 2 and 3, July 18 and 19, and August 9 and 10.

**Table 3. Area 1 (Butte County)
1956 Corn Performance Tests on Irrigated Land—Clay Soil**

Hybrid or Variety	Acre Yield Bu.	Moisture Percent	1956			Performance Rating
			Yield Bu.*	Moisture Percent	Stalk Lodging Percent	
5-Year Average						
DeKalb 56	71	18	66	20	2	9
Funk G-18	71	22	66	26	3	14
Sokota S. D. 220	70	17	69	20	3	2
S. D. 262	70	20	68	22	3	5
Funk G-11	62	19	59	19	3	17
Average of 5 entries tested 5 years	68	19	---	---	---	---
4-Year Average						
Sokota S. D. 250	79	18	66	24	3	12
S. D. 270	73	19	66	24	4	13
Disco 95-W	70	18	60	23	3	18
Average of 8 entries tested 4 years	72	18	---	---	---	---
3-Year Average						
Gurney 90	65	21	62	24	2	16
Average of 9 entries tested 3 years	68	20	---	---	---	---
2-Year Average						
Trojan F-99	83	25	81	25	2	1
Jacques W. P. #2	75	22	68	22	2	8
Average of 11 entries tested 2 years	73	23	---	---	---	---
Pfister P. A. G. 43	---	---	71	25	3	3
DeKalb 62	---	---	71	26	4	6
Kingscrot KS4	---	---	71	27	4	7
Cargill 100N	---	---	70	27	6	10
Pfister P. A. G. 28	---	---	69	23	13	4
Haapala H-340	---	---	67	22	2	11
Kingscrot KA3	---	---	62	21	4	15
Average	---	---	67	23	---	---

*Differences in yield of less than 8 bushels per acre are not statistically significant.

Black Hills Area

Al Sheeler Farm. The test on Vale fine sandy loam followed a 1955 crop of beets. Prior to spring plowing, approximately 125 pounds of 17-17-0 mixed fertilizer and several loads of manure were spread on the field. On June 27, 1956, a sidedressing of 60 pounds of available nitrogen as urea were applied. Planting was done on May 18 and harvesting on October 8 and 9. The plant population was 18,000 per acre. The farmer cooperater did the irrigation work.

Butte County (dryland). Since no yields were obtained in 1956 because of drought, the following table taken from the 1955 circular gives a summary of available information from tests of previous years.

Table 4. Area 1 (Butte County) 1955 Corn Performance Tests on Dryland—Pierre Clay Soil

Hybrid or Variety	2-Year Average*		1955		
	Yield Bu.	Moisture Percent	Yield Bu.†	Moisture Percent	Performance Rating
Sokota S. D. 220	36	18	18	26	3
Sokota S. D. 250	35	25	17	37	6
Jacques 853J	33	20	15	27	5
Black Hills Special‡	33	30	14	36	14
Kingscrost KE3	32	15	17	23	4
White Dent‡	28	27	12	34	16
Falconer‡	26	21	7	32	17
Kingscrost KE1	—	—	19	28	1
Pfister 33	—	—	19	30	2
DeKalb 56	—	—	16	34	7
Funk G-11	—	—	16	35	8
Gurney 90	—	—	15	29	9
DeKalb 58	—	—	15	33	11
Trojan F-99	—	—	15	39	12
S. D. 262	—	—	15	37	13
Disco 95-W	—	—	14	37	15
Haapala H359	—	—	13	22	10
Average of all entries	32	22	15	32	—

*Average of 1953 and 1955 data.

†Differences in yield of less than 3 bushels per acre are not statistically significant.

‡Open pollinated varieties.

Black Hills Area

Table 5. Area 1 (Butte County)
1956 Corn Performance Tests on Irrigated Land—Sandy Soil

Hybrid or Variety	Acre Yield Bu.	Moisture Percent	1956		Performance Rating
			Yield Bu.*	Moisture Percent	
4-Year Average					
Funk G-18	118	29	116	24	5
Sokota S. D. 270	109	30	111	20	6
DeKalb 56	107	26	108	19	8
S. D. 262	106	29	114	20	3
S. D. 220	105	22	107	18	9
Funk G-11	98	24	100	21	16
Average of 6 entries tested 4 years	107	26	—	—	—
3-Year Average					
Sokota S. D. 250	111	27	114	18	1
Gurney 90	98	27	101	21	15
Disco 95-W	94	28	94	23	18
Average of 9 entries tested 3 years	106	27	—	—	—
2-Year Average					
Trojan F-99	109	35	119	26	4
Jacques W. P. #2	98	32	99	21	17
Average of 11 entries tested 2 years	109	30	—	—	—
Kingscrot KS4	—	—	117	23	2
Cargill 100N	—	—	116	26	7
Kingscrot KA3	—	—	109	22	10
Pfister P. A. G. 43	—	—	109	24	11
DeKalb 62	—	—	108	26	12
Haapala H340	—	—	104	22	13
Pfister P. A. G. 28	—	—	103	22	14
Falconer	—	—	43	18	19
Average	—	—	105	22	—

*Differences in yield of less than 17 bushels per acre are not statistically significant.

West River Area

Fall River County. In 1956 a trial was initiated on the Angostura Irrigation Project near Hot Springs. The field, in sweet clover in 1955, was spring plowed in 1956. Ninety pounds of available nitrogen in the form of anhydrous ammonia were applied prior to planting. Planting was completed on May 16 and harvesting on October 18. Stands were 18,000 plants per acre.

**Table 6. Area 2 (Fall River County) 1956 Corn
Performance Tests on Irrigated Land**

Hybrid or Variety	Acre Yield Bu.*	Moisture Percent	Stalk Lodging Percent	Performance Rating
Sokota S. D. 604	144	16	6	2
DeKalb 410	143	14	2	1
Pioneer 349	140	17	2	3
Kingscrot K04	140	19	5	4
S. D. Exptl. #13	140	19	2	7
United Hagie UH32A	139	17	2	5
Kingscrot KS5	137	16	3	6
S. D. Exptl. #19	136	19	3	10
Funk G-26	133	16	6	9
Disco 101-A	131	13	6	8
Pfister P. A. G. 71	130	16	3	11
Pfister P. A. G. 62	130	17	3	12
Cargill 100N	125	16	9	14
DeKalb 236	124	15	7	13
Pioneer 377A	121	13	1	15
S. D. 270	121	14	4	17
S. D. 250	119	12	3	16
DeKalb 248	119	16	3	20
Sokota S. D. 400	118	14	6	18
S. D. 262	117	14	5	19
Funk G-6	117	15	3	21
DeKalb 62	116	14	3	22
Average	129	15	4	---

*Differences in yield of less than 13 bushels per acre are not statistically significant.

West River Area

Jackson County. Because of drought, no yields have been obtained for the last 3 years in this county. The following table is a summary of available information obtained from tests of previous years.

Table 7. Area 2 (Jackson County) 1953 Corn Performance Tests

Hybrid or Variety	2-Year Average*		1951		
	Acre Yield Bu.	Moisture Percent	Yield Bu.†	Moisture Percent	Performance Rating
S. D. 250	17	22	22	13	4
S. D. 224	13	26	21	11	5
Sokota S. D. 262	13	28	19	11	10
S. D. 400	13	31	18	12	13
S. D. 212	12	27	21	12	6
S. D. 270	12	27	19	12	9
Funk G-9	12	34	19	13	11
Disco 85-W	11	22	18	11	15
Rainbow Flint	11	24	16	12	21
Funk G-1A	11	32	18	13	16
Kingscrot KE3	10	19	18	11	14
Average of 11 entries tested 2 years.....	12	27	---	---	---
Sokota S. D. 220	---	---	26	11	1
Master F32	---	---	25	12	2
Kingscrot KE1	---	---	22	11	3
Gurney 90	---	---	21	11	7
DeKalb 58	---	---	20	12	8
F. U. 4417	---	---	19	12	12
Disco 90-W	---	---	17	11	18
DeKalb 62	---	---	17	11	19
Wisconsin 355	---	---	17	12	17
Jacques 803	---	---	16	11	20
Gurney 85	---	---	14	12	22
Gehu	---	---	4	14	23
Average	---	---	19	12	---

*Two-year averages are of the 1951 and 1953 crops. Drought eliminated the 1952, 1954, 1955, and 1956 trials.

†Differences in yield of less than 7 bushels per acre are not statistically significant.

North Central Area

McPherson County. The corn trials at the North Central Station at Eureka follow small grain in the rotation. Fertility practices call for 160 pounds of 16-20-0 mixed fertilizer per acre preceding the small grain and 10 tons of manure before the corn. In 1956 soil surface moisture was only fair at planting time. High temperatures and low moisture in June were only partially offset by below normal temperatures and above average rainfall in July and August and yields were 6 to 7 bushels below the 5-year average. This test was planted May 18 and harvested October 8.

Table 8. Area 3 (McPherson County) 1956 Corn Performance Tests

Hybrid or Variety	Acre Yield Bu.	Moisture Percent	1956		
			Yield Bu.*	Moisture Percent	Performance Rating
5-Year Average					
Sokota S. D. 220	34	20	27	22	13
Pioneer 388	34	22	28	19	7
DeKalb 46	31	20	27	18	10
Wisconsin W240	31	23	30	19	2
Wisconsin W355	28	26	23	27	27
Average of 5 entries tested 5 years	32	22	—	—	—
4-Year Average					
Nodak 301	33	21	24	22	24
Average of 6 entries tested 4 years	33	22	—	—	—
3-Year Average					
Sokota S. D. 250	29	29	26	26	18
Funk G-11	28	27	26	26	20
Kingscrost KE7	26	22	26	18	14
Average of 9 entries tested 3 years	28	24	—	—	—
2-Year Average					
S. D. Exptl. # 17	26	16	29	19	6
S. D. Exptl. # 16	25	17	29	17	5
Nodak 305	25	21	29	26	9
S. D. Exptl. # 18	24	19	27	20	11
Pfister P. A. G. 28	24	25	32	24	1
Pioneer 395	21	20	24	19	21
Gurney 85	19	22	24	25	25
Average of 16 entries tested 2 years	22	21	—	—	—
United Hagie UH24A	—	—	30	24	4
Minnesota A. E. S. 201	—	—	28	17	8
Funk G-18	—	—	28	32	15
South Dakota A. E. S. 101	—	—	27	10	3
DeKalb 58	—	—	27	29	7
Pfister P. A. G. 32	—	—	26	22	16
Agasco Morden 77	—	—	25	12	12
Trojan B-55	—	—	25	22	19
Cargill A95N	—	—	25	25	22
Jacques 853J	—	—	24	22	23
Disco 85-W	—	—	23	25	26
Average	—	—	27	22	—

*Differences in yield of less than 5 bushels per acre are not statistically significant.

North Central Area

Hyde County. The Hyde County plots on the Central Station at Highmore rotate with small grain. Fertilizer practices call for 200 pounds of 16-20-0 mixed fertilizer per acre before the small grain and 100 pounds of 16-20-0 and 10 tons of manure per acre previous to corn. Soil moisture was poor at planting time which, coupled with the season which followed, gave below average yields. The test was planted May 25 and harvested October 23.

Table 9. Area 3 (Hyde County) 1956 Corn Performance Tests

Hybrid or Variety	Acre Yield Bu.	Moisture Percent	1956		
			Yield Bu.*	Moisture Percent	Performance Rating
5-Year Average					
S. D. 220	40	13	30	8	1
S. D. 400	40	21	25	15	8
Pioneer 377A	39	22	23	17	15
Sokota S. D. 270	37	18	23	10	11
Kingscrost KS4	35	19	20	15	19
S. D. 224	34	17	28	9	3
Pioneer 388	34	17	18	13	23
S. D. 262	34	20	22	12	14
Average of 8 entries tested 5 years	37	18	---	---	---
4-Year Average					
Funk G-18	33	13	20	13	18
Peavey PV 35	32	14	22	10	13
Average of 10 entries tested 4 years	36	14	---	---	---
3-Year Average					
Sokota S. D. 250	42	11	25	9	6
Van's Hybrid V44	39	12	22	9	12
Average of 12 entries tested 3 years	40	13	---	---	---
2-Year Average					
Haapala H360	37	10	29	9	2
Funk G-26	29	16	25	12	9
United Hagie UH26	25	11	24	10	10
Average of 15 entries tested 2 years	30	12	---	---	---
Jacques 1053J	---	---	27	12	4
Cargill 100N	---	---	26	14	5
Tomahawk 4A	---	---	26	15	7
Pfister P. A. G. 43	---	---	20	11	17
DeKalb 236	---	---	20	12	16
Farmers 223	---	---	19	15	22
DeKalb 252	---	---	19	19	24
Disco 101-A	---	---	18	11	21
Trojan F-99	---	---	18	12	20
Average	---	---	23	12	---

*Differences in yield of less than 10 bushels per acre are not statistically significant.
 †1954 test is not included in the average.

North James River Area

Brown County. Yields in this trial just about equaled the 5-year average. Again weather was hot in June but below normal the rest of the season. Rainfall was very near the long time average. Frost on September 6 killed the plants early and strong winds the rest of the month caused excessive stalk breakage. Such lodging information is not presented because differences among replications were not closely associated with hybrids. The test was planted May 18 and harvested October 10.

Table 10. Area 4 (Brown County) 1956 Corn Performance Tests

Hybrid or Variety	Acre Yield Bu.	Moisture Percent	1956		
			Yield Bu.*	Moisture Percent	Performance Rating
5-Year Average					
Sokota S. D. 270	62	17	64	16	3
Pioneer 382	60	14	58	12	12
Kingscrot KS4	60	17	65	18	2
Pioneer 388	59	14	61	14	7
S. D. 262	59	15	58	16	17
DeKalb 58	56	15	62	15	8
Average of 6 entries tested 5 years	60	15	---	---	---
4-Year Average					
Sokota S. D. 250	62	15	60	13	9
Average of 7 entries tested 4 years	62	17	---	---	---
3-Year Average					
Funk G-18	64	19	65	17	1
Disco 101-A	60	20	60	16	13
Average of 9 entries tested 3 years	61	18	---	---	---
2-Year Average					
Pfister P. A. G. 44	59	14	63	16	5
Kingscrot KB4	59	16	61	19	14
Tomahawk 4A	56	16	65	18	4
United Hagie UH26	54	13	58	14	15
Haapala H360	51	13	62	14	6
Average of 14 entries tested 2 years	57	14	---	---	---
Farmers 223	---	---	62	20	11
Jacques 1053J	---	---	60	14	10
Funk G-26	---	---	59	17	16
DeKalb 55	---	---	58	15	18
Peavey PV97	---	---	56	15	19
Trojan E-89	---	---	55	18	20
Cargill 100N	---	---	54	20	21
Pfister P. A. G. 32	---	---	50	14	22
Agasco 464A	---	---	50	20	23
Average	---	---	59	16	---

*Differences in yield of less than 7 bushels per acre are not statistically significant.

Northeast Area

Codington County. The test in Codington county was on the Northeast Experimental Farm, 15 miles north of Watertown. Climatic conditions were favorable for corn in 1956. While for the rest of the state June was above average in temperature, this was one of the few locations where rainfall was also above normal for this month. In addition July and August also had above average rainfall and as a result yields were better than average. Fertilizers containing 60 pounds of available nitrogen and 40 pounds of P_2O_5 were applied. The test was planted May 22 and harvested October 11.

Table 11. Area 5 (Codington County) 1956 Corn Performance Tests

Hybrid or Variety	Acre Yield Bu.	Moisture Percent	1956		
			Yield Bu.*	Moisture Percent	Performance Rating
3-Year Average					
Pioneer 388	42	23	47	16	7
Sokota S. D. 220	41	21	41	17	22
Kingscrost KA4	40	26	49	20	6
Sokota S. D. 250	39	24	45	19	15
Gurney 90	39	27	45	22	17
Haapala H375	37	23	47	16	9
Funk G-18	34	31	41	23	27
Average of 7 entries tested 3 years	39	25	---	---	---
2-Year Average					
S. D. Exptl. #16	51	13	53	15	1
S. D. Exptl. # 18	48	14	48	16	4
Trojan F-99	48	20	51	25	5
Farmers 205	46	20	48	23	11
S. D. Exptl. #17	44	14	43	15	16
Funk G-11	44	16	44	14	13
Disco 101-A	44	24	45	30	25
Peavey PV355	43	16	44	20	21
Average of 15 entries tested 2 years	45	18	---	---	---
Pfister P. A. G. 32	---	---	52	19	2
Cargill A95N	---	---	50	19	3
Disco 90-W	---	---	49	20	8
Nodak 301	---	---	47	16	10
Kingscrost KS5	---	---	47	26	18
Pfister P. A. G. 28	---	---	46	20	12
DeKalb 55	---	---	46	25	20
Pioneer 383	---	---	45	22	19
DeKalb 46	---	---	44	16	14
Van's Hybrid V727	---	---	43	30	28
Tomahawk 14	---	---	42	22	26
Jacques 1053-JA	---	---	42	28	29
United Hagie UH214	---	---	40	31	30
South Dakota A. E. S. 101	---	---	39	11	23
Agasco Morden 77	---	---	38	11	24
Average	---	---	45	20	---

*Differences in yield of less than 9 bushels per acre are not statistically significant.

Northeast Area

Brookings County. In this test the yields exceeded the 5-year average. This was due to an almost 4-inch above average rainfall in July and nearly 1 inch above average in August, coupled with below normal temperatures both months. Also, June, while being hot, still had average rainfall. All of this tended to offset the low subsoil moisture which prevailed in the spring. A rotation of 2 years small grain, 1 year corn is employed. Fertility is maintained on these plots by 150 pounds of 16-20-0 mixed fertilizer each year previous to small grain and 10 tons of manure previous to corn. The plot was planted May 22 and harvested October 25.

Table 12. Area 5 (Brookings County) 1956 Corn Performance Tests

Hybrid or Variety	Acre Yield Bu.	Moisture Percent	Root Lodging Percent	1956					Perform- ance Rating
				Yield Bu.*	Moisture Percent	Lodging		Ear Drop Percent	
						Root Percent	Stalk Percent		
5-Year Average									
Sokota S. D. 250	74	21	3	87	12	6	19	2	14
S. D. 262	74	22	13	91	11	7	15	6	5
S. D. 270	74	24	8	90	13	9	12	2	9
Funk G-6	72	25	5	93	14	1	8	1	6
Kingscrot KS4	70	24	8	94	14	9	18	9	2
Pioneer 388	69	19	6	85	12	8	17	6	18
S. D. 400	69	25	7	87	14	4	31	26	16
Sokota S. D. 220	65	17	4	81	12	5	14	7	24
Average of 8 entries tested 5 years	71	22	7	---	---	---	---	---	---
4-Year Average									
Disco 101-A	74	20	4	94	14	8	15	9	3
Tomahawk 14	71	22	6	84	12	13	15	2	22
Average of 10 entries tested 4 years	72	22	5	---	---	---	---	---	---
3-Year Average									
Trojan F-99	70	21	3	94	12	1	28	13	1
United Hagie UH214..	69	24	2	87	16	2	22	10	20
DeKalb 58	66	18	8	82	13	7	16	4	25
Average of 13 entries tested 3 years	68	21	7	---	---	---	---	---	---
2-Year Average									
Haapala H-130	66	19	14	94	14	28	12	2	4
Farmers 223	63	19	1	90	16	1	21	4	12
Kingscrot KS5	59	18	2	92	14	4	10	3	7
Average of 16 entries tested 2 years	63	17	9	---	---	---	---	---	---
S. D. Exptl. #22	---	---	---	92	17	18	26	2	11
DeKalb 236	---	---	---	91	13	6	16	1	8
Pioneer 383	---	---	---	90	13	7	7	4	10
Van's Hybrid V903	---	---	---	90	16	14	13	2	13
Pfister P. A. G. 62	---	---	---	88	15	4	29	6	15
Gurney 124	---	---	---	88	16	4	10	2	17
Funk G-26	---	---	---	87	15	1	15	10	19
Jacques 1053-JA	---	---	---	85	14	4	14	2	21
Cargill 95N	---	---	---	79	13	18	12	1	25
Pfister P. A. G. 32	---	---	---	76	12	0	20	12	26
Peavey PV 355	---	---	---	74	15	0	29	8	27
Average	---	---	---	88	13	7	17	6	---

*Differences in yield of less than 6 bushels per acre are not statistically significant.

South Central Area

Brule County. Soil variations caused very erratic yields in this trial in 1956. Plots along one edge yielded more than they should have in comparison with the rest of the trial. However, a cool July and August plus above average rainfall gave yields considerably better than average. The test was planted on May 24 and harvested October 22.

Table 13. Area 6 (Brule County) 1956 Corn Performance Tests

Hybrid or Variety	Acre Yield Bu.	Moisture Percent	1956		
			Yield Bu.*	Moisture Percent	Performance Rating
5-Year Average†					
DeKalb 410	49	23	52	10	15
S. D. 250	46	18	46	7	25
S. D. 262	45	21	58	9	4
Farmers 223	44	22	54	14	14
S. D. 270	41	20	44	7	27
Sokota S. D. 400	41	21	48	11	23
Average of 6 entries tested 5 years	44	21	---	---	---
4-Year Average†					
Pioneer 388	50	12	57	10	6
Average of 7 entries tested 4 years	49	12	---	---	---
3-Year Average†					
Gurney 100	49	16	52	11	16
Average of 8 entries tested 3 years	52	14	---	---	---
2-Year Average†					
Pioneer 383	65	13	55	9	9
Vinton V-14	64	19	59	13	5
DeKalb 248	61	16	51	12	20
Funk G-26	49	16	43	12	28
Average of 12 entries tested 2 years	56	15	---	---	---
Pfister P. A. G. 57	---	---	72	11	1
Cornhusker 83	---	---	63	18	2
Trojan F-99	---	---	60	14	3
Haapala H130	---	---	59	16	7
Jacques 1108J	---	---	57	13	8
Sokota S. D. 604	---	---	56	16	11
Cargill 105N	---	---	54	9	10
Funk G-30A	---	---	54	14	12
Tekseed 45A	---	---	54	15	13
Turner N14A	---	---	53	14	17
Curry's C-57	---	---	53	15	18
Kingscrot KS4	---	---	51	10	19
United Hagie UH41A	---	---	50	14	21
Disco 101-A	---	---	48	11	22
Tomahawk 42	---	---	48	14	24
Pfister P. A. G.	---	---	45	8	26
Beeghly Ia. 4376	---	---	43	16	29
Average	---	---	53	12	---

*Differences in yield of less than 16 bushels per acre are not statistically significant.
†1955 test is not included in the average.

South James River Area

Hutchinson County. This test was moved in 1956 from the Roy Konrad farm just north of Kaylor to the Southeast Experimental Farm located 4 miles east of Menno. However, results obtained in 1954 and 1955 from the Kaylor plots were used to obtain 2- and 3-year averages. Hutchinson County was in the severe drought area in 1956 and the test results were very poor. The plots were located on land which contained corn in 1955. Fertilizer applied consisted of 60 pounds of nitrogen and 40 pounds of available P_2O_5 per acre. The test was planted May 16 and harvested October 19.

Table 14. Area 7 (Hutchinson County) 1956 Corn Performance Tests

Hybrid or Variety	Acre Yield Bu.	Moisture Percent	1956		
			Yield Bu.*	Moisture Percent	Performance Rating
3-Year Average					
DeKalb 410	55	15	24	11	5
Pfister P. A. G. 57	51	14	22	11	7
Pioneer 352	51	16	26	14	3
Sokota S. D. 400	50	13	29	9	1
Jacques 1153J	50	17	23	13	6
Pioneer 352	49	15	19	11	17
Certified Seed Co. Ia. 306	49	17	13	13	30
Tomahawk 60	47	16	15	15	27
Turners T-48	47	17	7	15	32
Average of 9 entries tested 3 years	50	16	---	---	---
2-Year Average					
Sokota S. D. 604	39	14	27	11	2
S. D. Exptl. #19	39	15	19	13	16
Tekseed 115	39	15	22	13	8
S. D. Exptl. #20	38	14	21	13	13
Cornhusker 84	38	15	21	14	12
Funk G-75A	38	17	18	17	20
Disco 108-AA	36	12	21	10	10
Trojan G-94	36	15	21	14	11
Farmers 427A	35	15	18	14	18
Gurney 118A	34	14	18	11	19
Average of 19 entries tested 2 years	37	14	---	---	---
Haapala H130	---	---	25	11	4
Vinton V-14	---	---	21	9	9
Pfister P. A. G. 244	---	---	20	14	14
Kingscrost K04	---	---	19	13	15
Cargill 175	---	---	18	12	21
Curry C-49	---	---	17	12	22
United Hagie UH41A	---	---	17	13	23
Funk G-76	---	---	17	15	24
Renk & Sons R405A	---	---	16	13	25
Jacobsen J39	---	---	15	15	26
DeKalb 459	---	---	14	12	29
Moews 14	---	---	14	13	28
Green Acres 395	---	---	13	14	31
Average	---	---	19	13	---

*Differences in yield of less than 10 bushels per acre are not statistically significant.

Southeast Area

Minnehaha County. In this test the high June temperatures also accompanied above average rainfall. Furthermore, July and August rainfall was above average. This, plus fertile soil and a side dressing of 40 pounds of nitrogen, offset the low subsoil moisture at the beginning of the season and gave above average yields. The test was planted May 21 and harvested October 15.

Table 15. Area 8 (Minnehaha County) 1956 Corn Performance Tests

Hybrid or Variety	Acre Yield Bu.	Moisture Percent	1956			Performance Rating
			Yield Bu.*	Moisture Percent	Root Lodging Percent	
5-Year Average						
Pfister P. A. G. 56	70	20	81	16	3.6	2
United Hagie UH 32A	69	26	79	23	1.4	12
S. D. 250	67	18	79	16	0.0	5
Sokota S. D. 270	67	18	66	16	7.0	29
Sokota S. D. 400	65	21	73	19	3.7	24
S. D. 262	63	20	74	17	10.2	17
Average of 6 entries tested 5 years	67	21	---	---	---	---
3-Year Average†						
Funk G-26	71	21	81	17	8.8	4
S. D. Exptl. #13	71	24	82	23	4.7	6
Pfister P. A. G. 71	71	23	83	21	1.0	3
DeKalb 248	70	24	78	25	14.7	20
Haapala H130	69	23	80	20	2.5	8
S. D. 604	69	27	80	26	5.8	16
Pioneer 371	68	21	63	19	2.7	33
Trojan F-102	64	24	72	20	4.7	28
Average of 14 entries tested 3 years	68	22	---	---	---	---
2-Year Average						
Pioneer 383	60	16	72	16	1.9	19
Disco 111-AA	60	24	77	25	1.5	22
Funk G-30A	60	25	77	23	7.5	21
Cornhusker 84	59	24	76	25	4.7	25
Gurney 105	56	24	68	25	0.6	31
Carlson C-6	55	24	67	25	3.5	32
Average of 20 entries tested 2 years	60	20	---	---	---	---
Vinton V-35	---	---	89	24	4.3	1
McCurdy 100	---	---	83	25	1.1	7
Kingscrot K04	---	---	83	25	3.9	9
Jacques 1158J	---	---	82	26	3.7	10
Iowearth 16	---	---	81	26	6.2	13
Farmers 427A	---	---	81	26	2.8	15
Tekseed 31	---	---	80	24	0.5	11
Cargill 180	---	---	79	25	2.6	18
Dekalb 410	---	---	77	20	7.7	14
Moews 60	---	---	77	28	8.5	26
Beeghly Regular, Storm Breaker..	---	---	77	28	0.0	27
Tomahawk 22	---	---	76	22	1.5	23
Renk & Sons R222A	---	---	68	20	4.6	30
Average	---	---	77	23	6.2	---

*Differences in yield of less than 10 bushels are not statistically significant.

†Entries tested 4 years were same as those tested 5 years, so no 4-year averages are given.

Southeast Area


Clay County. This location was in the heart of South Dakota's drought area. Yields were much below those customary for the area. Moisture was deficient every month of the season and totaled over $7\frac{1}{2}$ inches less than normal for the entire growing period. Such conditions bring about large environmental differences throughout a test plot. This causes experimental error to be high and large differences between varieties are necessary before one hybrid is really better in performance than another. The test was planted May 14 and harvested October 18. 

Table 16. Area 8 (Clay County) 1956 Corn Performance Tests

Hybrid or Variety	Acre Yield Bu.	Moisture Percent	1956		
			Yield Bu.*	Moisture Percent	Performance Rating
5-Year Average					
Pioneer 349	72	17	51	11	3
DeKalb 627	72	19	38	15	34
DeKalb 410	69	16	49	11	5
Pioneer 352	69	18	45	12	13
Farmers 427A	67	18	46	12	12
Tekseed 115	67	19	40	12	27
Sokota S. D. 604	65	17	38	12	29
Sokota S. D. 400	61	15	37	12	33
Average of 8 entries tested 5 years.....	68	17	—	—	—
4-Year Average					
Tomahawk 78	71	19	44	15	18
Gurney 118A	67	18	40	12	24
Average of 10 entries tested 4 years.....	67	17	—	—	—
3-Year Average					
Jacobsen J20A	60	19	48	13	7
United Hagie UH41A	51	19	36	16	36
Average of 12 entries tested 3 years.....	55	17	—	—	—
2-Year Average					
Funk G-75A	59	17	53	15	2
Pfister P. A. G. 244	54	16	47	14	11
Cornhusker 88	53	16	49	14	9
Jacques 1208J	52	21	47	20	15
Curry's C-49	51	16	42	15	23
Green Acres 395	51	18	46	14	14
Trojan G-94	49	16	42	14	20
McCurdy 100M	49	17	44	17	19
Kingscrost KT6	49	18	45	16	17
Beegley Ia. 4376	48	15	36	13	35
Funk G-77A	46	16	40	12	25
Average of 23 entries tested 2 years.....	51	16	—	—	—
Cornelius C-49	—	—	52	11	1
Cargill 251	—	—	51	13	4
Iowearth 16	—	—	50	15	6
S. D. Exptl. # 19	—	—	49	15	8
McCurdy 111-1	—	—	47	11	10
S. D. Exptl. # 20	—	—	45	16	16
Kingscrost KT7	—	—	42	15	22
Turner T-48	—	—	41	16	26
Disco 108-AA	—	—	39	11	28
Pfister P. A. G. 277	—	—	39	14	30
Certified Seed Co. Ia. 306	—	—	39	15	32
Albertson's C76	—	—	38	13	31
Mocws 15	—	—	37	12	21
Average	—	—	44	14	—

*Differences in yield of less than 12 bushels per acre are not statistically significant.