

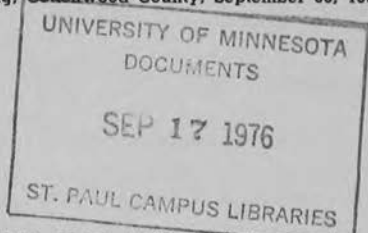
Minnesota Hybrid Corn

Field Trials, 1938

RALPH F. CRIM



Hybrid Corn Field Meeting, Cottonwood County, September 30, 1938



UNIVERSITY OF MINNESOTA

AGRICULTURAL EXTENSION DIVISION

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THE demand for hybrid seed corn this year has increased materially over last year. Standard open-pollinated varieties are being rapidly replaced by various hybrids. Some hybrids have been found to be greatly superior to open-pollinated varieties, others were decidedly unadapted to localities where they were distributed. Many corn growers have been confused by the large number of hybrids offered for sale; an opportunity to observe various hybrids and obtain reliable information on them before planting on a commercial scale has been provided through field trials.

A plan for carrying on a number of field trials in several representative corn growing regions of the state was started in 1937. The object was to enable farmers and others to obtain information on various hybrids as to adaptation and suitability to respective localities of the state. Well-planned field trials, corn field meetings at harvest time, and the publication of results should aid farmers in choosing hybrids best adapted to their conditions.

Plan Followed

The same general plan carried out during 1937 has been continued in 1938. Experiment station and seed company hybrids were planted in yield trials in eight corn-growing regions of the state under the direction and leadership of the Division of Agronomy and Plant Genetics of the Minnesota Experiment Station. Experiment station

hybrids, seed company hybrids, and standard open-pollinated varieties have been compared. The standard open-pollinated varieties used in these trials included Murdock, Golden King, and Minnesota No. 13. These standard varieties, well known throughout the corn growing region of the state, were included in the trials as a standard of comparison. Planting was made at the uniform rate of four seeds per hill. The tests were carried out in randomized blocks in the field, six replicates in each location. Commercial seed companies and others entering hybrids in these trials indicated the location where they were to be tested in each of the eight locations of the state. Seed was submitted to University Farm and prepared for planting.

Cooperation

The Division of Agronomy and Plant Genetics of the Minnesota Experiment Station, commercial seed companies, the Agricultural Extension Service, the Minnesota Crop Improvement Association, county agents, and farmers each played an important part in conducting these trials. Seed companies entering corn in these trials include: Northrup, King and Company, Minneapolis, Minnesota; Vassar Growers, Inc., Dassel, Minnesota; Farmer Seed and Nursery Company, Faribault, Minnesota; Jacques Seed Company, Prescott, Wisconsin; Michael-Leonard Seed Company, Sioux City, Iowa; Pioneer Hi-Bred Corn Company, Al-

gona, Iowa; H. H. Turner Seed Company, Grand Junction, Iowa; National Hybrid Seed Corn Company, Anamosa, Iowa; DeKalb Agricultural Association, Inc., DeKalb, Illinois, and the Funk Brothers Seed Company, Bloomington, Illinois. A total of eighty-nine entries was made. Of these, seven were made by the Minnesota Experiment Station, five by the Wisconsin Experiment Station, two by the Minnesota Hybrid Corn Growers Association, and seventy-five by commercial seed companies.

Locations

The trials were located in important corn-growing sections of central and southern Minnesota. Four trials were made in representative regions of southern Minnesota where Murdock, Silver King, Golden Jewel, and related types have been well adapted. Counties where these trials were conducted include Rock in the extreme southwestern portion of the state; Cottonwood in southwestern Minnesota about seventy miles east of Rock County; Faribault in south central Minnesota not far from the Iowa-Minnesota line; and Houston in the Root River Valley in southeastern Minnesota.

Four trials were located in central Minnesota where Minnesota No. 13, Golden King, and Rustler White Dent are known to be well adapted. These trials were made in Otter Tail County, in central Minnesota; Meeker County, in central Minnesota about sixty miles directly west of the Twin Cities; and Goodhue County, south of the Twin City area near Northfield. The trial which was planted near Clarkfield in Yellow Medicine County was destroyed by hail during the summer and was not harvested.

Grown under Farm Conditions

Each cooperating farmer reserved a block of three to three and one-half acres of land in a portion of his field of corn on which the trial plot was located. The land was marked off so the corn could be planted, cultivated, and cared for in the same manner as his own field. The trial plot received the same attention as the farmer's field of corn. Planting was done by hand at the rate of four seeds per hill. No replanting or thinning was done. Each hybrid or variety was replicated six times on a plot three rows wide by twenty hills long. The eighty-nine entries made were distributed among the eight locations. Entries made were grouped as nearly as possible on the basis of maturity and adaptation. Thirty-five hybrid entries and Murdock were planted in each of the four locations in southern Minnesota. Minnesota No. 13 and Golden King were planted in each of the three locations in central Minnesota. Thirty-six lots were planted in each location with the exception of Meeker County at which location there were thirty-two.

Harvesting

Harvesting began in Meeker County on September 20 and was completed in Rock County on October 14. The stand was recorded and other field notes were taken. All the corn from the central row of each plot was harvested and weighed. Samples were taken from each plot for moisture determinations. Yields have been computed and are reported on a 14 percent moisture basis. No corrections have been made for differences in stand.

Identification and Publicity

All hybrids and open-pollinated varieties were entered in the record and planting plan by entry number. Further identification was not made on plot stakes in the field. Seed companies or others entering corn in these trials were not informed as to the entry number given their hybrids until the field meetings at harvest time. This information was recorded in the planting plan and filed in a vault. Hybrid-corn field days were held at each location at which time a card was placed at each plot, revealing the hybrid name and the individual or seed company which entered the hybrid.

The 1938 Corn-growing Season

During the planting season, frequent and heavy rains delayed planting in many cases from a week to two weeks. The heavier than normal precipitation continued until well along in the summer. The very favorable fall prolonged the growing season which enabled corn to mature satisfactorily before frost.

Except in the Otter Tail County plot, a killing freeze did not occur until October 1 or after. Corn was killed in Otter Tail County about the 25th of September. Taken as a whole, the 1938 corn growing season was very favorable and yields were good. Some storm damage was reported in Faribault and Cottonwood counties. The Faribault County plot was injured to some extent by two violent wind storms. The Cottonwood County plot was injured slightly by hail. The Yellow Medicine County trial was completely destroyed by hail in July. The fall of 1938 was unusual in that frost was delayed from two to three weeks longer than is expected. Corn matured very well; even later hybrids arrived at maturity before a killing freeze. With the exception of Otter Tail County, practically all of the hybrids were well matured by harvest time. In a few instances, hybrids entered in the trials were not well adapted, being too late for the location. The later-maturing hybrids are shown in Group III of the table for each county.

Table 1. Hybrids and Open-pollinated Varieties Grown in 1937 and 1938 in Meeker County

Variety	Source	Meeker County, 1937				Meeker County, 1938				Average yield, bu., 2 years	Average moisture, 2 years
		Yield, bu.	Per cent moisture	Rank	Group	Yield, bu.	Per cent moisture	Rank	Group		
Minhybrid 401	University Farm	45.2	33.8	4	1	61.9	40.5	2	1	53.6	37.2
Iowalth 98	Mich-Leonard Seed Co.	48.1	35.6	3	1	56.8	39.9	3	1	52.5	37.8
Kingscrosst A-2	Northrup, King & Co.	48.2	34.6	2	1	51.2	42.8	9	1	49.7	38.7
T4	H. H. Turner Seed Co.	45.0	36.3	5	1	52.4	43.6	6	1	48.7	40.0
Iowalth 3	Mich-Leonard Seed Co.	41.6	36.0	9	1	51.2	42.0	8	1	46.4	39.0
Kingscrosst Minn. 13D	Northrup, King & Co.	56.2	38.6	1	2	58.5	44.7	4	2	57.4	41.7
Golden King (McArthur)	University Farm	36.5	36.5	6	2	49.2	41.0	11	1	42.9	38.8
Minnesota 13	University Farm	36.4	37.9	7	2	47.4	43.2	12	1	41.9	40.6
Iowalth 2	Mich-Leonard Seed Co.	51.7	42.1	1	3	61.0	43.9	3	2	56.4	43.0
Minhybrid 403	University Farm	47.3	39.2	4	3	52.9	43.7	5	1	50.1	41.5
Minhybrid 301	University Farm	43.7	39.5	5	3	52.5	44.1	8	2	48.1	41.8

Method of Analyzing Yield Trials

It is important in Minnesota to grow varieties and hybrids that will mature under Minnesota conditions. As has been emphasized, the 1937 and 1938 corn growing seasons were especially favorable for maturing late strains of corn. For this reason and because of the importance of maturity, it seems desirable to divide the hybrids at each location into three maturity groups. This division was made on the basis of the calculated minimum level of significance for moisture content which was obtained by the analysis of variance and is two times the standard error of a difference. This is added to the average moisture content of the varieties that are accepted as a standard for the locality which sets up the higher limit for moisture content of Group I. The moisture content for Group II is set up by adding the minimum level of significance for moisture content to the upper limit of Group I. The odds are at least 19:1 that the hybrids in Group II have a significantly higher moisture content than the average of the check

varieties and hybrids that have been accepted as the standard of comparison for each particular location. The method may be illustrated by Faribault County. The average per cent of moisture of Minhybrids 301, 403, and Murdock in this trial was 26.0 per cent. Adding 2.2, the minimum level of significance, gives 28.2 which was accepted as the upper limit of Group I. Group II consisted of hybrids with moisture content between 28.2 and 30.4 which was obtained by adding 2.2 to the upper limit of Group I. Those hybrids which contain more than 30.4 moisture were placed in Group III. The calculated standard error of a difference for yield in bushels per acre was obtained by the analysis of variance. This was multiplied by two to give a value which when subtracted from the highest yielding variety set up a limit for the lowest yield accepted in Group I. The odds were at least 19:1 that varieties yielding less than this limit were significantly lower in yielding ability than the highest yielding variety in Group I. In other words, the odds are less than 19:1 that varieties in Group I do not differ sig-

Table 2. Hybrids and Open-pollinated Varieties Grown in 1937 and 1938 in Bigstone and Otter Tail Counties

Variety	Source	Bigstone County, 1937				Otter Tail County, 1938					
		Yield, bu.	Per cent moisture	Rank	Group	Yield, bu.	Per cent moisture	Rank	Group	Average yield, bu., 2 years	Average moisture, 2 years
Minhybrid 401	University Farm	63.1	37.8	1	1	52.9	39.3	1	1	58.0	38.5
Minhybrid 402	University Farm	57.5	33.3	2	1	46.9	37.4	2	1	52.2	35.3
Wisconsin 355	Wisc. Expt. Sta.	55.0	38.4	4	1	45.6	39.5	4	1	50.3	39.0
Kingscrosst Ea.M.13 A-2	Northrup, King & Co.	56.2	40.5	3	1	41.5	40.1	8	1	48.9	40.3
Jacques P.Hy.350	Jacques Seed Co.	52.0	41.1	5	1	41.7	43.1	3	2	46.9	42.1
Kingscrosst Ex.Ea.M.13 E-2	Northrup, King & Co.	51.6	40.5	6	1	37.1	40.2	14	1	44.4	40.3
Iowealth 90	Mich-Leonard Seed Co.	65.4	44.7	1	2	43.9	45.4	2	2	54.6	45.1
Iowealth 98	Mich-Leonard Seed Co.	63.4	42.3	3	2	43.6	42.3	6	1	53.5	42.3
Kingscrosst Minn. 13D T4	Northrup, King & Co.	61.1	44.4	6	2	44.8	45.2	1	2	53.0	44.8
Iowealth 2	H. H. Turner Seed Co.	64.1	43.0	2	2	36.7	46.6	6	3	50.4	44.8
Minnesota 13	Mich-Leonard Seed Co.	61.8	44.8	5	2	37.1	52.5	5	3	49.5	48.7
Jacques P.Hy. 404	University Farm	49.1	44.8	15	2	42.9	46.7	1	3	46.0	45.8
Iowealth 3	Jacques Seed Co.	51.5	42.2	14	2	40.2	42.7	10	1	45.9	42.5
Golden King (McArthur)	Mich-Leonard Seed Co.	52.4	43.7	13	2	38.0	43.1	6	2	45.2	43.4
	University Farm	55.3	43.5	11	2	33.7	42.6	16	1	44.5	43.1

Table 3. Hybrids and Open-pollinated Varieties Grown in 1937 and 1938 in Goodhue County

Variety	Source	Goodhue County, 1937				Goodhue County, 1938				Average yield, bu., 2 years	Average moisture, 2 years
		Yield, bu.	Per cent moisture	Rank	Group	Yield, bu.	Per cent moisture	Rank	Group		
T4	H. H. Turner Seed Co.	47.0	32.2	1	1	64.9	35.8	4	1	56.0	34.0
Iowealth 98	Mich-Leonard Seed Co.	45.3	29.1	3	1	61.4	31.7	7	1	53.4	30.4
Minhybrid 401	University Farm	44.4	27.0	5	1	56.9	30.5	9	1	50.7	28.8
Iowealth 3	Mich-Leonard Seed Co.	40.2	31.5	11	1	56.4	32.4	10	1	48.3	32.0
Golden King (McArthur)	University Farm	41.1	32.7	8	1	55.0	33.7	12	1	48.1	33.2
E4	H. H. Turner Seed Co.	44.3	33.2	2	2	70.2	38.4	2	2	57.3	35.8
Iowealth 2	Mich-Leonard Seed Co.	39.7	34.4	7	2	68.1	36.1	1	1	53.9	35.3
Minhybrid 301	University Farm	41.5	33.4	5	2	65.2	35.5	3	1	53.4	34.5
Minhybrid 403	University Farm	43.3	33.5	3	2	61.4	37.4	10	2	52.4	35.5
Jacques P.Hy. 606	Jacques Seed Co.	42.5	38.0	1	3	66.2	40.5	3	3	54.3	39.3
Jacques P.Hy. 550	Jacques Seed Co.	39.4	37.8	3	3	59.7	38.6	5	3	49.6	38.2
Jacques P.Hy. 525	Jacques Seed Co.	41.1	37.8	2	3	50.3	36.7	15	2	45.7	37.3
Wisconsin 531	Wisc. Expt. Sta.	36.5	37.2	5	3	53.7	36.3	13	1	45.1	36.8
Minnesota 13	University Farm	38.3	36.2	4	3	47.6	35.7	14	1	43.5	36.0

nificantly in yield. The hybrids in Groups II and III for moisture content were similarly divided into two sections for yielding ability.

The division for yielding ability can be understood by an actual illustration taken from Faribault County. The highest yield for any hybrid in Group I was 79.4 bushels. The minimum level of significance of 8.8 bushels for yield was subtracted from 79.4 which gave 70.6 bushels. Varieties in this first group which yielded 70.6 bushels or more cannot be definitely differentiated in yielding ability from the highest yielding variety in the group, the odds being 19:1 that Iowealth AP yields significantly more than a hybrid giving a yield of 70.6 bushels. Within each of the three maturity groups, a line is drawn separating those hybrids for which the odds are 19:1 that they are significantly lower in yielding ability than the highest yielding hybrid of the first group. In Group I in Faribault County, there are thirteen varieties that are significantly lower in yielding ability than Iowealth AP, entry 26.

The advantages of this method of reporting the results appear rather obvious. The first group contains the hybrids which are

most outstanding on the basis of their moisture content, used in those trials to measure the relative period of maturity. The second, or immediate group, contains hybrids that are somewhat higher in moisture content. These matured for the most part satisfactorily during the favorable season of 1938. Group III in the table represents hybrids with the highest moisture content which according to the data would have little chance of reaching maturity in a less favorable growing season.

Avoid Hasty Conclusions

The date of the first killing frost in the fall of 1938 at all locations, with the exception of Otter Tail County, was from two to three weeks later than can be normally expected. The growing season of 1938 was very favorable for late maturing varieties. Some of the later-maturing hybrids have matured very satisfactorily this year, but might be quite immature should a killing freeze occur as in an average season. The per cent of mois-

ture at the time the corn was harvested is a fair guide to maturity in a normal season. The yields reported for 1938 are a record of performance of one season which may be classified with the better seasons such as 1920, 1923, 1932, and 1937. These seasons were more favorable than the average over a period of ten or twenty years.

It is of interest to point out that

Table 4. Hybrids and Open-pollinated Varieties Grown in 1937 and 1938 in Brown and Cottonwood Counties

Variety	Source	Brown County, 1937				Cottonwood County, 1938				Average yield, bu., 2 years	Average moisture, 2 years
		Yield, bu.	Per cent moisture	Rank	Group	Yield, bu.	Per cent moisture	Rank	Group		
Pioneer Hi-Bred 355	Pioneer Hi-Bred Corn Co.	68.0	27.0	3	1	61.6	26.8	3	1	64.8	26.9
Minhybrid 403	University Farm	70.0	26.7	1	1	54.9	30.1	16	1	62.5	28.4
E4	H. H. Turner Seed Co.	65.3	27.5	5	1	57.8	34.9	6	3	61.6	31.2
Minhybrid 301	University Farm	60.6	24.3	8	1	59.6	26.0	7	1	60.1	25.2
Pioneer Hi-Bred 357	Pioneer Hi-Bred Corn Co.	63.8	26.8	7	1	56.3	30.6	12	1	60.1	28.7
Master Hybrid 2	Far. Seed & Nurs. Co.	65.5	27.7	4	1	52.7	26.6	20	1	59.4	27.2
National Hybrid 99	Nat'l Hybrid Corn Co.	70.1	28.4	2	2	53.0	24.8	19	1	61.6	26.6
Murdock	University Farm	47.8	29.4	7	2	52.6	28.5	21	1	50.2	29.0
Wisconsin 680	Wisc. Expt. Sta.	63.3	34.6	6	3	59.9	32.4	1	2	61.8	33.5
Kingscrot Ried's L4	Northrup, King & Co.	66.1	33.6	2	3	53.0	32.9	4	2	59.6	33.3

Table 5. Hybrids and Open-pollinated Varieties Grown in 1937 and 1938 in Rock County

Variety	Source	Rock County, 1937				Rock County, 1938				Average yield, bu., 2 years	Average moisture, 2 years
		Yield, bu.	Per cent moisture	Rank	Group	Yield, bu.	Per cent moisture	Rank	Group		
Minhybrid 403	University Farm	59.4	32.1	4	1	81.7	20.2	2	1	70.6	26.2
Nat'l Hybrid 99	Nat'l Hybrid Corn Co.	65.5	33.4	1	1	69.0	18.7	11	1	67.3	26.1
E4	H. H. Turner Seed Co.	59.5	32.4	3	1	75.1	22.3	4	2	67.3	27.4
Minhybrid 301	University Farm	55.1	30.4	8	1	77.2	20.2	8	1	66.2	25.3
Kingscrot Minn. 13D	Northrup, King & Co.	56.9	33.3	6	1	75.2	20.2	10	1	66.1	26.8
Iowearth 8	Mich-Leonard Seed Co.	59.5	35.5	5	2	86.3	26.2	1	3	72.9	30.9
Iowearth A	Mich-Leonard Seed Co.	63.6	35.6	2	2	79.7	22.8	2	2	71.7	29.2
Pioneer Hi-Bred 355	Pioneer Hi-Bred Corn Co.	54.1	34.0	6	2	80.3	20.7	4	1	67.2	27.4
Pioneer Hi-Bred 357	Pioneer Hi-Bred Corn Co.	59.6	34.7	4	2	72.0	23.6	16	3	65.8	29.2
Murdock	University Farm	43.9	35.2	7	2	64.3	20.2	14	1	54.1	27.7
Nat'l Hybrid 98	Nat'l Hybrid Corn Co.	60.4	36.1	1	3	66.7	18.9	13	1	63.6	27.5

there are thirty-three hybrids, Murdock, Minnesota 13, and Golden King in the 1938 trials which were previously reported in the 1937 yield trials. Those varieties which were in the trials for two years follow. The tables include yield in bushels, the per cent of moisture for each year, and the average yield and per cent of moisture for two years.

Table 6. Hybrids and Open-pollinated Varieties Grown in 1937 and 1938 in Waseca and Faribault Counties

Variety	Source	Waseca County, 1937				Faribault County, 1938				Average yield, bu., 2 years	Average moisture, 2 years
		Yield, bu.	Per cent moisture	Rank	Group	Yield, bu.	Per cent moisture	Rank	Group		
Minhybrid 403	University Farm	60.0	28.9	2	1	72.4	26.5	7	1	66.2	27.7
Minhybrid 301	University Farm	56.3	27.4	3	1	69.6	25.3	13	1	63.0	26.4
Pioneer Hi-Bred 355	Pioneer Hi-Bred Corn Co.	56.9	32.5	6	2	72.6	25.6	6	1	64.8	29.1
Master Hybrid 2	Far. Seed & Nursery Co.	53.6	30.9	7	2	69.7	24.7	12	1	61.7	27.8
Murdock	University Farm	49.9	32.4	9	2	56.2	26.1	22	1	53.1	29.3
DeKalb 202	DeKalb Agr. Ass'n, Inc.	65.1	35.9	1	3	65.4	30.6	5	3	65.3	33.3
Kingscrosst Ried's L4	Northrup, King & Co.	56.4	39.2	9	3	69.4	30.7	2	2	62.9	35.0
E4	H. H. Turner Seed Co.	59.8	33.1	3	3	64.8	25.6	18	1	62.3	29.4
Pioneer Hi-Bred 357	Pioneer Hi-Bred Corn Co.	57.9	34.8	5	3	66.7	23.1	16	1	62.3	29.0
Kingscrosst Ried's FB	Northrup, King & Co.	58.0	34.6	4	3	63.4	32.7	7	3	60.7	33.7
Jacques P.Hy. 570	Jacques Seed Co.	56.1	33.2	10	3	63.3	25.8	19	1	59.7	29.5

Table 7. Hybrids and Open-pollinated Varieties Grown in 1937 and 1938 in Fillmore and Houston Counties

Variety	Source	Fillmore County, 1937				Houston County, 1938				Average yield, bu., 2 years	Average moisture, 2 years
		Yield, bu.	Per cent moisture	Rank	Group	Yield, bu.	Per cent moisture	Rank	Group		
Pioneer Hi-Bred 355	Pioneer Hi-Bred Corn Co.	75.8	31.0	2	1	78.4	33.6	3	1	77.1	32.3
Minhybrid 403	University Farm	69.5	32.3	4	1	75.2	34.6	6	1	72.4	33.5
E4	H. H. Turner Seed Co.	72.2	29.4	3	1	69.5	34.7	8	1	70.9	32.1
Minhybrid 301	University Farm	68.3	29.2	7	1	69.2	33.1	9	1	68.8	31.2
Master Hybrid 2	Far. Seed & Nursery Co.	68.3	31.5	6	1	64.1	33.2	12	1	66.2	32.4
Pioneer Hi-Bred 357	Pioneer Hi-Bred Corn Co.	63.6	32.4	10	1	67.1	36.5	5	2	65.4	34.5
Iowearth A	Mich-Leonard Seed Co.	71.0	33.7	2	2	70.2	36.9	4	2	70.6	35.3
Iowearth 8	Mich-Leonard Seed Co.	67.0	33.3	4	2	70.7	42.7	5	3	68.9	38.0
Nat'l Hybrid 98	Nat'l Hybrid Corn Co.	69.8	33.1	3	2	63.5	30.4	13	1	66.7	31.8
Murdock	University Farm	59.4	33.1	6	2	55.1	33.8	15	1	57.3	33.5
Kingscrosst Ried's FB	Northrup, King & Co.	77.1	35.7	1	3	79.3	39.2	1	3	78.2	37.5
Wisconsin 680	Wisc. Expt. Sta.	68.6	35.7	5	3	71.3	39.2	3	3	70.0	37.5

Variability of Hybrids from Different Seed Sources

In each of the four trials in southern Minnesota, Minhybrids 301 and 403 were entered from three sources: University Farm, the Minnesota Hybrid Corn Growers Association, and the Farmer Seed and Nursery Company of Faribault. All of this seed was of excellent quality as to physical appearance and germination. The results of this study is given in Table 8.

It is of interest to note that the average yields of Minhybrids 301 and 403 varied rather widely and that large differences were obtained in some cases

in yields of a hybrid from different seed sources as tested at a single locality. Thus, the average yields of Minhybrid 301 from University Farm seed were 68.9 bushels; from the Minnesota Hybrid Corn Growers Association seed, 63.7 bushels; and seed furnished by the Farmer Seed and Nursery Company, 68.2 bushels. As lower yields were obtained in all four trials for seed entered by the Hybrid Corn Growers Association, it seems that this lot of seed did not, for some reason, have the yielding ability of the other two lots.

For Minhybrid 403, on the other hand, the seed entered by the Hybrid

Table 8. Variability of Hybrids from Different Seed Sources

Variety	Source	Location of trial	Yield, bu. per acre	Per cent moisture
Minhybrid 301	University Farm	Faribault County	69.6	25.3
		Cottonwood County	59.6	26.0
		Rock County	77.2	20.2
		Houston County	69.2	33.1
		Average	68.9	26.2
Minhybrid 301	Minn. Hybrid Corn Growers Association	Faribault County	63.2	23.7
		Cottonwood County	56.8	26.1
		Rock County	69.0	20.6
		Houston County	65.2	32.8
		Average	63.7	25.8
Master Minhybrid 301	Farmer Seed and Nursery Company	Faribault County	70.0	25.6
		Cottonwood County	59.8	27.6
		Rock County	77.6	20.3
		Houston County	65.4	33.8
		Average	68.2	26.8
Minhybrid 403	University Farm	Faribault County	72.4	26.5
		Cottonwood County	54.9	30.1
		Rock County	81.7	20.2
		Houston County	75.2	34.6
		Average	71.1	27.9
Minhybrid 403	Minn. Hybrid Corn Growers Association	Faribault County	72.2	26.1
		Cottonwood County	58.9	28.4
		Rock County	80.9	21.7
		Houston County	76.0	35.2
		Average	72.0	27.9
Master Minhybrid 403	Farmer Seed and Nursery Company	Faribault County	66.9	27.9
		Cottonwood County	56.8	29.2
		Rock County	78.6	21.6
		Houston County	72.4	34.4
		Average	68.7	28.3

est yielding hybrid, there are ten hybrids which are in the higher yielding class which is indicated by a line drawn between entries 74 and 3.

Group II.—Minnesota 13 and Golden King contained 43.2 and 41.0 per cent moisture, respectively, at harvest time which is less than that found in any of the hybrids belonging to Group II. As hybrids of similar date of average maturity commonly have a lower moisture content than open-pollinated

varieties, it is probable that the hybrids in Group II may be a little late in maturity for the average season in this location. Applying the minimum level of significance to this group, the maximum moisture that could be allowed in this group would be 46.0 per cent. Eleven hybrids in this group range in moisture from 43.9 to 45.8 per cent.

Subtracting 11.2, the minimum level of significance, from 68.4 bushels of entry 38, the high-yielding hybrid in this group, places

Table 9. Trials Conducted on the H. B. Abrahamson Farm, Dassel, in Meeker County. Harvested September 20, 1938

Variety	Entry No.	Source of seed	Yield, bu. per acre, 14 per cent moisture	Per cent stand	Per cent moisture at harvest
GROUP I					
Iowealth 90	19	Mich-Leonard Seed Co.	62.2	85	43.7
Minhybrid 401	6	University Farm	61.9	89	40.5
Iowealth 98	20	Mich-Leonard Seed Co.	56.8	83	39.9
National Hybrid 95	54	National Hybrid Corn Co.	56.4	84	42.7
Minhybrid 403	5	University Farm	52.9	75	43.7
T4	28	H. H. Turner Seed Co.	52.4	85	43.6
Tru-Krost 100	86	Vassar Growers, Inc.	51.4	84	37.6
Iowealth 3	17	Mich-Leonard Seed Co.	51.2	85	42.0
Kingscrot Early Minn. 13A-2	49	Northrup, King & Co.	51.2	76	42.8
Wisc. Hybrid 350	74	Jacques Seed Co.	51.0	84	43.3
Golden King (McArthur)	3	University Farm	49.2	73	41.0
Minnesota 13	2	University Farm	47.4	73	43.2
GROUP II					
DeKalb 250	38	DeKalb Agr. Ass'n, Inc.	68.4	83	45.8
Iowealth 5	18	Mich-Leonard Seed Co.	63.0	78	45.6
Iowealth 2	16	Mich-Leonard Seed Co.	61.0	79	43.9
Kingscrot Minn. 13D	51	Northrup, King & Co.	58.5	83	44.7
National Hybrid 90	53	National Hybrid Corn Co.	57.9	79	45.2
Master Minhybrid 403	8	Far. Seed & Nursery Co.	54.7	81	44.8
Master Minhybrid 301	9	Far. Seed & Nursery Co.	53.9	81	44.7
Minhybrid 301	4	University Farm	52.5	84	44.1
Tru-Krost 150	87	Vassar Growers, Inc.	51.8	78	45.0
Jacques Proven Hybrid 404	76	Jacques Seed Co.	48.9	81	43.9
Jacques Proven Hybrid 406	75	Jacques Seed Co.	42.7	86	44.8
GROUP III					
Iowealth Minn. S	21	Mich-Leonard Seed Co.	57.4	76	46.2
DeKalb 201	31	DeKalb Agr. Ass'n, Inc.	51.0	79	46.7
Jacques Proven Hybrid 455	77	Jacques Seed Co.	49.8	81	46.9
DeKalb 210	35	DeKalb Agr. Ass'n, Inc.	44.7	79	55.0
*DeKalb 206	34	DeKalb Agr. Ass'n, Inc.	42.9	88	48.8
DeKalb 200	30	DeKalb Agr. Ass'n, Inc.	42.7	80	47.7
Wisc. Hybrid 531	83	Wisc. Expt. Sta.	41.2	83	49.3
Master Wisc. 525	12	Far. Seed & Nursery Co.	35.8	81	47.6
Jacques Proven Hybrid 550	71	Jacques Seed Co.	35.0	83	49.8
		Minimum level of significance	11.2		2.2

* Experimental hybrid, not in commercial production.

five hybrids in the higher-yielding class which is indicated by a line drawn between entries 53 and 8.

Group III.—Hybrids in this group may be expected to mature in this locality later than Minhybrids 301 and 403 which are found in Group II. It seems probable that Minhybrids 301 and 403 are too late in maturity for the average season in this region. For this reason, hybrids in Group III do not seem well adapted for this locality. There are nine hybrids in this group which range in moisture from 46.2 to 55.0 per cent. A killing freeze may be expected in this location any time after the middle of September.

Subtracting 11.2, the minimum level of significance for yield from the highest yield, 57.4 bushels for entry 21, there are three hybrids that may be placed in the higher-yielding class for this group which is indicated by a line drawn between entries 77 and 35.

All varieties were standing well at the time of harvest at this location. There was no outstanding difference in varieties as to the per cent and degree of lodging.

Otter Tail County

Group I.—In this general location, strains of open-pollinated corn earlier than those adapted for central Minnesota are required. The Morris strain of Minnesota 13, Golden King, and other early varieties have matured satisfactorily. Minhybrids 401 and 402 have ripened a little earlier than open-pollinated varieties grown by farmers in this locality. The average per cent of moisture of Minhybrids 401, 402, and Golden King of 39.8 per cent has been taken as a base for establishing the moisture groups in this location. The minimum level of significance was 3.1. Adding 3.1 to 39.8 per cent equals

42.9 per cent, the highest per cent of moisture that could be allowed in this group. There are sixteen varieties in Group I which range from 33.3 to 42.7 per cent moisture. The corn in this location was killed by frost on September 25. A killing frost may be expected on or before this time in the average season in this locality.

The minimum level of significance for yield is 6.4 bushels. Subtracting 6.4 from 52.9 bushels, the yield of entry 6 the highest yielding hybrid, leaves two hybrids which are in the higher-yielding class. This is indicated by a line drawn between entries 7 and 52.

Group II.—Adding 3.1 to 42.9 equals 46.9 per cent which is the highest per cent allowed in Group II, there are seven varieties in this group which range in moisture from 43.1 to 45.9 per cent. The hybrids in this group may be considered somewhat later than Group I and require a favorable season for satisfactory maturity.

The minimum level of significance for yield is 6.4 bushels. Subtracting 6.4 from 44.8 bushels, the highest yielding hybrid, entry 51, equals 38.4 bushels. There are five hybrids in the higher-yielding class. This is indicated by a line drawn between entries 54 and 17.

Group III.—There are thirteen varieties in this group which range in moisture from 46.3 to 57.2 per cent. Most of the hybrids in this group were very immature at the time of harvest which was made after a killing frost.

The minimum level of significance is 6.4. Subtracting 6.4 from 42.9 bushels, entry 2, the highest-yielding variety, there are six varieties which are in the higher-yielding class. The line designating the higher-yielding class falls between entries 28 and 15.

It is of interest to note that the highest-yielding entries in Groups II and III are significantly lower than the highest entry in Group I—the best adapted group.

The corn was standing very well and scarcely a trace of lodging was recorded in any variety.

Goodhue County

Group I.—In this general location, maturity intermediate between Minhybrid 401 and the two later maturing

hybrids, Minhybrids 301 and 403, would be desirable for average seasonal conditions. In very unfavorable growing seasons, Minhybrids 301 and 403 may not mature satisfactorily. These two hybrids have been maturing as early as strains of Minnesota 13 grown in the locality. The average per cent of moisture of Minhybrids 401, 301,

Table 10. Trials Conducted on the E. L. Evenson Farm, Fergus Falls, in Otter Tail County. Harvested September 27, 1938

Variety	Entry No.	Source of seed	Yield, bu. per acre, 14 per cent moisture	Per cent stand	Per cent moisture at harvest
GROUP I					
Minhybrid 401	6	University Farm	52.9	95	39.3
Minhybrid 402	7	University Farm	46.9	90	37.4
National Hybrid 85	52	National Hybrid Corn Co.	46.2	89	40.4
Wisc. Hybrid 355	85	Wisc. Expt. Sta.	45.6	88	39.5
Master Minhybrid 401	13	Far. Seed & Nursery Co.	44.2	86	41.1
Iowearth 98	20	Mich-Leonard Seed Co.	43.6	85	42.3
Tru-Krost Minn. 402	89	Vassar Growers, Inc.	42.4	86	35.6
Kingscrot Early Minn. 13A-2	49	Northrup, King & Co.	41.5	81	40.1
Tru-Krost 100	86	Vassar Growers, Inc.	41.2	81	33.3
Jacques Proven Hybrid 404	76	Jacques Seed Co.	40.2	85	42.7
Kingscrot E. A. Minn. 13E	44	Northrup, King & Co.	38.8	86	40.4
Wisc. Hybrid 360	84	Wisc. Expt. Sta.	37.9	81	42.6
National Hybrid 98	55	National Hybrid Corn Co.	37.2	84	42.5
Kingscrot Extra Ea. Minn. 13E-2	45	Northrup, King & Co.	37.1	79	40.2
Jacques Proven Hybrid 340	80	Jacques Seed Co.	36.3	73	42.2
Golden King (McArthur)	3	University Farm	33.7	83	42.6
GROUP II					
Kingscrot Minn. 13D	51	Northrup, King & Co.	44.8	91	45.2
Iowearth 90	19	Mich-Leonard Seed Co.	43.9	84	45.4
Jacques Proven Hybrid 350	74	Jacques Seed Co.	41.7	90	43.1
Master Wisconsin 350	14	Far. Seed & Nursery Co.	40.1	85	44.1
National Hybrid 95	54	National Hybrid Corn Co.	38.6	88	43.6
Iowearth 3	17	Mich-Leonard Seed Co.	38.0	88	43.1
* DeKalb 206	34	DeKalb Agr. Ass'n, Inc.	30.3	86	45.9
GROUP III					
Minnesota 13	2	University Farm	42.9	84	46.7
National Hybrid 90	53	National Hybrid Corn Co.	42.4	81	51.2
DeKalb 201	31	DeKalb Agr. Ass'n, Inc.	39.5	81	50.0
Iowearth Minn. S.	21	Mich-Leonard Seed Co.	38.6	83	50.3
Iowearth 2	16	Mich-Leonard Seed Co.	37.1	80	52.5
T4	28	H. H. Turner Seed Co.	36.7	79	46.6
Master Wisc. 455	15	Far. Seed & Nursery Co.	33.8	93	47.3
Jacques Proven Hybrid 351	78	Jacques Seed Co.	32.6	80	46.3
Iowearth 95	22	Mich-Leonard Seed Co.	32.3	80	53.9
DeKalb 210	35	DeKalb Agr. Ass'n, Inc.	29.6	79	52.6
DeKalb 230	36	DeKalb Agr. Ass'n, Inc.	27.9	94	55.7
Jacques Proven Hybrid 325	79	Jacques Seed Co.	25.1	85	57.2
DeKalb 200	30	DeKalb Agr. Ass'n, Inc.	24.3	79	51.3
		Minimum level of significance	6.4		3.1

* Experimental hybrid, not in commercial production.

403, Minnesota 13, and Golden King has been taken as a base for setting up the maturity groups in this location. The average moisture content of these five varieties is 34.6 per cent. By applying the minimum level of significance for moisture of 1.9 per cent, there are fifteen varieties which fall in this group. The range in moisture content

is from 29.3 to 36.3 per cent. The highest per cent of moisture allowed in this group would be 36.5 per cent.

The highest yield in this group is 68.1 bushels made by entry 16. The minimum level of significance for yield is 7.5 bushels. Subtracting 7.5 from 68.1 bushels, there are seven hybrids that fall in a higher-yielding class. This is indicated by a line drawn between entries 20 and 51.

Table 11. Trials Conducted on the Andrew T. Hoverstad Farm, Dennison, in Goodhue County. Harvested October 7, 1938

Variety	Entry No.	Source of seed	Yield, bu. per acre, 14 per cent moisture	Per cent stand	Per cent moisture at harvest
GROUP I					
Iowealth 2	16	Mich-Leonard Seed Co.	68.1	66	36.1
Iowealth 5	18	Mich-Leonard Seed Co.	66.1	73	34.9
Minhybrid 301	4	University Farm	65.2	78	35.5
T4	28	H. H. Turner Seed Co.	64.9	63	35.8
Master Minhybrid 301	9	Far. Seed & Nursery Co.	63.0	75	36.2
National Hybrid 95	54	National Hybrid Corn Co.	61.4	72	31.7
Iowealth 98	20	Mich-Leonard Seed Co.	60.7	75	29.3
Kingscrot Ried's Minn. 13D	51	Northrup, King & Co.	59.8	70	36.1
Minhybrid 401	6	University Farm	56.9	78	30.5
Iowealth 3	17	Mich-Leonard Seed Co.	56.4	64	32.4
National Hybrid 98	55	National Hybrid Corn Co.	55.3	60	31.7
Golden King (McArthur)	3	University Farm	55.0	68	33.7
Wisc. Hybrid 531	83	Wisc. Expt. Sta.	53.7	68	36.3
Minnesota 13	2	University Farm	48.6	59	35.7
*Jacques Proven Hybrid 1001	72	Jacques Seed Co.	47.4	78	35.2
GROUP II					
DeKalb 250	38	DeKalb Agr. Ass'n, Inc.	71.5	73	37.5
E4	29	H. H. Turner Seed Co.	70.2	75	38.4
Minhybrid 403	65	Minn. Hybrid Corn Growers	68.1	80	38.0
National Hybrid 90	53	National Hybrid Corn Co.	68.0	68	37.5
DeKalb 201	31	DeKalb Agr. Ass'n, Inc.	67.2	70	38.0
Iowealth Minn. S	21	Mich-Leonard Seed Co.	65.8	67	38.3
Master Minhybrid 403	8	Far. Seed & Nursery Co.	64.5	76	38.0
National Hybrid 105	57	National Hybrid Corn Co.	64.0	68	36.9
Jacques Proven Hybrid 570	69	Jacques Seed Co.	62.3	72	38.4
Minhybrid 403	5	University Farm	61.4	67	37.4
Minhybrid 301	64	Minn. Hy. Corn Grow. Ass'n	60.5	69	36.9
Iowealth A	23	Mich-Leonard Seed Co.	60.4	61	38.2
National Hybrid 110	58	National Hybrid Corn Co.	59.3	63	36.7
Master Wisc. Hy. 525	12	Far. Seed & Nursery Co.	56.7	78	38.2
Jacques Proven Hybrid 525	73	Jacques Seed Co.	50.3	69	36.7
GROUP III					
Kingscrot Ried's 13, No. 82	50	Northrup, King & Co.	68.2	80	41.0
*DeKalb 206	34	DeKalb Agr. Ass'n, Inc.	66.9	81	40.0
Jacques Proven Hybrid 606	70	Jacques Seed Co.	66.2	79	40.5
DeKalb 210	35	DeKalb Agr. Ass'n, Inc.	61.3	65	40.7
Jacques Proven Hybrid 550	71	Jacques Seed Co.	59.7	73	38.6
DeKalb 200	30	DeKalb Agr. Ass'n, Inc.	53.4	59	41.6
		Minimum level of significance	7.5		1.9

* Experimental hybrid, not in commercial production.

Table 12. Trials Conducted on the Ed C. Johnson Farm, Jeffers, in Cottonwood County.
Harvested September 30, 1938

Variety	Entry No.	Source of seed	Yield, bu. per acre, 14% moisture	Per cent moisture at harvest	Per cent stand	Lodging	
						Per cent	De- gree
GROUP I							
Iowearth AP	26	Mich-Leonard Seed Co.	70.5	29.8	89	28	11
DeKalb 250	38	DeKalb Agr. Ass'n, Inc.	63.2	28.2	78	33	11
Pioneer Hi-Bred 355	60	Pioneer Hi-Bred Corn Co.	61.6	26.8	76	13	9
Iowearth 2	16	Mich-Leonard Seed Co.	61.3	29.2	78	22	11
DeKalb 201	31	DeKalb Agr. Ass'n, Inc.	61.0	29.5	72	20	9
Master Minhybrid 301	9	Far. Seed & Nursery Co.	59.8	27.6	75	30	13
Minhybrid 301	4	University Farm	59.6	26.0	73	22	9
T4	28	H. H. Turner Seed Co.	59.5	26.9	79	33	11
Minhybrid 403	65	Minn. Hy. Corn Grow. Ass'n	58.9	28.4	76	22	9
Minhybrid 301	64	Minn. Hy. Corn Grow. Ass'n	56.8	26.1	72	30	13
Master Minhybrid 403	8	Far. Seed & Nursery Co.	56.8	29.2	73	30	11
Pioneer Hi-Bred 357	61	Pioneer Hi-Bred Corn Co.	56.3	30.6	70	45	11
Iowearth Minn. S	21	Mich-Leonard Seed Co.	55.3	29.3	73	40	13
Jacques Proven Hybrid 606	70	Jacques Seed Co.	55.3	30.1	78	18	8
National Hybrid 95	54	National Hybrid Corn Co.	55.2	23.7	76	22	9
Minhybrid 403	5	University Farm	54.9	30.1	72	13	7
Iowearth A	23	Mich-Leonard Seed Co.	54.2	22.2	72	37	13
Jacques Proven Hybrid 570	69	Jacques Seed Co.	53.1	29.0	78	12	9
National Hybrid 99	56	National Hybrid Corn Co.	53.0	24.8	69	35	13
Master Hybrid 2	11	Far. Seed & Nursery Co.	52.7	26.6	63	67	18
Murdock	1	University Farm	52.6	28.5	73	98	34
Master Wisc. 570	10	Far. Seed & Nursery Co.	51.7	29.1	69	15	9
GROUP II							
Wisc. Hybrid 680	82	Wisc. Expt. Station	59.9	32.4	78	3	1
National Hybrid 110	58	National Hybrid Corn Co.	59.1	32.5	73	30	11
National Hybrid 105	57	National Hybrid Corn Co.	57.2	31.5	70	22	11
Kingscrosst Ried's L-4	48	Northrup, King & Co.	53.0	32.9	64	15	9
Funk Hybrid G-7	40	Funk Bros. Seed Co.	51.5	31.6	66	8	7
Jacques Proven Hybrid 625	68	Jacques Seed Co.	50.8	31.7	78	16	2
*Funk Hybrid G-10	41	Funk Bros. Seed Co.	50.7	32.4	73	13	7
GROUP III							
DeKalb 230	36	DeKalb Agr. Ass'n, Inc.	68.6	34.7	84	31	11
Funk Hybrid G-15	42	Funk Bros. Seed Co.	67.5	35.8	85	3	4
Pioneer Hi-Bred 350	63	Pioneer Hi-Bred Corn Co.	62.8	34.8	85	53	18
Kingscrosst Ried's 13 FK(82)	50	Northrup, King & Co.	61.0	35.6	76	12	9
Iowearth 8	24	Mich-Leonard Seed Co.	59.6	36.9	72	11	7
E4	29	H. H. Turner Seed Co.	57.8	34.9	83	27	7
Iowearth 15	25	Mich-Leonard Seed Co.	52.1	34.2	67	18	11
		Minimum level of significance	6.7	2.5			

* Experimental hybrid, not in commercial production.

Group II.—There are fifteen hybrids in this group that range in moisture from 36.7 to 38.4 per cent. By applying the minimum level of significance for moisture, the highest moisture content that could be allowed in this group would be 38.4 per cent.

The highest yield in the group is 71.5 bushels made by entry 38. The minimum

level of significance for yield is 7.5 bushels. Subtracting 7.5 from 71.5 bushels, there are eight hybrids that fall in a higher-yielding class. This is indicated by a line drawn between entries 57 and 69.

Group III.—There are six hybrids in this group which range in moisture content from 38.6 to 41.6 per cent. These hybrids were green at the time

of harvest and could be expected to be killed by frost in an average season. On the basis of moisture content, these are considered to be too late for the location.

The minimum level of significance for yield is 7.5 bushels. Subtracting 7.5 from 68.2 bushels, the highest yield made by entry 50, there are four hybrids which fall in the higher-yielding class. This is indicated by a line drawn between entries 35 and 71.

The corn of all varieties was standing very well at the time of harvest which was made October 7. The first killing frost is expected about two weeks earlier in this locality in the average season.

Cottonwood County

Group I.—Minhybrids 301 and 403 have been maturing very satisfactorily in this location since their release by the Minnesota Experiment Station. These hybrids on the average mature somewhat earlier than standard varieties of Murdock, Golden Jewel, and Silver King which have been grown in the locality for many years. The average per cent of moisture of Minhybrids 301, 403, and Murdock has been taken as a base for setting up the maturity groups in this location. The average moisture content at harvest of the three varieties is 28.2 per cent. By applying the minimum level of significance of 2.5 per cent for moisture, there are twenty-two varieties that fall in this first group. The range in moisture is 22.2 to 30.6 per cent. The highest per cent of moisture allowed in this group would be 30.7 per cent.

The highest yield in this group is 70.5 bushels made by entry 26. The minimum level of significance for yield is 6.7 bushels. Subtracting 6.7 from 70.5 bushels, there is one hybrid which is in the higher-yielding class. This is indicated by a line drawn between entries 26 and 38.

Group II.—There are seven hybrids in this group that ranged in moisture at harvest from 31.5 to 32.9 per cent. The highest content of moisture allowed in this group would be 33.2 per cent. These hybrids are not a great deal higher in moisture than Group I and may be expected to mature in favorable seasons.

The minimum level of significance for yield is 6.7 bushels. Subtracting 6.7 from 59.9 bushels made by the highest yielding hybrid entry 82, there are three hybrids which are in the higher-yielding class. This is indicated by a line drawn between entries 57 and 48. The highest yielding hybrid in Group II is significantly lower in yield than the highest yielding entry in Group I.

Group III.—There are seven hybrids in this group which range in moisture from 34.2 to 36.9 per cent. Two hybrids in this group contained more than 35.7 per cent of moisture which on the basis of the significant level for moisture is the upper limit for Group III. The foliage of the two late hybrids in this group was green at the time of harvest while Groups I and II were entirely ripe.

The minimum level of significance for yield is 6.7 bushels. Subtracting 6.7 from 68.6 bushels, the highest yielding hybrid in entry 36, there are three hybrids that fall in a higher-yielding class which is indicated by a line drawn between entries 63 and 50.

The corn in this location was injured to some extent by a hail storm in August. A heavy wind accompanied the hail storm. Murdock showed the greatest per cent and degree of lodging of all varieties in the trial. All varieties were lodged but not enough to interfere with harvesting. The per cent and degree of lodging is indicated in Table 12.

Rock County

Group I.—This trial was located in the extreme southwest corner of the

Table 13. Trials Conducted on the Alfred F. Turner Farm, Magnolia, in Rock County.
Harvested October 14, 1938

Variety	Entry No.	Source of seed	Yield, bu. per acre, 14% moisture	Per cent moisture at harvest	Per cent stand	Lodging	
						Per cent	De- gree
GROUP I							
Iowearth Minn. S	21	Mich-Leonard Seed Co.	82.5	19.9	89	100	50
Minhybrid 403	5	University Farm	81.7	20.2	85	94	23
Minhybrid 403	65	Minn. Hy. Corn Grow. Ass'n	80.9	21.7	93	98	30
Pioneer Hi-Bred 355	60	Pioneer Hi-Bred Corn Co.	80.3	20.7	89	100	25
Master Minhybrid 403	8	Far. Seed & Nursery Co.	78.6	21.6	86	93	27
Iowearth 2	16	Mich-Leonard Seed Co.	77.9	21.6	89	100	54
Master Minhybrid 301	9	Far. Seed & Nursery Co.	77.6	20.3	91	100	39
Minhybrid 301	4	University Farm	77.2	20.2	85	96	32
National Hybrid 105	57	National Hybrid Corn Co.	75.3	20.8	88	100	48
Kingscrosst Minn. 13D	51	Northrup, King & Co.	75.2	20.2	88	100	54
National Hybrid 99	56	National Hybrid Corn Co.	69.0	18.7	81	100	48
Minhybrid 301	64	Minn. Hy. Corn Grow. Ass'n	69.0	20.6	80	98	41
National Hybrid 98	55	National Hybrid Corn Co.	66.7	18.9	76	99	41
Murdock	1	University Farm	64.3	20.2	86	100	54
GROUP II							
Iowearth AP	26	Mich-Leonard Seed Co.	94.3	21.9	94	100	52
Iowearth A	23	Mich-Leonard Seed Co.	79.7	22.8	81	100	41
National Hybrid 110	58	National Hybrid Corn Co.	76.8	22.1	89	100	45
E4	29	H. H. Turner Seed Co.	75.1	22.3	89	96	41
Jacques Proven Hybrid 1101	66	Jacques Seed Co.	73.1	23.1	88	80	24
GROUP III							
Iowearth 8	24	Mich-Leonard Seed Co.	86.3	26.2	88	68	18
Funk Hybrid G-15	42	Funk Bros. Seed Co.	84.2	26.6	90	55	18
*DeKalb 206	34	DeKalb Agr. Ass'n, Inc.	82.1	24.5	93	68	13
Pioneer Hi-Bred 350	63	Pioneer Hi-Bred Corn Co.	80.9	23.5	89	100	52
Jacques Proven Hybrid 645	67	Jacques Seed Co.	80.7	23.9	89	67	13
DeKalb 204	33	DeKalb Agr. Ass'n, Inc.	80.6	25.1	86	73	23
Funk Hybrid G-23	43	Funk Bros. Seed Co.	78.5	30.0	91	50	13
Jacques Proven Hybrid 625	68	Jacques Seed Co.	77.9	25.0	86	73	13
Kingscrosst Ried's 13 FK(82)	50	Northrup, King & Co.	77.8	27.6	89	81	30
Iowearth 15	25	Mich-Leonard Seed Co.	77.1	24.4	85	87	34
Pioneer Hi-Bred 349	62	Pioneer Hi-Bred Corn Co.	76.8	27.9	93	85	27
*Funk Hybrid G-10	41	Funk Bros. Seed Co.	76.5	25.9	89	68	17
DeKalb 293	39	DeKalb Agr. Ass'n, Inc.	75.7	25.2	86	89	34
Funk Hybrid G-7	40	Funk Bros. Seed Co.	75.7	24.9	85	70	13
DeKalb 200	30	DeKalb Agr. Ass'n, Inc.	73.0	24.0	79	91	27
Pioneer Hi-Bred 357	61	Pioneer Hi-Bred Corn Co.	72.0	23.6	83	98	36
Master Wisc. 570	10	Far. Seed & Nursery Co.	70.4	23.4	81	91	18
		Minimum level of significance	6.7	1.5			

* Experimental hybrid, not in commercial production.

state near Magnolia. All varieties with the exception of some in Group III were ripe previous to the first killing frost. All varieties in this group were well matured. Murdock, Golden Jewel, Silver King, and similar maturing varieties have been grown in the locality for many years and are known to be adapted. The average per cent of mois-

ture in Minhybrids 301 and 403 and Murdock was taken as a base for setting up the maturity groups in this location. The average content of moisture at harvest in the three varieties is found to be 20.2 per cent. By applying the minimum level of significance for moisture, there are fourteen varieties that fall in this group. The range in

moisture content is 18.9 to 21.7 per cent. The highest per cent of moisture allowed in this group would be 21.7 per cent.

The highest yield in this group is 82.5 bushels made by entry 21. The minimum level of significance for yield is 6.7 bushels. Subtracting 6.7 from 82.5 bushels, there are eight hybrids that fall in a higher-yielding class, indicated by a line drawn between entries 4 and 57.

Group II.—There are five hybrids in this group that range in moisture content from 22.1 to 23.1 per cent. By applying the minimum level of significance for moisture, the highest moisture content allowed would be 23.2 per cent. All hybrids in the group were well matured on the date of harvest, October 14.

The highest-yielding hybrid in this group was made by entry 26 which yielded 94.3 bushels. Subtracting 6.7 from 94.3 bushels, it is found that this hybrid is significantly higher than all others in the group.

Group III.—There are seventeen hybrids in this group which range in moisture content from 23.4 to 30.0 per cent. By applying the minimum level of significance for moisture, the highest moisture allowed in this group would be 24.7 per cent. There are ten hybrids in this group that would fall in a later maturing group than allowed for Group III which in less favorable seasons would not be expected to mature satisfactorily in this section of the state. All varieties were killed by frost previous to harvesting which is about three weeks later than the average killing frost is expected in the locality.

The highest yield in this group is 86.3 bushels made by entry 24. Subtracting the minimum level of significance for yield, 6.7 from 86.3 bushels, there are six hybrids that fall in a higher-yielding class. The line indicating the lower limit of the higher yielding class is drawn between entries 33 and 43.

A very severe wind storm caused

all varieties to be lodged. The per cent and degree of lodging is reported for this location in Table 13. The per cent of lodging was high in all varieties.

Faribault County

Group I.—Minhybrids 301 and 403 have been maturing early and yielding very satisfactorily in this section of the state. These hybrids have matured somewhat earlier than Murdock, Golden Jewel, Silver King, and other open-pollinated farm varieties. The average per cent of moisture in Minhybrids 301 and 403 and Murdock has been taken as a base for setting up the maturity group in this location. The average moisture content at harvest of the three varieties is 26.0 per cent. By applying the minimum level of significance, 2.2 per cent for moisture, there are twenty-two varieties that fall in this group. The range in moisture content is 23.1 to 27.9 per cent. The highest per cent of moisture allowed in this group would be 28.2 per cent.

The highest yield in this group is 79.4 bushels made by entry 26. The minimum level of significance for yield is 8.8 bushels. Subtracting 8.8 from 79.4 bushels, there are nine hybrids that fall in the higher-yielding class. This is indicated by a line drawn between entries 65 and 58.

Group II.—There are five hybrids in this group that range in moisture from 29.1 to 30.7 per cent. By applying the minimum level of significance, the highest moisture content that could be allowed in this group would be 30.4 per cent. These hybrids were well matured at the time of harvest and may be expected to mature satisfactorily in favorable seasons.

The minimum level of significance for yield is 8.8 bushels. Subtracting 8.8 from 73.8 bushels made by the highest yielding hybrid, entry 59, there are two hybrids which

fall in the higher-yielding class. This is indicated by a line drawn between entries 48 and 68.

Group III.—There are nine hybrids in this group which range in moisture from 30.6 to 35.8 per cent. By applying the minimum level of significance for moisture, there are four hybrids that contain more than 32.6 per cent

of moisture which may be considered as very late maturing hybrids. These hybrids were green at harvest time.

The minimum level of significance for yield is 8.8 bushels. Subtracting 8.8 from 79.1 bushels, the highest yielding hybrid entry 27, there are three hybrids that fall in a higher-yielding class. This is indicated by a line drawn between entries 46 and 50.

Table 14. Trials Conducted on the Donald C. Willette Farm, Delavan, in Faribault County, Harvested October 5, 1938

Variety	Entry No.	Source of seed	Yield, bu. per acre, 14% moisture	Per cent moisture at harvest	Per cent stand	Lodging	
						Per cent	De-gree
GROUP I							
Iowealth AP	26	Mich-Leonard Seed Co.	79.4	26.3	91	76	13
DeKalb 240	37	DeKalb Agr. Ass'n, Inc.	78.1	26.7	88	68	15
Iowealth 2	16	Mich-Leonard Seed Co.	77.1	22.0	94	81	18
National Hybrid 105	57	National Hybrid Corn Co.	75.1	25.3	94	67	11
Pioneer Hi-Bred 350	63	Pioneer Hi-Bred Corn Co.	74.9	26.7	86	73	16
Pioneer Hi-Bred 355	60	Pioneer Hi-Bred Corn Co.	72.6	25.6	90	41	11
Minhybrid 403	5	University Farm	72.4	26.5	85	39	11
Iowealth A	23	Mich-Leonard Seed Co.	72.4	25.8	89	63	13
Minhybrid 403	65	Minn. Hy. Corn Grow. Ass'n	72.2	26.1	81	38	13
National Hybrid 110	58	National Hybrid Corn Co.	70.2	25.5	86	59	13
Master Minhybrid 301	9	Far. Seed & Nursery Co.	70.0	25.6	80	54	13
Master Hybrid 2	11	Far. Seed & Nursery Co.	69.7	24.7	75	66	17
Minhybrid 301	4	University Farm	69.6	25.3	88	31	11
Iowealth Minn. S	21	Mich-Leonard Seed Co.	68.1	26.0	84	54	18
Master Minhybrid 403	8	Far. Seed & Nursery Co.	66.9	27.9	83	46	11
Pioneer Hi-Bred 357	61	Pioneer Hi-Bred Corn Co.	66.7	23.1	89	78	16
*Funk Hybrid G-10	41	Funk Bros. Seed Co.	66.5	27.4	84	28	11
E4	29	H. H. Turner Seed Co.	64.8	25.6	89	60	11
Jacques Proven Hybrid 570	69	Jacques Seed Co.	63.3	25.8	79	59	11
Minhybrid 301	64	Minn. Hy. Corn Grow. Ass'n	63.2	23.7	73	43	11
Master Wisc. 570	10	Far. Seed & Nursery Co.	59.1	27.6	76	53	11
Murdock	1	University Farm	56.2	26.1	80	97	44
GROUP II							
National Hybrid 112	59	National Hybrid Corn Co.	73.8	30.3	89	53	11
Kingscrot Ried's L-4	48	Northrup, King & Co.	69.4	30.7	78	43	13
Jacques Proven Hybrid 625	68	Jacques Seed Co.	60.4	29.1	83	40	11
Jacques Proven Hybrid 645	67	Jacques Seed Co.	60.1	29.2	79	27	11
DeKalb 293	39	DeKalb Agr. Ass'n, Inc	60.0	29.6	75	76	18
GROUP III							
Iowealth AQ	27	Mich-Leonard Seed Co.	79.1	35.8	84	22	11
Funk Hybrid G-15	42	Funk Bros. Seed Co.	74.2	31.6	85	15	11
*Kingscrot Ried's 13 No. 84	46	Northrup, King & Co.	71.3	32.0	86	53	11
Kingscrot Ried's 13 FK(82)	50	Northrup, King & Co.	67.5	33.0	85	28	11
DeKalb 202	32	DeKalb Agr. Ass'n, Inc.	65.4	30.6	83	36	11
Funk Hybrid G-7	40	Funk Bros. Seed Co.	63.6	31.1	79	25	11
Kingscrot Ried's FB	47	Northrup, King & Co.	63.4	32.7	76	63	13
Funk Hybrid G-23	43	Funk Bros. Seed Co.	62.4	35.6	88	44	11
Iowealth 15	25	Mich-Leonard Seed Co.	62.1	30.7	75	38	11
		Minimum level of significance	8.8	2.2			

* Experimental hybrid, not in commercial production.

Table 15. Trials Conducted on the Clarence Gustafson Farm, Houston, in Houston County. Harvested October 12, 1938

Variety	Entry No.	Source of seed	Yield, bu. per acre, 14 per cent moisture	Per cent stand	Per cent moisture at harvest
GROUP I					
Iowearth 2	16	Mich-Leonard Seed Co.	81.9	83	34.1
Iowearth AP	26	Mich-Leonard Seed Co.	80.3	93	35.6
Pioneer Hi-Bred 355	60	Pioneer Hi-Bred Corn Co.	78.4	86	33.6
National Hybrid 105	57	National Hybrid Corn Co.	76.5	81	34.9
Minhybrid 403	65	Minn. Hy. Corn Grow. Ass'n	76.0	86	35.2
Minhybrid 403	5	University Farm	75.2	85	34.6
Master Minhybrid 403	8	Far. Seed & Nursery Co.	72.4	80	34.4
E4	29	H. H. Turner Seed Co.	69.5	88	34.7
Minhybrid 301	4	University Farm	69.2	81	33.1
Master Minhybrid 301	9	Far. Seed & Nursery Co.	65.4	85	33.8
Minhybrid 301	64	Minn. Hy. Corn Grow. Ass'n	65.2	81	32.8
Master Hybrid 2	11	Far. Seed & Nursery Co.	64.1	70	33.2
National Hybrid 98	55	National Hybrid Corn Co.	63.5	80	30.4
Iowearth Minn. S	21	Mich-Leonard Seed Co.	62.1	80	35.6
Murdock	1	University Farm	55.1	84	33.8
GROUP II					
DeKalb 250	38	DeKalb Agr. Ass'n, Inc.	80.3	86	36.5
Kingscrot Ried's No. 13, 82	50	Northrup, King & Co.	80.2	86	38.1
National Hybrid 110	58	National Hybrid Corn Co.	78.5	84	36.3
Iowearth A	23	Mich-Leonard Seed Co.	70.2	83	36.9
Pioneer Hi-Bred 357	61	Pioneer Hi-Bred Corn Co.	67.1	85	36.5
Jacques Proven Hybrid 625	68	Jacques Seed Co.	66.9	83	38.2
Jacques Proven Hybrid 606	70	Jacques Seed Co.	64.6	85	37.4
Master Wisc. 570	10	Far. Seed & Nursery Co.	55.5	79	37.7
Jacques Proven Hybrid 570	69	Jacques Seed Co.	53.7	85	36.1
Jacques Proven Hybrid 550	71	Jacques Seed Co.	48.9	85	37.4
Wisc. Hybrid 531	83	Wisc. Expt. Sta.	48.9	80	36.8
GROUP III					
Kingscrot FB	47	Northrup, King & Co.	79.3	85	39.2
National Hybrid 112	59	National Hybrid Corn Co.	74.5	81	40.1
Wisc. Hybrid 680	82	Wisc. Expt. Sta.	71.3	88	39.2
Iowearth 15	25	Mich-Leonard Seed Co.	70.9	81	39.3
Iowearth 8	24	Mich-Leonard Seed Co.	70.7	85	42.7
Wisc. Hybrid 696	81	Wisc. Expt. Sta.	70.7	93	39.1
Funk Hybrid G-15	42	Funk Bros. Seed Co.	69.7	88	40.3
Jacques Proven Hybrid 645	67	Jacques Seed Co.	63.4	85	38.3
Funk Hybrid G-7	40	Funk Bros. Seed Co.	62.4	84	38.7
*Funk Hybrid G-10	41	Funk Bros. Seed Co.	60.6	90	40.3
			Minimum level of significance 11.8		

* Experimental hybrid, not in commercial production.

Severe wind storms caused lodging in all varieties. The degree of lodging was not enough to interfere with harvesting. Lodging was most striking in Murdock.

Houston County

Group I.—This trial was located in the Root River Valley on productive

land not subject to overflow. Minhybrids 301, 403, Murdock, Golden Jewel, Silver King, and varieties of similar maturity have been maturing in the valleys of southeastern Minnesota very satisfactorily. At the time of harvest, October 12, most of the varieties in this group were still green. The average per cent of moisture of Min-

hybrids 301 and 403 and Murdock has been taken as a base for setting up the maturity group for this location. The average moisture content of the three varieties at the time of harvest was 33.8 per cent. By applying the minimum level of significance 2.2 for moisture, there are fifteen varieties that fall in this group. The range in moisture content of the fifteen varieties is 30.4 to 35.6 per cent. The highest per cent of moisture allowed in this group is 36.0 per cent.

The highest yield in this group is 81.9 bushels made by entry 16. The minimum level of significance for yield is 11.8 bushels. Subtracting 11.8 from 81.9 bushels, there are seven hybrids that fall in the higher-yielding class indicated by a line drawn between entries 8 and 29.

Group II.—There are eleven hybrids in this group that range in moisture content from 36.1 to 38.2 per cent. By applying the minimum level of significance for moisture, the highest per cent of moisture that could be allowed in this group would be 38.2. These varieties could be expected to mature in this locality in average growing seasons. All varieties in the group retained green foliage up to the date of harvest.

The minimum level of significance for yield is 11.8 bushels. Subtracting 11.8 from 80.3 bushels made by entry 38, the highest yielding hybrid, there are four hybrids that fall in the higher-yielding class. The division is indicated by a line drawn between entries 23 and 61.

Group III.—There are ten hybrids in this group which range in moisture content from 38.3 to 42.7 per cent. By applying the minimum level of significance for moisture, there is one hybrid that exceeds the highest per cent of moisture allowed in this group which is 40.4 per cent and would fall into a later group. All hybrids in this group may be considered late for this locality. The first killing frost is normally expected on or before October first in the valleys of Houston, Fillmore, and Winona counties.

The highest yielding hybrid in this group is 79.3 bushels in entry 47. Applying the minimum level of significance for yield of 11.8, there are seven hybrids which fall in the higher-yielding class. The line indicating the lower limit of the higher-yielding class is drawn between entries 42 and 67.

All varieties were standing well at the time of harvest. Lodging was not serious enough to report.

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