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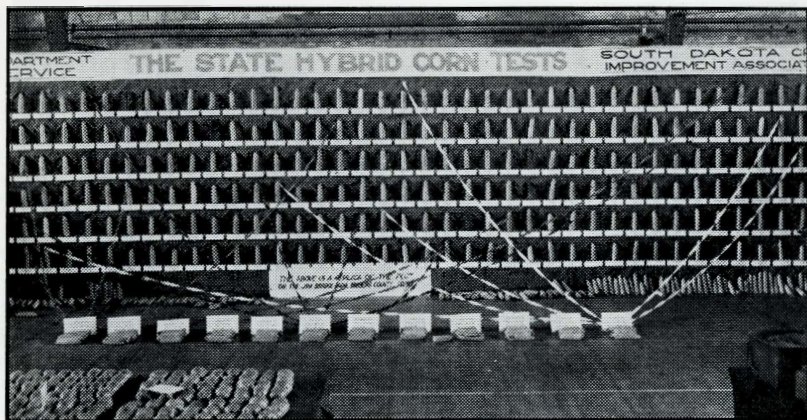
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The 1939 State Hybrid Corn Yield Tests

By S. P. Swenson

Farm and Home Week at State College, November 1939



A Section of the State Hybrid Corn Test Exhibit at the State Crop Show
The State Crop Show is Sponsored Annually by the South Dakota State Crop
Improvement Associations

Extension Service
Agricultural Experiment Station
South Dakota State College
Brookings

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THE
1939 State
Hybrid Corn Yield Tests

By S. P. Swenson¹

INTRODUCTION

Purpose of Tests

During the past few years, hybrid corn has become a subject of primary interest among farmers in the corn belt as a means of increasing the yield and quality of the corn crop. Results obtained from tests in the major and some of the minor corn-producing states have shown that the best hybrids have very markedly outyielded the best open-pollinated varieties. On the other hand, these tests also have demonstrated that many hybrids are inferior or at least not superior to the best open-pollinated varieties. Finally, the results from these tests have shown that the adaptation of varieties of hybrid corn, like the adaptation of varieties of open-pollinated corn, is a regional or local problem which can be determined only by actual field tests.

Plant breeders employed by experiment stations and commercial seed corn companies have developed a large number of hybrids which are now offered on the seed corn market. The large number of varieties is confusing to the farmer who must decide not only whether or not it will be profitable for him to grow hybrid corn but also which variety he should choose. The South Dakota State Hybrid Corn Yield Tests were therefore begun in 1938 for the purpose of determining whether or not there were varieties of hybrid corn adapted to the corn-growing areas of the state and if so, which varieties were best adapted to the different sections. Corn growers, county agents, teachers of vocational agriculture, and hybrid seed corn dealers will no doubt find that the results from these tests will be of considerable value in formulating recommendations for their localities, especially after two or three years' results have been obtained.

Plan of Procedure

A plan was evolved whereby the South Dakota Crop Improvement Association, in cooperation with the Agronomy Department and Extension

1. Associate Agronomist, South Dakota Agricultural Experiment Station.

Service of South Dakota State College, offered to test the most promising hybrids of commercial hybrid seed corn companies at different locations in the southeastern and eastern section of South Dakota. A definite fee is charged by the association for each hybrid in each location to cover the cost of planting, harvesting, and publishing the results. Local adapted open-pollinated varieties and promising experiment station hybrids are included for comparison. The technical supervision of the tests is furnished by the Agronomy Department while the demonstrations of the tests to the public are conducted by the Extension Service.

Cooperating Agencies

In addition to the agencies which have been mentioned, hybrid seed corn companies, local seed dealers, private seed corn growers, county agents, and farmers play important parts in conducting these tests.

A total of 95 commercial hybrids, 21 experiment station hybrids, 4 privately developed hybrids, and 57 open-pollinated varieties were planted in the 1939 tests. Commercial hybrid corn companies, organizations, and individuals who entered varieties and paid the entry fees in 1939 are as follows:

Name	Address	Name of Hybrids
Carlson Seed Co.	Audubon, Iowa	Carlson's
Dakota Improved Seed Co.	Mitchell, S. D.	Disco
DeKalb Agr. Assoc., Inc.	DeKalb, Ill.	DeKalb Hybrid
Farmer Seed & Nursery Co.	Faribault, Minn.	Master
Funk Bros. Seed Co.	Bloomington, Ill.	Funk's Hybrid
Jacques Seed Co.	Prescott, Wis.	Jacques Proven Hybrid
Michael-Leonard Seed Co.	Sioux City, Iowa	Iowearth
National Hybrid Corn Co.	Anamosa, Iowa	National Hybrid
Northrup, King & Co.	Minneapolis, Minn.	Kingscrot
Pioneer Hi-Bred Corn Co.	Des Moines, Iowa	Pioneer Hi-Bred
Sundstrom, Otto	Beresford, S. D.	Sundstrom's
Turner, H. H.	Grand Junction, Iowa	Turner's
Vassar Growers, Inc.	Dassel, Minn.	Tru-Krost
Wis. Hybrid Corn Associates	Lancaster, Wis.	Wis. Hybrid

Local seed dealers, private corn growers, county agents, and farmers who contributed seed of open-pollinated varieties to be used as checks are indicated with the names of the varieties in the tables showing the results. The Minhybrids, Wisconsin hybrids, Iowa hybrids, and Nebraska hybrids were furnished by the experiment stations in Minnesota, Wisconsin, Iowa, and Nebraska, respectively.

The interest and cooperation of all of these agencies and individuals aided in making these tests successful and their efforts are herewith gratefully acknowledged.

Locations

The trials were grown under actual farm conditions on farms located in representative corn growing sections in eastern South Dakota as indi-

cated on the map on page 8. The cooperators furnishing land for the tests were as follows:

Location No.	Name	City	County
1.	Jensen Bros.	Gayville	Clay
2.	Otto Sundstrom	Beresford	Lincoln
3.	John L. Hofer	Freeman	Hutchinson
4.	Ray Knutson	Brandon	Minnehaha
5.	H. P. Backus	Madison	Lake
6.	A. G. Vincent	Letcher	Sanborn
7.	James Biggar	Brookings	Brookings
8.	Walter Schwanke	Watertown	Codington
9.	Chris Christian	Milbank	Grant

Each cooperator reserved a block sufficiently large to conduct the test in a corner or portion of a regular cornfield so it could be cared for in the same manner as his own field.

Early in the season, the test in Grant county was destroyed by wind so the county agent's test on the Walter Grothe farm near Twin Brooks was used instead. Grasshoppers and drought destroyed the test in Hutchinson county so data were taken on the county agent's test on the Herman Driscoll farm near Emery in Hanson county.²

Planting

Land for the test plot was marked off in both directions with a corn planter so the rows would match with those in the main field. The actual planting was done by hand at the rate of three seeds per hill. Seven replicates were planted in Clay, Lincoln, Hutchinson, and Minnehaha and six in the remaining counties. The individual plots of each variety consisted of two rows, 12 hills long, making a total of 24 hills or 72 seeds per plot. The varieties were randomized within each replicate so they would not fall in the same order each time. No replanting or thinning was done. The substitute test in Grant county consisted of three replicates. In Hanson county, five replicates had been planted and the plots consisted of two 10-hill rows with two seeds planted in each hill, instead of three.

In order to have a uniform check in all of the locations, Dawes' Fulton Yellow Dent was included in all plots. In addition, Wimple's Yellow Dent (Sundstrom) was used in the first four tests and Brookings 86 was planted in the remaining tests.

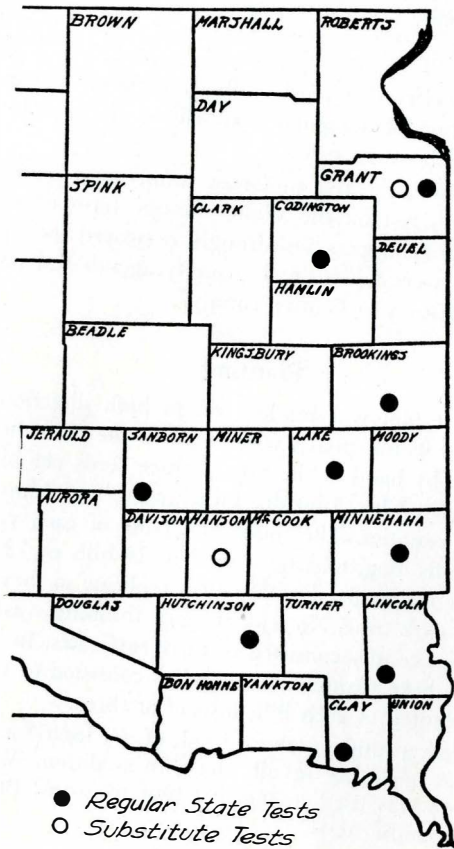
Notes

Notes were taken in August on stand and smut, and at harvest time on other characters such as lodging, number of ears on ground, diseased ears, carworm damaged ears, and good ears.

2. The cooperation of County Agent Dyke in Grant county and County Agent Prunty in Hanson county in making the results of these tests available is gratefully acknowledged.

Harvesting

Harvesting began on September 30 and was completed on October 14. All of the corn from each individual variety plot was harvested and weighed. About a pint of shelled corn was taken from representative ears of each variety in the even-numbered replicates in Clay, Lincoln, and Min-



nehaha counties, and in the odd-numbered replicates in Lake, Sanborn, Brookings, Codington, Hanson, and Grant counties. These samples of shelled corn were placed in moisture-proof cans and stored in the Agronomy Department where they were later tested for moisture content on a Steinlite Moisture Tester.

The 1939 Growing Season

The season of 1939 was generally long over the entire corn area with respect to the number of frost-free days, but other conditions varied considerably between the different tests. The early spring season up to about the third week of May was unusually dry so that much of the corn did not emerge. From the latter part of May up to early July, conditions were extremely favorable in most of the corn area. However, grasshoppers and hot, dry weather later became serious in the southern and western parts of the intensive corn growing section. In general, the 1938 and 1939 seasons were very favorable to the maturing of late varieties of corn when grasshoppers, drought, and high temperatures were not serious limiting factors.

The conditions under which each specific test was grown will be discussed in more detail in connection with the tables of results. It should be emphasized, however, that conditions were unusually favorable for some of the tests such as those in Brookings and Codington counties. The test in Lincoln county, on the other hand, was subjected to very unfavorable conditions. Conditions for the remaining tests were in general slightly better than average.

Analysis of Yields and Other Data

It is important that a corn variety mature properly under the conditions where it is grown. Since notes on date of silking and tasseling were not taken, moisture percentage was used as an indication of maturity in the analysis of the results. The average moisture percentage of local adapted open-pollinated varieties was used as a basis for determining the moisture percentages which would be acceptable for the locality. By calculating the minimum level of significance which is equal to two times the standard error of the difference³ in moisture percentage between any two varieties, it was possible to determine how high a moisture percentage would be significantly different from the average of the adapted open-pollinated varieties. A variety with a moisture content exceeding the average of the open-pollinated varieties by less than two times the standard error would therefore not be considered significantly higher than the open-pollinated varieties and could be placed in the same moisture group. A second group may then be set up by including varieties beyond the range of the two times the standard error but below four times the standard error, a third group would fall between four times the standard error and six times the standard error, and so on until all the varieties are included. This method of setting up maturity groups was used in arranging the tables of results.

To illustrate the method, Table 6 for Clay county may be used. The average moisture percentage of the 8 local open-pollinated varieties was 11.4 percent and the minimum level of significance was 1.0 percent. Group

3. The standard error is obtained by a special statistical treatment. The odds are 19:1 that a difference equal to two times the standard error is a true difference.

I therefore contains all varieties having a moisture percentage of less than 12.4 (11.4 percent plus 1.0 percent); Group II, 12.4 to 13.3 percent; and Group III, 13.4 to 14.3 percent.

Within the moisture groups, the varieties were then arranged in order of yield with the highest yielding variety first and the remaining varieties in descending order. The minimum level of significance for yield in bushels per acre was then calculated and used to divide the varieties within the moisture groups. By subtracting the figure for the minimum level of significance from the highest yielding variety in each group, it was possible to determine the point below which a variety would be considered to yield significantly less than the highest yielding variety. Horizontal lines have been drawn in the yield columns to indicate these points.

To illustrate with the Clay county data, the highest yielding variety in Group I yielded 59.0 bushels per acre. The minimum level of significance of 8.8 bushels subtracted from 59.0 bushels leaves 50.2 bushels, the point at which the lower yielding varieties may be considered to yield significantly less than the highest yielding variety of the preceding group.

This method of presentation has the advantage of not only giving yield but also maturity due consideration. Since proper maturity is important, it should be given considerable emphasis in the selection of a corn variety.

DISCUSSION OF RESULTS

Drawing Conclusions

Hasty conclusions regarding hybrid corn varieties should be avoided, especially because the last two or three seasons have been longer than average. Some of the later-maturing hybrids which have yielded and matured satisfactorily in 1938 and 1939 would undoubtedly be immature at the time of the first killing frost in an average season. The moisture percentages will serve as a fair guide to maturity.

The discussion with tables 6 to 14 also should be studied in order to determine the conditions under which the test was grown in 1939. Was the test on low or on high ground? How were moisture conditions? Did hot dry winds occur at a critical stage or was the season relatively cool? Were grasshoppers a serious factor? The conditions of the 1938 tests were discussed in Extension Mimeographed Circular No. 200, issued in January, 1939, from the Extension Service at South Dakota State College.

The average yields and moisture percentages of all hybrid and open-pollinated varieties grown in both 1938 and 1939 are presented for Lincoln, Minnehaha, Sanborn, Brookings, and Grant counties in Tables 1 to 5. The complete 1939 data for these five counties are given in Tables 7, 8, 10, 11, and 14. Tables 6, 9, 12, and 13 are for Clay, Lake, Codington, and Hanson counties, respectively, where the tests were grown for the first time in 1939.

The 1938-39 Averages

The average yields and moisture percentages for 1938 and 1939 are arranged in order of the yields of the varieties within the groups set up in Tables 1 to 5. The groups were set up according to the moisture groups in which the varieties occurred in the two years and are set apart in the tables by an extra space. For example, in Brookings County (Table 4), the first twelve varieties fell in Group I in both years and therefore constitute one group. The following group consists of those which were in Group I in one year and Group II in the other and the next group those having an average Group II rating such as II and II or I and III.

The ranks within groups in the last two columns are simply the ranks within the moisture groups which each variety had with respect to the other varieties grown for the two years. In Table 4, for example, Wis. 455 ranked second among the sixteen varieties in Group I in 1938 and fifth among the six varieties in Group II in 1939. Wis. 606 ranked eleventh in Group I in 1938 and second in Group II in 1939, while Iowearth AP ranked twelfth in Group I in 1938 and first in Group III in 1939 among the varieties grown during both years.

Table 1—Lincoln County

Average yield and moisture content for 1938 and 1939 on Otto Sundstrom Farm, Beresford

Variety	Yield bu. per A.			Percent moisture			Group		Rank within group	
	1938	1939	average 1938-39	1938	1939	average 1938-39	1938	1939	1938	1939
Fulton Y. D. (Dawes)	25.3	18.6	22.0	12.9	8.8	10.9	I	I	1	1
Sundstrom's 56	18.6	16.2	17.4	12.9	12.1	12.5	I	I	2	3
DeKalb Hybrid 204	17.7	12.4	15.1	15.9	12.0	14.0	I	I	3	8
National Hybrid 110	14.5	15.2	14.9	15.4	12.0	13.7	I	I	9	5
Sundstrom's 90	17.2	12.4	14.8	16.8	11.2	13.5	I	I	4	7
Iowearth A	16.3	12.7	14.5	15.9	12.7	14.3	I	I	6	6
Iowa 939	16.3	11.0	13.7	17.5	13.3	15.4	I	I	7	15
DeKalb Hybrid 433	15.0	12.1	13.6	16.9	11.1	14.0	I	I	8	10
Wimple's Y. D. (Sundstrom)	14.5	11.5	13.0	16.1	12.0	14.1	I	I	10	12
Iowa 931	13.9	11.0	12.5	16.2	12.3	14.3	I	I	11	14
Turner's Iowa Hybrid 939	16.3	8.5	12.4	17.5	14.6	16.1	I	I	7	20
Pioneer Hi-Bred 322	12.4	11.3	11.9	16.3	13.7	15.0	I	I	12	13
National Hybrid 112	11.2	12.3	11.8	17.0	12.0	14.5	I	I	13	9
Reid's Y. D. (Sundstrom)	10.1	11.6	10.9	14.4	11.5	13.0	I	I	14	11
Funk's Hybrid G-8	16.6	4.8	10.7	17.4	12.7	15.1	I	I	5	21
National Hybrid 114	8.7	9.6	9.2	17.2	12.1	14.7	I	I	15	19
DeKalb Hybrid 601	16.5	15.7	16.1	19.8	14.2	17.1	II	I	2	4
Funk's Hybrid G-15	18.3	10.4	14.4	20.0	13.3	16.7	II	I	1	18
DeKalb Hybrid 404	10.1	17.8	14.0	18.4	12.0	15.2	II	I	5	2
Iowearth AP	16.4	10.5	13.5	18.1	11.8	15.0	II	I	3	16
Iowearth AF	13.7	10.4	12.1	19.4	12.9	16.2	II	I	4	17
Iowearth 15	13.4	7.5	10.5	21.7	17.6	19.7	III	II	1	1

Table 2—Minnehaha County

Average yield and moisture content for 1938 and 1939 on Ray Knutson Farm, Brandon

Variety	Yield bu. per A.			Percent moisture			Group		Rank within group	
	1938	1939	average 1938-39	1938	1939	average 1938-39	1938	1939	1938	1939
DeKalb Hybrid 493	47.9	41.1	44.5	15.8	12.0	14.9	I	I	2	9
Iowealth AP	49.0	39.8	44.4	16.4	12.8	14.6	I	I	1	12
DeKalb Hybrid 204	44.0	44.0	44.0	15.6	11.7	13.7	I	I	4	5
DeKalb 404, 404A	41.2	45.8	43.5	16.2	11.9	14.1	I	I	6	2
Phillips' Y. D.	41.0	44.9	43.0	14.5	13.3	13.9	I	I	7	4
Wis. 606	47.5	39.3	43.4	15.7	11.9	13.8	I	I	3	14
Sundal's Y. D.	39.9	43.8	41.9	13.2	11.5	12.4	I	I	8	6
Pioneer Hi-Bred 357	35.0	48.0	41.5	15.8	11.0	13.4	I	I	16	1
National Hybrid 110	35.9	45.4	40.7	15.6	12.0	13.8	I	I	13	3
Kingscrot 100 Day D	38.7	40.4	39.6	14.0	12.3	13.2	I	I	9	11
Wis. 456	41.6	37.0	39.3	11.9	10.9	11.4	I	I	5	19
National Hybrid 105	35.0	43.1	39.1	12.9	10.7	11.8	I	I	15	7
Wimple's Y. D. (Sundstrom)	35.1	41.8	38.5	16.6	11.3	14.0	I	I	14	8
Turner's E-4	36.5	38.6	37.6	15.0	10.9	13.0	I	I	11	16
Fulton Y. D. (Dawes)	36.8	37.5	37.2	12.9	10.7	11.8	I	I	10	18
Thompson's Y. D.	36.3	36.8	36.6	14.9	12.1	13.5	I	I	12	20
Wis. 531	32.9	39.5	36.2	13.8	12.8	13.3	I	I	17	13
Knutson's Y. D.	30.8	38.7	35.3	14.7	10.4	12.6	I	I	18	15
Iowealth 10	45.7	38.2	42.0	17.2	12.4	14.8	II	I	1	17
Disco 931	31.1	33.5	32.3	17.0	11.7	14.4	II	I	3	21
Pioneer Hi-Bred 322	35.7	41.0	38.4	18.5	14.2	16.4	II	II	2	1
Iowa 939	39.6	40.8	40.2	20.3	13.3	16.8	III	I	1	10
Funk's Hybrid G-7	30.8	42.6	36.7	15.5	15.6	15.6	I	III	19	1

Table 3—Sanborn County

Average yield and moisture content for 1938 and 1939 on A. G. Vincent Farm, Letcher

Variety	Yield bu. per A.			Percent moisture			Group		Rank within group	
	1938	1939	average 1938-39	1938	1939	average 1938-39	1938	1939	1938	1939
Farmer's Variety	9.7	44.1	26.9	10.8	12.1	11.5	I	I	4	1
Fulton Y. D. (Dawes)	11.0	32.6	21.8	10.8	9.8	10.3	I	I	1	2
Kingscrot 100 Day D	9.1	30.5	19.8	11.4	10.9	11.2	I	I	6	5
Funk's Hybrid G-7	6.9	30.7	18.8	15.6	13.0	14.3	I	I	8	4
Sanborn Co. G. Jewel	4.3	31.3	17.8	13.9	12.4	13.2	I	I	13	3
Wis. 456	9.4	25.0	17.2	10.2	11.8	11.0	I	I	5	8
Sanborn Co. E. Murdock	7.9	25.8	16.9	13.1	10.6	11.9	I	I	7	7
Iowealth AP	5.0	27.3	16.2	16.0	13.4	14.7	I	I	12	6
Sanborn Co. Fulton Y. D.	9.8	22.3	16.1	12.0	12.5	12.3	I	I	3	10
National Hybrid 105	10.9	19.9	15.4	11.7	11.5	11.6	I	I	2	13
Wis. 531	2.8	23.5	13.2	13.0	12.1	12.6	I	I	17	9
Sanborn Co. Silver King	5.5	19.9	12.7	11.3	9.3	10.3	I	I	11	12
Wimple's Y. D.	6.8	18.4	12.6	13.5	13.6	13.6	I	I	9	16
Disco 931	3.5	20.3	11.9	13.6	12.9	13.3	I	I	14	11
DeKalb Hybrid 404	3.5	18.9	11.2	13.8	13.4	13.6	I	I	15	15
Pioneer Hi-Bred 322	3.4	19.0	11.2	16.4	14.1	15.3	I	I	16	14
Disco E-4	2.7	16.3	9.5	14.4	9.4	11.9	I	I	18	17
DeKalb Hybrid 204	5.7	22.5	14.1	13.6	16.0	14.8	I	II	10	1

Table 4—Brookings County

Average yield and moisture content for 1938 on
Cheever Bros. Farm, and 1939 on James Biggar Farm, Brookings

Variety	Yield bu. per A.			Percent moisture			Group		Rank within group	
	1938	1939	1938-39 average	1938	1939	1938-39 average	1938	1939	1938	1939
Wis. 455	24.8	65.8	45.3	13.2	18.6	15.9	I	I	2	5
Kingscrot 100 Day D	18.2	71.2	44.7	18.8	18.1	18.5	I	I	8	2
Fulton Y. D. (Dawes)	25.6	62.9	44.3	13.5	16.4	15.0	I	I	1	7
Brookings 86	21.4	60.8	41.1	16.3	17.3	16.8	I	I	3	8
Minhybrid 401	19.7	59.7	39.7	16.9	15.1	16.0	I	I	5	10
Pioneer Hi-Bred 355	5.7	71.3	38.5	19.0	17.7	18.4	I	I	15	1
Minhybrid 402	20.5	56.1	38.3	16.7	13.5	15.1	I	I	4	12
Fulton Y. D. (Sexauer)	18.6	54.2	36.4	13.5	19.8	16.7	I	I	6	13
Turner's E-4	3.5	68.6	36.1	18.9	18.4	18.7	I	I	16	4
Minn. 13 (Sexauer)	18.5	50.9	34.7	14.6	18.2	17.4	I	I	7	14
National Hybrid 105	7.1	60.7	33.9	16.8	17.0	16.9	I	I	13	9
Golden King (Sexauer)	13.6	47.9	30.8	15.5	18.1	16.8	I	I	10	15
Wis. 606	9.0	66.5	37.8	20.6	21.8	21.2	I	II	11	2
Disco E-4	3.6	69.3	36.5	20.9	19.1	20.0	II	I	4	3
Early Murdock (Sexauer)	13.7	56.1	34.9	14.8	20.5	17.2	I	II	9	6
National Hybrid 90	6.3	62.8	34.6	16.1	20.5	18.3	I	II	14	5
National Hybrid 95	4.5	63.9	34.2	22.1	17.6	19.9	II	I	3	6
Minhybrid 403	5.4	58.4	31.9	22.2	18.3	20.3	II	I	2	11
DeKalb Hybrid 250	7.1	66.1	36.6	20.9	21.6	21.3	II	II	1	3
Iowearth AP	8.8	62.9	35.9	20.6	23.0	21.8	I	III	12	1
DeKalb Hybrid 404	1.9	69.2	35.6	20.6	21.2	20.9	II	II	6	1
Pioneer Hi-Bred 357	3.3	63.4	33.4	21.5	21.2	21.4	II	II	5	4

Table 5—Grant County

Average yield and moisture content on
Christ Christian Farm and 1939 on Walther Grothe Farm, Milbank

Variety	Yield bu. per A.			Percent moisture			Group		Rank within group	
	1938	1939	1938-39 average	1938	1939	1938-39 average	1938	1939	1938	1939
Pioneer Hi-Bred 355	53.3	67.5	60.4	13.9	22.0	17.9	I	I	1	1
Kingscrot D	50.7	65.1	57.9	15.8	20.9	18.4	I	I	5	2
Wisconsin 455	49.9	59.9	54.9	12.0	20.9	16.5	I	I	6	6
Disco E-4	46.8	61.7	54.3	14.3	20.2	17.3	I	I	8	4
National Hybrid 90	46.1	60.1	53.1	13.1	20.7	16.9	I	I	10	5
Turner's E-4	50.8	55.0	52.9	15.6	18.1	16.9	I	I	4	7
Iowearth 90	49.6	51.2	50.4	15.8	19.2	17.5	I	I	7	8
Iowearth 95	52.8	47.6	50.2	16.3	18.5	17.4	I	I	3	10
Jacques Proven Hybrid 350	44.8	50.1	47.5	12.7	19.7	16.2	I	I	12	9
Jacques Proven Hybrid 240	53.0	41.5	47.3	13.1	18.1	15.6	I	I	2	11
Master Minhybrid 402	44.8	40.1	42.5	11.2	16.1	13.7	I	I	11	12
National Hybrid 95	56.8	62.3	59.6	21.9	18.3	20.1	II	I	1	3
Pioneer Hi-Bred 357	43.0	72.1	57.6	15.3	23.4	19.4	I	II	13	1
DeKalb 404 A	46.7	64.2	55.5	18.6	25.0	21.8	I	II	9	2
DeKalb 250	41.7	59.6	50.7	15.9	23.6	19.8	I	II	14	3

Discussion of 1939 Results

Clay County

The Clay County Test was located on the Missouri River flats in the southwestern part of the county. This test would represent the strip of land along the river, extending from Union county through the eastern one-third of Charles Mix county.

The test was planted on May 12 at a time when the soil was dry and hard so that it was difficult to plant at a uniform depth. Owing to extremely dry weather during May, the emergence was very poor and the percent stand was consequently variable and low, averaging only 60 to 65 percent. During

Table 6—Clay County
Jensen Bros., Gayville Harvested Oct. 2, 1939

Variety	Entry No.	Yield bu. per A. of ear		Percent moisture at harvest	Percent stand	Percent lodging	Percent good ears	Percent ears on ground
		moisture in grain	15% at harvest					
Group I:								
Pioneer Hi-Bred 349	88	59.0	11.1	77	4	76	2.5	
Clay Co. Wimple's Y. D.	124	54.7	10.6	74	35	67	5.4	
Pioneer Hi-Bred 352	54	53.5	9.9	74	10	81	2.9	
DeKalb Hybrid 601	19	50.4	12.2	61	12	87	3.1	
Iowearth 25	42	49.8	12.1	57	11	74	4.5	
Kingscrot 107 Day FK	3	49.3	10.7	68	9	77	.6	
Funk's Hybrid G-8	29	48.3	11.2	74	2	66	1.9	
Wis. 678	115	48.1	11.2	72	5	79	3.0	
Pioneer Hi-Bred 322	57	47.9	11.6	58	10	79	.9	
Jacques Proven Hybrid 696	60	47.9	12.0	68	5	69	2.4	
National Hybrid 110 A	72	47.4	11.7	68	4	61	5.2	
DeKalb Hybrid 422	16	47.2	11.0	73	7	69	3.0	
Funk's Hybrid G-27	32	46.8	11.1	64	2	70	3.5	
Funk's Hybrid G-15	30	45.7	11.7	68	4	74	2.9	
Turner's Iowa Hybrid 939	82	45.2	10.9	65	14	73	10.3	
Master Minhybrid 301	22	45.0	9.1	68	8	72	.7	
Clay Co. Iowa Goldmine	127	44.9	11.7	65	13	67	8.3	
Clay Co. Dawson's Y. D.	126	44.5	10.9	71	22	70	3.4	
Carlson's C-7	36	44.3	10.8	61	14	79	4.6	
DeKalb Hybrid 615	20	44.1	12.3	56	12	86	.8	
DeKalb Hybrid 404 A	15	43.9	8.2	74	4	67	4.2	
Master Minhybrid 403	21	43.8	9.5	69	4	64	2.8	
Iowearth II	41	43.3	11.4	58	10	76	2.4	
Turner's Ill. Hybrid 751	84	42.9	12.1	61	5	73	3.3	
Clay Co. Golden King	128	42.6	9.6	72	16	60	4.4	
WHCA Wis. 606	93	42.5	10.0	69	6	73	3.4	
Iowa 3732	106	42.4	9.0	59	12	74	11.8	
Iowearth AF	38	42.4	10.6	76	5	74	6.3	
Iowa 939	102	41.5	10.6	63	15	83	11.5	
Sundstrom's 55	120	41.3	9.5	69	19	67	1.6	
Iowa 4014	108	41.2	10.6	53	6	72	3.9	
Clay Co. Reid's Y. D.	122	41.2	12.1	63	39	73	4.2	
Farmer's Variety		40.8	11.1	65	24	67	3.5	
Iowearth AQ	37	40.6	11.9	56	9	78	5.3	
National Hybrid 117	75	39.8	11.8	51	9	86	1.6	

Table 6—Clay County (cont'd)

Jensen Bros., Gayville Harvested Oct. 2, 1939

Variety	Entry	Yield bu. per		Percent		Percent	
		A. of ear	moisture	Percent	Percent	Percent	Percent
		No. corn with 15% moisture in grain harvest	at harvest	stand	lodging	good ears	ears on ground
Iowa 3215	103	39.7	9.3	59	13	69	12.5
Clay Co. Longfellow Cattle Corn	123	39.0	11.4	61	28	71	5.4
Iowa 3735	107	38.9	7.3	65	5	46	5.2
Jacques Proven Hybrid 645	59	38.9	10.3	64	2	61	.6
Iowa 3550	104	38.8	10.3	64	6	72	7.2
Wis. 603	113	37.7	10.2	63	7	66	4.7
Iowa 432	100	36.9	10.5	47	9	81	6.9
Fulton Y. D. (Dawes)	136	36.8	9.6	77	6	52	2.4
Iowa 931	101	36.3	9.8	59	18	71	17.9
Iowa 3721	105	36.3	9.2	55	12	64	2.9
Nebraska 238	109	36.3	10.8	51	5	80	2.5
Sundstrom's 90	118	35.7	8.5	62	15	61	2.5
Wimple's Y. D. (Sundstrom)	159	34.5	11.3	54	20	66	1.8
WHCA Wis. 531	92	34.4	10.0	69	2	54	3.6
Kingscrot 110 Day L4	2	34.2	10.2	48	14	79	3.5
Iowearth 17R	40	32.9	11.8	53	1	65	1.7
National Hybrid 114	74	32.8	10.9	55	8	73	4.4
Group II:							
Pioneer Hi-Bred 307	56	57.7	13.2	67	6	81	2.2
Turner's Iowa Hybrid 13	83	46.8	12.5	70	14	74	9.9
Carlson's No. 20	34	44.4	12.7	73	10	71	2.0
National Hybrid 118	76	41.6	12.8	54	7	76	6.0
Kingscrot 110 Day FB	1	40.3	12.7	58	15	72	3.5
Group III:							
Funk's Hybrid G-114	33	50.0	14.4	73	1	69	1.5
WHCA Wis. 695	95	48.2	13.7	65	3	75	.3
Funk's Hybrid G-23	31	43.6	13.6	66	4	70	3.1
Iowearth 20 B	39	43.4	14.0	66	8	76	1.8
Clay Co. Minn. 13	125	37.0	13.7	68	19	63	4.0
Minimum level of significance		8.8	1.0				

the remainder of the season, conditions were favorable so the average yield from the test was 41.7 bushels per acre. Because of the dry fall, the corn was very dry by harvest time, the average moisture content for the varieties being only 11.1 percent.

The varieties used as bases for setting up moisture groups were all of the open-pollinated varieties, except Dawes' Fulton Yellow Dent and Sundstrom's Wimple's Yellow Dent which were not local varieties. The average moisture content of these varieties was 11.4 percent while the minimum level of significance is 1.0 percent. The moisture groups were therefore as follows: Group I, 12.3 percent or below; Group II, 12.4 percent—13.3 percent; and Group III, 13.4—14.3 percent.

With the exception of the local Clay county strain of Wimple's Yellow Dent, all of the open-pollinated varieties were significantly exceeded in yield by several hybrids. In general, the hybrids lodged much less than the

open-pollinated varieties. Of further interest is the fact that the highest percentages of ears on the ground were found among the hybrids.

Lincoln County

This test, located in the southwest corner of Lincoln county, has been grown for two years under unfavorable conditions of drought and grasshopper infestations.

The 1939 test was planted on May 12 under soil moisture conditions which were only fair but later rains resulted in fairly good emergence and consequent stands. At or shortly after silking and tasselling, the grasshopper infestation became severe and in combination with heat and drought caused

Table 7—Lincoln County

Otto Sundstrom, Beresford Harvested Sept. 30, 1939

Variety	Entry No.	Yield bu. per		Percent moisture at harvest	Percent stand	Percent lodging	Percent good ears	Percent ears on ground
		A. of ear corn with 15% moisture in grain	Percent					
Group I:								
Sundstrom's 55	120	20.3	11.4	91	15	24	9.0	
Minhybrid 403	98	19.2	11.1	77	7	21	16.5	
Fulton Y. D. (Dawes)	136	18.6	8.8	82	24	19	4.3	
Iowa 3721	105	18.6	10.4	72	14	25	17.6	
Iowa 3215	103	18.5	9.8	70	14	24	24.8	
DeKalb Hybrid 240	13	18.3	10.7	86	8	19	12.9	
Kingscrot 110 Day No. 76	4	17.9	14.2	83	11	32	5.1	
DeKalb Hybrid 404 A	15	17.8	12.0	87	5	35	18.4	
Farmer's Variety		17.6	11.5	81	15	32	14.3	
Iowa 3735	107	17.3	10.5	74	17	20	19.2	
Minhybrid 301	99	17.2	10.4	71	5	20	17.1	
Iowa 3732	106	17.0	10.3	71	14	24	25.6	
Master Minhybrid 403	21	16.9	9.9	80	9	25	16.8	
Sundstrom's 56	119	16.2	12.1	84	15	30	15.4	
DeKalb Hybrid 601	19	15.7	14.2	77	4	15	8.3	
National Hybrid 110	71	15.2	12.0	86	8	25	26.6	
Clay Co. Golden King	128	14.8	10.7	82	15	14	16.0	
Master Hybrid No. 2	23	14.3	11.4	76	8	20	13.6	
Pioneer Hi-Bred 324	58	14.0	13.4	84	4	37	21.1	
Clay Co. Minn. 13	125	13.9	11.0	79	14	19	12.6	
Iowa 432	100	13.5	13.2	82	6	26	10.5	
Iowealth A	46	12.7	12.7	85	4	29	19.1	
Iowa 3550	104	12.7	14.9	82	5	28	13.1	
Sundstrom's 90	118	12.4	11.2	86	14	20	8.6	
DeKalb Hybrid 204	11	12.4	12.0	84	4	23	17.3	
National Hybrid 112	73	12.3	12.0	79	6	26	24.5	
DeKalb Hybrid 433	17	12.1	11.1	83	4	20	25.1	
Pioneer Hi-Bred 352	54	11.8	12.9	86	9	35	15.7	
Lincoln Co. Reid's Y. D.	161	11.6	11.5	73	9	18	19.5	
Wimple's Y. D. (Sundstrom)	159	11.5	12.0	77	15	21	7.7	
National Hybrid 105	77	11.3	9.8	87	4	5	6.0	
Pioneer Hi-Bred 322	57	11.3	13.7	88	12	23	8.9	
Iowa 931	101	11.0	12.3	65	9	47	34.0	
Iowa 939	102	11.0	13.3	70	9	36	23.7	
Kingscrot 107 Day FK	3	10.7	15.0	86	6	15	5.3	

Table 7—Lincoln County (cont'd)

Otto Sundstrom, Beresford Harvested Sept. 30, 1939

Variety	Yield bu. per Percent						
	Entry No.	A. of ear No. corn with 15% moisture in grain	Percent of ear moisture at harvest	Percent stand	Percent lodging	Percent good ears	Percent ears on ground
Nebraska 238	109	10.6	13.6	73	5	41	4.5
Iowwealth AP	44	10.5	11.9	87	8	26	22.7
Iowwealth AF	38	10.4	12.9	86	3	32	21.3
Funk's Hybrid G-15	30	10.4	13.3	77	3	27	12.6
Kingscrost 110 Day L4	2	9.7	13.4	69	11	25	22.0
Jacques Proven Hybrid 525	62	9.6	11.8	81	2	15	5.7
National Hybrid 114	74	9.6	12.1	84	3	24	14.8
Jacques Proven Hybrid 696	60	9.4	13.8	83	T	21	10.9
Wis. 678	115	9.0	14.6	81	6	25	17.1
Sundstrom's 931	121	8.7	12.1	78	13	23	28.9
Turner's Iowa Hybrid 939	82	8.5	14.6	75	7	26	25.0
Iowa 4014	108	8.4	13.3	55	6	25	16.4
Jacques Proven Hybrid 570	61	8.2	11.0	81	5	22	11.4
Jacques Proven Hybrid 645	59	7.9	10.6	85	1	16	9.8
Wis. 603	113	7.4	13.0	84	2	17	8.5
Iowwealth 10	45	4.9	11.7	82	3	15	5.0
Funk's Hybrid G-8	29	4.8	12.7	85	1	15	1.5
Group II:							
Turner's Ill. Hybrid 751	84	11.7	17.9	70	3	27	5.6
Iowwealth II	41	10.5	16.7	88	4	9	8.9
Wis. 615	114	10.3	16.4	84	5	24	8.3
Funk's Hybrid G-27	32	9.6	15.7	82	2	17	7.6
Iowwealth 15 A	43	7.5	17.6	57	1	21	7.6
Funk's Hybrid G-114	33	7.3	17.4	90	T	19	4.4
Turner's E-7	85	6.9	16.2	81	7	23	18.9
Group III:							
Kingscrost 110 Day FB	1	9.5	18.7	76	8	26	3.7
Pioneer Hi-Bred 349	88	9.2	19.9	77	5	17	4.8
Carlson's C-11	35	6.8	21.2	81	1	20	3.5
Minimum level of significance		6.1	3.3				

very marked reductions in the yields which averaged only 12.2 bushels per acre. The average moisture content of the varieties at the time of harvest was 13.2 percent.

The average moisture content of the local strains of Reid's and Wimple's Yellow Dents was 11.8 percent and the minimum level of significance for moisture content was 3.3 percent. Only two moisture groups were obtained—Group I with 15.0 percent moisture or below and Group II with 15.1 percent moisture or above.

As noted in the table, most of the higher yielding varieties are hybrids although none yielded significantly higher than the better open-pollinated varieties. The percent lodging is somewhat higher for the open-pollinated varieties but the percent of ears on the ground is highest among some of the hybrids.

Hutchinson County

This test, planted May 13 on the John L. Hofer farm near Freeman in east central Hutchinson county, was a complete failure because of grasshoppers and drought. The county agent's test in Hanson county was therefore used instead. (See Page 25 and Table 13.)

Minnehaha County

The Minnehaha county test has been grown on the same farm for two years under what might be considered about average conditions for the area.

The test in 1939 was planted on May 15 under rather dry soil conditions. However, rains soon after were favorable to a fairly good percent of emergence and stand. Grasshoppers were a very minor factor and only short and mild periods of drought occurred. The average yield for the plot was 40.3 bushels per acre and the average moisture content was 12.0 percent.

Table 8—Minnehaha County

Ray Knutson, Brandon Harvested Oct. 7, 1939

Variety	Entry No.	Yield bu. per A. of ear		Percent moisture at harvest			Percent ears on ground
		corn with 15% moisture in grain	moisture at harvest	Percent stand	Percent lodging	Percent good ears	
Group I:							
Pioneer Hi-Bred 357	53	48.0	11.0	86	10	69	5.8
Iowa 432	100	47.4	12.4	80	12	78	6.7
DeKalb Hybrid 240	13	46.5	11.1	88	4	66	8.0
Wis. 615	114	46.0	13.0	84	3	83	8.2
DeKalb Hybrid 404 A	15	45.8	11.9	85	8	68	11.8
Turner's E-7	85	45.4	11.3	86	9	72	27.9
National Hybrid 110	71	45.4	12.0	78	7	64	11.6
Iowa 4014	108	44.9	11.8	84	5	69	19.9
Minnehaha Co. Phillips Y. D.	149	44.9	13.3	82	22	66	9.1
DeKalb Hybrid 204	11	44.0	11.7	88	4	75	8.2
Minnehaha Co. Sundal's Y. D.	150	43.8	11.5	78	24	58	6.8
Iowa 3721	105	43.4	10.6	76	11	76	25.9
Iowa 931	101	43.3	11.0	85	6	70	43.7
Iowa 3215	103	43.2	11.2	84	8	68	41.3
National Hybrid 105	70	43.1	10.7	84	13	64	16.0
Iowa 3732	106	42.7	10.8	81	12	73	37.5
Kingscrot 97 Day D-4	7	42.5	10.9	82	13	71	7.4
Iowa 3735	107	42.2	10.2	82	11	69	22.8
Pioneer Hi-Bred 355	55	42.1	11.1	83	4	75	13.9
Wimple's Y. D. (Sundstrom)	159	41.8	11.3	80	22	66	11.0
Pioneer Hi-Bred 324	58	41.8	13.0	83	4	78	20.0
Kingscrot 105 Day D-3	5	41.4	11.3	81	8	66	5.0
Jacques Proven Hybrid 645	59	41.3	12.9	81	15	62	12.1
DeKalb Hybrid 493	18	41.1	12.0	87	6	70	12.3
Iowhealth 12	51	41.0	12.3	80	3	65	9.0
Farmer's Variety		40.9	10.7	73	28	61	12.8
Iowa 939	102	40.8	13.3	78	4	77	24.8
Kingscrot 100 Day D	6	40.4	12.3	83	12	68	6.5
Sundstrom's 55	120	40.1	11.4	83	26	54	9.6
Minnehaha Co. Anderson's Y. D.	151	40.0	11.6	81	33	63	12.1

Table 8—Minnehaha County (cont'd)

Ray Knutson, Brandon Harvested Oct. 7, 1939

Variety	Entry No.	Yield bu. per		Percent stand	Percent lodging	Percent good ears	Percent ears on ground
		A. of ear corn with 15% moisture in grain harvest	Percent moisture at harvest				
Iowa 3550	104	40.0	13.2	83	5	70	16.0
Iowealth AP	44	39.8	12.8	85	4	69	25.1
WHCA Wis. 531	92	39.5	12.8	83	5	59	19.9
Tru-Krost Wis. 606 (110 day)	78	39.3	11.9	69	3	61	14.3
Sundstrom's 90	118	39.1	11.7	78	22	56	11.2
Minnehaha Co. Knutson's Y. D.	148	38.7	10.1	68	22	64	13.0
Turner's E-4	86	38.6	10.9	86	8	67	18.4
Iowealth 2	48	38.5	11.3	78	9	75	21.4
Iowealth 10	45	38.2	12.4	79	4	61	11.7
Tru-Krost No. 170	80	38.0	10.5	81	3	58	3.5
Sundstrom's 56	119	37.8	12.2	84	20	64	15.2
Fulton Y. D. (Dawes)	136	37.5	10.7	81	15	55	7.0
National Hybrid 99	69	37.5	11.6	79	15	64	17.9
WHCA Wis. 606	93	37.3	11.8	82	3	62	17.7
Minhybrid 301	99	37.1	11.0	69	5	73	6.7
Funk's Hybrid G-27	32	37.1	12.5	78	3	58	14.1
Master Wis. 456 (100 day)	25	37.0	10.9	79	5	51	11.9
Pioneer Hi-Bred 352	54	37.0	11.5	84	5	67	14.7
Minnehaha Co. Thompson's Y.D.	152	36.8	12.1	81	20	69	12.1
Iowealth 3	50	36.3	11.1	72	10	74	19.9
Disco 931	90	33.5	11.7	83	6	64	39.8
WHCA Wis. 456	91	33.4	10.9	81	8	44	6.6
Master Minhybrid 401	24	33.1	10.2	75	12	69	7.2
Minhybrid 403	98	32.0	10.9	66	5	68	12.1
Iowealth 98	47	30.6	11.9	75	3	47	8.2
Group II:							
Pioneer Hi-Bred 349	88	44.7	14.3	85	4	68	6.3
Kingscrot 107 Day FK	3	41.3	13.7	85	9	60	2.9
Pioneer Hi-Bred 322	57	41.0	14.2	89	6	70	11.7
DeKalb Hybrid 225	12	40.0	14.7	81	4	68	13.3
Nebraska 238	109	38.1	13.9	70	2	73	10.3
Group III:							
Funk's Hybrid G-7	28	42.6	15.6	85	8	66	8.3
Minimum level of significance		6.6	1.9				

All open-pollinated varieties except Wimple's and Fulton Yellow Dents were used in establishing the moisture base of 11.6 percent. The minimum level of significance was 1.9 percent. The moisture groups therefore are: Group I, 13.4 percent or below; Group II, 13.5—15.3 percent; and Group III, 15.4—17.2 percent.

Several of the higher yielding varieties are hybrids but none is significantly higher than the better open-pollinated varieties. The greatest amount of lodging was found among open-pollinated varieties while the largest percentage of dropped ears was found among some of the hybrids.

Lake County

East central Lake county where this test was located is an excellent corn-producing community. Conditions were about average with respect to rainfall and temperature for this test which was grown for the first time in 1939.

Table 9—Lake County

H. P. Backus, Madison Harvested Oct. 7, 1939

Variety	Entry No.	Yield bu. per A. of ear		Percent moisture at harvest	Percent stand	Percent lodging	Percent good ears	Percent ears on ground
		No. corn with 15% moisture in grain	moisture					
Group I:								
Pioneer Hi-bred 352	54	41.0	16.1	91	11	64	10.3	
Disco 931	90	37.6	17.5	87	11	67	24.8	
Sundstrom's 56	119	36.7	16.5	87	22	57	10.5	
Brookings 86	135	35.7	13.5	84	19	72	6.5	
Disco E-4	89	35.6	16.7	92	18	59	15.0	
Iowealth AP	44	34.2	17.6	89	14	61.3	23.9	
DeKalb Hybrid 240	13	34.1	17.6	86	7	56.4	8.1	
National Hybrid 105	70	33.4	13.9	86	11	66.2	18.2	
DeKalb Hybrid 201	10	32.6	16.1	84	8	66.0	22.3	
Early Murdock		32.1	14.4	81	17	59.7	10.4	
Kingscrosst 105 Day D	6	31.8	16.6	80	23	69.9	11.4	
Sliver King		31.2	15.1	81	19	58.8	10.4	
Kingscrosst 105 Day D-3	5	31.1	17.5	79	21	68.8	7.9	
Iowealth 3	50	30.8	13.1	86	23	68.7	17.0	
Jacques Proven Hybrid 522	62	30.5	18.2	84	9	54.9	7.3	
Dawes		30.0	13.6	80	22	62.1	9.0	
Turner's T-4	87	29.7	18.4	85	19	55.1	16.9	
Jacques Proven Hybrid 455	63	29.6	17.3	86	8	56.2	10.2	
DeKalb Hybrid 225	12	29.4	17.7	79	11	57.1	9.4	
Minhybrid 401	96	29.2	11.9	77	7	59.1	16.4	
Fulton Y. D. (Dawes)	136	28.6	14.0	83	25	54.3	6.2	
Wis. 460	112	28.5	18.3	82	10	62.1	12.3	
Minhybrid 301	99	28.4	13.8	66	7	54.5	7.6	
Minn. No. 13		28.4	12.6	80	17	52.5	13.3	
Kingscrosst 97 Day D-4	7	28.0	16.7	83	21	68.3	18.7	
Tru-Krost Minhybrid 301	79	27.9	15.5	79	8	53.3	7.7	
Pioneer Hi-bred 355	55	27.7	13.8	84	8	57.8	13.4	
Turner's E-4	86	27.2	16.5	86	16	52.8	11.9	
Iowealth 2	48	26.2	14.5	81	19	71.0	29.3	
Minhybrid 402	97	26.1	11.9	74	8	55.5	18.6	
Farmer's Variety		25.4	14.0	79	19	59.6	13.2	
Rainbow Flint		23.9	13.0	67	19	51.1	5.0	
Minhybrid 403	98	23.7	16.1	70	5	53.0	12.3	
Group II:								
DeKalb Hybrid 250	14	32.9	21.3	74	12	54.8	9.4	
WHCA Wis. 606	93	31.4	20.2	88	22	61.0	13.0	
Pioneer Hi-bred 322	57	29.9	21.7	86	30	62.9	8.6	
Funk's Hybrid G-7	28	29.4	19.1	82	38	51.2	9.8	
WHCA Wis. 625	94	25.0	21.8	80	10	62.1	17.9	
Funk's Hybrid G-27	32	23.5	20.0	76	26	51.1	7.5	
Iowealth 98	47	16.1	19.2	76	6	38.2	8.9	
Minimum level of significance		12.5	5.1					

The test was planted on May 13. A minor grasshopper outbreak and short periods of drought occurred during the growing season but were not serious at any time. The average yield was 29.9 bushels per acre and the average moisture content 16.4 percent.

The open-pollinated varieties, excepting Dawes' Fulton Yellow Dent and Brookings 86, averaged 13.7 percent moisture which was used as a basis for

Table 10—Sanborn County

A. G. Vincent, Letcher Harvested Oct. 2, 1939

Variety	Yield bu. per		Percent			Percent ears on ground	
	Entry No.	A. of corn with 15% moisture in grain	of ear at harvest	Percent stand	Percent lodging		
Group I:							
Farmer's Variety		44.1	12.1	88	11	87.0	6.6
Fulton Y. D. (Dawes)	136	32.6	9.8	75	13	75.2	6.7
Sanborn Co. Golden Jewel	146	31.3	12.4	78	15	73.4	10.7
Pioneer Hi-bred 355	55	30.9	11.9	83	3	73.1	15.3
Brookings 86	135	30.7	11.4	76	11	79.2	8.0
Funk's Hybrid G-7	28	30.7	13.0	85	9	71.1	6.0
Kingscrot 100 Day D	6	30.5	10.9	76	18	76.4	5.7
Kingscrot 105 Day D-3	5	29.4	10.3	83	19	77.5	8.5
Iowalth 3	50	29.1	13.6	82	12	77.9	13.3
Iowalth AP	44	27.3	13.4	81	6	74.0	31.0
Kingscrot 97 Day D-4	7	26.8	9.9	72	17	80.1	11.1
Wis. 615	114	26.8	14.8	87	6	82.0	10.4
DeKalb Hybrid 240	13	26.6	10.6	86	2	71.6	11.2
Sanborn Co. Early Murdock	143	25.8	10.6	78	15	67.1	7.1
Minhybrid 401	96	25.0	8.5	73	5	72.3	13.6
WHCA Wis. 456	91	25.0	11.8	81	3	61.3	13.1
Minhybrid 402	97	24.9	9.0	73	3	71.2	12.2
Wis. 460	112	24.0	11.3	76	5	71.8	7.8
WHCA Wis. 531	92	23.5	12.1	79	4	76.9	17.1
Sanborn Co. Imp. Minn. 13	147	23.5	13.5	75	13	70.5	12.9
Iowalth 12	51	22.6	12.8	79	4	73.7	8.8
Sanborn Co. Fulton Y. D.	145	22.3	12.5	68	16	62.0	7.8
Sundstrom's 56	119	21.9	12.2	80	14	76.4	14.2
Iowalth 90	49	21.7	9.8	78	11	67.9	7.8
Pioneer Hi-bred 352	54	21.7	11.8	90	6	66.8	25.1
Jacques Proven Hybrid 570	61	20.8	13.4	79	7	75.0	11.5
Disco 931	90	20.3	12.9	86	9	72.5	36.0
Sanborn Co. Silver King	142	19.9	9.3	53	21	79.5	11.4
National Hybrid 105	70	19.9	11.5	90	14	68.5	24.1
Jacques Proven Hybrid 645	59	19.2	14.6	80	3	74.4	18.0
Pioneer Hi-bred 322	57	19.0	14.1	87	13	69.7	24.0
DeKalb Hybrid 404-A	15	18.9	13.4	84	4	76.7	17.3
Sanborn Co. Wimple's Y. D.	144	18.4	13.6	75	16	71.6	17.9
Disco E-4	89	16.3	9.4	88	14	59.8	19.0
Group II:							
Funk's Hybrid G-27	32	27.1	17.7	84	9	75.3	11.4
Carlson's C-7	36	25.9	16.7	71	8	74.3	11.1
DeKalb Hybrid 204	11	22.5	16.0	73	5	69.7	8.8
DeKalb Hybrid 225	12	17.4	16.9	62	4	72.4	8.9
Minimum level of significance		14.6	3.0				

establishing the two moisture groups. The minimum level of significance was 5.1 percent. Group I contains varieties with 18.8 percent moisture or less and Group II the varieties having more than 18.8 percent moisture.

Some of the higher yielding varieties are hybrids but some of the open-pollinated varieties are also in the high-yielding group. The open-pollinated varieties were highest in percent of lodging but some of the hybrids were highest in percent of ears on the ground.

Sanborn County

Conditions for this test, grown for the second year, were at least average or better as far as rainfall and temperature were concerned.

Planting was done on May 14 in a very dry soil. Later rains resulted in good emergence but damage due to wire-worms was severe in spots within the test area. The average yield was 24.9 bushels per acre and the average moisture content 12.6 percent.

The average moisture content of the open-pollinated varieties, excepting Dawes' Fulton Yellow Dent and Brookings 86, was 11.9 percent and the minimum level of significance 3.0 percent. Three moisture groups were established, Group I with 14.9 percent or below, Group II with 15.0—17.9 percent, and Group III with 18.0—20.9 percent moisture.

The highest-yielding varieties were open-pollinated, the farmer's own variety being the highest in yield. However, several hybrids follow closely in yield. Lodging was more pronounced among the open-pollinated varieties while the percent of ears on the ground was highest among some of the hybrids.

Brookings County

The test in this county was moved out to the James Biggar farm for 1939 where conditions were very favorable for corn. The land is rather low, the soil is a medium to heavy loam, and moisture conditions were good. This test represents the heavier soil found in the eastern and southeastern portions of the county.

This test was planted on May 19 when the soil was fairly dry but a rain soon after resulted in a good emergence and stand. The varietal average for yield was 62.5 bushels per acre and for moisture 18.4 percent.

The average moisture content of all the open-pollinated varieties was 17.9 percent while the minimum level of significance was 2.5 percent. Three moisture groups were established as follows: Group I, 20.3 percent or below; Group II, 20.4—22.7 percent; and Group III, 22.8 percent or above.

Fifteen hybrids exceeded the highest yielding open-pollinated variety in yield in Group I. The two highest-yielding hybrids are in Group II because of higher moisture percentages. The open-pollinated varieties tend to lodge more but some of the hybrids tend to drop more ears on the ground.

Table 11—Brookings County

James Biggar, Brookings Harvested Oct. 13, 1939

Variety	Entry No.	Yield bu. per A. of ear moisture			Percent ears on ground		
		No. corn with 15% moisture in grain	at harvest	stand	Percent lodging	Percent good	Percent ears on ground
Group I:							
Kingscrot 97 Day D-4	7	71.9	20.0	95	45	91	3.4
Pioneer Hi-bred 355	55	71.3	17.7	90	7	89	7.5
Kingscrot 100 Day D	6	71.2	18.1	93	30	91	2.8
Disco E-4	89	69.3	19.1	92	15	81	3.6
Turner's E-4	86	68.6	18.4	91	21	81	6.2
Jacques Proven Hybrid 525	62	68.4	17.4	94	15	89	8.7
Jacques Proven Hybrid 455	63	65.8	18.6	90	15	91	5.6
Kingscrot 105 Day 103	5	65.7	19.6	93	34	86	3.0
Turner's T-4	87	65.4	17.0	89	32	83	12.2
Wis. 460	112	65.2	18.4	88	10	77	4.0
Tru-Krost No. 170	80	64.9	14.5	84	10	79	2.5
Minhybrid 301	99	64.5	19.2	80	16	64	2.5
Iowearth 2	48	64.2	16.8	84	10	86	12.7
National Hybrid 95	68	63.9	17.6	90	11	84	10.6
Kingscrot 95 Day A-3	8	63.4	16.9	87	43	92	1.6
Fulton Y. D. (Dawes)	136	62.9	16.4	85	40	63	4.1
Iowearth 90	49	62.5	15.3	84	15	92	6.7
Tru-Krost Minhybrid 301	79	62.3	16.8	78	18	85	5.4
Wis. 404	111	61.8	17.1	93	16	78	4.7
Brookings 86	135	60.8	17.3	89	31	86	3.0
National Hybrid 105	77	60.7	17.0	87	6	84	4.5
Minhybrid 401	96	59.7	15.1	88	26	93	6.0
Minhybrid 403	98	58.4	18.3	77	8	88	3.2
Master Hybrid No. 4	27	57.3	13.2	90	11	83	1.9
Iowearth 95	52	56.8	16.3	88	7	69	6.7
Master Minhybrid 402	26	56.1	13.5	85	23	88	5.2
Farmer's Variety (Early Murdock)		55.4	16.0	81	59	82	3.1
Sexauer's Silver King	134	55.4	18.7	82	56	87	4.7
Minhybrid 402	97	55.3	13.0	83	20	79	6.1
Sexauer's Fulton Y. D.	132	54.2	19.8	79	35	82	3.2
Sexauer's Minn. 13	129	50.0	18.2	73	41	81	.6
Sexauer's Northwestern Dent	133	48.1	16.2	86	37	87	2.0
Sexauer's Golden King	131	47.9	18.1	72	38	80	5.3
Group II:							
DeKalb Hybrid 240	13	74.7	20.7	90	14	91	1.3
DeKalb Hybrid 201	10	73.7	20.8	90	14	90	7.9
DeKalb Hybrid 404-A	15	69.2	21.2	91	8	88	4.6
WHCA Wis. 606	93	66.5	21.8	92	9	88	4.1
DeKalb Hybrid 250	14	66.1	21.6	86	8	84	4.8
Pioneer Hi-bred 357	53	63.4	21.3	91	27	84	4.5
National Hybrid 90	67	62.8	20.5	94	22	83	3.7
Sexauer's Early Murdock	130	56.1	20.5	80	29	85	6.1
Group III:							
Sundstrom's 56	119	67.6	23.0	94	47	86	3.8
Iowearth AP	44	62.9	23.0	91	18	85	15.2
DeKalb Hybrid 225	12	62.6	28.9	88	8	84	1.8
Minimum level of significance		14.2	2.5				

Codington County

This test was perhaps the best in 1939 because of the excellent uniformity of the land on which it was grown. Conditions were better than average with respect to rainfall, temperature and length of the growing season.

Planting was done on May 20 and a rain soon after resulted in excellent stands. Abundant rain fell throughout the growing season until the latter part when the condition became rather dry. The average yield of the test was 39.0 bushels per acre. The average moisture content of the

Table 12—Codington County

Walter Schwanke, Watertown Harvested Oct. 14, 1939

Variety	Entry No.	Yield bu. per		Percent			Percent ears on ground
		A. of ear corn with 15% moisture in grain	moisture at harvest	Percent stand	Percent lodging	Percent good ears	
Group I:							
DeKalb Hybrid 240	13	46.7	19.7	94	31	75	8.4
Wis. 355	110	43.5	14.1	97	36	75	3.2
Tru-Krost No. 170	80	42.9	14.5	89	16	71	0.8
Kingscrost 95 Day A	8	42.1	15.4	91	53	78	3.7
Fulton Y. D. (Dawes)	136	42.1	16.1	91	72	70	5.5
WHCA Wis. 456	91	40.7	20.0	95	24	67	3.9
Kingscrost 97 Day D-4	7	40.5	17.3	96	58	78	4.7
Kingscrost 100 Day D	6	40.4	18.3	90	44	71	2.9
Pioneer Hi-Bred 355	55	40.3	17.8	98	31	73	15.7
Disco E-4	89	40.0	17.5	96	47	71	16.4
Brookings 86	135	39.8	18.2	94	70	76	19.8
Codington Co. Sauer's Y. D.	158	39.7	14.3	79	71	69	2.8
Codington Co. Minn. 13	153	39.7	18.4	92	67	78	15.6
Wis. 404	111	39.6	15.8	94	21	68	5.6
Minhybrid 401	96	39.1	12.5	90	48	81	12.2
Codington Co. Kameska Y. D.	157	39.0	13.5	91	57	69	12.6
Iowwealth 90	49	38.5	15.5	93	33	71	3.8
Farmer's Variety		38.2	18.6	89	74	76	17.7
Iowwealth 2	48	37.3	20.0	92	51	70	26.0
National Hybrid 90	67	37.1	17.1	96	47	71	4.1
Turner's T-4	87	36.9	16.6	93	72	75	15.5
Codington Co. Golden King	154	36.8	18.6	87	66	68	4.9
Minhybrid 402	97	36.5	12.4	88	29	76	7.1
Codington Co. Imp. Minn. 13	156	36.4	15.3	78	73	73	.3
Codington Co. Linderer's Y. D.	155	36.2	15.5	84	71	79	.2
Iowwealth 95	52	34.8	16.6	92	26	60	7.0
WHCA Wis. 531	92	33.9	17.5	88	35	66	15.0
Turner's E-4	86	33.6	19.3	89	48	63	20.8
Group II:							
DeKalb Hybrid 225	12	40.9	23.7	94	19	66	10.0
WHCA Wis. 606	93	40.5	23.0	96	22	65	7.6
DeKalb Hybrid 201	10	39.0	21.0	94	52	73	11.8
DeKalb Hybrid 250	14	38.8	22.1	90	29	66	5.5
Pioneer Hi-Bred 357	53	34.7	22.0	96	55	65	8.2
Minimum level of significance		4.7	3.8				

open-pollinated varieties was 16.5 percent and the minimum level of significance, 3.8 percent. Only two moisture groups were established, Group I with 20.2 percent moisture or below and Group II with 20.3 percent moisture or more.

Several hybrids significantly exceeded most of the open-pollinated varieties in yield although one open-pollinated variety was among the highest five varieties. Lodging and dropped ears were high in this test, the open-pollinated varieties tending to lodge the most while the percent of ears on the ground was highest among some hybrids.

Hanson County

This replicated test was planned and planted by County Agent Prunty but it was kindly conceded by Mr. Prunty to be treated as one of the State Tests. It should be pointed out that the varieties in this test were of Mr. Prunty's own choosing and that they are not the same group as was originally planted in Hutchinson county in the regular state test. Conditions were about average for the locality as indicated by the average yield of 23.5 bushels per acre. The average moisture content for all varieties was 16.7 percent and for the local open-pollinated varieties, 17.4 percent. Using the minimum level of significance of 3.8 percent, three moisture groups were established: Group I with 21.1 percent or less; Group II, 21.2—24.9 percent; and Group III, 25.0 percent or more.

Several of the hybrids outyielded the highest-yielding open-pollinated variety, although not significantly. Percent lodging and percent ears on the ground showed the same tendency as in other tests. Open-pollinated varieties tended to lodge more but the most ears were dropped by some of the hybrids.

Grant County

The regular State Test which was planted May 16 on the Chris Christian farm was destroyed by a severe windstorm early in the season. County Agent Dyke therefore kindly offered his own replicated test on the Walter Grothe farm near Twin Brooks to be treated as a State Test. The list of varieties was made up by Mr. Dyke and is not the same as the one for the varieties planted in the regular test. This location represents the excellent corn growing area in the vicinity of Milbank. Conditions were very favorable in 1939, the average yield of the varieties in the test being 56.8 bushels per acre. The average moisture content of all varieties was 20.8 percent while that of the farmer's open-pollinated variety was 18.5 percent. The minimum level of significance was 4.4 percent. The moisture groups are as follows: Group I, 22.8 percent or less; Group II, 22.9—27.2 percent; and Group III, 27.3 percent or more.

Several of the hybrids appeared to be outstanding for yield, eighteen exceeding the farmer's open-pollinated variety in Group I. The highest yielding variety is in Group II because of excessive moisture. Since there is but one open-pollinated variety it is difficult to make comparisons for lodging and dropped ears.

Table 13—Hanson County

Harry Driscoll, Emery Harvested Sept. 30, 1939

Variety	Entry No.	Yield bu. per A. of ear		Percent moisture			Percent ears on ground
		No. corn with 15% moisture in grain	at harvest	Percent stand	Percent lodging	Percent good ears	
Group I:							
National Hybrid 99	29	32.6	15.7	76	12	81	1.2
Funk's Hybrid G-27	47	31.6	19.8	75	3	72	1.5
DeKalb Hybrid 240	14	30.0	17.3	78	7	83	.7
Disco 939	37	29.5	13.9	59	6	80	3.4
DeKalb Hybrid 493	3	29.1	13.9	73	4	77	2.1
Disco E-4	16	28.9	13.1	85	22	63	3.8
Turner's E-4	2	28.4	15.7	79	12	64	2.6
Pioneer Hi-Bred 355	7	27.8	15.4	80	13	66	3.3
Pioneer Hi-Bred 349	21	27.4	20.9	81	3	68	.5
DeKalb Hybrid 204	6	26.0	19.9	78	9	78	1.3
National Hybrid 110	5	25.9	14.5	73	11	73	4.5
Iowearth 3	28	25.6	12.9	62	19	80	2.2
Pioneer Hi-Bred 352	17	25.5	13.6	81	4	66	1.9
Golden Jewel	23	25.4	16.3	58	29	77	.8
Tru-Krost 301	38	25.4	17.2	73	12	75	4.3
Kingscrosst D-4	18	25.3	11.0	69	10	82	3.5
Turner T-4	34	25.3	12.3	77	22	74	7.7
National Hybrid 105	32	25.1	14.6	80	16	71	6.4
DeKalb Hybrid 201	26	24.9	16.1	67	20	77	4.4
National Hybrid 95	20	24.7	13.2	70	14	65	5.3
DeKalb Hybrid 250	50	24.3	15.5	58	6	72	2.4
National 112	8	24.0	18.1	69	3	82	1.5
Jacques 455	13	24.0	18.1	65	10	80	3.0
Pioneer Hi-Bred 322	27	23.9	20.3	71	3	75	1.9
Disco 931	33	23.7	15.5	74	8	75	6.8
Iowearth 90	19	23.7	13.3	60	7	90	4.6
Tru-Krost 170	40	23.5	13.0	69	10	70	1.6
Silvermine	43	23.0	18.4	75	24	74	1.5
Driscoll corn	15	22.4	17.4	60	17	79	2.2
Pioneer Hi-Bred 357	48	22.4	15.6	78	15	76	2.2
Pioneer Hi-Bred 324	10	22.3	17.3	59	8	71	3.7
Iowearth 2	9	22.1	13.7	61	12	83	4.0
National Hybrid 114	41	21.6	16.6	61	5	66	2.2
Master Minhybrid 401	30	20.7	12.0	65	15	71	10.4
DeKalb Hybrid 200	39	20.5	16.5	56	7	79	3.4
Tru-Krost Wis. 606	25	20.2	16.5	61	12	72	3.8
Master Wis. 456	22	20.1	16.0	64	9	76	4.8
Iowearth AP	11	20.1	20.5	76	5	74	7.3
Iowearth 12	44	20.0	21.1	62	1	62	1.7
Iowearth 10	46	19.5	15.7	59	8	73	2.5
Jacques 570	45	19.3	15.3	49	9	90	3.1
Jacques 525	42	19.2	16.0	64	6	75	2.5
Jacques 645	4	19.1	17.2	52	5	77	2.8
Kingscrosst D-3	31	18.5	15.4	57	8	82	4.5
DeKalb Hybrid 225	36	18.4	20.0	57	13	66	.0
Iowearth 98	49	17.5	13.4	61	3	69	4.3
Group II:							
Nubred	1	24.1	21.3	76	15	71	2.5
Kingscrosst FK	24	23.4	22.4	64	11	81	.8
Funk's Hybrid G-7	35	18.4	21.2	50	8	78	2.9

Table 13—Hanson County (cont'd)
Harry Driscoll, Emery Harvested Sept. 30, 1939

Variety	Entry No.	Yield bu. per A. of ear		Percent moisture at harvest	Percent stand	Percent lodging	Percent good ears	Percent ears on ground
		corn with 15% moisture in grain	moisture					
Group III:								
DeKalb Hybrid 404-A	12	20.3	26.6	72	5	78	6.2	
Minimum level of significance		8.2	3.8					

Table 14—Grant County
Walter Grothe, Twin Brooks Harvested Oct. 14, 1939

Variety	Yield bu. per A. of ear		Percent moisture at present	Percent stand	Percent lodging	Percent good ears	Percent ears on ground
	corn with 15% moisture in grain	moisture					
Group I:							
DeKalb Hybrid 240	68.8	20.4	91	11	77	4.0	
Pioneer Hi-Bred 355	67.5	22.0	94	6	75	4.3	
Kingscrot 100 Day D	65.1	20.9	93	30	79	1.3	
Kingscrot 105 Day D-3	63.0	20.3	91	26	80	4.1	
National Hybrid 95	62.3	18.3	95	18	78	3.4	
Disco E-4	61.7	20.2	96	14	81	3.4	
Tru-Krost Minhybrid 301	60.9	22.2	88	11	76	3.6	
National Hybrid 90	60.1	20.7	93	18	74	2.1	
Jacques Proven Hybrid 455	59.9	20.9	87	9	82	1.0	
Kingscrot 97 Day D-4	59.2	19.7	92	32	83	.0	
Turner's T-4	59.2	19.7	87	29	67	1.8	
National Hybrid 85	58.1	16.6	91	21	80	4.3	
National Hybrid 105	56.7	21.6	93	9	78	2.8	
Turner's E-4	55.0	18.1	89	12	75	3.7	
Kingscrot 95 Day A-3	53.7	18.3	84	44	83	1.0	
Iowalth 90	51.2	19.2	92	12	80	3.4	
Jacques Proven Hybrid 350	50.1	19.7	92	3	83	2.7	
Jacques Proven Hybrid 525	49.7	22.0	84	6	83	2.7	
Farmer's Variety (O. P.)	49.2	18.5	88	20	70	5.8	
Tru-Krost No. 170	47.9	18.7	88	8	69	3.2	
Iowalth 95	47.6	18.5	89	8	75	2.2	
Tru-Krost Wis. 350 (90 day)	46.6	19.1	87	7	71	3.2	
Jacques Proven Hybrid 340	41.5	18.1	85	11	82	6.2	
Master Minhybrid 402	40.1	16.1	90	14	81	4.0	
Kingscrot 90 Day E-5	33.3	16.5	82	30	76	3.3	
Group II:							
Pioneer Hi-Bred 357	72.1	23.4	96	21	78	2.0	
DeKalb Hybrid 201	66.6	25.2	93	7	84	3.2	
DeKalb Hybrid 404-A	64.2	25.0	86	11	87	2.5	
Iowalth 2	62.7	23.1	90	7	76	.5	
Iowalth AP	60.1	26.2	93	11	76	5.0	
DeKalb Hybrid 250	59.6	23.6	90	4	77	1.5	
Jacques Proven Hybrid 570	56.1	24.4	89	8	79	3.2	
Group III:							
DeKalb Hybrid 225	65.8	28.9	91	5	82	2.9	
Minimum level of significance		11.1	4.4				

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