

AGRICULTURAL EXPERIMENT STATION

DEPARTMENT OF AGRONOMY

in cooperation with

DIVISION OF CEREAL CROPS AND DISEASES

BUREAU OF PLANT INDUSTRY

U. S. Department of Agriculture

MANHATTAN, KANSAS

KANSAS CORN TESTS, 1939

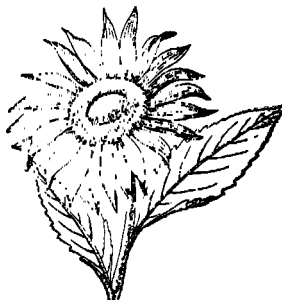


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SUMMARY

1. The Kansas corn testing program includes adapted, open-pollinated varieties and hybrids produced and distributed by federal, state, and commercial agencies.

2. The characters given consideration in this program are resistance to lodging, drouth, diseases and insects; and yield, suckers, plant and ear height, ear drop, ear size, maturity, shelling percentage, and test weight.

3. The Kansas Corn Performance Tests were added to the Kansas corn testing program in 1939 in order to increase hybrid corn testing facilities. Two test fields were located in each of the five districts, one on bottom land and one on upland. Each field contained **60 to 70** entries, replicated five times.

4. The yield of the entries in these tests are reported on a shelled corn basis, corrected to 15.5 percent moisture.

5. Significant differences in yield calculated by standard methods are indicated in Tables III to VII, inclusive.

6. Seasonal conditions vary from year to year and with this variation there is a difference in the response of corn hybrids and varieties. The results given indicate the comparative value of the various entries in a season similar to 1939. A large acreage should not be planted with one specific hybrid until its value has been proved by several years of testing.

7. Corn variety and hybrid strip tests are conducted on farms in order to obtain information over a wide range of conditions. Results of these tests are summarized by districts in Tables VIII and IX.

8. The Kansas hybrid corn breeding program has developed many promising inbred lines and hybrids. Preliminary results indicate that some of these hybrids are superior to the varieties and hybrids now available for farm planting. No hybrids developed by the Kansas Agricultural Experiment Station are available for commercial distribution at this time.

KANSAS CORN TESTS, 1939¹

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INTRODUCTION

Corn, one of the principal grain crops, has been studied by the Kansas Agricultural Experiment Station since 1888. These studies have determined the best adapted varieties for the various sections of the state. The possibility of improving corn production through the use of hybrids has become an important factor during the last few years. Work on the development of hybrids through the use of Kansas inbred lines has been in progress since 1923. Hybrids produced from Kansas lines and out-of-state hybrids have been tested by the Kansas Agricultural Experiment Station since 1926 and in cooperative strip tests since 1928. The continued improvement of corn hybrids has made it desirable to increase constantly the hybrid and variety testing program in the state.

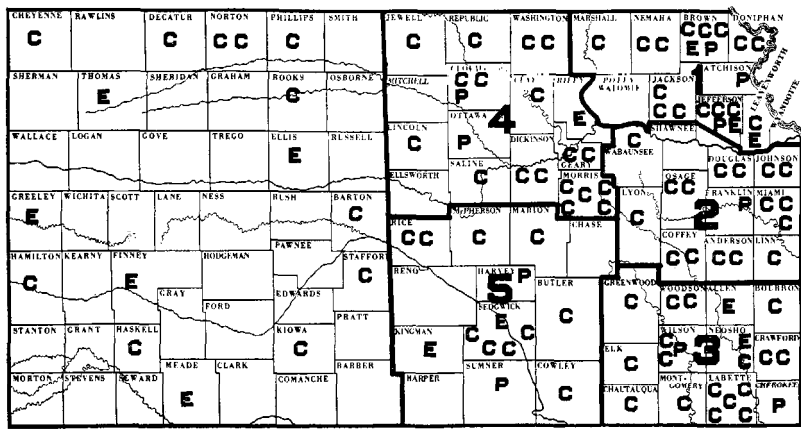


Fig. 1. Kansas Corn Testing Program, 1939.
 Kansas Corn Districts 1, 2, 3, 4 and 5.
 E - Experiment Station Tests, 13 locations.
 P - Kansas Corn Performance Tests, 10 locations.
 C - Cooperative Corn Strip Tests, 86 locations.

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KANSAS CORN TESTING PROGRAM

The Kansas corn testing program outlined in figure 1 includes adapted open-pollinated varieties and hybrids produced and distributed by federal, state and commercial agencies. The characters given consideration in this program are resistance to lodging, drought, diseases and insects; and yield, suckers, plant and ear height, ear drop, ear size, maturity, shelling percentage and test weight.

New experimental double crosses are tested at Manhattan and in outlying fields selected for this purpose. Advance tests are conducted on branch experiment stations, experiment fields, and in performance tests. The relatively few hybrids showing the widest range of adaptation are then entered in the cooperative strip tests.

KANSAS CORN PERFORMANCE TESTS

PURPOSE

The Kansas Corn Performance Tests were added to the Kansas corn testing program to make possible the testing of a larger number of corn hybrids than could be tested in cooperative strip tests. The program also permits tests in more localities than is possible on the agricultural experiment stations. In these tests the more promising corn hybrids released by federal, state, and commercial agencies were compared with the best locally adapted varieties.

PLAN AND LOCATION OF TESTS

For the purpose of the tests, the eastern half of the state was divided into five districts as shown in figure 1. Two test fields, one on upland and one on bottom land, were located in districts 1, 2, 3 and 5. In district 4, both tests were on bottom land. The Kansas Corn Performance Tests were made possible because of the cooperation of the following men on whose farms the tests were conducted: Atchison County, M. N. Hendrikson, Route 2, Atchison; Brown County, O. J. Olsen, Horton; Cherokee County, Challis Potter, Columbus; Cloud County, Merle Magaw, Ames; Franklin County, Chester Wagner, Richmond; Harvey County, Orville Haury, Halstead; Jefferson County, Rol Shirley, Route 2, Perry; Ottawa County, W. C. Anderson, Tescott; Sumner County, S. M. Barner, Belle Plaine; and Wilson County, C. E. Hall, New Albany.

Each entry was included in both tests within the district, and in at least two districts. The entries in the tests are shown in Table I. From 60 to 70 entries were planted on each field. In order to help eliminate soil and other differences, each kind of corn was replicated five times in each test field. Entries were distributed at random within each replication. Each entry was planted in plots two rows wide and twelve hills long.

TABLE I. ENTRIES IN THE KANSAS CORN TESTS, 1939.

Trade Name	Color of Corn	Entered by	Performance Record in Table No.
HYBRIDS			
DeKalb 816	Y	DeKalb Agricultural Association, DeKalb, Ill.	3, 5
825	Y	DeKalb Agricultural Association, DeKalb, Ill.	3, 5
891	Y	DeKalb Agricultural Association, DeKalb, Ill.	3, 4, 5, 6, 7, 8
899	Y	DeKalb Agricultural Association, DeKalb, Ill.	3, 4, 5, 6, 7, 8
919W	W	DeKalb Agricultural Association, DeKalb, Ill.	3, 4, 5, 6, 7, 8
Funk G-32	Y	Funk Brothers Seed Company, Bloomington, Ill.	5, 6, 7
G-46	Y	Funk Brothers Seed Company, Bloomington, Ill.	4, 8
G-56	Y	Funk Brothers Seed Company, Bloomington, Ill.	4, 6, 7, 8
G-62	Y	Funk Brothers Seed Company, Bloomington, Ill.	3, 5, 8
G-90	Y	Funk Brothers Seed Company, Bloomington, Ill.	6, 7
G-94	Y	Funk Brothers Seed Company, Bloomington, Ill.	3, 4
G-135	Y	Funk Brothers Seed Company, Bloomington, Ill.	4, 5, 6, 7, 8
G-212	Y	Funk Brothers Seed Company, Bloomington, Ill.	3, 5, 8
G-235	Y	Funk Brothers Seed Company, Bloomington, Ill.	3, 5, 8
G-244	Y	Funk Brothers Seed Company, Bloomington, Ill.	3, 4, 8
Illinois 200	Y	Kansas Agricultural Experiment Station and U. S. D. A., Manhattan, Kans.	4, 5, 6, 7
243	Y	Kansas Agricultural Experiment Station and U. S. D. A., Manhattan, Kans.	6, 7
784	Y	Kansas Agricultural Experiment Station and U. S. D. A., Manhattan, Kans.	4, 6, 7
885A	Y	Kansas Agricultural Experiment Station and U. S. D. A., Manhattan, Kans.	4, 6, 7
960	Y	Kansas Agricultural Experiment Station and U. S. D. A., Manhattan, Kans.	3, 4, 5, 6, 7, 8, 10
Indiana 845E	Y	Kansas Agricultural Experiment Station and U. S. D. A., Manhattan, Kans.	3, 4
Iowa 13	Y	Kansas Agricultural Experiment Station and U. S. D. A., Manhattan, Kans.	3, 4, 5, 6, 7, 10
939	Y	Kansas Agricultural Experiment Station and U. S. D. A., Manhattan, Kans.	3, 4, 5, 6, 7, 8, 10
3110	Y	Kansas Agricultural Experiment Station and U. S. D. A., Manhattan, Kans.	4
3395	Y	Kansas Agricultural Experiment Station and U. S. D. A., Manhattan, Kans.	4, 5, 6, 7
3816	Y	Kansas Agricultural Experiment Station and U. S. D. A., Manhattan, Kans.	3, 4, 5, 6, 7
3836	Y	Kansas Agricultural Experiment Station and U. S. D. A., Manhattan, Kans.	3, 4, 6, 7
Iowearth 30	Y	Michael-Leonard Seed Company, Sioux City, Iowa	3, 4, 5, 6, 7, 8
53	Y	Michael-Leonard Seed Company, Sioux City, Iowa	3, 5
CI	Y	Michael-Leonard Seed Company, Sioux City, Iowa	3, 5
27N	Y	Michael-Leonard Seed Company, Sioux City, Iowa	3, 4
28N	Y	Michael-Leonard Seed Company, Sioux City, Iowa	3, 4, 5, 6, 7
29N	Y	Michael-Leonard Seed Company, Sioux City, Iowa	4, 6, 7
Jewett 11	Y	Jewett Hybrid Corn Company, Butler, Mo.	3, 4

TABLE I. (Continued)

Kansas	1043	Y	Kansas Agricultural Experiment Station and U. S. D. A.,	Manhattan, Kans.	4
	1070	Y	Kansas Agricultural Experiment Station and U. S. D. A.,	Manhattan, Kans.	4
	1089	Y	Kansas Agricultural Experiment Station and U. S. D. A.,	Manhattan, Kans.	3
	1092	Y	Kansas Agricultural Experiment Station and U. S. D. A.,	Manhattan, Kans.	4
	1102	Y	Kansas Agricultural Experiment Station and U. S. D. A.,	Manhattan, Kans.	4
	1104	Y	Kansas Agricultural Experiment Station and U. S. D. A.,	Manhattan, Kans.	3
	1108	Y	Kansas Agricultural Experiment Station and U. S. D. A.,	Manhattan, Kans.	3
	1109	Y	Kansas Agricultural Experiment Station and U. S. D. A.,	Manhattan, Kans.	4
	1226	Y	Kansas Agricultural Experiment Station and U. S. D. A.,	Manhattan, Kans.	3
	1227	Y	Kansas Agricultural Experiment Station and U. S. D. A.,	Manhattan, Kans.	4
	1237	Y	Kansas Agricultural Experiment Station and U. S. D. A.,	Manhattan, Kans.	5, 6, 7
	1245	Y	Kansas Agricultural Experiment Station and U. S. D. A.,	Manhattan, Kans.	6, 7
	1250	Y	Kansas Agricultural Experiment Station and U. S. D. A.,	Manhattan, Kans.	5
	1296	Y	Kansas Agricultural Experiment Station and U. S. D. A.,	Manhattan, Kans.	5, 6, 7
	1364	Y	Kansas Agricultural Experiment Station and U. S. D. A.,	Manhattan, Kans.	3
	1412	Y	Kansas Agricultural Experiment Station and U. S. D. A.,	Manhattan, Kans.	4, 6, 7
	1457	Y	Kansas Agricultural Experiment Station and U. S. D. A.,	Manhattan, Kans.	3
	1466	Y	Kansas Agricultural Experiment Station and U. S. D. A.,	Manhattan, Kans.	3
	1468	Y	Kansas Agricultural Experiment Station and U. S. D. A.,	Manhattan, Kans.	4, 6, 7
	1475	Y	Kansas Agricultural Experiment Station and U. S. D. A.,	Manhattan, Kans.	6, 7
	1484	Y	Kansas Agricultural Experiment Station and U. S. D. A.,	Manhattan, Kans.	4
	1495	Y	Kansas Agricultural Experiment Station and U. S. D. A.,	Manhattan, Kans.	4
	1501	Y	Kansas Agricultural Experiment Station and U. S. D. A.,	Manhattan, Kans.	6, 7
	1509	Y	Kansas Agricultural Experiment Station and U. S. D. A.,	Manhattan, Kans.	3, 6, 7
	1510	Y	Kansas Agricultural Experiment Station and U. S. D. A.,	Manhattan, Kans.	3, 4, 5
	1511	Y	Kansas Agricultural Experiment Station and U. S. D. A.,	Manhattan, Kans.	3
	1512	Y	Kansas Agricultural Experiment Station and U. S. D. A.,	Manhattan, Kans.	4
	1513	Y	Kansas Agricultural Experiment Station and U. S. D. A.,	Manhattan, Kans.	4, 5
	1514	Y	Kansas Agricultural Experiment Station and U. S. D. A.,	Manhattan, Kans.	4
	1516	Y	Kansas Agricultural Experiment Station and U. S. D. A.,	Manhattan, Kans.	3
	2003	W	Kansas Agricultural Experiment Station and U. S. D. A.,	Manhattan, Kans.	3
	2009	W	Kansas Agricultural Experiment Station and U. S. D. A.,	Manhattan, Kans.	3
	2011	W	Kansas Agricultural Experiment Station and U. S. D. A.,	Manhattan, Kans.	3
	2012	W	Kansas Agricultural Experiment Station and U. S. D. A.,	Manhattan, Kans.	3
	2013	W	Kansas Agricultural Experiment Station and U. S. D. A.,	Manhattan, Kans.	4
	2015	W	Kansas Agricultural Experiment Station and U. S. D. A.,	Manhattan, Kans.	3, 4, 5, 6, 7
	2026	W	Kansas Agricultural Experiment Station and U. S. D. A.,	Manhattan, Kans.	3, 4, 5, 6, 7
	2030	W	Kansas Agricultural Experiment Station and U. S. D. A.,	Manhattan, Kans.	4
	2107	W	Kansas Agricultural Experiment Station and U. S. D. A.,	Manhattan, Kans.	3, 4, 5, 6, 7
	2157	W	Kansas Agricultural Experiment Station and U. S. D. A.,	Manhattan, Kans.	5
	2174	W	Kansas Agricultural Experiment Station and U. S. D. A.,	Manhattan, Kans.	5, 6, 7
	2181	W	Kansas Agricultural Experiment Station and U. S. D. A.,	Manhattan, Kans.	5
	2182	W	Kansas Agricultural Experiment Station and U. S. D. A.,	Manhattan, Kans.	4
	A	Y	Kansas Agricultural Experiment Station and U. S. D. A.,	Manhattan, Kans.	5
	B	Y	Kansas Agricultural Experiment Station and U. S. D. A.,	Manhattan, Kans.	5
	C	Y	Kansas Agricultural Experiment Station and U. S. D. A.,	Manhattan, Kans.	5
	D	Y	Kansas Agricultural Experiment Station and U. S. D. A.,	Manhattan, Kans.	5

TABLE I. (Continued)

Kansas	E	Y	Kansas Agricultural Experiment Station and U. S. D. A., Manhattan, Kans.	5
	F	Y	Kansas Agricultural Experiment Station and U. S. D. A., Manhattan, Kans.	5, 6, 7
	G	Y	Kansas Agricultural Experiment Station and U. S. D. A., Manhattan, Kans.	3, 4, 5, 6, 7
	H	Y	Kansas Agricultural Experiment Station and U. S. D. A., Manhattan, Kans.	6, 7
	I	Y	Kansas Agricultural Experiment Station and U. S. D. A., Manhattan, Kans.	6, 7
	J	Y	Kansas Agricultural Experiment Station and U. S. D. A., Manhattan, Kans.	5
	K	Y	Kansas Agricultural Experiment Station and U. S. D. A., Manhattan, Kans.	6, 7
	L	Y	Kansas Agricultural Experiment Station and U. S. D. A., Manhattan, Kans.	6, 7
	M	Y	Kansas Agricultural Experiment Station and U. S. D. A., Manhattan, Kans.	5
	N	Y	Kansas Agricultural Experiment Station and U. S. D. A., Manhattan, Kans.	6, 7
	O	Y	Kansas Agricultural Experiment Station and U. S. D. A., Manhattan, Kans.	6, 7
29	W	Kansas Agricultural Experiment Station and U. S. D. A., Manhattan, Kans.	3	
	W	Kansas Agricultural Experiment Station and U. S. D. A., Manhattan, Kans.	3	
Double "K"	77	Y	Kellogg-Kelly Seed Company, St. Joseph, Mo.	3, 4
	Keystone 38	Y	Cornell Seed Company, St. Louis, Mo.	3, 4
	XX No. 1	Y	Ed F. Mangelsdorf and Brother, Atchison, Kans.	3, 4, 5, 6, 7
Missouri	8	Y	Missouri Corn Growers Association, Columbia, Mo.	3, 4, 5, 6, 7, 8, 9, 10
			Fees paid by: Missouri Hybrid Corn Company, Fulton, Mo. Midwest Hybrid Corn Company, Buckner, Mo. Cornell Seed Company, St. Louis, Mo.	
	47	Y	Same as for Missouri 8	3, 4, 5, 6, 7, 8
M-L	514	Y	Moews-Lowe Hybrid Corn Company, Aroma Park, Ill.	3
	523	Y	Moews-Lowe Hybrid Corn Company, Aroma Park, Ill.	4
	830	Y	Moews-Lowe Hybrid Corn Company, Aroma Park, Ill.	5, 6, 7
National	125E	Y	National Hybrid Corn Company, Anamosa, Iowa	3, 5
	130	Y	National Hybrid Corn Company, Anamosa, Iowa	3, 4, 10
	131	Y	National Hybrid Corn Company, Anamosa, Iowa	3, 4
	132	Y	National Hybrid Corn Company, Anamosa, Iowa	3, 4, 5, 8
	132 ₁	Y	National Hybrid Corn Company, Anamosa, Iowa	3, 4, 6, 7, 8
Nebraska	110	Y	Kansas Agricultural Experiment Station and U. S. D. A., Manhattan, Kans.	3, 8
	238	Y	Kansas Agricultural Experiment Station and U. S. D. A., Manhattan, Kans.	3, 4, 5, 6, 7, 8
Pioneer	307	Y	Garst and Thomas Company, Coon Rapids, Iowa	3, 4, 5, 6, 7, 8, 9, 10
	313	Y	Garst and Thomas Company, Coon Rapids, Iowa	3, 4, 5, 6, 7
	315	Y	Garst and Thomas Company, Coon Rapids, Iowa	3, 4, 5, 6, 7
	322	Y	Garst and Thomas Company, Coon Rapids, Iowa	3, 4, 5, 6, 7, 8
	324	Y	Garst and Thomas Company, Coon Rapids, Iowa	3, 4, 5, 6, 7
U. S.	13	Y	Ed F. Mangelsdorf and Brother, Atchison, Kans.	3, 4, 5, 6, 7, 8
	35	Y	Kansas Agricultural Experiment Station and U. S. D. A., Manhattan, Kans.	3, 4, 5, 6, 7
	44	Y	Moews-Lowe Hybrid Corn Company, Aroma Park, Ill.	3, 4, 5, 6, 7, 8, 9, 10

KANSAS CORN TESTS, 1939

TABLE I. (Continued)

U. S.	63	Y	Kansas Agricultural Experiment Station and U. S. D. A., Manhattan, Kans.	3, 4, 6, 7
	102	Y	Kansas Agricultural Experiment Station and U. S. D. A., Manhattan, Kans.	4, 6, 7
VARIETIES				
Cassel		W	Kansas Crop Improvement Association, Manhattan, Kans.	8
Colby Yellowcap		Y	Kansas Crop Improvement Association, Manhattan, Kans.	8
Corn. White (Works)		W	Kansas Agricultural Experiment Station and U. S. D. A., Manhattan, Kans.	8, 9
Freed		W	Kansas Crop Improvement Association, Manhattan, Kans.	5, 6, 7
Hays Golden		Y	Kansas Crop Improvement Association, Manhattan, Kans.	3, 4, 5, 6, 7, 8, 9, 10
Midland (Anderson Co.)		Y	Kansas Crop Improvement Association, Manhattan, Kans.	3, 4, 5, 6, 7, 8, 9, 10
Midland (Coffey Co.)		Y	Kansas Crop Improvement Association, Manhattan, Kans.	4, 8, 9
Phillips Co. Yellow		Y	Kansas Agricultural Experiment Station and U. S. D. A., Manhattan, Kans.	8
Pride of Saline		W	Kansas Crop Improvement Association, Manhattan, Kans.	3, 4, 5, 6, 7, 8, 9, 10
Reid Yellow Dent		Y	Kansas Crop Improvement Association, Manhattan, Kans.	3, 8, 9, 10
Local Variety		Y	Cooperator	3, 5

PROCEDURE

Each entry was given a number by which it was known throughout the season. The original designation was not given to the entries until all of the results had been computed. Since the identity of the different entries was coded, the possibility of either conscious or unconscious discrimination was prevented. The seed was obtained from commercial lots when possible.

The seed was planted by hand in order to insure a uniform rate. The fields in districts 1 and 2 and the bottom land field in district 3 were planted at the rate of three kernels per hill. The upland field in district 3 and all fields in districts 4 and 5 were planted at the rate of two kernels per hill. The hills were spaced three and one-half feet apart each way. Proper spacing was assured by cross marking with a planter on the test fields where the seedbed had been plowed and by the use of a rope marker where the seedbed had been listed.

In most of Kansas, the soil remained dry and cold until late in the spring of 1939, preventing quick germination of the seed and gave an opportunity for seed decay, field mice, wire worms, and birds to reduce the stands greatly. Consequently, it was necessary to do some replanting in every test and to do considerable replanting in Sumner and Harvey Counties. The Ottawa and Brown County tests were discarded because of poor stands. The Cherokee County and Wilson County plots were replanted, but because of the variations in stand and growth, it was decided that the yields would not be reliable and the test plots were not harvested. Lack of uniformity prevented securing yields from more than one replication in the Jefferson County test. This test is omitted from the report, because the data from one replication are not considered reliable.

Stand notes were taken at replanting time. Firing notes were taken on all tests during the last week in July. Records on yield, lodging, dropped ears, ear height, and final stand were obtained at harvest. Representative samples of all entries from two or more replications in all of the tests harvested were shelled to determine shelling percentage, test weight, and moisture content. The number of ears per plot were counted in order to determine ear size and number of ears per plant.

COMPUTATION OF RESULTS

Yield and other data on the Cloud, Sumner and Harvey County tests are averages of five replications per field. Due to soil differences, only four replications of the Atchison County test and two replications of the Franklin County test were used in the summaries.

The yields of the entries in each test are reported on a comparable basis of bushels of shelled grain per acre corrected to a moisture content of 15.5 percent. The number of ears per plot was used in determining the number of ears per 100 pounds of

ear corn. This is a relative indication of ear size. The average number of ears per plant was also determined. The moisture determinations were made on shelled corn with a Tag-Heppens-stall moisture meter.¹ The shelling percentage and test weight were determined for each entry.

Stand of each entry is reported as percentage of perfect stand. Rate of planting and other information are given in Table II. The percentage of lodged plants was determined for each entry. Firing is reported as percentage of leaf surface burned. The percentage of dropped ears was obtained by counting the ears on the ground at harvest time and dividing this number by the total number of ears.

SIGNIFICANCE OF YIELD DIFFERENCES

It is not possible to determine the relative yielding ability with absolute accuracy, since small differences do not prove that one hybrid is better than another. Experience has shown that differences in yield may be expected between any plots planted from the same seed. These differences may be due to such things as soil or stand differences but they are reduced to a large extent by repeating or "replicating" the same corn five times on the same test. Even with replication, differences remain which are said to be due to chance. These differences are called "experimental error." Methods are available for utilizing the differences within a strain in calculating such chance errors and for determining how large a difference between strains may be considered a real difference. These differences are called "significant differences" and are shown for each district. For example, in Table III the highest yielding hybrid produced **84.34** bushels per acre. In this district, **4.51** bushels has been calculated to be significant. Subtracting **4.61** bushels from **84.34** leaves **79.83** bushels. Since the first nine entries yielded more than **79.83** bushels per acre, they are not considered to be significantly different from each other. In other words, any two entries in Table III must differ by more than **4.51** bushels before they have been proved to be different in yielding ability.

INTERPRETATION OF RESULTS

The results given in Tables III to X, inclusive, indicate the comparative value of various corn hybrids and varieties in a season similar to that of **1939**. Seasonal conditions vary from year to year and with this variation there is a difference in response of corn hybrids and varieties. A period of early prolonged drouth and high temperatures is likely to favor an early maturing entry, whereas a later maturing entry often is able to take advantage of the longer growing season when the drouth period does not occur until later. In **1938**, Missouri No. **8**

1. We acknowledge the assistance of the Grain Supervision Office, Kansas City, Mo., and the A. A. A. Testing Laboratory, Manhattan, Kan., in determination of the moisture content.

TABLE II. LOCATION, PROCEDURE, AGRONOMIC AND CLIMATIC INFORMATION ON KANSAS CORN PERFORMANCE TESTS, 1939.

	District 1		District 2		District 3		District 4		District 5	
	Atchison	Brown	Jefferson	Franklin	Wilson	Cherokee	Cloud	Ottawa	Sumner	Harvey
No. of entries	70	70	70	70	60	60	60	60	60	60
No. of replications										
Planted	5	5	5	5	5	5	5	5	5	5
Harvested	4	0	1	5	0	0	5	0	5	5
Size of plot (hills)	2 x 12	2 x 12	2 x 12	2 x 12	2 x 12	2 x 12	2 x 12	2 x 12	2 x 12	2 x 12
Rate of planting (kernels per hill)	3	3	3	3	3	2	2	2	2	2
Date of planting	May 1	May 2-3	Apr. 30	Apr. 25	Apr. 12	Apr. 10	May 2	May 3	Apr. 13	Apr. 14
Date of harvest	Oct. 23	None	Nov. 2	Sept. 16	None	None	Oct. 16	None	Oct. 25	Oct. 30
Seedbed preparation	List	List	List	Plow	List	Plow	List	List	List	List
Rainfall (a)	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
May	5 1.17	7 1.17	5 1.37	8 3.25	8 5.07	12 7.13	8 3.82	6 2.32	8 2.36	4 1.61
June	6 5.41	10 8.66	15 5.61	8 4.74	7 4.46	14 7.27	9 2.59	9 5.74	13 5.90	12 5.79
July	1 0.50	2 1.72	3 0.37	1 0.37	3 1.23	3 1.74	4 0.64	5 1.22	4 0.28	5 3.48
Aug.	5 2.94	3 3.30	9 6.15	4 4.10	5 5.22	4 2.87	8 3.94	8 3.37	1 2.50	7 5.61
Total 4 months	17 10.02	22 14.85	32 13.50	21 12.46	23 15.98	33 19.01	29 10.99	28 12.65	26 11.04	28 16.49

(a) First figure represents number of rains and second the total monthly rainfall in inches.

KANSAS CORN TESTS, 1939

TABLE III. RESULTS, KANSAS CORN PERFORMANCE TEST, DISTRICT 1, ATCHISON COUNTY, 1939.

Rank in yield	Hybrid or variety	Acre yield bushels	Lodged plants			Flrimg %	Ear ht. in.	Stand %	Dropped ears %	Ears per plant	Ear size No. ears per cwt.	Shelling %	Moisture %	Test wt.
			Total %	Root %	Stalk %									
			1	U. S. 44	84.34										12	0	12	18	49	91	5	1.0	189	83.8	9.2	61
2	U. S. 35	84.20	15	0	15	13	43	95	15	0.9	181	83.2	9.2	60
3	Funk G-94	83.11	12	0	12	15	49	89	17	1.0	180	83.0	9.4	60
4	Pioneer 313	82.57	19	0	19	15	51	87	0	1.0	186	84.0	9.0	61
5	U. S. 13	81.87	13	0	13	20	53	92	25	1.0	190	83.3	9.8	61
6	Iowa 13	81.02	47	2	45	15	52	87	24	1.1	201	85.8	9.7	59
7	Iowa 3816	80.89	18	0	18	10	46	87	9	1.1	199	84.5	9.0	60
8	De Kalb 816	80.50	14	0	14	18	53	91	18	1.0	189	82.5	9.4	60
9	Illinois 960	79.86	31	0	31	15	50	87	6	1.1	200	84.1	9.2	60
Differences in yield of less than 4.51 bushels an acre are not significant in this test.														
10	Kansas 1104	79.26	10	0	10	15	54	94	14	1.0	189	80.9	11.1	61
11	Pioneer 324	78.65	7	0	7	10	41	88	4	1.0	195	82.4	9.0	61
12	Moews-Lowe 514	77.81	14	0	14	18	52	93	12	0.9	183	83.7	9.2	60
13	Kansas 1089	76.93	24	0	24	13	52	88	20	1.0	191	82.8	9.8	60
14	Funk G-62	76.66	37	0	37	20	50	88	20	1.0	196	82.9	9.4	60
15	Funk G-244	76.60	27	1	26	20	51	85	6	1.1	219	85.0	9.2	60
16	Iowearth CI	76.36	26	1	25	12	48	94	10	1.0	218	85.0	9.2	60
17	Jewett 11	76.09	48	0	48	28	52	94	12	1.0	208	83.3	9.4	59
18	National 131	75.28	30	1	29	15	48	87	6	1.1	210	83.8	9.2	61
19	Kansas 2011	75.19	19	0	19	20	55	87	2	0.9	178	81.1	10.0	62
20	Iowa 3836	75.01	11	0	11	15	49	88	8	1.0	203	84.3	9.2	57
21	Indiana 845E	74.83	33	0	33	12	47	91	16	1.0	196	82.7	9.4	61
22	Keystone 38	74.56	8	0	8	10	48	83	22	1.0	193	82.4	9.4	61
23	Missouri 47	74.55	29	0	29	18	49	83	5	1.0	198	83.7	9.4	60
24	Missouri 8	74.43	35	0	35	20	52	90	12	1.0	203	83.5	9.9	60
25	Pioneer 315	74.42	32	2	30	12	44	86	6	1.1	218	84.8	9.0	62
26	De Kalb 919W	74.07	14	0	14	15	54	92	17	0.9	188	81.8	9.9	57
27	Double "K" 77	74.01	6	0	6	12	47	87	16	1.0	191	82.3	9.4	61
28	National 130	73.85	22	0	22	15	44	87	3	1.1	229	84.8	8.5	59
29	De Kalb 899	73.27	39	0	39	23	59	88	9	1.0	204	82.8	9.7	62
30	Kansas 1108	73.17	22	0	22	15	47	93	14	1.0	209	84.3	9.7	61

TABLE III. (Continued)

31	Kansas 1516	73.12	30	2	28	15	56	84	4	1.0	182	82.3	11.6	60
32	Funk G-212	72.89	18	0	18	15	48	82	4	1.0	192	84.8	9.4	60
33	Pioneer 307	72.55	21	0	21	12	44	91	2	1.0	216	84.5	9.2	61
34	Kansas 1364	71.94	23	1	22	12	55	89	20	0.9	185	82.0	9.9	61
35	Funk G-235	71.84	18	1	17	12	41	90	5	1.1	223	82.4	9.0	59
36	National 125E	71.29	16	0	16	15	48	89	11	1.0	221	85.0	9.2	58
37	National 132	71.03	33	3	30	15	48	88	6	1.0	208	83.1	9.9	60
38	Kansas 1466	69.42	14	1	13	15	47	86	4	1.0	210	83.3	9.7	61
39	De Kalb 891	68.18	31	0	31	18	46	89	16	0.9	194	82.6	9.4	60
40	Iowealth 30	68.15	37	2	35	15	49	84	10	1.0	211	83.3	9.5	59
41	Kansas 2012	68.03	24	1	23	23	53	92	2	1.0	223	82.7	9.4	61
42	Kansas 1511	67.79	22	2	20	12	51	93	6	0.9	209	80.2	9.4	61
43	Iowealth 28N	67.19	23	0	23	12	51	88	14	1.0	222	84.6	9.4	60
44	De Kalb 825	66.95	23	0	23	15	48	85	29	1.0	218	83.2	9.5	60
45	Pioneer 322	66.64	27	1	26	15	43	87	7	1.0	231	83.6	9.4	59
46	U. S. 63	66.57	5	0	5	12	43	76	5	1.0	183	80.9	9.0	60
47	Kansas 60T	66.22	22	2	20	18	63	78	4	1.0	193	77.9	9.8	62
48	Pride of Saline	66.04	25	1	24	18	56	90	7	0.9	193	80.8	10.6	60
49	Iowealth 53	65.93	25	1	24	15	53	87	7	1.0	217	83.6	9.4	60
50	Iowa 939	65.44	23	0	23	12	44	80	20	1.0	198	83.1	9.2	59
51	Local variety	65.39	37	0	37	25	60	90	25	1.0	227	83.1	9.6	60
52	Kansas 1457	64.90	24	0	24	15	51	86	0	1.0	204	80.4	11.1	61
53	Kansas 2003	64.78	11	0	11	15	53	76	1	0.9	179	82.1	10.0	59
54	Iowealth 27N	64.52	16	0	16	15	53	75	8	1.1	214	82.5	9.5	61
55	Nebraska 110	64.02	22	1	21	18	41	83	6	1.0	213	83.9	9.4	60
56	National 132 ₁	63.84	27	2	25	15	51	86	12	1.0	227	84.7	9.5	59
57	Kansas 2009	63.34	25	0	25	15	50	80	2	1.0	197	78.7	9.8	61
58	XX No. 1	62.87	30	0	30	15	49	79	15	1.0	216	82.7	9.4	59
59	Kansas G	62.84	11	0	11	12	43	85	1	0.9	212	83.6	9.4	60
60	Kansas 2015	62.04	18	0	18	12	50	89	2	0.9	212	77.7	10.2	60
61	Kansas 2026	61.76	19	0	19	20	51	86	0	0.9	207	80.9	9.7	60
62	Reid Yellow Dent	61.54	36	2	34	23	54	87	21	0.9	214	83.4	9.7	61
63	Kansas 1510	61.43	7	0	7	12	46	88	3	0.9	217	80.6	9.5	61
64	Kansas 1509	60.99	12	0	12	15	48	91	4	0.9	217	82.8	10.2	61
65	Kansas 2107	59.51	10	0	10	15	49	87	0	0.9	219	78.8	10.0	62
66	Nebraska 238	59.44	19	2	17	10	41	70	4	1.1	213	83.3	9.2	58
67	Kansas 29	54.65	16	4	12	25	59	85	10	0.8	214	79.7	9.5	62
68	Midland (A)	54.49	17	3	14	23	49	83	8	0.9	210	82.0	12.3	61
69	Kansas 1226	53.46	12	0	12	15	49	86	6	0.9	234	80.9	9.8	63
70	Hays Golden	52.96	34	1	33	18	46	82	1	0.9	235	79.2	9.5	61
Average of 70 entries		70.28	22	1	21	16	50	87	9	1.0	205	82.7	9.6	60

TABLE IV. RESULTS, KANSAS CORN PERFORMANCE TEST, DISTRICT 2, FRANKLIN COUNTY, 1939.

Rank in yield	Hybrid or variety	Acre yield bushels	Lodged plants			Flring %	Stand %	Dropped ears %	Ears per plant	Ear size No. ears per cwt.	Shelling %	Moisture %	Test wt.
			Total %	Root %	Stalk %								
			1	Jewett 11	45.73									3	0	3	25	92	6	0.9	316	81.7	8.8	57
2	Kansas 2015	44.43	2	1	1	30	94	2	0.9	295	75.0	12.8	59
Differences in yield of less than 4.05 bushels an acre are not significant in this test.													
3	Indiana 845E	41.64	2	0	2	25	87	27	0.9	331	83.6	9.1	58
4	Funk G-94	40.11	2	0	2	30	87	15	0.8	319	85.0	9.2	58
5	Kansas 2030	40.09	2	0	2	20	85	2	1.0	302	76.3	12.6	58
6	Kansas 1412	40.00	2	0	2	30	83	10	0.9	302	82.8	10.3	59
7	Moews-Lowe 523	39.70	1	0	1	20	83	18	1.0	369	86.8	8.7	57
8	Keystone 38	39.44	1	0	1	30	90	18	1.0	373	83.2	8.8	57
9	Iowealth 28N	38.69	2	0	2	30	90	13	1.0	387	83.4	9.1	57
10	Kansas 1484	38.68	1	0	1	30	93	8	1.0	385	81.5	10.3	60
11	Iowa 3110	38.49	1	0	1	40	83	19	1.1	421	84.4	8.4	55
12	Illinois 960	38.04	2	0	2	30	86	17	0.9	359	85.3	8.7	56
13	Kansas 1227	37.25	2	0	2	25	75	8	0.5	338	88.4	12.6	59
14	Iowa 3816	36.96	1	0	1	35	87	14	1.1	437	84.7	7.7	53
15	Missouri 47	36.41	2	0	2	25	88	16	0.8	338	84.9	9.3	57
16	Pioneer 307	36.41	2	1	1	40	87	10	1.0	391	81.7	11.6	58
17	Pioneer 313	35.21	0	0	0	25	83	5	1.0	404	84.0	8.3	57
18	Iowealth 29N	34.88	2	0	2	30	88	8	1.0	414	84.7	9.3	59
19	Funk G-56	34.58	2	0	2	25	83	14	0.9	372	83.0	10.1	59
20	Kansas 1070	34.13	2	0	2	35	92	10	0.9	377	80.3	10.1	61
21	National 130	33.67	2	0	2	35	84	5	0.9	401	85.7	8.4	57
22	Kansas 1092	33.67	1	0	1	30	89	7	0.9	381	80.4	9.0	61
23	Kansas 1468	33.53	1	0	1	35	85	19	0.9	376	83.2	8.7	58
24	Illinois 784	33.11	3	0	3	20	90	12	0.9	376	80.1	11.4	59
25	U. S. 44	32.78	2	0	2	35	84	19	0.8	350	83.7	8.7	58
26	Funk G-244	32.40	2	0	2	45	88	9	1.2	536	80.7	8.4	52
27	Pioneer 322	32.28	1	0	1	40	88	22	1.0	467	83.2	8.2	53
28	Illinois 200	32.21	0	0	0	30	70	17	1.0	348	80.0	8.8	59
29	Iowealth 27N	32.19	2	0	2	30	81	19	0.8	326	78.8	9.4	60
30	National 132	30.85	2	0	2	30	87	13	0.9	437	80.3	9.1	56

TABLE IV. (Continued)

31	U. S. 35	30.77	1	0	1	30	89	13	0.9	438	84.1	8.7	57
32	Kansas 1109	30.50	1	0	1	25	83	8	0.4	406	89.2	11.2	59
33	Kansas 1512	30.29	0	0	0	35	85	1	0.9	429	81.9	11.2	61
34	Nebraska 238	30.12	2	0	2	35	76	5	0.9	369	80.6	8.2	51
35	Double "K" 77	29.86	1	0	1	30	87	13	0.9	421	79.5	9.8	58
36	Funk G-46	29.72	2	0	2	25	86	9	0.8	382	80.5	10.0	60
37	Kansas 2107	29.71	1	0	1	35	83	0	1.0	419	77.6	10.1	59
38	U. S. 63	29.61	0	0	0	30	71	8	0.9	384	82.6	8.4	56
39	Kansas 2013	29.33	2	0	2	25	81	5	0.9	375	77.4	11.0	56
40	Pioneer 324	29.23	1	0	1	45	81	19	0.9	400	81.0	7.8	53
41	De Kalb 891	29.15	0	0	0	35	86	23	0.9	455	83.0	8.8	56
42	Iowa 3395	28.44	2	0	2	30	74	22	0.9	414	85.2	8.1	56
43	Iowa 13	28.35	2	0	2	30	82	34	0.8	407	83.5	8.1	56
44	Kansas 1514	28.23	2	0	2	30	87	9	0.7	338	77.8	14.8	60
45	Missouri 8	28.06	2	0	2	25	90	7	0.8	395	78.6	11.6	58
46	National 131	27.95	1	0	1	45	88	10	1.0	521	81.9	8.4	56
47	Kansas G	27.56	2	0	2	30	87	5	0.9	496	84.3	9.2	56
48	Pioneer 315	27.33	2	0	2	35	86	20	0.9	487	82.5	8.0	54
49	Illinois 885A	27.22	2	0	2	35	82	15	0.9	458	80.5	10.0	58
50	U. S. 13	27.14	1	0	1	40	90	12	0.9	492	81.0	9.3	58
51	Kansas 2026	26.47	2	0	2	30	90	2	0.9	484	76.7	11.1	58
52	Kansas 1513	26.31	2	1	1	55	88	8	0.9	504	81.0	9.8	60
53	Iowa 3836	26.16	2	2	0	20	67	14	0.9	414	82.1	8.3	51
54	National 1321	26.15	2	0	2	35	84	15	0.8	426	80.6	9.9	58
55	Iowa 939	25.48	1	1	0	45	78	27	0.8	435	82.0	8.1	52
56	De Kalb 899	25.48	1	0	1	25	87	3	1.0	508	75.3	11.4	60
57	Hays Golden	25.26	2	0	2	30	92	4	0.8	495	80.4	9.6	57
58	Pride of Saline	24.22	2	0	2	35	85	7	0.6	365	81.1	8.3	58
59	XX No. 1	24.00	2	0	2	30	72	18	0.9	419	80.5	9.3	55
60	Kansas 1510	23.96	1	0	1	35	90	8	0.8	505	82.1	9.5	59
61	Kansas 1495	23.05	1	0	1	40	77	12	0.8	426	80.9	9.9	59
62	Kansas 2182	23.00	2	0	2	25	92	3	0.7	372	67.4	15.5	56
63	Kansas 1043	22.66	0	0	0	35	83	2	0.7	412	80.9	12.3	59
64	Midland (A)	22.64	2	1	1	20	83	6	0.7	388	80.5	12.8	59
65	Kansas 1102	20.96	1	0	1	30	76	9	0.8	430	75.9	11.8	61
66	Iowealth 30	20.61	2	0	2	35	89	13	0.8	581	78.3	9.6	56
67	Funk G-135	20.20	2	0	2	35	92	7	0.8	515	73.6	13.2	59
68	U. S. 102	18.91	1	1	0	30	88	15	0.7	489	73.1	12.1	58
69	Midland (C)	17.61	2	0	2	35	83	5	0.6	432	77.3	17.3	56
70	De Kalb 919W	15.13	2	0	2	30	82	4	0.6	486	74.4	12.2	59
Average of 70 entries		30.49	2	0	2	32	85	11	0.9	411	81.1	10.0	57

TABLE V. RESULTS, KANSAS CORN PERFORMANCE TEST, DISTRICT 4, CLOUD COUNTY, 1939,

Rank in yield	Hybrid or variety	Acre yield bushels	Lodged plants			Flrimg %	Ear ht. in.	Stand %	Dropped ears %	Ears per plant	Ear size No. ears per cwt.	Shelling %	Moisture %	Test wt.
			Total %	Root %	Stalk %									
1	Kansas G	23.20	4	1	3	20	30	79	1	0.9	318	77.1	11.0	58
2	Nebraska 238	23.10	5	0	5	22	23	72	4	0.9	347	91.9	9.8	59
3	Pioneer 307	22.67	2	0	2	20	29	88	5	1.0	386	75.2	10.0	60
4	U. S. 35	22.03	3	1	2	16	27	84	4	1.0	368	72.4	10.0	60
5	Iowa 939	21.92	5	0	5	26	27	83	11	0.8	326	76.6	10.4	58
6	Iowearth 30	21.17	6	0	6	26	35	82	8	0.8	325	74.4	10.9	61
7	Pioneer 324	21.03	6	0	6	22	24	78	13	1.0	356	73.9	10.0	60
8	Pioneer 313	20.94	1	0	1	18	34	89	2	0.8	347	72.3	10.2	60
9	Funk G-212	20.78	4	1	3	26	30	82	9	0.8	337	77.0	10.2	61
10	National 132	20.51	4	0	4	22	33	80	4	0.9	347	73.2	10.5	57
11	Kansas B	20.49	10	0	10	24	28	81	7	0.9	348	77.4	11.0	62
Differences in yield of less than 2.94 bushels an acre are not significant in this test.														
12	Kansas 1237	20.21	7	0	7	28	30	81	2	0.9	344	73.1	10.8	62
13	Kansas 1250	20.17	5	0	5	16	28	88	7	0.9	390	75.5	10.2	59
14	Pioneer 322	19.99	4	0	4	24	28	90	9	0.9	376	70.7	9.7	60
15	Kansas M	19.82	1	0	1	20	27	75	2	1.0	349	70.5	11.1	61
16	De Kalb 891	19.15	1	0	1	20	30	85	8	0.9	369	72.7	10.5	60
17	Kansas E	19.04	3	0	3	20	28	78	3	0.8	348	78.7	13.2	58
18	Kansas C	17.95	5	1	4	18	29	75	8	0.8	347	75.5	11.7	62
19	Missouri 47	17.91	7	0	7	26	26	82	3	0.8	365	73.3	11.3	59
20	Pioneer 315	17.73	10	0	10	36	30	81	2	0.9	415	74.1	10.1	59
21	Iowearth CI	17.63	2	0	2	30	29	88	8	0.8	412	73.0	10.3	58
22	Kansas 1513	16.85	1	0	1	32	35	82	1	0.8	364	71.5	12.5	62
23	Illinois 200	16.69	0	0	0	20	35	88	5	0.8	408	69.1	10.3	60
24	Iowa 3816	16.66	2	0	2	32	26	79	9	0.8	371	71.3	10.1	58
25	Iowearth 53	15.97	3	0	3	34	34	86	5	0.8	399	70.2	10.3	58
26	National 125E	15.82	2	0	2	28	31	81	9	0.8	410	73.7	9.8	61
27	Funk G-235	15.49	7	0	7	32	29	86	7	0.8	406	70.8	10.4	58
28	Iowa 13	15.43	5	0	5	34	33	92	17	1.0	524	68.3	9.8	56
29	Freed	15.42	8	1	7	28	32	83	2	0.8	383	69.0	10.8	58
30	Funk G-62	14.79	9	0	9	38	34	80	12	0.7	376	72.7	11.0	61

TABLE V. (Continued)

31	U. S. 13	14.38	2	1	1	20	34	88	5	0.8	444	66.5	10.3	58
32	Funk G-32	14.31	2	0	2	30	36	87	7	0.9	473	65.8	9.8	59
33	Illinois 960	14.02	5	0	5	34	34	84	5	0.8	454	68.3	10.2	61
34	U. S. 44	14.02	9	0	9	34	27	83	9	0.7	407	74.1	9.8	60
35	Kansas 2181	13.82	4	1	3	34	28	80	1	0.7	343	69.3	15.1	60
36	Funk G-135	13.72	7	0	7	34	38	83	4	0.7	391	73.2	14.5	58
37	De Kalb 816	13.59	1	0	1	30	34	86	8	0.7	457	71.8	11.1	59
38	De Kalb 899	13.47	7	3	4	30	31	75	5	0.5	227	70.7	15.5	56
39	Hays Golden	13.31	6	0	6	30	30	76	2	0.7	421	75.0	10.0	60
40	Kansas 2107	13.22	0	0	0	34	27	88	1	0.7	410	66.2	11.4	62
41	Iowa 3395	12.92	7	0	7	40	29	83	14	0.8	519	73.8	9.8	58
42	Kansas 1296	12.47	7	2	5	36	33	82	4	0.8	471	67.4	10.5	61
43	De Kalb 825	12.34	2	0	2	24	28	82	11	0.7	414	69.5	10.0	60
44	Kansas 2174	12.16	6	0	6	36	36	77	0	0.8	395	62.9	13.0	52
45	Kansas 2026	12.16	4	0	4	40	27	83	1	0.7	399	67.5	14.1	59
46	Iowealth 28N	11.91	6	0	6	32	34	84	4	0.7	465	74.5	10.4	60
47	Kansas A	11.69	15	3	12	30	32	80	2	0.7	440	73.5	12.4	59
48	XX No. 1	11.29	6	0	6	34	26	70	12	0.8	464	69.6	10.7	57
49	Kansas D	11.15	5	0	5	22	30	74	1	0.7	433	71.7	9.7	61
50	Kansas J	10.55	10	0	10	36	26	78	0	0.5	370	71.4	11.0	62
51	Kansas 1510	10.46	3	0	3	22	34	81	0	0.5	408	73.2	10.5	61
52	Missouri 8	9.80	2	0	2	30	34	86	1	0.6	429	66.3	12.6	59
53	Kansas 2157	9.50	5	0	5	32	31	76	4	0.5	322	60.9	14.1	59
54	Pride of Saline	9.48	6	0	6	28	37	84	3	0.6	421	60.7	12.5	59
55	Kansas F	9.40	5	0	5	26	28	80	1	0.6	458	66.7	11.7	61
56	Local variety	8.87	8	2	6	32	35	91	8	0.5	453	64.5	10.4	55
57	Kansas 2015	8.80	5	0	5	30	32	92	0	0.6	473	60.7	15.8	59
58	De Kalb 919W	8.24	3	0	3	34	38	85	4	0.5	493	69.0	11.3	58
59	Midland (A)	8.16	8	2	6	34	36	85	4	0.5	397	67.8	16.4	54
60	Moews-Lowe 830	7.67	4	0	4	26	37	84	4	0.7	596	59.8	10.9	60
Average of 60 entries		15.29	5	0	5	28	31	82	5	0.8	400	71.1	11.2	59

KANSAS CORN TESTS, 1939

TABLE VI. RESULTS, KANSAS CORN PERFORMANCE TEST, DISTRICT 5, SUMNER COUNTY, 1939.

Rank in yield	Hybrid or variety	Acre yield bushels	Lodged plants			Firing %	Ear ht. in.	Stand %	Dropped ears %	Ears per plant	Ear size No. ears per cwt.	Shelling %	Moisture %	Test wt.
			Total %	Root %	Stalk %									
1	Kansas K	41.76	26	18	8	14	26	78	3	1.2	257	82.8	9.5	59
2	Kansas 1412	40.48	11	9	2	12	28	78	19	1.0	215	80.9	9.2	60
3	U. S. 13	40.25	5	3	2	30	30	84	20	1.0	241	81.9	9.8	59
4	Kansas 2026	40.09	9	6	3	18	23	90	0	1.0	251	78.6	10.0	57
5	Illinois 200	39.54	8	5	3	14	28	85	11	1.1	245	80.1	9.9	59
6	Kansas 1296	39.47	13	4	9	14	27	81	9	1.0	225	81.5	10.6	61
7	Kansas 1509	39.43	12	5	7	14	26	76	4	1.0	223	82.6	8.7	60
Differences in yield of less than 2.39 bushels an acre are not significant in this test.														
8	Illinois 885A	39.28	14	8	6	30	27	81	13	1.3	290	80.8	9.2	58
9	Missouri 8	38.72	19	7	12	18	28	80	7	1.1	244	80.3	9.4	58
10	Pioneer 313	38.13	15	12	3	20	26	82	2	1.0	235	82.1	11.7	58
11	U. S. 35	38.13	6	2	4	44	20	84	2	1.1	264	81.6	9.0	57
12	Moews-Lowe 330	37.84	7	2	5	24	28	86	18	1.2	273	81.1	15.8	59
13	U. S. 63	37.61	12	9	3	24	27	81	11	1.1	257	81.6	9.7	57
14	U. S. 102	37.56	18	14	4	18	30	78	3	1.1	260	79.9	9.0	57
15	Kansas 1468	37.44	14	5	9	36	26	85	5	1.2	309	82.4	9.3	58
16	Kansas G	37.37	22	18	4	20	22	73	1	1.1	232	82.6	9.7	58
17	Kansas 1501	37.33	10	3	7	12	25	80	3	1.0	229	79.9	9.0	62
18	U. S. 44	36.77	13	2	11	52	23	83	2	1.0	249	80.2	9.6	57
19	Kansas 2174	36.73	29	25	4	18	31	78	1	1.2	263	76.1	12.9	56
20	Kansas 1237	36.69	17	11	6	28	24	90	4	1.2	307	80.1	9.7	60
21	Kansas N	36.68	8	5	3	32	24	76	3	1.3	306	82.8	9.3	57
22	Kansas H	36.66	36	22	14	16	28	77	1	1.0	240	83.1	9.1	59
23	De Kalb 899	36.53	8	2	6	18	29	80	12	1.2	267	80.5	12.7	57
24	Funk G-90	35.66	15	4	11	20	27	73	16	1.1	237	79.3	9.1	59
25	Midland (A)	35.57	24	17	7	20	30	83	8	0.9	261	80.5	10.1	57
26	Funk G-135	35.39	18	8	10	16	30	80	10	1.2	276	77.3	10.3	59
27	Kansas 1245	35.17	15	5	10	30	23	82	1	1.2	319	81.3	9.7	58
28	Iowa 28N	35.16	24	17	7	22	26	83	12	1.3	318	79.8	9.8	57
29	Iowa 3816	35.02	16	8	8	36	22	77	4	1.2	289	83.2	12.7	57
30	Kansas F	34.83	29	22	7	12	25	73	2	1.0	227	80.0	10.3	59

TABLE VI. (Continued)

31	Missouri 47	34.64	19	7	12	34	23	76	3	1.1	270	81.4	10.0	56
32	Funk G-56	34.16	18	3	15	34	25	79	7	1.3	321	80.2	10.5	57
33	Kansas I	33.85	27	25	2	16	25	77	0	1.0	237	80.0	11.1	60
34	Funk G-32	33.72	11	4	7	24	25	78	10	1.1	281	80.4	10.1	56
35	Iowa 13	33.53	32	21	11	24	24	99	17	0.9	304	81.6	10.1	57
36	Kansas 1475	33.34	14	8	6	18	26	79	2	1.1	269	80.5	14.1	59
37	Illinois 960	33.31	16	7	9	46	26	78	11	1.3	326	80.7	12.7	56
38	Kansas O	33.29	35	27	8	28	24	88	1	0.9	269	83.3	10.1	56
39	Iowa 3836	33.10	18	15	3	26	24	72	12	1.1	262	80.9	10.5	58
40	Hays Golden	33.01	28	15	13	20	25	78	1	1.0	263	80.8	13.0	57
41	Pride of Saline	32.98	22	11	11	22	28	85	7	0.9	256	77.8	11.5	57
42	Kansas 2107	32.93	10	7	3	28	22	80	1	1.0	267	77.9	9.4	60
43	Pioneer 307	32.86	9	6	3	46	23	77	2	1.3	329	82.2	10.1	56
44	Freed	32.74	37	21	16	26	24	83	0	1.0	265	79.3	10.3	55
45	De Kalb 891	32.55	14	7	7	34	26	77	14	1.1	278	80.3	10.1	56
46	National 132 ₁	32.41	13	8	5	20	28	78	11	1.0	264	82.2	10.7	57
47	Pioneer 322	32.19	11	4	7	46	21	75	4	1.3	340	80.9	10.5	55
48	Iowa 939	32.16	22	12	10	40	24	75	12	1.0	255	79.9	10.1	55
49	Kansas 2015	32.13	11	4	7	16	25	75	1	1.0	244	77.3	10.3	58
50	Iowa 3395	31.89	22	11	11	42	26	99	11	1.0	331	82.2	10.2	56
51	Pioneer 315	31.72	13	4	9	62	20	73	2	1.4	363	80.0	8.9	56
52	Illinois 784	31.71	23	7	16	20	26	78	8	1.0	270	82.6	10.5	60
53	Illinois 243	31.49	17	4	13	22	26	82	7	1.1	296	80.0	10.2	58
54	XX No. 1	30.40	17	12	5	14	26	72	11	1.2	297	79.5	11.5	58
55	Iowearth 30	29.00	15	6	9	34	27	70	3	1.1	302	80.6	9.5	55
56	Iowearth 29N	28.96	8	3	5	30	26	72	8	1.2	316	82.1	10.6	56
57	Nebraska 238	28.88	35	27	8	44	20	67	6	1.2	295	79.8	9.7	55
58	De Kalb 919W	27.44	15	11	4	30	25	78	12	0.9	276	76.6	10.6	55
59	Pioneer 324	27.04	20	10	10	48	23	68	4	1.1	307	80.0	11.5	57
60	Kansas L	27.04	23	14	9	16	22	73	1	1.0	284	83.1	15.5	59
Average of 60 entries		34.70	17	10	7	27	25	79	7	1.1	274	80.7	10.5	58

KANSAS CORN TESTS, 1939

TABLE VII. RESULTS, KANSAS CORN PERFORMANCE TEST, DISTRICT 5, HARVEY COUNTY, 1939.

Rank in yield	Hybrid or variety	Acre yield bushels	Lodged plants			Firing %	Ear ht. in.	Stand %	Dropped ears %	Ears per plant	Ear size No. ears per cwt.	Shelling %	Moisture %	Test wt.
			Total %	Root %	Stalk %									
1	Kansas L	17.52	39	4	35	60	22	82	3	1.0	488	79.5	8.6	58
Differences in yield of less than 2.98 bushels an acre are not significant in this test.														
2	Iowa 3816	14.36	29	0	29	50	21	78	18	0.9	546	77.2	8.6	57
3	Kansas O	13.69	16	2	14	48	23	82	5	0.6	416	81.1	8.6	57
4	Kansas F	12.83	13	1	12	44	23	82	7	0.7	464	77.3	8.6	59
5	Kansas N	12.69	32	0	32	62	22	86	5	0.6	470	82.1	8.6	56
6	U. S. 35	12.48	16	2	14	46	21	85	24	0.7	514	77.9	8.6	59
7	Kansas 1412	12.24	11	0	11	46	22	85	7	0.6	468	79.2	8.6	58
8	Iowa 3836	12.15	17	3	14	44	22	70	12	0.8	502	75.8	8.6	55
9	XX No. 1	12.14	12	3	9	38	23	76	13	0.7	462	77.5	9.0	55
10	Kansas 1237	11.74	30	0	30	60	24	85	9	0.8	622	74.9	9.0	58
11	Kansas 2107	11.73	13	0	13	58	23	90	1	0.6	504	75.9	8.6	63
12	Hays Golden	11.40	33	4	29	58	22	83	5	0.7	491	75.5	9.0	57
13	Kansas H	11.00	16	5	11	40	26	88	3	0.5	433	78.1	8.6	58
14	Kansas G	10.91	26	2	24	52	20	82	2	0.6	483	79.4	8.6	55
15	U. S. 13	10.45	13	0	13	56	26	91	36	0.5	425	78.5	9.5	57
16	Kansas K	10.36	31	9	22	48	22	78	8	0.5	463	82.6	9.0	58
17	Kansas 1296	9.65	7	0	7	54	24	85	18	0.6	523	76.6	8.6	62
18	Pioneer 315	9.57	27	2	25	50	21	85	24	0.7	642	76.6	9.3	55
19	Iowa 13	8.81	19	1	18	56	26	89	34	0.6	629	78.9	8.6	54
20	Funk G-32	8.45	7	0	7	52	26	79	26	0.6	567	74.1	9.0	57
21	U. S. 44	8.27	36	1	35	70	24	90	10	0.5	639	80.6	9.0	57
22	Kansas 2026	8.10	16	1	15	50	23	87	4	0.5	547	74.5	8.6	60
23	Illinois 200	8.10	14	0	14	50	23	84	21	0.5	553	74.5	8.6	56
24	Iowealth 30	8.06	19	1	18	52	28	79	14	0.5	542	78.2	8.6	56
25	Kansas I	8.04	6	1	5	52	22	92	3	0.5	555	78.6	9.3	61
26	Pioneer 324	8.03	40	0	40	76	20	79	17	0.6	661	77.0	9.0	49
27	U. S. 63	7.52	14	1	13	50	22	75	16	0.7	723	75.1	8.6	53
28	Pioneer 322	7.52	41	0	41	76	20	71	18	0.7	717	75.1	8.6	51
29	De Kalb 891	7.37	21	4	17	58	22	87	29	0.4	522	71.9	9.0	57
30	Pioneer 313	7.33	26	2	24	60	22	77	12	0.6	669	80.0	8.6	53

TABLE VII. (Continued)

31	Freed	7.28	31	10	21	56	23	79	6	0.5	559	73.4	9.5	54
32	Funk G-90	7.27	14	1	13	52	26	80	17	0.5	595	75.0	9.0	59
33	Kansas 2015	7.24	14	0	14	56	26	94	2	0.4	587	75.0	9.3	62
34	Missouri 47	7.24	27	1	26	64	24	81	23	0.5	639	79.1	8.6	58
35	Kansas 1468	7.14	7	0	7	56	25	92	27	0.4	628	80.8	9.0	57
36	Iowa 3395	7.07	20	1	19	50	23	72	21	0.7	745	75.2	9.0	52
37	Iowa 939	6.70	26	2	24	68	20	69	27	0.7	716	75.5	8.6	51
38	Illinois 784	6.64	25	1	24	48	25	86	14	0.4	608	77.7	9.0	59
39	De Kalb 919W	6.51	4	1	3	54	26	79	26	0.5	581	76.4	9.3	58
40	Nebraska 238	6.50	18	1	17	56	19	62	18	0.6	612	75.7	8.6	51
41	Kansas 1245	6.29	40	3	37	72	20	80	3	0.6	800	73.3	8.6	56
42	Illinois 960	5.89	17	0	17	64	24	85	12	0.4	643	79.1	8.6	55
43	Pioneer 307	5.61	15	1	14	66	21	81	17	0.5	709	78.7	9.0	52
44	U. S. 102	5.42	13	0	13	54	30	90	21	0.4	729	72.9	8.6	56
45	Moews-Lowe 830	5.16	11	0	11	48	29	91	22	0.5	787	72.4	9.0	58
46	Illinois 885A	5.04	16	0	16	58	24	85	29	0.4	658	76.9	9.0	58
47	National 132 ₁	4.92	10	3	7	52	29	80	10	0.3	545	78.2	8.6	57
48	Kansas 1509	4.69	9	1	8	46	25	89	7	0.2	447	78.6	9.3	61
49	De Kalb 899	4.34	14	2	12	52	28	85	8	0.3	670	72.6	9.0	59
50	Kansas 1475	3.82	8	3	5	52	25	86	3	0.3	642	70.5	9.0	61
51	Pride of Saline	3.82	12	1	11	46	26	87	6	0.3	673	67.3	9.3	55
52	Missouri 8	3.60	21	0	21	54	27	86	11	0.3	628	74.4	9.0	57
53	Kansas 1501	3.59	11	0	11	52	22	78	3	0.3	707	69.6	8.6	60
54	Iowalth 29N	3.53	15	0	15	62	25	86	24	0.2	646	77.2	8.6	58
55	Iowalth 28N	3.49	17	0	17	56	27	85	18	0.3	837	76.2	8.6	57
56	Funk G-135	3.48	13	0	13	52	28	84	6	0.3	722	67.8	9.0	59
57	Kansas 2174	2.82	20	0	20	68	26	87	4	0.2	750	70.6	9.0	54
58	Illinois 243	2.69	20	2	18	54	25	80	14	0.3	908	72.3	8.6	57
59	Funk G-56	2.62	29	1	28	62	26	87	18	0.3	1133	76.7	9.0	56
60	Midland (A)	0.87	19	0	19	56	24	86	9	0.1	957	60.9	9.0	....
Average of 60 entries		7.73	19	1	18	55	24	83	14	0.5	618	75.9	8.8	56

KANSAS CORN TESTS, 1939

outyielded U. S. 44, 7.6 bushels per acre in the Atchison County test. On the same field in 1939, U. S. 44 outyielded Missouri No. 8, 9.91 bushels per acre. In 1938, three open-pollinated varieties outyielded U. S. 44, but in 1939 the yield of the best open-pollinated variety was far below that of U. S. 44.

One or two years' results do not prove the superiority of any hybrid or variety. One should not plant his entire corn acreage to one specific hybrid until its local adaptation and consistent superiority have been established by careful trials through several years. The variation of hybrids in their response to differences in climate makes it necessary to conduct tests in representative sections of the state. Therefore, climatic and sectional differences should be considered when selecting any corn hybrid for planting.

There are many characteristics which are desirable in a hybrid besides yield. Some of these are the ability to stand erect, retain the ears until husking, and have a desirable ear size. These and many other factors are studied in the performance tests, and the results are given in Tables III to X.

ANNOUNCEMENT OF 1940 KANSAS CORN PERFORMANCE TESTS

The general plan of the 1939 Kansas Corn Performance Tests has proved satisfactory. The tests will be continued in 1940 on practically the same basis. Those who are interested in entering hybrids or open-pollinated varieties in the 1940 tests should apply before February 1 to the Kansas Corn Performance Test Committee, Dept. of Agronomy, Kansas State College, Manhattan, Kansas, for further information.

KANSAS COOPERATIVE CORN STRIP TESTS

Corn variety and hybrid strip tests are conducted by the Department of Agronomy of Kansas State College in cooperation with county agricultural agents, vocational teachers, and farmers. Seed for these tests is furnished by the Department of Agronomy through the Seed Distribution project. The tests are planted and harvested by the farmer cooperator and county agent or vocational teacher. Each test is visited before harvest by a representative of the Department of Agronomy for the purpose of taking notes and observing the reliability of the test.

The entries in these tests are planted in four-row plots of sufficient length to secure reliable areas for harvest. The two inside rows, of sufficient length to make one thirty-fifth or one seventieth of an acre, are harvested for yield data. If the corn is well dried at harvest, field weights are used for yield calculations. When the moisture content appears ununiform, moisture samples are retained and reweighed after the moisture content becomes uniform. Yields on a few of the tests are calculated on a shelled corn basis, using 56 pounds per bushel. In most cases, the yields are calculated on the ear corn basis, using 70 pounds per bushel. Seed of standard varieties was obtained from growers of certified seed. The hybrids included in the tests were selected by asking the commercial producers and experiment stations to nominate entries for each district.

YIELDS IN 1939

In the spring of 1939, 86 corn strip tests were located in 52 counties. The yield and rank of varieties and hybrids from 43 of these cooperative tests are reported in Table VIII. No yields are reported for 43 tests because of drouth, lack of uniformity, failure to harvest, or for some other cause.

YIELDS, TWO-YEAR SUMMARY, 1938-1939

Table IX gives the two-year (1938 and 1939) average yield and rank of varieties and hybrids. Two entries with equal yields are given the same rank. Since the plots in these tests are not replicated, yields from several tests in one district must be averaged to secure reliable data. Response of different entries to climatic variations makes the average yield for two years more reliable than is that for one year.

TABLE VIII. COOPERATIVE CORN STRIP TESTS, 1939, RANK AND YIELD (bus. per acre).

Variety or Hybrid	Dist. 1 10 tests		Dist. 2 7 tests		Dist. 3 11 tests		Dist. 4 5 tests		Dist. 5 8 tests		NW. Dist. 2 tests	
	Rank	Yield	Rank	Yield	Rank	Yield	Rank	Yield	Rank	Yield	Rank	Yield
Missouri 8	9	34.1	8	18.6	2	36.9	11	23.7	1	25.9	.....	.....
DeKalb 891	8	34.2	.....	.....	.....	.....	9	25.4	.....	.....	1	52.7
Pride of Saline	12	32.9	11	16.9	7	34.8	10	24.9	5	23.7	3	49.7
Pioneer 307	7	34.8	4	22.4	5	35.1	4	29.7	2	24.4	.....	.....
National 132	3	37.2	6	21.0	.....	.....	1½	31.8	.....	.....	2	50.8
Midland (A)	13	32.8	12	16.2	.....	.....	.....	.....	6	21.8	.....	.....
Iowwealth 30	4	37.1	7	20.6	6	34.9	1½	31.8	4	24.1	.....	.....
Missouri 47	5	36.8	5	21.3	.....	.....	.....	.....	.....	.....	.....	.....
Reid Yellow Dent	10	33.8	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Funk G-212	2	38.4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hays Golden	11	33.4	2	23.5	9	33.4	7	27.1	8	21.3	6	44.0
U. S. 44	6	36.4	1	23.9	1	38.5	.....	.....	.....	.....	.....	.....
Midland (C) .....	.....	.....	10	17.6	8	34.2	.....	.....	.....	.....	.....	.....
DeKalb 919W .....	.....	.....	9	18.2	.....	.....	.....	.....	.....	.....	.....	.....
Funk G-46 .....	.....	.....	3	22.9	.....	.....	.....	.....	.....	.....	.....	.....
National 132 ₁ .....	.....	.....	.....	.....	10	32.2	.....	.....	12	17.2	.....	.....
Com. Wh. (Works) .....	.....	.....	.....	.....	11	31.8	.....	.....	.....	.....	.....	.....
DeKalb 899 .....	.....	.....	.....	.....	3	36.8	.....	.....	3	24.2	.....	.....
Funk G-135 .....	.....	.....	.....	.....	4	35.6	.....	.....	.....	.....	.....	.....
Ill. 960 .....	.....	.....	.....	.....	.....	.....	5	28.8	.....	.....	.....	.....
U. S. 13 .....	.....	.....	.....	.....	.....	.....	3	31.4	.....	.....	.....	.....
Neb. 238 .....	.....	.....	.....	.....	.....	.....	12	23.5	11	18.1	9	40.0
Iowa 939 .....	.....	.....	.....	.....	.....	.....	8	26.3	9½	21.1	4	45.3
Funk G-244	1	40.8	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Funk G-62 .....	.....	.....	.....	.....	.....	.....	6	28.6	.....	.....	.....	.....
Cassel .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	8	42.6
Neb. 110 .....	.....	.....	.....	.....	.....	.....	.....	.....	7	21.4	.....	.....
Funk G-56 .....	.....	.....	.....	.....	.....	.....	.....	.....	9½	21.1	.....	.....
Colby Yellowcap ..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	10	31.1
Pioneer 322 .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	7	43.8
Funk G-235 .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5	45.1
Phillips Co. Yel. ..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	11	29.3

Note: Map showing districts is given on page 5 of this publication.
 (A) Anderson Co. (C) Coffey Co.

TABLE IX. COOPERATIVE CORN STRIP TESTS, 1938-1939, RANK AND YIELD (bus. per acre)

Variety or Hybrid	Dist. 1 16 tests		Dist. 2 13 tests		Dist. 3 16 tests		Dist. 4 6 tests		Dist. 5 10 tests	
	Rank	Yield	Rank	Yield	Rank	Yield	Rank	Yield	Rank	Yield
Missouri 8	2	42.5	1	27.8	2	37.3	4	26.0	.....	.....
Pride of Saline	4	40.5	4	25.3	3	35.9	3	26.1	1	27.0
Pioneer 307	3	41.0	.....	.....	.....	.....	1	30.3	.....	.....
Midland (Anderson Co.)	7	38.0	5	24.5	.....	.....	.....	.....	2	24.7
Reid Yellow Dent	5	38.4	.....	.....	.....	.....	.....	.....	.....	.....
Hays Golden	6	38.2	3	25.5	6	33.4	2	26.8	3	24.4
U. S. 44	1	43.1	.....	.....	1	38.0	.....	.....	.....	.....
Midland (Coffey Co.) .....	.....	.....	2	26.3	4	35.3	.....	.....	.....	.....
Com. White (Works) .....	.....	.....	.....	.....	5	34.7	.....	.....	.....	.....

Note: Map showing districts is given on page 5 of this publication.

TABLE X. RESULTS, KANSAS CORN TEST, ATCHISON COUNTY, TWO-YEAR AVERAGE (1938-1939), BOTTOM LAND.

Variety or Hybrid	Acre Yield Bushels	Lodged Plants %	Ear Size No. of Ears per Cwt.	Shelling %
U. S. 44	71.0	6.2	208	83.3
Missouri 8	69.7	19.4	202	83.1
Illinois 960	67.8	17.1	240	83.4
Iowa 13	67.1	26.3	226	84.6
National 130	65.6	12.1	233	84.4
Pioneer 307	64.5	11.8	233	84.9
Pride of Saline	63.7	14.7	202	80.7
Iowa 939	59.8	14.7	215	82.5
Reid Yellow Dent	58.8	21.6	212	82.9
Midland (A)	56.0	10.8	208	82.1
Hays Golden	51.6	19.0	254	79.8
Average of 11 entries	63.2	15.8	221	82.9

KANSAS EXPERIMENT STATION TESTS

The Department of Agronomy, Kansas Agricultural Experiment Station, in cooperation with the Division of Cereal Crops and Diseases, United States Department of Agriculture, has been working for a number of years on the production of corn hybrids suitable for Kansas conditions.

Hybrid seed corn is produced by crossing selected inbred lines. These inbred lines are the "building materials" of the corn breeder. The first requisite of a hybrid corn program, therefore, is to develop inbred lines. These lines are obtained by self-pollinating the corn plant through several generations. Self-pollination is accomplished by applying pollen from a plant to the silks of the same plant. Experience has shown that a hybrid corn program requires the production of a large number of inbred lines. As a result, from 10 to 20 thousand self-pollinations are made at Manhattan each year.

Inbred lines of corn are of little value in themselves, for they are inferior to open-pollinated varieties in vigor and yield. When two unrelated inbred lines are crossed, however, the vigor is restored. The better hybrid combinations among selected inbred lines also give substantial increases in yield over the better varieties.

The hundreds of crosses made by the experiment station must be compared carefully before any can be recommended for general planting. New Kansas hybrids are tested first in preliminary performance trials. Outstanding combinations are then compared in "advanced tests" at branch stations and experiment fields. The relatively few hybrids showing the most promise are then entered in the Kansas Corn Performance Tests and cooperative strip tests. In this program 2,250 entries were compared in over 9,000 plots during the past season.

Preliminary results indicate that some of the hybrids developed in the Kansas hybrid corn program are superior to the varieties commonly grown and the hybrids now available from other sources. The following Table gives the frequency distribution of the yields of 397 hybrids and varieties compared in experiment station tests in 1939.

FREQUENCY DISTRIBUTION OF YIELDS OF 397 ENTRIES.

Entries	Class center (bushels)								Total
	30	35	40	45	50	55	60	65	
Varieties	1	0	7	15	8	3	1	0	35
Hybrids									
Out-of-state	2	0	2	7	15	4	4	1	35
Kansas	0	3	21	47	131	82	39	4	327

The characters given consideration in the Kansas hybrid corn program are resistance to lodging, drouth, diseases and insects; and yield, suckers, plant and ear height, ear drop, ear size, maturity, shelling percentage and test weight. A large number of hybrids must be made and tested in order to obtain one having all of these desirable qualities. Obviously, many of the high-yielding hybrids shown in the preceding table lack one or more of these desirable qualities. When a desirable combination is found, however, it can be expected to perform in the same way each time it is grown under similar conditions.

When a hybrid has been thoroughly tested and its desirability ascertained, the first phase in the commercial production of hybrid corn is the increasing of the inbred lines. The second phase is that of crossing the inbred lines into single crosses. These single crosses must then be combined into double cross seed for the production of hybrid corn. After the program has been started, however, all of these various phases may be carried out during the same year.

Anyone desiring more information on hybrid corn may obtain free copies of Kansas Circular 196 entitled "Hybrid Corn in Kansas" by writing to the Department of Agronomy, Kansas State College, Manhattan, Kansas.