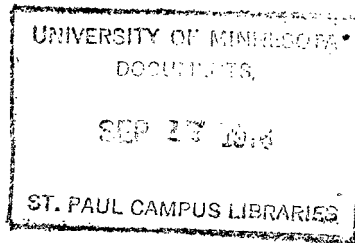


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Commercial + Experiment  
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Corn Yield Trials, 1941

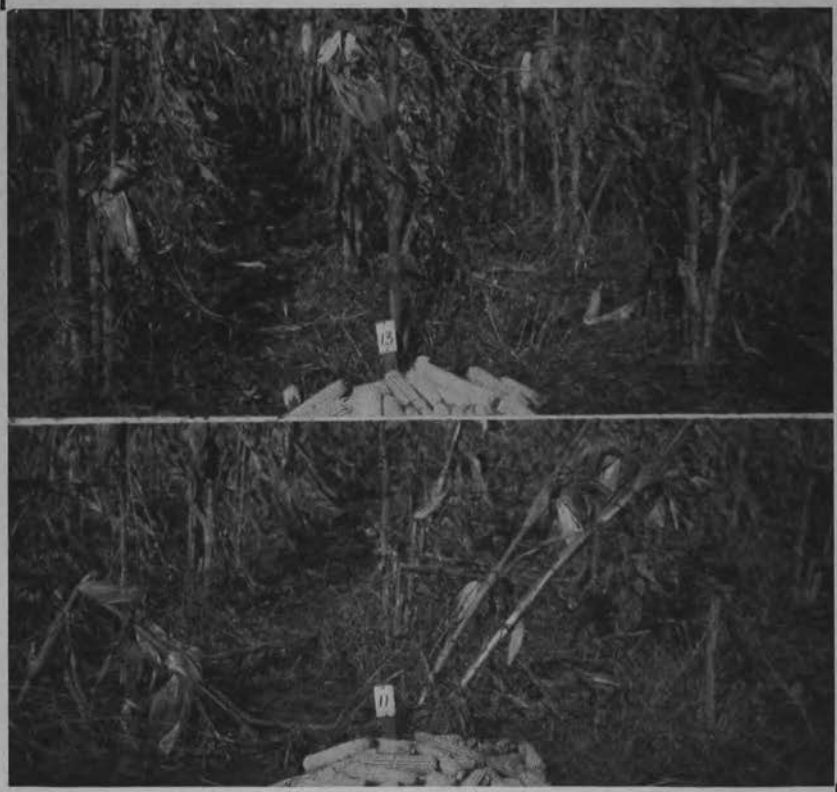
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# Commercial and Experiment Station Corn Yield Trials, 1941

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Ralph F. Crim



Not All Hybrids Have Good Standing Ability

AGRICULTURAL EXTENSION DIVISION  
UNIVERSITY OF MINNESOTA

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# Commercial and Experiment Station Corn Yield Trials, 1941

Ralph F. Crim<sup>1</sup>

**M**INNESOTA CONTINUES its march forward in corn production. Hybrid corn has replaced standard open-pollinated varieties to a very large extent. Approximately 75 to 80 per cent of the corn acreage in the main corn producing area of the state was planted with hybrid seed in 1941. Minnesota farmers have on the average planted approximately 4,500,000 acres to corn for the last 10 or 12 years. Corn is regarded as our greatest cereal crop. The corn producing area of the state lies largely in southern and central Minnesota. Many hybrids being sold to farmers are superior to open-pollinated varieties in yield, standing ability, and other characters. There are some hybrids which are inferior to standard open-pollinated varieties. Some late maturing hybrids are being grown that are not well adapted to locations where they have been distributed. Many farmers are confused with the large number of hybrids being offered under various names and numbers. The main objective in conducting field demonstration trials is to furnish farmers, seed producers, and others an opportunity to observe the various hybrids under comparable field conditions and to obtain reliable and direct information relative to yielding ability, adaptability, lodging resistance, disease reaction, and other factors. Important information may be gathered by making observations on the standing corn in the field in advance of the published results. Field observations are considered important as an aid in selecting suitable hybrids for locations and areas of the state.

Extension Service, the Minnesota Crop Improvement Association, commercial seed companies, county agents, farmers, and others interested played a very important part in conducting the trials. Local committees were organized by county agents including farmers, seed growers, elevator managers, and others. Local farmers and others assisted in planting, harvesting, and conducting field demonstration meetings. An entry fee was charged for each commercial entry.

Commercial and experiment station hybrids were planted in 1941 in 11 representative corn growing areas under the direction and leadership of the Division of Agronomy and Plant Genetics and the Agricultural Extension Service of the University of Minnesota.

## Cooperation and Plan Followed

The Division of Agronomy and Plant Genetics of the Minnesota Experiment Station, the Minnesota Agricultural

## Source of Seed

Seed of commercial hybrids entered by producers in the 1941 corn yield trials was collected from stocks which were being sold to farmers. Before

<sup>1</sup>The author expresses his appreciation of valuable help and suggestions from members of the Staff of the Division of Agronomy and Plant Genetics.

planting time a representative of the Minnesota Experiment Station collected seed from stocks in the hands of retail seed dealers, farmers, or other distributors. Seed was collected according to the convenience and discretion of the person in charge of assembling seed for the yield trials. Seed stocks of Minhybrid varieties and Wisconsin Experiment Station hybrids were furnished by the two experiment stations. Seed of experimental entries was secured directly from seed companies. An experimental entry is one that has not been sold previously in commercial quantities and it is indicated in this pamphlet in tables by an asterisk (\*).

### Locations

Eleven hybrid corn field demonstration trials were located in the north central, central, south central, and southern maturity zones. The trial in Clay County was conducted near the northern border of the county located in the north central zone where the growing season ranges from 89 to 95 days. In the central maturity zone, 96-102 days maturity, trials were conducted in Ottertail, Traverse, and Stearns counties. In the south central zone, 103-109 days average growing season, trials were conducted in Lac qui Parle, Lincoln, McLeod, and Dakota counties. Three trials were con-

### Identification and Source of Varieties

Name	Number of Entries	Source
Minhybrids .....	20	Minnesota Experiment Station, University Farm
Standard Varieties .....	5	Minnesota Experiment Station, University Farm
Wisconsin Hybrids .....	14	Wisconsin Experiment Station, Madison, Wisconsin
Master Hybrids .....	12	Farmer Seed & Nursery Co., Faribault, Minnesota
Kingscrot Hybrids .....	22	Northrup King & Co., Minneapolis, Minnesota
Iowearth Hybrids .....	7	Michael-Leonard Seed Co., Sioux City, Iowa
Pioneer Hi-Breds .....	8	Pioneer Hi-Bred Corn Co., Des Moines, Iowa
Reid-National Hybrids .....	12	Reid Hybrid Corn Co., Anamosa, Iowa
Funk's Hybrids .....	4	Funk Bros. Seed Co., Bloomington, Illinois
Turner Hybrids .....	5	Turner Hybrid Seed Corn Co., Grand Junction, Iowa
Pride Hybrids .....	12	Twin City Seed Co., Minneapolis, Minnesota
Vassar Hybrids .....	7	L. P. Vassar, Minneapolis, Minnesota
Jacques Proven Hybrids .....	25	Jacques Seed Co., Prescott, Wisconsin
Thompson Hybrids .....	3	Thompson Hybrid Corn Co., Belmond, Iowa
Pfister Hybrids .....	4	Thompson Hybrid Seed Co., Windom, Minnesota
Pfister Hybrids .....	3	Northern Seed Co., Belvidere, Illinois
Farmers Hybrids .....	3	Farmers Hybrid Seed Corn Co., Hampton, Iowa
Haapala's Hybrids .....	3	Levi Haapala & Sons, Dassel, Minnesota
Sundstrom's Hybrid .....	1	O. W. Sundstrom, Garden City, Minnesota
Farmer's Variety .....	1	Craigmile, Rix, and Slosser
Nicollet Co. Seed Exp. ....	1	Nicollet County Seed Co., St. Peter, Minnesota

One hundred and seventy-two entries were made. Five of these were standard open-pollinated varieties including the Haney strain of Minnesota 13, a very early strain; the Morris strain, a medium maturing strain; and the University Farm Minnesota 13, a later maturing strain; Golden King; and Murdock. A total of 167 hybrids were entered composed of 20 Minhybrids, 14 Wisconsin hybrids, and 133 commercial hybrids.

ducted in the southern maturity zone with 110-116 days average growing season, including Murray, Martin, and Winona counties.

### Rate of Planting and Stand

A good stand is a very important factor in securing high yields in corn production. Many farmers and investigators believe that a uniform rate of planting three seeds per hill is sufficient while others believe that more than three seeds per hill are needed. Two rates of planting have been carried out in all locations in the 1941 corn yield trials. All varieties were replicated six times, three of which were planted at the rate of three seeds per hill and three replicates were planted at the rate of four seeds per hill.

The yield as reported in the tables is an average of the six replicates. A summary table giving the results of the two rates of planting is found on page 32.

There is nearly always some loss of stand from the time that the corn emerges from the soil until harvest time. This is due to the condition of the soil at the time the plants are emerging, losses from cultivation and rodents, from inherent differences in seed, and other causes. The percentage of stand as published in this pamphlet is based on the number of plants remaining at harvest time and represents that per cent of a perfect stand of three or four plants per hill.

### Grown Under Farm Conditions

In all of these field trials, the trial plot was part of the cooperator's field of corn. A block of land was marked off and the corn planted so as to enable the operator to cross cultivate the trial plot the same as the rest of his field. Planting was done by hand. Each plot was three rows wide and 18 hills long. No replanting or thinning was

done during the season. Cooperating farmers followed their usual practices in caring for the corn on their farms.

### 1941 Corn Growing Season

The season as a whole was very favorable for corn. Planting was completed in all 11 locations in normal season at the time when most farmers were busily engaged in planting corn. For the most part the soil was in good physical condition and contained sufficient moisture to enable the seed to germinate rather quickly. In all locations the first part of the season was rather cool and the soil contained an abundant supply of moisture. Due to the cool weather, corn did not make rapid progress during the first few weeks. Frequent and heavy rains following planting delayed cultivation and resulted in a heavy growth of weeds. Through efficient cultivation weeds were well under control before corn was laid by. There was an abundance of moisture through the season with the exception of a critical period during the latter part of July and early August which was accompanied by a very severe heat wave.

The latter part of August, all of September, and early October were extremely favorable for ripening corn. Killing frosts occurred quite late in all of the 11 locations. Corn in the locations furthest north including Clay, Ottertail, and Traverse counties was not injured by frost until very late in September or early October. Earlier varieties in the south central and southern maturity zones were well matured before the first killing frost in October. The later maturing varieties ripened very nicely although the moisture content was high. Many varieties in all locations contained a high moisture content at harvest time. With the exception of Clay, Ottertail, and Traverse counties, harvesting was done when farmers were actively engaged in harvesting corn. Yet most

of the corn carried too much moisture for satisfactory storage when farmers normally would be harvesting.

### Identification of Varieties

All hybrids and open-pollinated varieties were entered in the records and planting plans by an entry number. Planting plans were filed in a vault at University Farm during the growing season. Field identification was indicated by a number written on a stake identifying each hybrid in the central row of each plot. Identification of varieties was made at field meetings held at harvest time by placing a large placard at each plot identifying the hybrid name and producer.

### Harvesting

Harvesting began in Clay County September 30 and was completed in Winona County October 23. Before harvest, field notes were taken recording the percentage stand, smutted plants, lodging, and other information. All of the corn from the central row of each plot was harvested and field weights recorded. A quantity of shelled corn from approximately 17 to 20 representative ears was taken in the field from each plot for a moisture determination. Yields have been computed and are recorded on a 14 per cent moisture basis. No corrections have been made for differences in stand. The per cent of stand is recorded for each entry in the tables.

### Method of Recording Lodging

Lodging is reported in per cent and degree. If one third or one half of the plants of a plot were leaning or were not standing straight, it was recorded in the field notes as 33 or 50 per cent lodged, respectively. The degree of lodging is reported in code form which expresses degrees from the perpendicular as indicated in figure 1. The de-

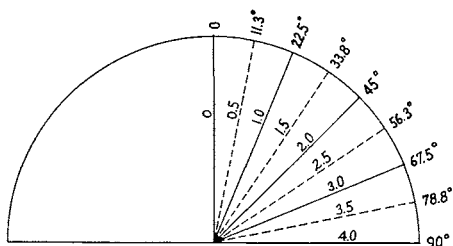


FIG. 1. CODE USED IN EXPRESSING DEGREE OF LODGING

gree of lodging indicates the extent or the degrees from perpendicular the plants were leaning. Where the plants were leaning 11.25 degrees it is expressed as 0.5. If the plants were leaning to the extent of 45 degrees, the degree of lodging is expressed as 2. This means that when lodging is expressed as 0.5 it is rather slight, while the code number 2, indicating 45 degrees, would be considered severe. As a general rule, farmers have little difficulty harvesting corn that is lodged with an index of 0.5 but have much difficulty when it lodges 45 to 67.5 degrees, expressed in code as 2 and 3, respectively. The use of the code in expressing the degree of lodging is more convenient in recording field notes than expressing in terms of degrees.

### Relation of Yield to Maturity Groups

A study of the yields in the higher yielding classes in the several maturity groups for the 11 locations indicates that yields in the later maturity groups are not higher than yields in the early groups. Growing conditions during the season of 1941 were generally favorable for later maturing varieties. Early varieties placing in Group I contained significantly less moisture at harvest time than those in later groups. Early varieties not only yielded well but also can be expected to mature in seasons less favorable than 1941, before the average killing frost in the fall. Another ad-



Table 1. High Yielding Variety and Per Cent Moisture by Maturity Groups, 1941

County	Group I Early		Group II Med. Early		Group III Med. Late		Group IV Late		Group V Very Late	
	Bu.	Per cent Moisture	Bu.	Per cent Moisture	Bu.	Per cent Moisture	Bu.	Per cent Moisture	Bu.	Per cent Moisture
Clay .....	44.3	29.8	45.8	34.0	41.5	35.6	49.7	37.3	.....	.....
Ottertail .....	66.5	32.5	66.3	36.6	67.9	38.6	70.4	39.7	.....	.....
Traverse .....	70.0	35.5	71.6	37.4	63.9	38.8	.....	.....	.....	.....
Stearns .....	57.8	30.3	61.3	32.7	66.8	34.6	59.7	36.3	.....	.....
Lac qui Parle .....	63.9	23.2	70.8	28.1	63.4	28.9	62.9	30.8	67.6	32.1
McLeod .....	64.7	24.0	68.1	29.1	62.3	30.9	60.8	32.9	.....	.....
Lincoln .....	74.3	21.9	75.5	24.2	73.8	25.4	66.0	26.8	64.9	28.3
Dakota .....	71.1	24.9	63.3	27.3	69.6	29.7	66.7	30.1	.....	.....
Murray .....	76.0	24.6	74.5	25.9	76.4	26.9	74.0	28.6	.....	.....
Martin .....	89.5	21.8	88.3	23.2	94.2	24.8	90.5	25.4	87.1	26.9
Winona .....	112.1	30.1	110.3	31.2	116.2	32.4	.....	.....	.....	.....

vantage in favor of early varieties is that harvesting can be completed in season before a heavy autumn snowfall. Still another important factor is the matter of satisfactory storage in the crib. Later varieties this year were not fit for storage in many instances by late October. Storage and marketing factors are more satisfactory with earlier varieties. Varieties in Group I are considered early and well adapted. Varieties in Group II are considered later than those in Group I and may not ripen satisfactorily in seasons of average or below average growing conditions. It should be kept in mind that the last five seasons have been more favorable than average. In table 1 is found the high yield and the per cent of moisture for the variety in the respective maturity group for each location.

### Maturity Zones

In order to place hybrids in areas of the state where they may be best adapted, it appears necessary to divide the state into maturity zones where climatic conditions, rainfall, length of growing season, and soil are such that will enable varieties of known maturity to be grown satisfactorily. Lines cannot be drawn arbitrarily across the state or sections of the state that will definitely place all communities or farms in a definite maturity zone.

Boundaries of the maturity zones are approximately correct for large areas of the state where the length of the growing season and growing conditions are similar. Within these zones varieties of similar maturity may be best adapted. Maturity zones have been made up on the basis of yield data gathered from many locations of the state over many years of testing plus information from weather records, rainfall, and soil types. A map of Minnesota showing maturity zones is found in figure 2.

### Analyzing Yield Trials

Satisfactory maturity is very important under Minnesota growing conditions. Well adapted varieties can be expected to mature satisfactorily in average growing seasons. Corn growers of Minnesota have not experienced a poor season since 1936. Conditions have been extremely favorable for ripening adapted varieties of corn for the past ten or more years. Late varieties have appeared to mature satisfactorily even though they contained a relatively large quantity of moisture at harvest time. Satisfactory maturity is of such importance in Minnesota that it seems desirable to divide hybrids at each location on a maturity basis. This division was made on the basis of the calculated level of significance for moisture content, which was

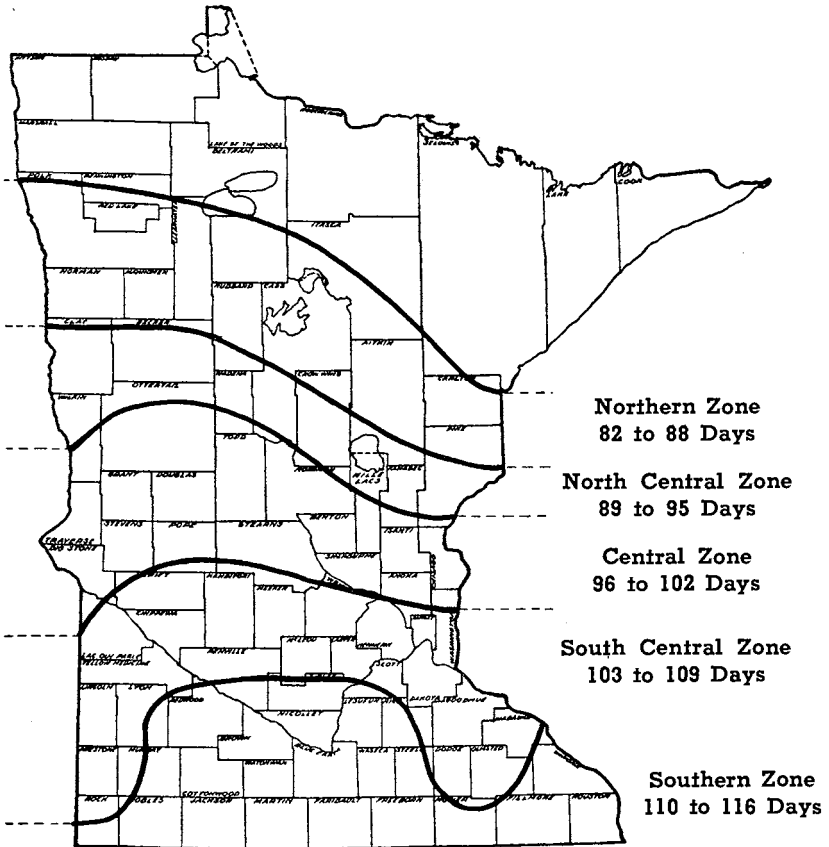


FIG. 2. ZONES INDICATE THE APPROXIMATE NUMBER OF DAYS GROWING SEASON THAT MAY BE EXPECTED FROM EMERGENCE AFTER PLANTING TO MATURITY, THE STAGE OF BEING WELL DENTED BEFORE A KILLING FROST

obtained by the analysis of variance and the use of two times the standard error of a difference. This value was added to the average moisture content of standard open-pollinated varieties and hybrids that are accepted as the standard for the locality which sets up the higher limit for moisture content in Group I. The moisture content for Group II is set up by adding the minimum level of significance for moisture content to the upper level of Group I. The odds are at least 19 to 1 that the hybrids in Group II had a significantly higher moisture content

than the average of the varieties and hybrids that had been accepted as a standard of comparison for each particular location.

The method may be illustrated for Martin County. The average per cent of moisture at the time of harvest of Minhybrids 404, 403, and Murdock in this trial was 20.4 per cent; adding 1.5, the minimum level of significance, gives 21.9 per cent, which was accepted as the upper limit of Group I in this county. Group II consisted of hybrids with a moisture content between 22.0 and 23.4 per cent, which

was obtained by adding 1.5 to 21.9 per cent, the upper limit of Group I. Groups III and IV were set up in a similar manner.

The calculated standard error of a difference in 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 in Group I sets up a limit for the lowest yield accepted belonging to the highest yielding class in Group I. The odds were at least 19 to 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 to 1 that varieties in class 1 do not differ significantly in yield. Hybrids in Groups II to IV for moisture content were similarly divided into classes for yielding ability.

The method of analysis for yielding ability is illustrated for the trial in Martin County. The highest yield for any hybrid in Group I was 89.5 bushels.

The minimum level of significance of 9.9 bushels for yield was subtracted from 89.5 which gave 79.6 bushels. Varieties in this group which yielded 79.6 bushels or more cannot be definitely differentiated from the highest yielding variety in the group. The odds are 19 to 1 that Minhybrid 405 yielded significantly more in this trial than a hybrid giving a yield of 78.1 bushels. Within each of the maturity groups a line is drawn separating those hybrids on which odds are 19 to 1 that they are significantly lower in yielding ability than the highest yielding hybrid of the group. In Group I in Martin County there are eight varieties that are significantly lower in yielding ability than Minhybrid 405.

Subtracting 9.9 bushels from 79.6 gives 69.7 bushels, the lowest yield accepted in class 2, Group I. There are two varieties that are placed in class 3, Group I, that have odds of at least 19 to 1 of being lower yielding than any variety which is placed in class 2, Group I.

#### Example—Setting up Maturity Groups and Yield Classes, Martin County

##### Moisture Grouping

Minhybrid 403 .....	19.0 per cent
Minhybrid 404 .....	21.8 per cent
Murdock .....	20.5 per cent
Average moisture, three varieties	20.4 per cent
Add minimum level of significance	1.5 per cent
<hr/>	
Group I includes varieties below ....	21.9 per cent
Add .....	1.5 per cent
<hr/>	
Group II includes varieties from	
22.0 to .....	23.4 per cent
Add .....	1.5 per cent
<hr/>	
Group III includes varieties from	
23.5 to .....	24.9 per cent
Add .....	1.5 per cent
<hr/>	
Group IV includes varieties from	
25.0 to .....	26.4 per cent
Add .....	1.5 per cent
<hr/>	
Group V includes varieties from	
26.5 to .....	27.9 per cent

##### Yield Classes Within Group I

High yielding variety .....	89.5 bushels
Subtract minimum level of	
significance .....	9.9 bushels
<hr/>	
Class 1—11 varieties .....	79.6 bushels
	to 89.5 bu.
Subtract .....	9.9 bushels
<hr/>	
Class 2—6 varieties .....	69.7 bushels
	to 79.6 bu.
Class 3—2 varieties below.....	69.7 bushels



## Summary of Three-Year Trials

**Y**IELD TRIALS conducted over several years are desirable as a means of selecting hybrids that are best adapted in a locality. Growers of hybrid corn can well afford to pay particular attention to varieties that have given a satisfactory performance in yield trials over a period of years. For these reasons three-year summary tables are presented for 1939 to 1941, inclusive, for seven locations.

### Methods Used

The methods used will be illustrated in some detail for Dodge, Mower, and Dakota counties, 1939 to 1941, table 2. Varieties or hybrids placed in Group I for moisture content at harvest for two years and in Group I or Group II for the third year were considered to mature satisfactorily in that locality. The minimum level of significance for moisture was calculated by using the

significant differences in moisture previously calculated for 1939, 1940, and 1941. These were 1.7, 2.3, and 2.6, respectively, the formula used being that for an average of averages or in this case

$$1/3 \sqrt{(1.7)^2 + (2.3)^2 + (2.6)^2},$$

which equals 1.3 per cent. The base moisture for Group I was obtained by calculating the average base moisture for Dodge, Mower, and Dakota counties for 1939, 1940, and 1941, which was found to be 24.0 per cent. Adding 1.3, the minimum level of significance for moisture, to 24.0 per cent equals 25.3 per cent, the highest moisture allowed in Group I. It will be noticed that these varieties are placed in a separate group in the table. Five varieties placed in Group I which seem to be well adapted to this section of the state. One variety fell in Group II which may be fairly well adapted in favorable

Table 2. Varieties Grown in Dodge County 1939, Mower County 1940, and Dakota County 1941

Variety	Yield, Bushels				Per Cent Moisture			
	1939	1940	1941	Av.	1939	1940	1941	Av.
<b>GROUP I</b>								
Minhybrid 301 .....	72.6	54.7	63.9	63.7	24.3	24.8	24.8	24.6
Pioneer Hi-Bred 355 .....	74.8	53.0	61.0	62.9	24.0	24.3	24.3	24.2
Reid-National Hybrid 95 .....	72.8	46.8	55.8	58.5	22.1	25.6	24.7	24.1
Golden King (Leitschuh) .....	69.1	43.4	47.7	53.4	23.1	23.4	24.0	23.5
Minn. 13 (U. Farm) .....	58.4	44.7	48.2	50.4	24.1	24.4	24.6	24.4
<b>GROUP II</b>								
Turner E4 .....	75.0	49.3	58.7	61.0	23.0	28.3	25.8	25.7
<b>GROUP III</b>								
Reid-National Hybrid 110 .....	76.1	48.4	54.2	59.6	24.4	27.0	28.8	26.7
Minimum level of significance for yield—4.6 bushels; moisture—1.3 per cent								

Table 3. Varieties Grown in Ottertail County 1939, Pope County 1940, and Ottertail County 1941

Variety	Yield, Bushels				Per Cent Moisture			
	1939	1940	1941	Av.	1939	1940	1941	Av.
<b>GROUP I</b>								
Minhybrid 401 .....	52.6	54.3	61.9	56.3	29.1	30.9	34.8	31.6
Minn. 13 (Morris) .....	49.9	43.5	46.7	46.7	28.9	34.4	36.3	33.2
<b>GROUP II</b>								
Kingscrost D4 (97 day) .....	43.3	51.0	59.0	51.1	33.9	37.3	37.3	36.2
Minimum level of significance for yield—4.2 bushels; moisture—1.5 per cent								

Table 4. Varieties Grown in Meeker County 1939 and McLeod County 1940 and 1941

Variety	Yield, Bushels.				Per Cent Moisture			
	1939	1940	1941	Av.	1939	1940	1941	Av.
<b>GROUP I</b>								
Kingscrot D (100 day).....	81.9	65.4	56.7	68.0	23.1	27.4	25.8	25.4
Reid-National Hybrid 95.....	80.7	59.9	50.9	63.8	20.8	29.2	26.7	25.6
Minn. 13 (U. Farm).....	77.9	55.9	56.5	63.4	21.7	28.0	25.5	25.1
Golden King (Leitschuh).....	67.0	55.7	44.9	55.9	20.6	29.1	25.9	25.2
<b>GROUP II</b>								
Pioneer Hi-Bred 355.....	73.2	68.9	53.2	65.1	27.9	30.8	26.2	28.3
Minimum level of significance for yield—4.9 bushels; moisture—1.7 per cent								

Table 5. Varieties Grown in Yellow Medicine County 1939 and Lincoln County 1940 and 1941

Variety	Yield, Bushels				Per Cent Moisture			
	1939	1940	1941	Av.	1939	1940	1941	Av.
<b>GROUP I</b>								
Minhybrid 301.....	82.2	62.0	64.6	69.6	16.8	25.7	20.5	21.0
Pioneer Hi-Bred 355.....	75.9	62.7	59.0	65.9	18.2	26.2	20.9	21.8
Wisconsin 460 (100 day).....	78.0	49.4	57.4	61.6	18.9	25.3	22.6	22.3
Golden King (Leitschuh).....	70.2	53.6	51.3	58.4	16.7	23.1	20.9	20.2
Minn. 13 (U. Farm).....	69.0	47.7	55.2	57.3	18.8	25.3	22.9	22.3
Minimum level of significance for yield—4.8 bushels; moisture—1.3 per cent								

Table 6. Varieties Grown in Nobles County 1939 and 1940 and Murray County 1941

Variety	Yield, Bushels				Per Cent Moisture			
	1939	1940	1941	Av.	1939	1940	1941	Av.
<b>GROUP I</b>								
Iowearth AP.....	99.7	67.6	71.9	79.7	20.4	29.3	24.4	24.7
Turner E4.....	106.1	65.0	67.2	79.4	18.7	30.4	22.9	24.0
Minhybrid 301.....	105.0	68.7	64.2	79.3	16.7	26.4	22.4	21.8
Pioneer Hi-Bred 355.....	106.0	67.1	62.5	78.5	17.2	27.3	22.4	22.3
Reid-National Hybrid 110.....	110.3	63.7	59.9	77.9	18.4	29.7	26.9	25.0
Minhybrid 403.....	96.6	60.9	57.1	71.5	18.8	28.5	23.4	23.6
<b>GROUP II</b>								
Iowearth A.....	112.9	62.0	69.2	81.4	21.4	32.1	24.8	26.1
Funk's Hybrid G-7.....	108.4	60.9	68.4	79.2	22.6	31.2	25.9	26.6
<b>GROUP III</b>								
Pioneer Hi-Bred 322.....	121.0	69.8	69.7	86.8	22.8	35.3	26.3	28.1
Minimum level of significance for yield—5.3 bushels; moisture—1.8 per cent								

seasons. There is one variety in Group III which may be considered late for this locality.

A minimum level of significance for differences in yielding ability was calculated by using the significant differences in yielding ability previously calculated for 1939, 1940, and 1941. These were 7.3, 7.4, and 9.1 bushels, respectively, the formula used being

that for an average of averages or in this case

$$1/3\sqrt{(7.3)^2+(7.4)^2+(9.1)^2},$$

which equals 4.6 bushels. The odds are 19 to 1 that varieties or hybrids differing in yield by an average of 4.6 bushels are significantly different in yielding ability. Subtracting this value, 4.6 bushels, from the highest yielding

hybrid in Group I, Minhybrid 301, with an average yield of 63.7 bushels, gives a value of 59.1 bushels and places two hybrids in Group I in the high yielding class. There is one hybrid in Group II

and one hybrid in Group III. Tables 2-8 give average yields and average moisture content for a three-year period for seven representative corn growing areas of the state.

Table 7. Varieties Grown in Watonwan County 1939 and Martin County 1940 and 1941

Variety	Yield, Bushels				Per Cent Moisture			
	1939	1940	1941	Av.	1939	1940	1941	Av.
<b>GROUP I</b>								
Minhybrid 301 .....	94.0	56.6	79.6	76.7	14.8	21.2	18.5	18.2
Pioneer Hi-Bred 355 .....	91.9	58.7	76.5	75.7	15.2	21.8	19.2	18.7
Minhybrid 403 .....	87.4	52.2	76.9	72.2	16.4	22.9	19.0	19.4
<b>GROUP II</b>								
lowealth AP .....	85.8	69.3	79.8	78.3	17.7	23.0	20.7	20.5
<b>GROUP III</b>								
Pfister 274 .....	99.0	72.0	83.3	84.8	18.5	24.3	22.3	21.7
lowealth A .....	99.2	66.7	81.6	82.5	17.7	25.8	21.9	21.8
Reid-National Hybrid 110A <sub>1</sub> .....	95.2	62.3	80.2	79.2	16.7	25.4	22.3	21.5
<b>GROUP IV</b>								
Pioneer Hi-Bred 322 .....	92.4	72.8	86.9	84.3	18.8	27.5	22.9	23.1
Funk's Hybrid G-7 .....	98.1	52.4	84.1	78.2	19.1	24.8	23.4	22.4
<b>GROUP V</b>								
Pfister 266 .....	93.3	70.2	85.9	83.1	21.7	27.8	23.6	24.4
Minimum level of significance for yield—5.1 bushels; moisture—.9 per cent								

Table 8. Varieties Grown in Houston County 1939 and Winona County 1940 and 1941

Variety	Yield, Bushels				Per Cent Moisture			
	1939	1940	1941	Av.	1939	1940	1941	Av.
<b>GROUP I</b>								
Reid-National 110 .....	82.7	87.2	91.4	87.1	20.9	25.3	31.5	25.9
Pioneer Hi-Bred 355 .....	81.1	81.5	95.1	85.9	19.8	23.8	28.2	23.9
Minhybrid 301 .....	77.2	79.9	94.4	83.8	19.6	24.4	28.5	24.2
Minhybrid 403 .....	74.9	78.0	95.2	82.7	19.7	25.6	29.3	24.9
<b>GROUP II</b>								
lowealth A .....	87.1	80.3	105.1	90.8	22.6	29.4	30.7	27.6
<b>GROUP III</b>								
Pioneer Hi-Bred 322 .....	93.0	89.0	110.1	97.4	23.9	29.5	31.8	28.4
Minimum level of significance for yield—5.4 bushels; moisture—.9 per cent								

## Summary of Four-Year Trials

**YIELDS HAVE BEEN** conducted for four years, 1938 to 1941, inclusive, in five representative corn growing areas of the state, including: 1. Meeker and McLeod; 2. Goodhue, Dodge, Mower, and Dakota; 3. Rock, Nobles, and Murray; 4. Cottonwood, Watonwan, Martin; and 5. Houston and Winona counties.

The method used is illustrated for Rock, Nobles, and Murray counties for 1938 to 1941, table 11. Varieties placed in Group I for three years and in Group I or II the fourth year were considered well adapted in their locality. The minimum level of significance for moisture was calculated by using the significant differences in moisture previously calculated for each of the years 1938, 1939, 1940, and 1941. These were 1.5, 4.1, 3.2, and 1.5 per cent, respectively, the formula used being that for an average of averages or in this case

$$1/4\sqrt{(1.5)^2+(4.1)^2+(3.2)^2+(1.5)^2},$$

which equals 1.4 per cent. The base moisture for Group I was obtained by calculating the average base moisture for Rock, Nobles, and Murray counties for 1938 to 1941, which was found to be 22.6 per cent. Adding 1.4, the minimum level of significance for moisture, to 22.6, equals 24.0, the highest moisture allowed in Group I. These varieties are placed in a separate group in the table. Five varieties fall in Group I, two varieties in Group II, and a third variety in Group III. The minimum level of significance for differences in yielding ability was calculated by using the significant differences in yielding ability previously calculated for the years 1938, 1939, 1940, and 1941. These were 6.7, 7.2, 11.5, and 8.3 bushels, respectively. The formula used was that for an average of averages being

$$1/4\sqrt{(6.7)^2+(7.2)^2+(11.5)^2+(8.3)^2},$$

which equals 4.3 bushels. The odds are

**Table 9. Varieties Grown in Meeker County 1938 and 1939 and McLeod County 1940 and 1941**

Variety	Yield, Bushels					Per Cent Moisture				
	1938	1939	1940	1941	Av.	1938	1939	1940	1941	Av.
<b>GROUP I</b>										
Reid-National Hybrid 95.....	56.4	80.7	59.9	50.9	61.9	42.7	20.8	29.2	26.7	29.9
Minn. 13 (U. Farm).....	47.4	77.9	55.9	56.5	59.4	43.2	21.7	28.0	25.5	29.6
Minimum level of significance for yield—4.6 bushels; moisture—1.5 per cent										

**Table 10. Varieties Grown in Goodhue County 1938, Dodge County 1939, Mower County 1940, and Dakota County 1941**

Variety	Yield, Bushels					Per Cent Moisture				
	1938	1939	1940	1941	Av.	1938	1939	1940	1941	Av.
<b>GROUP I</b>										
Minhybrid 301 .....	65.2	72.6	54.7	63.9	64.1	35.5	24.3	24.8	24.8	27.4
Reid-National Hybrid 95.....	61.4	72.8	46.8	55.8	59.2	31.7	22.1	25.6	24.7	26.2
Minn. 13 (U. Farm).....	48.6	58.4	44.7	48.2	49.9	35.7	24.1	24.4	24.6	27.2
<b>GROUP II</b>										
Turner E4 .....	70.2	75.0	49.3	58.7	63.3	38.4	23.0	28.3	25.8	28.9
<b>GROUP III</b>										
Reid-National Hybrid 110..	59.3	76.1	48.4	54.2	59.5	36.7	24.4	27.0	28.8	29.2
Minimum level of significance for yield—3.9 bushels; moisture—1.1 per cent										

19 to 1 that varieties differing in yield by an average of 4.3 bushels are significantly different in yielding ability. Subtracting 4.3 from the highest yielding hybrid in Group I, Iowearth AP, with an average yield of 83.4 bushels, equals 79.1 bushels. The odds are at

least 19 to 1 that Iowearth AP yielded significantly more than other varieties in Group I.

Tables 9-13 give average yield and average moisture content for a four-year period for five representative corn growing areas of the state.

Table 11. Varieties Grown in Rock County 1938, Nobles County 1939 and 1940, and Murray County 1941

Variety	Yield, Bushels					Per Cent Moisture				
	1938	1939	1940	1941	Av.	1938	1939	1940	1941	Av.
<b>GROUP I</b>										
Iowearth AP .....	94.3	99.7	67.6	71.9	83.4	21.9	20.4	29.3	22.4	23.5
Pioneer Hi-Bred 355.....	80.3	106.0	67.1	62.5	78.9	20.7	17.2	27.3	22.4	21.9
Minhybrid 301 .....	77.2	105.0	68.7	64.2	78.8	20.2	16.7	26.4	22.4	21.4
Turner E4 .....	75.1	106.1	65.0	67.2	78.4	22.3	18.7	30.4	22.9	23.6
Minhybrid 403 .....	81.7	96.6	60.9	57.1	74.8	20.2	18.8	28.5	23.4	22.7
<b>GROUP II</b>										
Iowearth A .....	79.7	112.9	62.0	69.2	80.9	22.8	21.4	32.1	24.8	25.3
Reid-National Hybrid 110..	76.8	110.3	63.7	59.9	77.7	22.1	18.4	29.7	26.9	24.3
<b>GROUP III</b>										
Funk's Hybrid G-7.....	75.7	108.4	60.9	68.4	78.4	24.9	22.6	31.2	25.9	26.2
Minimum level of significance for yield—4.3 bushels; moisture—1.4 per cent										

Table 12. Varieties Grown in Cottonwood County 1938, Watonwan County 1939, and Martin County 1940 and 1941

Variety	Yield, Bushels					Per Cent Moisture				
	1938	1939	1940	1941	Av.	1938	1939	1940	1941	Av.
<b>GROUP I</b>										
Iowearth A .....	54.2	99.2	66.7	81.6	75.4	22.2	17.7	25.8	21.9	21.9
Minhybrid 301 .....	59.6	94.0	56.6	79.6	72.5	26.0	14.8	21.2	18.5	20.1
Pioneer Hi-Bred 355.....	61.6	91.9	58.7	76.5	72.2	26.8	15.2	21.8	19.2	20.8
Minhybrid 403 .....	54.9	87.4	52.2	76.9	67.9	30.1	16.4	22.9	19.0	22.1
<b>GROUP II</b>										
Iowearth AP .....	70.5	85.8	69.3	79.8	76.4	29.8	17.7	23.0	20.7	22.8
<b>GROUP III</b>										
Funk's Hybrid G-7.....	51.5	98.1	52.4	84.1	71.5	31.6	19.1	24.8	23.4	24.7
Minimum level of significance for yield—4.2 bushels; moisture—.9 per cent										

Table 13. Varieties Grown in Houston County 1938 and 1939 and Winona County 1940 and 1941

Variety	Yield, Bushels					Per Cent Moisture				
	1938	1939	1940	1941	Av.	1938	1939	1940	1941	Av.
<b>GROUP I</b>										
Pioneer Hi-Bred 355.....	78.4	81.1	81.5	95.1	84.2	33.6	19.8	23.8	28.2	26.4
Minhybrid 403 .....	75.2	74.9	78.0	95.2	80.8	34.6	19.7	25.6	29.3	27.3
Minhybrid 301 .....	69.2	77.2	79.9	94.4	80.2	33.1	19.6	24.4	28.5	26.4
<b>GROUP II</b>										
Reid-National Hybrid 110..	78.5	82.7	87.2	91.4	84.9	36.3	20.9	25.3	31.5	28.5
<b>GROUP III</b>										
Iowearth A .....	70.2	87.1	80.3	105.1	85.7	36.9	22.6	29.4	30.7	29.9
Minimum level of significance for yield—5.0 bushels; moisture—.9 per cent										



## Results of 1941 Trials

**R**ESULTS of the 1941 yield trials are given in tables 14 through 24, beginning with Clay County, the furthest north, located in the north central zone; and following with Ottertail, Traverse, and Stearns in the central zone; Lac qui Parle, Lincoln, McLeod, and Dakota in the south central zone; and Murray, Martin, and Winona in the southern zone.

### Clay County

The trial was conducted on the Ralph Slosser farm near the village of Felton in the north central part of Clay County. This is near the northern border of the north central maturity zone. Soil and growing conditions are almost the same as in the southern half of the northern zone. Early varieties in this location may be well adapted to the northern zone. In this general location early maturity is extremely important. The Haney strain of Minnesota 13, a very early strain, has matured satisfactorily in this location for many years and is considered well adapted. Minhybrids 402 and 700 are as early as or earlier than Minnesota 13 (Haney). Varieties of similar maturity to these three are well adapted to this location.

**Group I.**—The average per cent of moisture of Minhybrids 402 and 700 and Minnesota 13 (Haney) has been taken as a base for setting up maturity groups in this location. The average per cent of moisture of these three varieties was 31.8 per cent. Adding 1.7, the minimum level of significance for moisture, to 31.8 equals 33.5, the highest moisture content allowed in this group. There are 22 varieties in this group which are as early as Minhybrids 402 and 700 and Minnesota 13 (Haney).

The minimum level of significance for differences in yield is 7.9 bushels. Subtracting 7.9 from 44.3 bushels, the yield of Minhybrid 402, the highest yielding hybrid, there are 17 hybrids that fall in a higher yielding class, indicated by a line drawn between Twin City Pride B3 and Minhybrid 700.

**Group II.**—There are four hybrids in this group that contained significantly more moisture at harvest time than those in Group I and are considered later. The range in moisture is 33.9 to 34.8 per cent. The highest yielding hybrid in this group is not significantly higher than the highest yielding hybrid in Group I.

There are four hybrids in Group III and two hybrids in Group IV which appear to be too late for this location.

### Ottertail County

The trial was conducted on the Martin Bergerud farm about 11 miles south and one mile west of Fergus Falls, in the southwest part of the county near the Grant and Wilkin county lines. This is in the northern part of the central zone. In this general locality hybrids of the same maturity as the Morris strain of Minnesota 13 and Minhybrid 401 have matured satisfactorily for many years. The Morris strain of Minnesota 13 has been considered well adapted.

**Group I.**—The average per cent of moisture of Minhybrids 401 and 602 and Minnesota 13 (Morris strain) has been taken as a base for setting up maturity groups in this location. The average per cent of moisture of these three varieties was 35.3 per cent. Adding 1.1, the minimum level of significance for moisture, to 35.3 equals 36.4, the highest moisture allowed in this group. There are 23 hybrids in this

group. There are eight hybrids in this group which contained significantly less moisture at harvest than the base moisture of 35.3 per cent, which would put them in still an earlier group. These early varieties may be well adapted in the southern part of the north central zone. Earlier hybrids have compared favorably in yield with late hybrids in this location.

The minimum level of significance for differences in yield is 7.6 bushels. Subtracting 7.6 from 66.5 bushels, the highest yielding variety, gives 58.9

bushels and places six varieties in a higher yielding class, indicated by a line drawn between Jacques Proven Hybrid 800 and Master Hybrid F40. Three varieties fall in class 4 for yielding ability in this group.

**Groups II, III, and IV.**—There are seven varieties in Group II that contained significantly more moisture at harvest time than Group I, which are considered later and can be expected to mature in favorable seasons. There is one hybrid each in Groups III and IV which is considered very late for

Table 14. Clay County Yield Trial Conducted on Ralph Slosser Farm, Felton, Harvested September 30, 1941

Variety	Average yield bu. per acre 14 per cent moisture	Average per cent moisture	Average per cent stand	Lodging		Average number broken stalks	Average number smutted plants
				Per cent	Degree		
<b>GROUP I</b>							
Minhybrid 402 .....	44.3	29.8	94.6	74.3	.7	0.0	.2
Vassar Wisconsin 279 .....	43.9	32.6	93.1	37.7	.5	.5	.7
Minhybrid 601 .....	43.3	33.3	93.2	24.3	.5	1.0	.2
Twin City Pride D4 .....	42.4	32.4	88.7	44.3	.5	1.3	.8
Jacques Proven Hybrid 801 .....	42.3	32.8	95.6	42.3	.5	.5	2.3
Minhybrid 800 .....	42.3	31.5	86.9	44.2	.5	2.8	.8
Minhybrid 600 .....	41.5	32.4	95.3	46.8	.5	1.5	.5
Jacques Proven Hybrid 800 .....	41.5	32.8	95.3	51.5	.6	.3	1.0
Jacques Proven Hybrid 802 .....	40.0	28.0	86.1	39.5	.5	3.3	.2
*Kingscrot 125 .....	39.8	33.5	91.9	84.8	.8	.5	5.2
Minhybrid 701 .....	39.7	31.0	92.3	51.5	.5	1.8	1.5
*Master Hybrid F40 .....	39.2	33.1	88.4	42.3	.5	.5	2.2
Wisconsin 275 .....	38.9	32.6	87.6	40.5	.5	1.3	1.0
Minhybrid 702 .....	36.9	33.2	88.1	44.2	.5	1.2	1.2
Kingscrot E10 (85 day) .....	36.8	30.0	91.8	64.3	.8	1.7	2.8
Wisconsin 279 .....	36.6	32.5	86.6	54.3	.5	.2	1.7
Twin City Pride B3 .....	36.6	33.5	92.5	50.0	.5	0.0	3.0
Minhybrid 700 .....	34.8	31.6	88.4	30.5	.5	3.0	.5
Master Hybrid F20 .....	34.1	32.0	90.7	55.3	.6	1.7	1.3
Vassar 100 .....	33.7	29.5	93.6	56.2	.5	1.2	1.0
Kingscrot E (90 day) .....	33.7	29.7	94.6	62.8	.6	1.3	3.7
Golden Glow (Slosser) .....	33.4	33.4	85.9	90.5	1.2	1.0	3.2
<b>GROUP II</b>							
Iowearth 90 .....	45.8	34.0	88.5	73.7	.7	.2	2.3
*Minhybrid 2 (Exp.) .....	37.5	33.9	82.6	19.5	1.4	.3	.7
Minn. 13 (Haney's) .....	35.4	34.1	89.4	89.7	1.0	1.2	4.3
*Kingscrot KE119 (119) .....	21.9	34.8	92.7	44.0	.5	1.0	8.0
<b>GROUP III</b>							
Kingscrot A6 (95 day) .....	41.5	35.6	94.4	68.3	.5	.5	5.8
Twin City Pride B17 .....	40.8	35.9	89.9	51.8	.5	.2	3.8
Reid-National 90 .....	36.5	35.8	83.9	41.7	.5	.2	4.3
Jacques Proven Hybrid 904 .....	31.5	35.5	90.1	48.8	.5	.2	5.3
<b>GROUP IV</b>							
*Pioneer Hi-Bred 365 .....	49.7	37.3	96.5	60.8	.6	.2	2.3
*Pioneer Hi-Bred 8334 .....	48.3	37.7	93.6	42.7	.5	.3	1.3
Minimum level of significance .....	7.9	1.7					

\* Experimental variety not in commercial production.

**Table 15. Ottertail County Yield Trial Conducted on Martin Bergerud Farm, Fergus Falls, Harvested October 1, 1941**

Variety	Average yield bu. per acre 14 per cent moisture	Average per cent moisture	Average per cent stand	Lodging		Average number broken stalks	Average number smutted plants
				Per cent	Degree		
<b>GROUP I</b>							
Twin City Pride B3	66.5	32.5	90.2	63.5	.8	0.0	2.2
Vassar Wisconsin 279	64.6	33.5	88.1	52.0	.5	0.0	2.0
Minhybrid 602	63.8	34.7	87.6	11.8	.4	.2	2.8
Minhybrid 401	62.0	34.8	88.6	83.0	1.0	.3	2.8
Minhybrid 600	61.2	33.7	87.3	21.0	.5	.7	.7
Jacques Proven Hybrid 800	59.0	34.4	90.7	62.7	.9	0.0	2.0
*Master Hybrid F40	57.5	32.7	86.5	65.2	.8	.3	2.8
Minhybrid 601	57.3	33.7	91.3	44.5	.7	.3	2.2
Jacques Proven Hybrid 801	57.2	33.6	91.3	44.2	.6	.3	4.5
Wisconsin 355	56.6	36.1	95.0	39.3	.6	0.0	3.5
Iowearth 90	56.6	35.4	88.6	55.3	.7	0.0	5.7
Minhybrid 603	55.0	36.4	84.9	6.5	.3	0.0	1.5
Kingscrot A6 (95 day)	53.4	35.6	87.3	61.8	.9	0.0	3.7
Twin City Pride B17	52.9	34.9	89.7	43.2	.6	0.0	4.0
Minhybrid 501	52.2	35.2	73.5	3.7	.2	.2	1.3
Reid-National 90	52.0	35.6	82.8	49.0	.6	0.0	3.3
Jacques Proven Hybrid 902	49.9	36.2	90.7	34.5	.5	0.0	4.3
Wisconsin 330	47.9	34.8	86.8	30.7	.6	.2	3.2
Minn. 13 (Morris)	46.7	36.3	87.8	84.8	1.2	0.0	3.5
*Kingscrot KA3	45.0	33.3	90.7	46.0	.7	.3	4.0
Wisconsin 404	43.6	35.8	92.3	21.7	.5	0.0	3.5
Vassar Wisconsin 355	42.4	36.3	92.9	14.3	.5	0.0	2.7
*Kingscrot KE119 (119)	38.8	33.9	92.1	50.2	.6	.2	4.8
<b>GROUP II</b>							
Minhybrid 604	66.3	36.6	91.0	3.8	.3	0.0	1.7
*Pioneer Hi-Bred 365	64.1	36.5	93.4	33.5	.6	.2	3.5
*Kingscrot KA1	62.3	37.1	89.7	25.0	.4	0.0	2.5
Minhybrid 500	61.2	37.3	85.2	6.7	.4	.2	2.0
Kingscrot D4 (97 day)	59.0	37.3	87.0	32.8	.5	.2	5.7
Wisconsin 350	43.4	36.7	91.8	28.0	.5	.2	3.5
Jacques Proven Hybrid 1003	42.1	37.4	87.8	17.8	.5	0.0	4.2
<b>GROUP III</b>							
*Pioneer Hi-Bred 367	67.9	38.6	93.1	21.3	.5	0.0	3.7
<b>GROUP IV</b>							
*Iowearth 100	70.4	39.7	94.2	22.3	.4	0.0	3.7
Minimum level of significance	7.6	1.1					

\* Experimental variety not in commercial production.

this location. Later hybrids have not yielded significantly higher than earlier varieties in this location.

**Traverse County**

The trial was located just a little east of Wheaton on the Arthur Krumweide farm approximately in the center of the county. This location is in the south and western part of the central zone where the Morris strain of Minnesota 13 and Minhybrid 401 are

known to mature satisfactorily in average seasons. These varieties may be considered a little too early in exceptionally favorable seasons in this location.

**Group I.**—The average per cent of moisture of Minhybrids 401 and 602 and Minnesota 13 (Morris strain) has been taken as a base for setting up maturity groups in this location. The average per cent of moisture of these three varieties was 34.3 per cent. Adding 1.6, the minimum level of signifi-

cance for moisture, to 34.3 equals 35.9, the highest moisture allowed in this group. There are 23 hybrids in this group, of which three contained significantly less moisture at harvest than the base moisture of 34.3 which would place them in still an earlier group. Earlier hybrids in this group have compared favorably in yield with later hybrids in this location.

The minimum level of significance for differences in yield is 11.4 bushels. Subtracting 11.4 from 70.0 bushels, the

highest yielding variety, there are 13 varieties that fall in a higher yielding class, indicated by a line drawn between Vassar 172 and Master Hybrid F60. There are nine hybrids that fall in class 2 for yielding ability in Group I.

**Groups II and III.**—There are 10 hybrids that were significantly higher in moisture at harvest which are considered later than Group I. The 10 varieties in Group II may be expected to mature satisfactorily in very favorable seasons. There is one variety in

Table 16. Traverse County Yield Trial Conducted on Arthur Krumweide Farm, Wheaton, Harvested October 3, 1941

Variety	Average yield bu. per acre 14 per cent moisture	Average per cent moisture	Average per cent stand	Lodging		Average number broken stalks	Average number smutted plants
				Per cent	Degree		
<b>GROUP I</b>							
*Pioneer Hi-Bred 365.....	70.0	35.5	90.5	2.8	.2	.2	5.3
*Kingscrot KA1 .....	67.6	35.7	88.6	2.8	.1	.5	3.8
Kingscrot D4 (97 day).....	66.4	35.3	76.5	1.0	.1	.5	4.8
Minhybrid 602 .....	64.6	35.2	75.4	1.0	.1	.2	3.2
Vassar 170 .....	64.5	35.4	81.7	0.0	0.0	0.0	5.2
Minhybrid 603 .....	64.3	34.7	84.7	0.0	0.0	0.0	4.2
Jacques Proven Hybrid 800.....	62.7	31.7	85.7	1.8	.1	0.0	3.3
Twin City Pride B17.....	62.0	33.9	80.7	1.0	.1	0.0	5.7
Vassar 171 .....	62.0	35.2	74.6	0.0	0.0	.2	4.0
Wisconsin 355 .....	61.9	34.5	89.7	1.8	.1	.3	6.7
Minhybrid 500 .....	59.5	35.8	76.5	0.0	0.0	.2	2.3
Minhybrid 601 .....	59.4	32.4	86.2	0.0	0.0	.2	2.5
Vassar 172 .....	58.6	34.7	68.3	0.0	0.0	.2	3.3
*Master Hybrid F60.....	58.5	34.2	85.7	1.0	.1	.3	6.3
Twin City Pride D32.....	58.0	34.8	80.4	1.0	.1	.2	4.7
Minhybrid 501 .....	57.8	33.2	67.7	0.0	0.0	.2	1.2
Minhybrid 600 .....	57.4	31.9	82.0	1.8	.1	0.0	2.7
Iowealth 90 .....	57.2	33.5	79.1	1.8	.1	.2	7.0
Minhybrid 401 .....	55.8	32.9	83.9	2.9	.1	0.0	5.0
Minn. 13 (Morris) .....	53.8	34.9	88.9	12.0	.4	.3	6.0
Wisconsin 350 .....	51.3	34.4	87.0	0.0	0.0	0.0	8.0
Jacques Proven Hybrid 955.....	48.3	34.9	81.0	2.0	.2	.2	6.3
Wisconsin 330 .....	45.4	34.3	80.0	0.0	0.0	0.0	4.0
<b>GROUP II</b>							
*Kingscrot KS7 .....	71.6	37.4	84.9	2.0	.2	0.0	5.2
Kingscrot KN2 .....	68.1	36.4	83.6	1.0	.1	0.0	6.5
Minhybrid 604 .....	67.1	37.1	85.7	0.0	0.0	0.0	5.2
*Pioneer Hi-Bred 367.....	66.4	36.4	84.7	0.0	0.0	.2	6.0
Kingscrot KS2 .....	63.4	36.1	84.4	0.0	0.0	.7	5.2
Reid-National 95 .....	63.1	36.7	85.4	1.8	.1	0.0	2.8
Reid-National 98 .....	61.0	37.5	81.2	1.0	.1	.2	8.8
Jacques Proven Hybrid 1050.....	51.0	37.1	85.7	3.7	.2	.2	7.2
Jacques Proven Hybrid Wis. 455	46.9	37.3	79.4	0.0	0.0	.2	6.8
Wisconsin 404 .....	43.1	36.4	86.2	0.0	0.0	.2	7.7
<b>GROUP III</b>							
*Iowealth 100 .....	63.9	38.8	83.6	0.0	0.0	0.0	6.8
Minimum level of significance.....	11.4	1.6					

\* Experimental variety not in commercial production.

Table 17. Stearns County Yield Trial Conducted on Joe Meyer Farm, Melrose,  
Harvested October 9, 1941

Variety	Average yield bu. per acre 14 per cent moisture	Average per cent moisture	Average per cent stand	Lodging		Average number broken stalks	Average number smutted plants
				Per cent	Degree		
<b>GROUP I</b>							
Minhybrid 602 .....	57.8	30.3	84.9	46.0	.5	7.7	1.8
Minhybrid 603 .....	57.0	32.1	89.2	32.5	.5	5.3	2.7
Minhybrid 601 .....	55.6	27.3	91.8	55.3	.6	5.0	1.8
Wisconsin 355 .....	54.7	30.9	90.2	46.2	.6	3.0	3.2
Jacques Proven Hybrid 955.....	53.8	31.1	92.1	32.2	.5	1.7	3.8
Twin City Pride B17.....	51.6	31.1	91.8	57.8	.7	2.7	6.0
Minhybrid 401 .....	51.3	30.3	90.7	73.7	.8	2.3	1.8
*Master Hybrid F60.....	51.2	30.6	91.8	60.0	.7	2.8	3.7
Vassar Wisconsin 355.....	50.8	31.7	92.3	28.7	.4	1.0	1.7
Minhybrid 501 .....	50.5	29.7	76.7	24.8	.5	1.3	.5
Minn. 13 (Morris).....	49.0	31.6	83.1	77.5	.9	3.7	3.5
Iowealth 90 .....	47.4	27.9	85.2	60.7	.8	.5	6.0
*Kingscrot KA3 .....	46.0	26.8	92.3	55.3	.8	1.2	6.8
Jacques Proven Hybrid 800.....	45.4	26.7	91.9	41.0	.7	.8	7.2
Minhybrid 600 .....	44.4	27.4	93.4	77.3	.8	8.5	1.3
Wisconsin 350 .....	44.3	31.7	87.0	27.8	.5	.8	4.8
Wisconsin 330 .....	44.0	29.9	86.5	28.5	.6	1.5	4.2
Jacques Proven Hybrid 902.....	43.7	29.7	90.2	51.7	.6	3.0	6.0
Kingscrot A2 (95 day).....	43.6	31.3	83.9	38.0	.6	.7	7.3
Twin City Pride B15.....	41.7	30.7	92.1	36.0	.5	.8	3.3
<b>GROUP II</b>							
*Pioneer Hi-Bred 365.....	61.3	32.7	94.2	28.8	.5	.7	1.7
Kingscrot KS2 .....	60.9	32.4	92.1	40.5	.6	0.0	7.2
Minhybrid 604 .....	58.3	32.2	92.9	30.5	.5	1.3	3.3
Reid-National 95 .....	55.7	32.2	92.9	45.2	.5	1.5	3.2
*Kingscrot KA1 .....	55.3	32.9	97.1	43.3	.5	.5	3.7
Vassar 170 .....	51.5	32.4	87.0	20.5	.5	.3	1.8
Jacques Proven Hybrid 1050.....	51.1	33.5	87.9	27.8	.5	.2	4.4
Jacques Proven Hybrid Wis. 460	50.8	33.1	88.9	41.7	.5	.7	3.8
Kingscrot D4 (97 day).....	48.5	32.5	84.1	30.5	.5	1.5	5.5
Wisconsin 404 .....	48.2	32.6	93.2	40.8	.5	.4	4.8
<b>GROUP III</b>							
*Pioneer Hi-Bred 367.....	66.8	34.6	92.8	28.8	.3	1.4	1.4
<b>GROUP IV</b>							
*Iowealth 100 .....	59.7	36.3	89.9	35.2	.5	.7	2.5
Minimum level of significance.....	9.6	1.4					

\* Experimental variety not in commercial production.

Group III which is too late for this location and has yielded somewhat less than the highest yielding hybrid in Group I.

### Stearns County

The trial was conducted on the Joseph Meyer farm near Greenwald, south of Melrose. The location is near the southern boundary of the central maturity zone. In this general location farmers have found strains of Minne-

sota 13 intermediate in maturity between the Morris strain and the University Farm strain to be well adapted. Minhybrid 401 has matured earlier than strains of Minnesota 13 which farmers were growing.

**Group I.**—The average per cent of moisture of Minhybrids 401 and 602 and Minnesota 13 (Morris) has been taken as a base for setting up maturity groups in this location. The average per cent of moisture of these varieties was 30.7 per cent. Adding 1.4, the

minimum level of significance for moisture, to 30.7 equals 32.1 per cent, the highest moisture allowed in this group. There are 20 hybrids which fall in this group. There are five varieties which are significantly lower

in moisture than the base 30.7 which would place them in still an earlier group.

The minimum level of significance for differences in yield is 9.6 bushels. Subtracting 9.6 from 57.8 bushels, the

Table 18. Dakota County Yield Trial Conducted on James Stevens Farm, Farmington, Harvested October 21, 1941

Variety	Average yield bu. per acre 14 per cent moisture	Average per cent moisture	Average per cent stand	Lodging		Average number broken stalks	Average number smutted plants
				Per cent	Degree		
<b>GROUP I</b>							
Kingscrot M2 .....	71.1	24.9	87.0	68.5	1.1	18.8	2.3
*Pioneer Hi-Bred 367.....	67.6	23.8	93.1	68.3	1.7	23.3	.7
Minhybrid 301 .....	64.0	24.8	89.7	59.2	1.0	12.0	3.3
Master Hybrid F80.....	63.3	23.9	87.8	68.3	1.4	18.8	2.2
Vassar 170 .....	63.0	22.2	88.1	28.7	.7	7.8	2.5
Kingscrot KS1 .....	62.9	24.8	89.4	48.0	.7	11.7	1.5
Imp. Minhybrid 301.....	62.5	24.9	84.9	78.5	1.3	20.0	3.0
Minhybrid 602 .....	62.4	23.3	89.4	79.2	1.8	33.3	1.2
Minhybrid 502 .....	62.1	25.9	89.2	76.5	1.3	23.5	2.8
Minhybrid 604 .....	62.0	24.3	88.1	65.5	1.4	23.5	2.5
Kingscrot KN2 .....	62.0	25.7	83.9	83.0	1.7	25.0	4.5
Minhybrid 603 .....	61.7	24.3	77.8	58.8	1.2	20.3	2.8
Pioneer Hi-Bred 355.....	61.0	24.3	86.8	65.5	.6	9.8	5.0
*Pioneer Hi-Bred 365.....	59.5	23.9	91.8	41.5	.7	9.5	1.0
Kingscrot KN1 (KN121).....	59.0	25.9	90.5	59.3	1.0	20.2	4.0
Minhybrid 500 .....	58.7	24.4	78.3	69.0	1.3	23.2	.8
Turner E4 .....	58.7	25.8	90.2	58.0	.8	14.2	1.2
Vassar 171 .....	57.8	22.7	86.8	56.2	1.0	12.8	1.3
Reid-National 95 .....	55.8	24.7	89.2	67.3	1.0	16.0	2.5
Twin City Pride D33.....	55.8	23.0	86.2	57.2	.9	14.5	3.5
Wisconsin 525 .....	54.6	25.8	81.7	64.7	.6	12.5	4.7
Jacques Proven Hybrid 1050.....	54.0	24.6	86.0	56.3	.7	9.7	3.8
Twin City Pride B45.....	53.7	25.9	93.6	60.0	.8	12.2	3.8
Wisconsin 456 .....	53.7	24.0	83.6	61.8	.7	14.3	3.8
Vassar 172 .....	53.5	23.5	84.4	69.3	1.7	18.2	.7
Wisconsin 460 .....	51.0	26.1	86.5	58.0	.9	14.7	4.5
Wisconsin 455 .....	50.6	25.9	87.8	65.2	.9	15.7	5.3
Murdock (Leitschuh) .....	49.1	26.2	81.2	87.7	1.7	21.7	6.0
Minnesota 13 (U. Farm).....	48.2	24.6	83.1	82.7	1.9	26.3	5.0
Golden King (Leitschuh).....	47.7	24.0	68.5	86.7	1.9	18.5	1.8
<b>GROUP II</b>							
*Funk's Hybrid G-1.....	63.3	27.3	90.5	54.7	.8	11.2	6.2
Pioneer Hi-Bred 370.....	60.4	26.6	89.7	50.7	.8	11.5	1.0
Jacques Proven Hybrid 1003.....	58.4	26.5	84.4	61.0	.9	13.8	1.3
Haapala's Hybrid 115.....	57.8	26.7	86.5	73.2	1.3	21.8	1.5
*Jacques Proven Hybrid 5J.....	57.3	26.4	89.4	80.0	1.8	28.8	1.3
Iowelth S .....	54.9	27.3	91.5	66.5	.9	14.8	3.5
Jacques Proven Hybrid 1104.....	53.4	27.3	79.6	64.5	1.3	17.7	3.0
<b>GROUP III</b>							
*Iowelth 100 .....	69.6	29.7	87.6	55.3	.7	11.3	3.8
Pioneer Hi-Bred 353.....	65.6	29.3	87.6	47.0	.8	10.5	2.5
Kingscrot KRI .....	65.5	29.5	87.0	62.5	.9	13.5	2.3
Reid-National 110 .....	54.2	28.8	81.2	35.2	.6	7.2	1.8
<b>GROUP IV</b>							
*Master Hybrid F101.....	66.7	30.1	85.2	56.3	.7	6.8	2.0
Minimum level of significance.....	9.1	1.8					

\* Experimental variety not in commercial production.

highest yielding variety, there are 11 varieties that fall in a higher yielding class, indicated by a line drawn between Minnesota 13 (Morris) and Io-wealth 90.

**Groups II, III, and IV.**—There are ten hybrids in Group II which contained significantly more moisture at harvest than those in Group I and are considered later in maturity. These may be expected to mature satisfactorily in very favorable seasons. There is one hybrid in Group III and one in Group IV which are considered to be too late for this location.

### Dakota County

The trial was located on the James Stevens farm, a little south of Farmington. The general location is in the southeast part of the south central maturity zone. In this location varieties similar in maturity to the University Farm strain of Minnesota 13, Golden King, and Minhybrid 301 have matured satisfactorily in average seasons. Somewhat later varieties have matured during the very favorable seasons of recent years. In this locality a considerable portion of the corn acreage is used for corn silage. Somewhat later varieties than those recorded in Group I may be well adapted for silage production. Well adapted hybrids for ear corn for this area should mature in 105 to 109 days with average seasons.

**Group I.**—The average per cent of moisture of Minhybrids 500 and 301, the University Farm strain of Minnesota 13, and Golden King has been taken as a base for setting up maturity groups in this location. The average per cent of moisture of the four varieties was 24.5 per cent. Adding 1.8, the minimum level of significance for moisture, to 24.5 equals 26.3 per cent, the highest moisture allowed in Group I. There are 30 varieties in this group. There are two varieties that were significantly lower in moisture at

harvest than the base moisture of 24.5 per cent which would place them in still an earlier group.

The minimum level of significance for yield is 9.1 bushels. Subtracting 9.1 from 71.1 bushels, the highest yielding variety, gives 62.0 bushels, and places 11 varieties in a higher yielding class as indicated by a line drawn between Kingscrot KN2 and Minhybrid 603. There are 14 varieties that fall in a second class and 5 that fall in a third class for yielding ability.

**Groups II, III, and IV.**—There are seven hybrids in Group II which contained significantly more moisture at harvest than Group I. These are considered later but may mature satisfactorily in favorable seasons. Yields in this group are lower than Group I. There are four hybrids in Group III and one in Group IV which are considered late for this locality.

### Lac qui Parle County

The trial was conducted on the Charles Craigmile farm a little south and west of Dawson, located in the west central area of the south central zone. Varieties similar in maturity to the University Farm strain of Minnesota 13, Golden King, and Minhybrid 301 have matured satisfactorily in this location. Very few of the varieties in this location were low enough in moisture content to permit satisfactory storage at the time of harvest.

**Group I.**—The average per cent of moisture of Minhybrids 500 and 301, Golden King, and Minnesota 13 (University Farm) has been taken as a base for setting up maturity groups in this location. The average per cent of moisture of these four varieties was 24.3 per cent. Adding 1.9, the minimum level of significance for moisture, to 24.3 equals 26.2 per cent, the highest moisture allowed in this group. There are 31 hybrids in this group. One hybrid, Twin City Pride D32, contained significantly less moisture than the

Table 19. Lac qui Parle County Yield Trial Conducted on Charles Craigmile Farm, Dawson,  
Harvested October 7, 1941

Variety	Average yield bu. per acre	Average per cent moisture	Average per cent stand	Lodging		Average number broken stalks	Average number smutted plants
				Per cent	Degree		
<b>GROUP I</b>							
Minhybrid 604 .....	63.9	23.2	81.2	0.0	0.0	0.0	3.0
*Pioneer Hi-Bred 365.....	63.4	25.0	82.5	0.0	0.0	.3	3.0
Kingscrot KN1 (KN121).....	61.5	25.6	83.6	0.0	0.0	0.0	3.2
Kingscrot D (100 day).....	59.7	25.0	79.6	0.0	0.0	.8	7.5
Jacques Proven Hybrid 1001.....	58.6	26.1	79.6	2.8	.1	.3	3.3
Jacques Proven Hybrid 955.....	58.1	22.7	75.1	1.8	.1	.2	2.2
Pioneer Hi-Bred 355.....	57.3	25.9	77.2	1.0	.1	0.0	6.0
Wisconsin 460 .....	57.3	24.7	80.4	0.0	0.0	.3	3.2
Kingscrot KN2 .....	56.5	24.8	81.0	0.0	0.0	.3	4.2
Minhybrid 502 .....	56.4	25.1	74.3	0.0	0.0	.5	2.7
Wisconsin 456 .....	56.3	26.1	80.0	1.0	.1	.3	4.2
Kingscrot KS1 .....	56.2	23.5	78.6	0.0	0.0	0.0	2.8
Twin City Pride D32.....	55.7	22.2	77.5	1.0	.1	.3	3.2
Minhybrid 301 .....	55.7	26.1	70.6	1.0	.1	.3	4.0
Imp. Minhybrid 301.....	55.5	25.6	77.2	1.0	.1	.7	4.0
Master Hybrid F80.....	55.4	25.9	76.7	1.0	.1	.2	3.3
Minhybrid 500 .....	54.1	23.2	74.3	0.0	0.0	.5	1.8
Charlie's Pride .....	54.0	26.1	75.7	11.0	.3	1.0	4.3
Haapala's Hybrid 115.....	53.6	26.2	74.9	0.0	0.0	.2	1.7
*Master Hybrid F81.....	53.5	25.1	75.9	0.0	0.0	.2	3.7
Vassar 150 .....	53.4	25.7	71.9	3.7	.1	.7	2.2
Minhybrid 603 .....	53.2	23.4	67.2	0.0	0.0	.3	2.8
Twin City Pride D33.....	52.1	23.2	68.0	1.0	.1	.2	2.3
Twin City Pride B17.....	51.3	23.2	77.5	1.0	.1	.7	2.5
Vassar 172 .....	51.3	24.8	66.1	0.0	0.0	0.0	1.5
Vassar 171 .....	50.8	23.6	66.4	0.0	0.0	.3	2.8
Minhybrid 602 .....	50.7	23.4	68.3	0.0	0.0	.3	1.7
Murdock (Leitschuh) .....	49.1	25.9	71.4	11.0	.3	.7	3.0
Wisconsin 455 .....	48.6	25.9	72.0	1.0	.1	0.0	3.3
Minn. 13 (U. Farm).....	44.6	24.0	64.6	13.0	.3	1.3	5.2
Golden King (Leitschuh).....	38.2	23.8	54.8	4.7	.3	.2	3.8
<b>GROUP II</b>							
*Pioneer Hi-Bred 367.....	70.8	28.1	84.7	0.0	0.0	0.0	3.2
Pioneer Hi-Bred 370.....	69.1	26.3	81.5	0.0	0.0	0.0	.5
*Kingscrot KS5 .....	61.3	27.2	75.4	0.0	0.0	0.0	3.8
Turner E4 .....	61.1	27.0	85.2	0.0	0.0	.3	3.3
Reid-National 95 .....	60.3	26.4	86.2	0.0	0.0	.7	3.8
*Funk's Hybrid G-1.....	59.2	26.5	82.5	0.0	0.0	.3	4.2
*Jacques Proven Hybrid 5J.....	57.4	27.8	80.2	0.0	0.0	0.0	1.0
Reid-National 104W.....	56.4	26.6	73.0	0.0	0.0	.3	2.0
Jacques Proven Hybrid Wis. 584	53.8	27.9	77.2	0.0	0.0	.5	2.0
<b>GROUP III</b>							
Pioneer Hi-Bred 353.....	63.4	28.9	80.0	0.0	0.0	0.0	2.5
Wisconsin 525 .....	55.7	29.2	80.4	0.0	0.0	0.0	4.5
<b>GROUP IV</b>							
Reid-National 104 .....	62.9	30.8	82.8	0.0	0.0	0.0	4.2
Ioweth S .....	60.6	31.1	84.7	0.0	0.0	.5	3.0
<b>GROUP V</b>							
*Ioweth 100 .....	67.6	32.1	82.8	0.0	0.0	0.0	5.2
Minimum level of significance.....	8.0	1.9					

\* Experimental variety not in commercial production.



base of 24.3 per cent which would place it in still an earlier group.

The minimum level of significance for differences in yield is eight bushels. Subtracting 8.0 from 63.9 bushels, the highest yielding variety, there are 12 varieties which are in a higher yielding class, indicated by a line drawn between Kingscrost KS1 and Twin City Pride D32. There are 17 varieties that fall in class 2 for yielding ability.

**Groups II, III, IV, and V.**—There are nine hybrids in Group II which contained significantly more moisture at harvest than Group I and are considered later. These may be expected to mature in this location in favorable seasons. The two hybrids in Group III may mature only under the most fa-

vorable seasons, such as 1941. Those in Groups IV and V are considered too late for this locality.

**Lincoln County**

The trial was located on the Chris Rix farm just a little east of Tyler. This is located in the southwest part of the south central zone. In this general location hybrids of about the same maturity as Minhybrid 301, Minnesota 13 (University Farm), and Golden King have matured satisfactorily in average seasons. Hybrids maturing in 105 to 109 days are considered well adapted to this locality. Later varieties have been grown and have matured in very favorable seasons.

**Table 20. Lincoln County Yield Trial Conducted on Chris Rix Farm, Tyler, Harvested October 13, 1941**

Variety	Average yield bu. per acre 14 per cent moisture	Average per cent moisture	Average per cent stand	Lodging		Average number broken stalks	Average number smutted plants
				Per cent	Degree		
<b>GROUP I</b>							
*Pioneer Hi-Bred 367.....	74.3	21.9	87.6	51.2	.9	20.3	1.3
Minhybrid 502 .....	70.4	21.9	89.2	78.3	1.5	35.0	1.5
Minhybrid 603 .....	67.9	21.9	81.0	47.2	1.2	20.5	1.2
Kingscrost KS2 .....	67.8	21.8	86.5	15.8	.4	2.7	3.0
*Pioneer Hi-Bred 365.....	<u>66.9</u>	21.5	86.5	28.7	.5	7.3	1.0
Kingscrost KS1 .....	65.9	20.9	87.0	22.2	.4	5.0	1.5
Minhybrid 301 .....	64.6	20.5	84.9	44.3	.7	12.7	1.5
Kingscrost KN1 (KN121).....	63.9	23.3	79.3	37.8	.6	10.5	3.7
Jacques Proven Hybrid 1102.....	63.2	23.2	82.3	46.3	.7	13.3	1.2
Imp. Minhybrid 301.....	63.2	21.4	78.6	42.5	.8	12.2	4.0
Minhybrid 602 .....	62.9	21.9	76.2	52.7	1.2	19.8	.2
Minhybrid 604 .....	62.5	19.3	88.9	60.8	1.2	29.7	1.0
Reid-National 105 .....	62.2	23.2	84.1	24.2	.5	7.5	2.5
Minhybrid 500 .....	61.8	22.3	83.1	41.7	.7	13.2	1.7
Vassar 150 .....	61.3	23.3	80.2	39.7	.7	11.8	2.0
Minhybrid 403 (Rix).....	<u>60.5</u>	22.6	81.2	28.7	.6	6.8	1.2
Wisconsin 456 .....	59.2	22.3	85.2	29.7	.5	8.2	1.8
Pioneer Hi-Bred 355.....	59.0	20.9	85.2	31.5	.6	7.5	2.2
Turner E4 .....	58.9	22.6	84.1	41.5	.7	13.3	2.3
Wisconsin 455 .....	58.9	22.9	85.2	45.3	.6	12.2	1.8
Master Hybrid F80.....	58.0	22.9	84.7	47.0	.6	14.5	2.0
Wisconsin 460 .....	57.4	22.6	87.8	43.5	.7	13.3	2.0
Jacques Proven Hybrid 1051.....	57.4	23.1	81.5	36.0	.5	9.0	.7
Kingscrost KN2 .....	57.3	22.7	81.2	52.5	.7	15.8	4.0
Minn. 13 (U. Farm) .....	55.2	22.9	78.3	49.8	1.0	20.7	2.0
Reid-National 107W .....	55.1	22.5	76.5	56.3	.8	16.2	1.0
Vassar 172 .....	54.8	21.6	66.7	19.3	.4	4.0	1.0
Jacques Proven Hybrid 1003.....	54.3	22.6	81.5	39.7	.6	10.5	1.0
Twin City Pride D33.....	54.1	20.7	74.6	35.0	.7	8.8	1.5
Murdock (Leitschuh).....	<u>53.8</u>	22.9	78.0	58.2	.7	18.8	3.7
Golden King (Leitschuh).....	<u>51.3</u>	20.9	69.3	39.8	.6	11.0	2.5

Table 20. Lincoln County Trial (Continued)

Variety	Average yield bu. per acre 14 per cent moisture	Average per cent moisture	Average per cent stand	Lodging		Average number broken stalks	Average number smutted plants
				Per cent	Degree		
<b>GROUP II</b>							
Pioneer Hi-Bred 353.....	75.5	24.2	85.7	30.7	.6	7.8	1.7
*lowealth 100 .....	72.7	24.8	87.8	22.2	.5	4.2	4.2
Pioneer Hi-Bred 370.....	70.1	23.5	86.8	30.5	.8	11.0	1.0
Iowealth S .....	67.2	23.4	89.2	46.2	.8	15.2	2.7
Twin City Pride C53.....	67.0	24.0	81.2	29.3	.6	8.0	1.3
*Funk's Hybrid G-1.....	65.3	24.2	85.7	45.2	.8	15.5	2.8
*Master Hybrid F104.....	64.2	23.7	89.9	29.7	.6	7.3	1.0
Wisconsin 525 .....	56.4	23.4	85.2	33.3	.5	9.3	2.8
Jacques Proven Hybrid 1107.....	55.1	23.6	88.3	52.7	.7	18.0	1.2
<b>GROUP III</b>							
Thompson Hybrid 45.....	73.8	25.4	87.0	22.3	.4	5.7	1.8
Funk's Hybrid G-12.....	69.7	26.1	82.5	13.2	.4	3.8	2.7
Thompson Hybrid 27.....	69.3	26.4	84.4	6.7	.3	6.7	2.0
Thompson Hybrid 36.....	68.5	25.1	87.0	31.7	.5	8.0	1.0
Pfister 274 .....	66.4	25.2	86.0	23.3	.5	5.2	5.5
*Twin City Pride B55.....	66.1	26.2	85.4	52.7	1.0	18.2	3.0
Reid-National 110 .....	63.9	25.8	75.4	13.0	.4	2.7	2.8
*Jacques Proven Hybrid 18J.....	61.9	25.6	80.9	30.7	.5	8.5	1.7
Reid-National 98 .....	52.5	25.5	84.9	30.5	.5	7.3	2.7
<b>GROUP IV</b>							
*Pfister 374 .....	66.0	26.8	81.2	28.7	.6	8.7	3.7
<b>GROUP V</b>							
Kingscrot KR1 .....	64.9	28.3	77.0	15.0	.5	2.7	2.5
Minimum level of significance.....	7.2	1.6					

\* Experimental variety not in commercial production.

**Group I.**—The average per cent of moisture of Minhybrids 500 and 301, Golden King, and Minnesota 13 (University Farm) has been taken as a base for setting up maturity groups in this location. The average per cent of moisture of the four varieties was 21.7 per cent. Adding 1.6, the minimum level of significance for moisture, to 21.7 equals 23.3 per cent, the highest moisture allowed in this group. There are 31 varieties in this group. Minhybrid 604 was significantly lower than the base moisture of 21.7 per cent, which would place it in still an earlier group.

The minimum level of significance for yield is 7.2 bushels. Subtracting 7.2 from 74.3 bushels, the highest yielding variety, gives 67.1 bushels, and places four varieties in a higher yielding class as indicated by a line drawn between Kingscrot KS2 and Pioneer Hi-Bred 365. There are 12 varieties that place in class 2, and 14 varieties

that place in class 3 for yielding ability in this group. Golden King places in a fourth class for yielding ability.

**Groups II, III, IV, and V.**—There are nine varieties in Group II which contained significantly more moisture at harvest and are considered later than Group I. These have yielded about the same as those hybrids in Group I. There are nine hybrids in Group III, and one each in Groups IV and V, which are considered too late for this locality.

### McLeod County

The trial was located on the Arthur Schuette farm a little north and west of Glencoe. The general location is in the south central area of the south central maturity zone. In this location varieties similar in maturity to the University Farm strain of Minnesota 13, Golden King, and Minhybrid 301

have matured satisfactorily in average seasons. Later varieties have been grown in this location in recent years which have matured satisfactorily in very favorable seasons. Hybrids ma-

turing in 105 to 109 days are satisfactory in this locality.

**Group I.**—The average per cent of moisture of Minhybrids 500 and 301, Golden King, and the University Farm

Table 21. McLeod County Yield Trial Conducted on Arthur Schuette Farm, Glencoe, Harvested October 10, 1941

Variety	Average yield bu. per acre	Average per cent moisture	Average per cent stand	Lodging		Average number broken stalks	Average number smutted plants
				Per cent	Degree		
<b>GROUP I</b>							
Twin City Pride D32.....	64.7	24.0	90.2	20.5	.5	1.2	1.2
Kingscrosst KS1 .....	64.7	26.5	91.0	20.3	.4	.8	1.3
*Pioneer Hi-Bred 367.....	63.5	25.5	94.4	11.2	.5	1.7	.5
Minhybrid 603 .....	62.5	25.4	86.5	13.2	.5	3.7	1.7
Kingscrosst KN2 .....	62.1	26.0	90.2	19.5	.4	1.5	3.0
Kingscrosst KN1 (KN121).....	60.3	26.5	92.1	13.0	.4	1.0	2.7
Master Hybrid F80 .....	60.0	24.9	85.7	15.0	.5	1.2	3.3
Imp. Minhybrid 301.....	59.7	26.0	87.8	25.2	.5	.8	3.0
*Funk's Hybrid G-1.....	59.6	27.0	88.6	21.3	.4	1.8	2.5
Vassar 171 .....	58.7	24.6	86.8	13.2	.5	.2	.5
Vassar 172 .....	58.5	25.1	85.4	24.5	.5	.8	1.2
Minhybrid 500 .....	58.4	24.3	89.2	12.2	.3	2.0	.8
Minhybrid 301 .....	57.9	27.2	88.3	14.0	.5	1.2	2.5
Turner E4 .....	57.5	25.8	88.6	23.2	.5	2.2	.8
Iowearth S .....	56.8	26.7	92.6	13.2	.5	.7	1.8
Kingscrosst D (100 day).....	56.7	25.8	91.0	16.7	.3	1.5	4.7
Minnesota 13 (U. Farm).....	56.5	25.5	86.8	48.0	.7	5.0	2.2
Haapala's Hybrid 115.....	55.5	26.8	92.3	21.3	.5	2.3	.3
Minhybrid 502 .....	55.5	25.9	90.2	22.0	.3	4.5	.3
Jacques Proven Hybrid 955.....	55.0	24.4	92.3	7.5	.3	.8	2.7
Vassar 150 .....	53.8	26.4	91.5	37.0	.5	1.8	3.2
Pioneer Hi-Bred 355.....	53.2	26.2	91.0	11.3	.4	.8	3.8
*Pioneer Hi-Bred 365.....	53.1	24.7	90.7	7.5	.3	.7	2.0
Minhybrid 604 .....	52.6	23.0	92.9	8.5	.4	1.3	1.5
*Jacques Proven Hybrid 6J.....	51.8	26.4	92.6	6.8	.5	1.7	3.7
Reid-National 95 .....	50.9	26.7	89.2	16.8	.5	1.7	1.0
Wisconsin 456 .....	50.8	27.1	92.6	20.5	.3	.8	2.5
Jacques Proven Hybrid 1107.....	50.6	27.4	91.8	15.0	.5	1.3	2.0
Murdock (Leitschuh) .....	48.4	27.1	74.9	55.2	.8	3.5	2.0
Twin City Pride B45.....	47.9	26.6	88.9	14.0	.5	.2	2.8
Wisconsin 455 .....	45.9	26.9	90.5	15.0	.5	1.3	3.8
Golden King (Leitschuh).....	45.0	25.9	64.3	57.8	1.0	2.5	3.0
<b>GROUP II</b>							
Pioneer Hi-Bred 353.....	68.1	29.1	91.5	5.7	.3	1.0	1.3
Reid-National 104 .....	62.3	28.9	95.5	11.2	.4	.3	1.3
*Kingscrosst K55 .....	56.8	28.6	95.0	19.5	.5	.8	3.2
*Nicoll County Seed Exp.....	53.4	29.7	89.9	15.7	.4	.3	1.8
Pioneer Hi-Bred 370.....	52.6	27.8	90.2	1.0	.1	.3	1.3
Jacques Proven Hybrid 1051.....	47.3	27.9	86.8	12.3	.4	.5	3.2
<b>GROUP III</b>							
*Master Hybrid F104.....	62.3	30.9	87.6	6.7	.3	1.5	1.5
Pfister 274 .....	61.1	29.9	86.0	16.0	.5	1.0	1.7
*Iowearth 100 .....	57.8	30.6	88.4	4.7	.3	1.2	2.5
<b>GROUP IV</b>							
Pfister 266 .....	60.8	32.9	91.3	9.5	.3	.3	1.5
Minimum level of significance.....	9.3	2.0					

\* Experimental variety not in commercial production.

strain of Minnesota 13 has been taken as a base for setting up maturity groups in this location. The average per cent of moisture of the four varieties was 25.7 per cent. Adding 2.0, the minimum level of significance for moisture, to 25.7 equals 27.7 per cent, the highest moisture allowed in this group. There are 32 varieties in this group. There is one variety which was significantly lower in moisture than the base of 25.7 per cent which would place it in still an earlier group.

The minimum level of significance for yield is 9.3 bushels. Subtracting 9.3 from 64.7 bushels, the highest yielding variety, gives 55.4 bushels and places 18 varieties in a higher yielding class as indicated by a line drawn between Minhybrid 502 and Jacques Proven Hybrid 955. There are 11 varieties in this group that fall in class 2 for yielding ability.

**Groups II, III, and IV.**—There are six hybrids in Group II which were significantly higher in moisture than Group I. These hybrids may be ex-

pected to mature satisfactorily in favorable seasons, such as 1941. Yields in this group are not significantly higher than Group I. There are three hybrids in Group III and one in Group IV which are considered too late for the locality in average seasons.

### Martin County

The trial was located on the Theodore Grefe farm in the northeastern part of the county near Blue Earth and Faribault counties. This general location is in the south central area of the southern maturity zone. In this location many farmers feel that varieties similar in maturity to Minhybrids 301 and 403 and Murdock are too early. Later varieties have matured in the very favorable seasons of recent years and this has stimulated the distribution of varieties much later than those named above.

**Group I.**—The average per cent of moisture of Minhybrids 403 and 404

Table 22. Martin County Yield Trial Conducted on Theodore Grefe Farm, Winnebago, Harvested October 17, 1941

Variety	Average yield bu. per acre	Average per cent moisture	Average per cent stand	Lodging		Average number broken stalks	Average number smutted plants
				Per cent	Degree		
<b>GROUP I</b>							
Minhybrid 405 .....	89.5	21.8	90.5	0.0	0.0	0.0	.5
Minhybrid 404 .....	89.2	21.8	89.2	1.0	.1	0.0	.5
Kingscrot M2 .....	88.4	19.2	90.5	6.7	.3	.5	1.7
Haapala's Hybrid 135.....	86.0	21.7	84.7	3.8	.2	.2	1.8
Turner N15A .....	85.9	21.6	82.4	16.8	.6	.5	3.0
Iowealth S .....	84.1	21.2	87.7	3.8	.3	.2	1.3
Pioneer Hi-Bred 370.....	81.8	21.1	87.2	7.7	.3	0.0	.8
Iowealth A .....	81.6	21.9	85.7	12.3	.4	1.0	1.0
Wisconsin 570 .....	81.4	21.6	88.4	2.8	.1	.7	.7
Iowealth AP .....	79.8	20.7	81.6	7.7	.4	1.7	1.0
Minhybrid 301 .....	79.6	18.5	86.4	7.5	.3	1.3	2.0
Twin City Pride D56.....	78.1	20.6	84.1	7.5	.3	.7	1.3
Imp. Minhybrid 301.....	77.3	18.6	81.0	8.5	.5	.8	2.3
Wisconsin 603 .....	77.2	21.9	86.2	5.8	.3	1.0	1.0
Minhybrid 403 .....	76.9	19.0	82.9	4.0	.3	.2	1.0
Pioneer Hi-Bred 355.....	76.5	19.2	83.2	4.8	.3	.5	3.7
Jacques Proven Hybrid 1104.....	74.2	21.9	78.9	8.5	.3	.5	1.8
Farmers Hybrid 204.....	68.5	21.9	77.5	13.2	.3	.5	.7
Murdock (Leitschuh) .....	66.8	20.5	74.9	37.7	.7	1.7	1.5

Table 22. Martin County Yield Trial (Continued)

Variety	Average yield bu. per acre 14 per cent moisture	Average per cent moisture	Average per cent stand	Lodging		Average number broken stalks	Average number smutted plants
				Per cent	Degree		
<b>GROUP II</b>							
*Master Hybrid F101.....	88.3	23.2	84.9	13.0	.3	.3	.8
Pioneer Hi-Bred 353.....	88.0	22.4	91.7	2.8	.2	.2	1.2
Pioneer Hi-Bred 322.....	87.0	22.9	89.6	3.8	.3	.7	1.8
Thompson Hybrid 36.....	86.3	23.2	89.7	6.7	.4	0.0	1.8
Sundstrom Hybrid 95.....	86.1	22.8	88.4	31.3	.5	1.2	1.3
Iowearth AF11.....	85.5	22.1	84.5	6.5	.3	0.0	1.5
*Master F105.....	84.6	22.3	88.1	7.5	.4	.3	1.3
*Reid-National 112R.....	84.6	23.4	81.6	4.7	.2	.7	2.7
Funk's Hybrid G-7.....	84.1	23.4	83.2	8.3	.4	.5	.2
Kingscrot KR1.....	83.7	22.7	82.5	5.7	.3	.3	1.2
Pfister 274.....	83.3	22.3	86.2	15.8	.5	.8	1.3
*Pfister 374.....	82.8	23.0	75.9	6.7	.3	.3	.7
*Master Hybrid F106.....	82.4	23.0	81.0	5.7	.3	.3	1.0
Twin City Pride D74.....	82.3	23.0	76.2	14.0	.5	.7	1.3
*Turner L101.....	81.2	22.8	77.8	8.5	.4	0.0	1.7
Reid-National 110A <sub>1</sub> .....	80.2	22.3	75.9	6.7	.4	0.0	1.2
Pioneer Hi-Bred 353A.....	79.9	22.7	81.4	9.5	.4	.2	1.5
Wisconsin 606.....	73.5	22.3	71.1	4.8	.3	1.0	.3
*Haapala's Hybrid 135A.....	73.4	23.2	82.0	8.3	.3	0.0	.8
Wisconsin 645.....	73.2	23.2	73.5	3.0	.3	.2	1.2
Reid-National 110.....	63.4	22.9	65.1	8.3	.3	.3	1.3
Turner N15.....	58.2	22.3	73.5	9.5	.5	.3	2.2
<b>GROUP III</b>							
Thompson Hybrid 27.....	94.2	24.8	88.0	5.5	.2	0.0	1.0
Iowearth 16.....	91.9	24.4	87.4	6.0	.5	.2	1.7
Thompson Hybrid 45.....	87.9	24.3	84.2	6.7	.3	.5	2.0
Kingscrot KR2.....	87.6	24.6	87.6	3.8	.3	0.0	1.5
Farmers Hybrid 321A.....	86.4	23.9	82.4	3.0	.3	0.0	.7
Pfister 266.....	86.0	23.6	83.6	13.2	.4	.2	.7
*Jacques Proven Hybrid 25J.....	85.2	23.7	83.2	3.0	.3	0.0	.5
Kingscrot KR4.....	84.2	24.7	84.4	3.0	.3	.2	2.7
Jacques Proven Hybrid 1205.....	83.2	24.4	82.1	2.0	.2	.3	2.5
Pfister 366.....	82.3	24.7	86.5	12.2	.5	.5	1.3
Farmers Hybrid 322.....	82.1	24.9	76.7	6.7	.4	.2	1.8
Funk's Hybrid G-12.....	82.1	23.9	81.0	1.0	.1	0.0	.5
Reid-National 116.....	81.7	23.9	80.5	6.7	.3	0.0	.8
Jacques Proven Hybrid 1155.....	77.5	23.6	83.4	6.7	.3	.3	1.2
Turner E7A.....	70.6	24.6	73.5	21.3	.5	1.3	1.2
<b>GROUP IV</b>							
*Funk's Hybrid G-29.....	90.5	25.4	87.7	1.0	.2	0.0	1.3
Jacques Proven Hybrid 1203.....	80.9	25.6	89.1	8.5	.3	.2	1.7
<b>GROUP V</b>							
Kingscrot KY.....	87.1	26.9	81.2	8.3	.3	0.0	1.0
*Master Hybrid F102.....	66.8	26.6	88.8	3.8	.3	.3	1.5
Minimum level of significance.....	9.9	1.5					

\* Experimental variety not in commercial production.

and Murdock has been taken as a base for setting up maturity groups in this location. The average per cent of moisture for the three varieties was found to be 20.4 per cent. Adding 1.5, the minimum level of significance for moisture, to 20.4 per cent equals 21.9 per

cent, the highest moisture allowed in this group. There are 19 varieties in this group. Two varieties, Minhybrid 301 and Improved Minhybrid 301, were significantly lower in moisture which would place them in still an earlier group.

The minimum level of significance for yield is 9.9 bushels. Subtracting 9.9 from 89.5 bushels, the highest yielding variety, gives 79.6 bushels and places 11 varieties in a higher yielding class, indicated by a line drawn between Minhybrid 301 and Twin City Pride D56. There are six varieties which fall in a second class for yielding ability.

**Group II.**—There are 22 varieties in this group which contained significantly more moisture than varieties in Group I and are considered later. These varieties can be expected to mature in favorable seasons in this locality. Varieties in this group have not yielded significantly less than varieties in Group I. Seventeen varieties fall in a higher yielding class.

**Groups III, IV, and V.**—There are 15 varieties in Group III which contained significantly more moisture at harvest than Group II. These are later than Groups I and II and will require favorable seasons such as 1939-1941 for satisfactory maturity. There are two varieties each in Groups IV and V which are considered too late for this locality in average growing seasons.

Hybrids in Groups IV and V have not yielded significantly higher than the high yielding hybrids of Group I.

### Murray County

The trial was located on the Frank Keller farm south and east of Slayton. The general location is in the southwestern part of the southern maturity zone. In this location varieties similar in maturity to Murdock and Minhybrid 403 have matured satisfactorily in average seasons. The very favorable seasons of recent years have stimulated the distribution of later varieties which have matured reasonably well under very favorable conditions. Hybrids maturing in 110 to 116 days are considered satisfactory for this locality. In this general locality somewhat earlier maturity is required than in counties lying farther east in the south central area of the southern zone. Hybrids with a maturity designation of 116 days may be too late in unfavorable seasons.

**Group I.**—The average per cent of moisture of Minhybrids 403 and 404 and Murdock has been taken as a base for setting up maturity groups in this

Table 23. Murray County Yield Trial Conducted on Frank Keller Farm, Slayton. Harvested October 15, 1941

Variety	Average yield bu. per acre	Average per cent moisture	Average per cent stand	Lodging		Average number broken stalks	Average number smutted plants
				Per cent	Degree		
<b>GROUP I</b>							
Pioneer Hi-Bred 353A	76.0	24.6	87.0	16.0	.5	5.0	.8
Iowearth AP	71.9	24.4	92.6	39.5	.7	11.7	1.0
Pioneer Hi-Bred 370	70.0	22.9	90.7	10.3	.4	2.3	1.0
Iowearth A	69.2	24.8	84.7	30.3	.4	7.0	2.2
Kingscrost KN1 (KN121)	69.0	24.1	84.4	25.0	.6	8.0	.8
Minhybrid 404	69.0	23.8	90.5	17.7	.5	5.5	.2
Turner E4	67.2	22.9	87.6	26.8	.5	10.7	.2
Imp. Minhybrid 301	66.9	22.9	87.3	30.7	.4	9.5	1.0
Kingscrost M2	65.5	23.5	87.3	38.8	.8	14.5	2.3
Minhybrid 301	64.2	22.4	82.3	47.0	.7	16.2	1.5
Pioneer Hi-Bred 355	62.5	22.4	84.9	27.7	.5	10.2	1.0
Wisconsin 570	61.7	24.8	86.5	46.8	.7	16.2	.8
Murdock (Leitschuh)	59.8	23.9	80.2	61.7	.7	14.8	2.3
Minhybrid 403	57.1	23.4	86.0	18.5	.6	6.3	1.2
Reid-National 107W	56.1	24.7	86.5	19.5	.5	5.7	.5
Twin City Pride D56	55.3	24.2	84.7	25.8	.5	9.7	.5

Table 23. Murray County Yield Trial (Continued)

Variety	Average yield bu. per acre 14 per cent moisture	Average per cent moisture	Average per cent stand	Lodging		Average number broken stalks	Average number smutted plants
				Per cent	Degree		
<b>GROUP II</b>							
Master Hybrid F105.....	74.5	25.9	88.6	19.5	.5	4.8	1.0
*Jacques Proven Hybrid 1205.....	72.3	26.6	82.3	2.8	.2	1.3	1.3
Iowearth AF11 .....	72.0	26.1	87.8	14.8	.4	3.5	.3
Pioneer Hi-Bred 353.....	71.6	25.4	85.2	9.3	.3	3.7	.3
Turner N15A .....	71.5	25.9	87.6	36.2	.6	10.2	1.7
Minhybrid 405 .....	71.4	25.4	84.7	19.5	.5	6.0	.5
Pioneer Hi-Bred 322.....	69.7	26.3	85.7	22.3	.6	7.7	1.5
Haapala's Hybrid 135.....	69.5	25.9	84.1	9.5	.4	2.2	.2
Pfister 274 .....	69.0	25.8	87.0	18.7	.5	6.3	1.5
Funk's Hybrid G-7.....	68.4	25.9	79.9	5.8	.4	1.7	1.0
Iowearth S .....	67.8	25.5	87.6	24.8	.5	7.5	1.3
Sundstrom Hybrid 95 .....	67.5	26.5	88.6	54.5	.7	18.3	1.8
*Reid-National 112 <sub>1</sub> .....	67.3	26.6	83.9	20.3	.5	4.3	1.3
*Haapala's Hybrid 135A.....	<u>65.2</u>	25.3	83.6	14.8	.5	4.0	.3
Wisconsin 606 .....	62.6	25.7	77.0	22.3	.5	7.5	.3
*Pfister 374 .....	62.5	26.6	79.9	39.0	.6	10.3	1.8
Wisconsin 603 .....	60.8	26.1	87.8	24.2	.5	8.5	1.5
Jacques Proven Hybrid 1104.....	59.1	26.5	85.2	30.5	.6	10.5	1.2
*Nicollet County Seed Exp.....	58.9	26.4	87.0	4.8	.3	1.8	1.3
<b>GROUP III</b>							
Twin City Pride D74.....	76.4	26.9	90.7	16.8	.5	4.0	.2
Thompson Hybrid 27.....	75.5	27.8	83.9	11.2	.4	2.5	2.0
Iowearth 16 .....	75.5	27.9	84.9	7.7	.5	1.5	.7
Kingscrot KR2 .....	75.3	27.4	81.5	3.8	.2	.7	1.5
Thompson Hybrid 45.....	74.4	27.4	88.4	6.7	.3	1.5	1.8
Farmers Hybrid 321A.....	72.7	27.9	85.2	3.8	.3	.5	1.3
Kingscrot KR1 .....	72.5	27.2	87.8	10.3	.4	2.3	.5
Pfister 266 .....	71.6	27.1	93.9	21.3	.4	6.2	2.3
*Master Hybrid F102.....	71.5	28.0	85.4	4.8	.3	1.2	2.0
Funk's Hybrid G-12.....	70.7	27.7	80.7	11.2	.3	3.0	1.3
Reid-National 110A <sub>1</sub> .....	70.0	26.9	86.8	14.8	.5	5.0	2.7
Turner N15 .....	69.5	27.3	85.2	7.7	.5	1.5	1.5
*Master Hybrid F103.....	<u>65.9</u>	27.9	84.9	2.0	.2	1.0	1.2
Wisconsin 645 .....	65.7	26.9	86.2	14.2	.5	3.7	.8
Thompson Hybrid 36.....	61.0	27.5	82.0	10.2	.4	2.8	1.0
Reid-National 110 .....	59.9	26.9	72.5	2.8	.2	1.2	.8
<b>GROUP IV</b>							
*Funk's Hybrid G-29.....	74.0	28.6	79.4	5.8	.4	1.0	3.5
Farmers Hybrid 322.....	<u>70.2</u>	28.5	82.3	22.2	.5	6.5	2.8
Turner E7A .....	64.1	28.3	83.9	37.7	.6	10.8	2.0
Jacques Proven Hybrid 1155.....	63.9	28.3	85.4	15.0	.5	4.0	.3
*Jacques Proven Hybrid 24J.....	62.2	29.4	82.5	16.8	.4	4.8	.5
<b>GROUP V</b>							
Kingscrot KR4 .....	70.1	30.8	85.7	2.8	.2	.7	1.3
Minimum level of significance.....	8.3	1.5					

\* Experimental variety not in commercial production.

location. The average per cent of moisture of the three varieties was 23.7 per cent. Adding 1.5, the minimum level of significance for moisture, to 23.7 equals 25.2 per cent, the highest moisture allowed in this group. There are 16 varieties in this group.

The minimum level of significance for yield is 8.3 bushels. Subtracting 8.3 from 76.0 bushels, the highest yielding variety, gives 67.7 bushels and places six varieties in a higher yielding class as indicated by a line drawn between Minhybrid 404 and Turner E4.

Seven varieties fall in class 2 for yielding ability.

**Group II.**—There are 19 varieties in this group which contained significantly higher moisture at harvest than varieties in Group I. These varieties are considered to be somewhat later and can be expected to mature in favorable seasons. Yields in this group are not significantly lower than in Group I.

**Group III.**—There are 16 varieties in this group which contained significantly more moisture than Group II and are considered too late for satisfactory maturity in average seasons.

**Groups IV and V.**—There are five varieties in Group IV and one variety in Group V which are considered later than those in Group III.

### Winona County

The trial was located on the John Daley farm a little west of Lewiston on U. S. Highway 14. This general location is in the southeast area of the southern maturity zone. In this location varieties similar in maturity to Murdock and Minhybrids 301 and 403 have matured satisfactorily in average

Table 24. Winona County Yield Trial Conducted on John Daley Farm, Lewiston, Harvested October 23, 1941

Variety	Average yield bu. per acre 14 per cent moisture	Average per cent moisture	Average per cent stand	Lodging		Average number broken stalks	Average number smutted plants
				Per cent	Degree		
<b>GROUP I</b>							
Pioneer Hi-Bred 353A.....	112.1	30.1	87.3	52.7	.8	5.5	.8
Pioneer Hi-Bred 353.....	109.1	29.4	85.4	48.3	.6	2.8	.7
Minhybrid 405.....	108.8	29.7	91.8	31.3	.5	3.7	2.2
Iowearth S.....	108.5	30.1	92.6	66.7	1.1	10.0	.7
Pioneer Hi-Bred 370.....	108.3	28.0	90.0	63.3	.8	2.0	.0
Kingscrot M2.....	106.2	28.2	89.4	69.2	1.1	15.5	1.0
Minhybrid 404.....	104.1	28.7	91.5	27.7	.5	4.2	.3
Kingscrot KN1 (KN121).....	103.8	29.9	94.7	64.3	.9	9.2	.5
Iowearth AP.....	103.6	29.6	88.9	87.5	1.6	19.0	.5
*Funk's Hybrid G-1.....	100.8	29.6	88.9	62.5	.9	7.0	1.5
Kingscrot M (105 day East).....	99.4	28.3	91.0	83.0	1.8	21.5	.7
Pfister 274.....	99.3	30.2	84.7	71.0	1.1	6.8	2.2
*Master Hybrid F100.....	97.0	30.1	88.9	71.7	1.3	15.0	.5
Wisconsin 603.....	96.1	30.0	87.8	59.7	.9	10.5	1.2
Wisconsin 606.....	95.8	30.2	88.1	64.5	.9	14.8	1.2
Minhybrid 403.....	95.2	29.3	89.9	43.5	1.1	11.8	.2
Pioneer Hi-Bred 355.....	95.1	28.2	87.3	68.2	1.1	11.5	1.7
Farmers Hybrid 204.....	95.0	30.3	82.3	66.3	1.0	11.3	1.0
Kingscrot KN2.....	94.9	28.2	90.7	70.2	1.3	21.5	1.0
Minhybrid 301.....	94.4	28.5	87.8	71.2	1.1	2.8	1.2
Imp. Minhybrid 301.....	93.8	28.6	86.2	69.2	1.2	12.3	.7
Jacques Proven Hybrid 1104.....	93.8	30.5	82.3	69.0	1.5	15.3	.7
Wisconsin 570.....	93.5	30.3	88.4	72.0	1.5	17.8	.5
Jacques Proven Hybrid 1051.....	91.0	28.9	81.7	57.3	1.0	7.5	.3
Twin City Pride B45.....	89.8	29.1	85.7	66.5	1.1	14.0	1.0
Minhybrid 500.....	87.3	26.8	83.9	62.8	1.1	15.5	.2
Murdock (Leitschuh).....	82.3	29.8	84.4	88.5	2.3	16.8	1.8
Minnesota 13 (U. Farm).....	74.5	27.9	83.9	87.7	2.0	2.8	1.8
<b>GROUP II</b>							
Thompson Hybrid 36.....	110.3	31.2	88.1	63.7	1.0	7.8	.8
Iowearth A.....	105.1	30.7	89.9	72.7	1.1	9.2	.7
*Pfister 374.....	96.9	31.1	78.0	75.8	1.0	9.2	1.7
Reid-National 110.....	91.4	31.5	80.4	60.8	1.0	4.0	1.0
Twin City Pride B58.....	90.0	30.9	87.2	58.7	1.2	12.5	1.7
Wisconsin 645.....	84.6	31.4	74.1	46.0	.8	6.2	0.0
*Jacques Proven Hybrid 20J.....	82.8	30.6	84.1	92.2	2.0	20.2	2.2



Table 24. Winona County Yield Trial (Continued)

Variety	Average yield bu. per acre 14 per cent moisture	Average per cent moisture	Average per cent stand	Lodging		Average number broken stalks	Average number smutted plants
				Per cent	Degree		
<b>GROUP III</b>							
Iowealth 16 .....	116.2	32.4	91.0	62.8	1.0	3.3	1.3
Thompson Hybrid 27 .....	114.9	32.5	88.1	60.0	.8	3.3	.8
Thompson Hybrid 45 .....	114.0	32.6	86.5	64.7	1.0	5.2	.5
*Master Hybrid F101 .....	111.7	31.8	90.5	71.0	1.1	3.5	.5
*Master Hybrid F106 .....	110.4	32.4	89.4	79.3	1.4	11.8	1.5
Pioneer Hi-Bred 322 .....	110.1	31.8	88.4	63.5	1.2	10.7	.2
Kingscrot KR1 .....	108.0	32.4	86.2	62.2	.9	7.2	.5
Reid-National 110A <sub>1</sub> .....	106.8	31.9	91.5	65.3	1.1	7.2	.7
Pfister 266 .....	104.6	32.4	87.0	87.5	1.5	11.8	1.2
*Master Hybrid F103 .....	103.8	32.4	93.9	54.3	.8	3.8	.5
Funk's Hybrid G-12 .....	102.8	31.9	81.7	57.0	.9	3.2	.8
Iowealth AF11 .....	100.8	31.9	81.5	64.2	1.1	8.3	0.0
Jacques Proven Hybrid 1155 .....	95.5	32.2	84.9	57.3	.9	4.7	1.0
Minimum level of significance .....	8.1	1.2					

\* Experimental variety not in commercial production.

seasons. It should be noted that the harvesting was completed rather late in October and yet the corn contained a very high moisture content. Farmers generally are anxious to crib corn on or before this time during the month of October ahead of early snowfall. Varieties in Group I, the early group, were not fit to crib because of too much moisture. Early maturity is an important factor in this location.

**Group I.**—The average per cent of moisture of Minhybrids 403 and 404 and Murdock has been taken as a base for setting up maturity groups in this location. The average per cent of moisture of the three varieties was 29.3 per cent. Adding 1.2, the minimum level of significance for moisture, to 29.3 equals 30.5 per cent, the highest moisture allowed in this group. There are 28 varieties that fall in this group. Three varieties containing significantly less than the base moisture could have been placed in still an earlier group.

The minimum level of significance for yield is 8.1 bushels. Subtracting

8.1 from 112.1 bushels, the highest yielding variety, gives 104.0 bushels and places seven varieties in a higher yielding class, indicated by a line drawn between Minhybrid 404 and Kingscrot KN1 (KN121). There are 7, 11, and 3 varieties that fall in class 2, 3, and 4, respectively, for yielding ability in this group.

**Group II.**—There are seven varieties in this group that were significantly higher in moisture and are considered later. These range in moisture from 30.6 to 31.5 per cent and were not fit for cribbing. With the exception of Thompson Hybrid 36 and Iowealth A, this group yielded significantly less than the higher yielding class in Group I.

**Group III.**—There are 13 varieties in this group that contained from 31.8 to 32.6 per cent of moisture, which appear to be late for this location in average seasons. Varieties in this group contained significantly more moisture than Group II and did not yield significantly higher than hybrids in Group I.

## *Summary of Two Rates of Planting*

A summary table is presented showing the average yields obtained from planting at the rate of four seeds and three seeds per hill in 11 locations in

1941. The average yield for all entries in each location and the average per cent of stand are reported for the two rates of planting in table 25.

**Table 25. Summary Table Two Rates of Planting, Three and Four Seeds per Hill**

County	Number of Entries	Av. Per Cent Stand		Av. Yield Bu. per Acre	
		3 seeds	4 seeds	3 seeds	4 seeds
Clay	32	89.4	87.8	37.0	41.9
Ottertail	32	88.8	89.3	54.5	56.7
Traverse	34	81.8	82.7	60.8	58.8
Stearns	32	91.1	88.5	49.4	53.9
Lac qui Parle	45	81.2	72.9	53.8	59.3
McLeod	42	89.6	88.7	57.5	55.4
Lincoln	51	82.9	83.1	61.9	63.5
Dakota	42	87.8	85.2	62.9	55.4
Murray	57	84.1	86.1	67.7	80.2
Martin	60	82.2	83.1	78.2	85.1
Winona	48	87.4	86.5	94.5	105.3

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