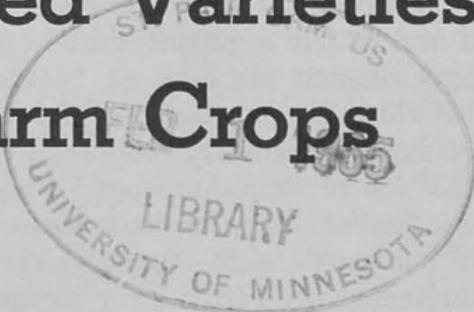


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Revised March 1941

# Improved Varieties of Farm Crops



Varieties Recommended for Minnesota by the  
Minnesota Experiment Station



A Field of Minrus Oats, Fillmore County

UNIVERSITY OF MINNESOTA



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UNIVERSITY OF MINNESOTA  
*Agricultural Extension Service*  
U. S. DEPARTMENT OF AGRICULTURE

# Improved Varieties of Farm Crops

**T**HIS list of recommended varieties for Minnesota has the joint approval of agronomists, plant breeders, and plant pathologists of the central experiment station at St. Paul and of the superintendents and agronomists of the various branch stations at Waseca, Morris, Crookston, Grand Rapids, and Duluth. A variety must have been tested in experimental plots for at least three years to be eligible for recommendation. The basis of recommendation is satisfactory performance in competitive trials when compared with standard varieties. These tests are conducted at the central and branch stations, in cooperative trials on farms, and, in addition, comparative trials of reaction to disease are conducted in specially prepared disease nurseries at the central station. Varieties introduced from outside the state are given the same careful trial as those developed in Minnesota.

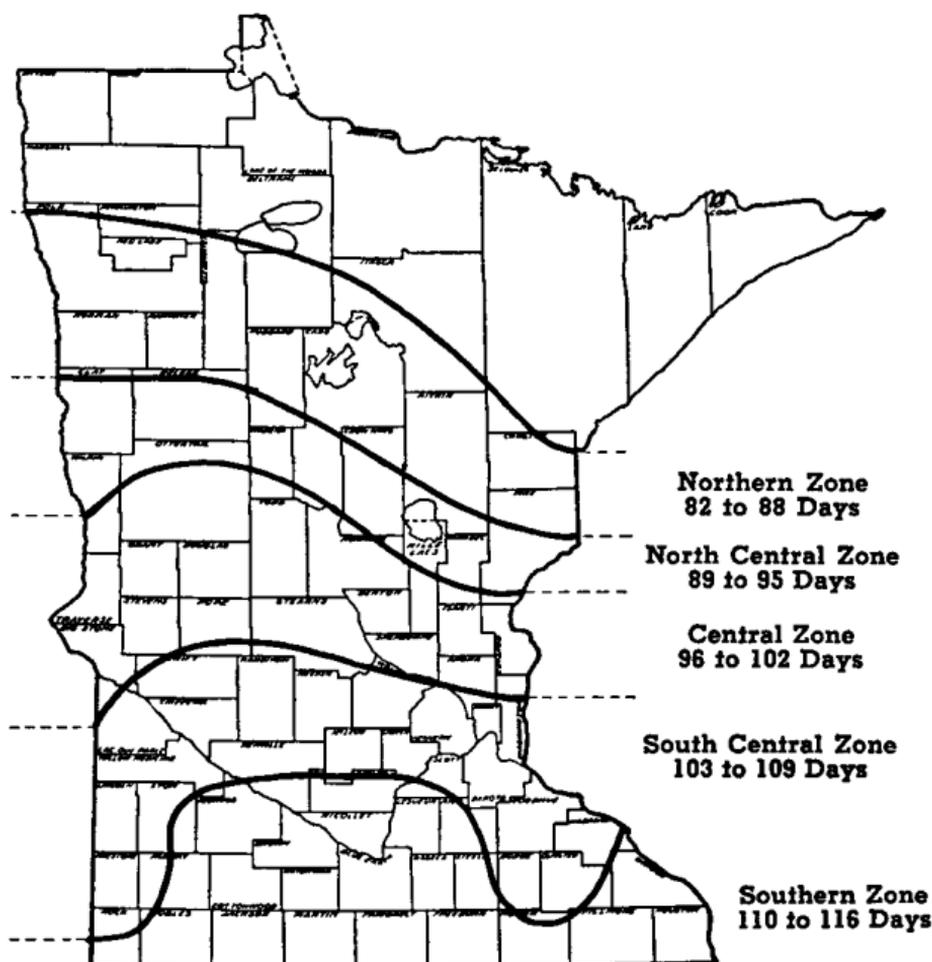
The list is followed by a statement of the important characters of each recommended variety and its origin and regional adaptation. A brief statement of varieties that are not recommended is also given.

## MATURITY REGIONS IN MINNESOTA

For small grains Minnesota may be subdivided into two main divisions: (1) Southern Minnesota which includes approximately all territory south of an east and west line passing through St. Paul; and (2) Central and northern Minnesota including the territory north of a line running east and west through St. Paul. In some cases a variety may yield much better comparatively in the cut-over region of northeastern Minnesota than in the Red River Valley. Therefore, the Red River Valley has been designated as Northwestern Minnesota and the cut-over region of central and northern Minnesota as Northeastern Minnesota.

The corn growing area of Minnesota has been divided into five regions of maturity. Days to maturity for corn refer to the approximate number of days of growing season that may be expected, on the average, from emergence of the seedlings to that stage when the moisture in the ears on the standing plants is approximately 40 per cent. At this time the ears are well dented.

The five maturity zones are: Late or Southern zone, Medium or South Central zone, Medium Early or Central zone, Early or North Central zone, and Very Early or Northern zone. The approximate days to maturity from south to north in these five zones are 113, 106, 99, 92, and 85, respectively. The regions of maturity are illustrated in the map on page 3.



MATURITY OR ADAPTATION ZONES FOR  
CORN IN MINNESOTA

## Varieties Recommended for Minnesota

### WHEAT Bread Varieties

#### Spring Wheat:

For all regions: Thatcher, Minn. No. 2303.

Southern Minnesota: Rival, Minn. Acc. No. 2670.\*

#### Winter Wheat:

For Southern Minnesota:

Minturki, Minn. No. 1507; Marmin, Minn. No. 2614.

### Durum Varieties

For Central and Northern Minnesota:

Mindum, Minn. No. 470.

### OATS

For Southern Minnesota:

Early maturing: Gopher, Minn. No. 674; Iogold, Minn. Acc. No. 711; and Nakota, S. Dak. No. 165, Minn. Acc. No. 741.

\* Accession number signifies that the variety referred to was originated at some other experiment station but has been tested in Minnesota and found desirable for use in the state.

Mid-early maturing: Minrus, Minn. No. 693.  
Medium maturing: Rusota, N. Dak. No. 20014, Minn.  
Acc. No. 708.

For Central and Northern Minnesota:

Early maturing: Gopher, Minn. No. 674; Iogold,  
Minn. Acc. No. 711; and Nakota, S. Dak. No.  
165, Minn. Acc. No. 741.

Mid-early maturing: Minrus, Minn. No. 693.

Medium maturing: Rusota, N. Dak. No. 20014, Minn.  
Acc. No. 708.

For Northwestern Minnesota only:

Medium maturing: Vanguard, Minn. Acc. No. 753.

For Northeastern Minnesota only:

Medium maturing: Anthony, Minn. No. 686.

## **BARLEY**

For all sections:

Barbless (Wisconsin No. 38), Minn. Acc. No. 529, and  
Velvet, Minn. No. 447.

For peat land:

Peatland, Minn. No. 452.

## **RYE**

For all sections:

Dakold, N. Dak. No. 959, Minn. Acc. No. 93; Wis-  
consin Pedigree No. 6, Minn. Acc. No. 115; and  
Emerald, Minn. No. 107.

For Southern Minnesota only:

Rosen, Minn. Acc. No. 82.

## **FLAX**

For Southern and Central Minnesota:

Redwing, Minn. No. 188.

For Central and Northern Minnesota:

Bison, Minn. Acc. No. 199.

For Red River Valley only:

Buda, Minn. Acc. No. 194.

## **FIELD CORN**

Southern zone (late maturity, 110-116 days)

Experiment station hybrids:

For husking and silage: Minhybrids 301, 403, 404,  
and 405.

For hogging off: Minhybrids in the 600, 700, and  
800 series.

Commercial hybrids: Pioneer 355, DeKalb 201, Tur-  
ner E4, National 110, Iowearth A.P., and Iowearth  
A.

Open-pollinated varieties: Silver King, Murdock,  
Golden Jewel, Late Minn. No. 13, and Golden  
King.

- South Central zone (medium maturity, 103-109 days)  
Experiment station hybrids: Minhybrids 301, 500, 501, and 502.  
Commercial hybrid: Pioneer 355.  
Open-pollinated varieties: Golden King, Rustler, and U. Farm strain of Minn. No. 13.
- Central zone (medium early maturity, 96-102 days)  
Experiment station hybrids: Minhybrids 600, 601, 602, 603, 604, and 401.  
Open-pollinated varieties: Morris strain of Minn. No. 13.
- North Central zone (early maturity, 89-95 days)  
Experiment station hybrids: Minhybrids 700, 701, 702, and 402.  
Open-pollinated varieties: Crookston strain North-western Dent and Haney's strain of Minn. No. 13.
- Northern zone (very early maturity, 82-88 days)  
Experiment station hybrid: Minhybrid 800.  
Open-pollinated varieties: Crookston strain North-western Dent, Dakota White, Gehu, Pearl, and Rainbow flints.

## **SWEET CORN**

Southern section:

Open-pollinated varieties: Country Gentleman and Stowell's Evergreen.

Southern and central section:

Early maturing:

Hybrids: Minhybrids 201 and 202.

Open-pollinated varieties: Golden Bantam and Crosby.

## **POP CORN**

Hybrid: Minhybrid 250.

Open-pollinated variety: Japanese Hull-less.

## **SOYBEANS**

Early maturing:

Minsoy, Minn. No. 139, and Wisconsin Black, Minn. Acc. No. 164.

Medium maturing:

Habaro, Minn. No. 109, and Minnesota-grown Manchú, Minn. Acc. No. 203.

## **FIELD PEAS**

Chancellor, Minn. Acc. No. 235, and Chang, Minn. Acc. No. 234.

## **ALFALFA**

For all sections: Grimm and Ladak.

# Characteristics of Recommended Varieties

## SPRING WHEAT

Spring wheat when grown in southern Minnesota, particularly when following corn in the rotation, is often severely injured by scab.

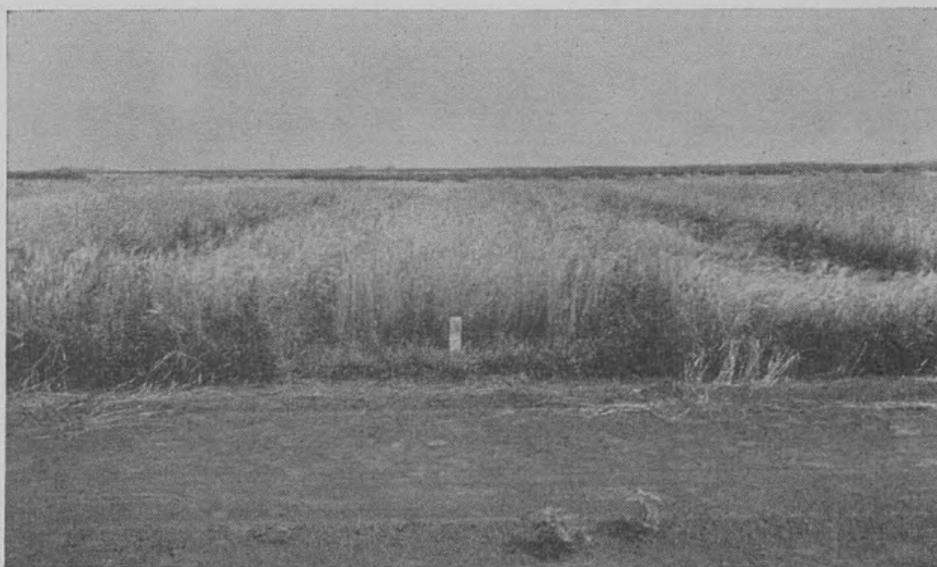
**Thatcher** is a beardless, early-maturing, high-yielding variety, having very strong straw. It is moderately resistant to stem rust and bunt, is resistant to loose smut, but is susceptible to leaf rust and fusarial head blight (scab). It is high in milling and baking qualities. It was produced through cooperation between the Minnesota Agricultural Experiment Station and the United States Department of Agriculture from a double cross of (Marquis x Iumillo) x (Kanred x Marquis).

**Rival** is a high-yielding, bearded variety. It is moderately resistant to stem and leaf rust. It is resistant to bunt and loose smut, moderately susceptible to scab, and susceptible to black chaff. It has weaker straw than Thatcher and tends to shatter. Rival has a higher bushel weight than Thatcher and appears equal to Thatcher in milling and baking quality. It is the result of a Ceres x (Hope-Florence) cross made at the North Dakota Agricultural Experiment Station.

**Mindum** is a bearded, amber-kerneled durum wheat having high-yielding ability. It is moderately susceptible to stem rust and bunt, but very resistant to leaf rust. It excels in quality of semolina products. Mindum resulted from a durum type selected in a common bread wheat. Mindum is recommended for the Red River Valley.

## WINTER WHEAT

Winter wheat, where it can be grown successfully, as in southern Minnesota, is more profitable than spring wheat.



YIELDS TRIALS IN ONE-FORTIETH-ACRE PLOTS  
Thatcher (center plot) proved highly resistant to lodging.

**Minturki** is a bearded, white-chaffed, stiff-strawed variety of the Turkey type. It is early-maturing, yields well, is somewhat resistant to stem rust, and moderately resistant to bunt, loose smut, and fusarial head blight, but it is moderately susceptible to leaf rust. It is very winter-hardy, but not so reliable on sandy lands as winter rye. It was produced from a cross of Turkey and Odessa.

**Marmin** is a bearded winter wheat similar to Minturki in yielding ability, winter hardiness, disease resistance, and time of maturity. It has higher bushel weight, harder texture of the grain, and produces whiter flour than Minturki. It is the result of a Minturki x Marquis cross.

## OATS

**Gopher** is early-maturing and open-panicled with white grain. It has short, stiff straw and is recommended especially for southern Minnesota although in certain years its yielding ability has been outstanding in central and northern Minnesota. It is susceptible to crown and stem rusts and moderately susceptible to smuts. It yields well on peat lands and is recommended for rich, heavy soils where lodging may occur. It may not grow tall enough to harvest easily on light or poor soil. Gopher is a selection from a commercial mixture of Sixty-Day oats, developed for the purpose of obtaining a stiff-strawed, high-yielding variety.

**Iogold** is early-maturing, open-panicled with yellow grain. It has short stiff straw but lodges more than Gopher on heavy soil. It is resistant to stem rust, susceptible to crown rust, and moderately susceptible to the smuts. This variety was produced at the Iowa station by selection from Kherson and is very satisfactory for southern Minnesota.

**Minrus** is intermediate between Gopher and Rusota in time of maturity. It is open-panicled and is about equal in height and stiffness of straw to Rusota. It is resistant to stem rust, susceptible to crown rust, and moderately susceptible to the smuts. Minrus is preferable to Gopher for growing on light soils in southern Minnesota, and it has yielded better than other varieties of oats on peat lands. This variety was produced from a cross of Minota and White Russian.

**Rusota** is midseason and open-panicled, and has white grain. It lodges more than Gopher, is resistant to stem rust, and moderately susceptible to crown rust and smuts. It has outyielded most other varieties in trials at Crookston. It is a plant selection from Green Russian made at the North Dakota station.

**Anthony** is midseason, open-panicled, white grain, and stiff-strawed. It is taller than Gopher and is high in yield and weight per bushel. It is resistant to stem rust, but susceptible to crown rust and smuts. It is recommended only for northeastern Minnesota. It was

produced from a cross of White Russian and Victory and resembles Victory in plant and kernel characters.

**Nakota** is a hull-less, early-maturing variety. It compares favorably in yielding ability with the standard hulled varieties. It is resistant to stem rust and smuts but is susceptible to crown rust. It was developed by the South Dakota Experiment Station from a double cross (Markton x Richland) x (Swedish Select x Kilby).

**Vanguard** is a midseason, open-panicked, white grain variety. It is resistant to black stem rust, but is susceptible to crown rust. It was produced at the Dominion Rust Research Laboratory, Winnipeg, Manitoba, from the cross Hajira x Banner. For the three-year period, 1938 to 1940, Vanguard yielded slightly less than Rusota at the Crookston station. It is recommended only for northwestern Minnesota.

## BARLEY

**Barbless (Wisconsin No. 38)** is a smooth-awned, high-yielding variety of barley with white aleurone and is of acceptable malting quality. It is resistant to spot blotch, moderately resistant to barley stripe, but is susceptible to scab and loose smut. It has yielded more than any other variety in tests conducted in Minnesota during the last five years except at Grand Rapids where it is exceeded by Peatland. Its greatest weakness is that it lodges badly when seeded on heavy or rich soils. It was produced by the Wisconsin station from a cross of Lion x Oderbrucker.

**Velvet** is a smooth-awned barley of the Manchuria type, with white aleurone. It yields somewhat less than Barbless in most regions of Minnesota. It is susceptible to scab, stripe, and loose smut. Because of its desirable malting quality, it is recommended for market production. It resulted from a cross of Luth, a high-yielding variety that is resistant to spot blotch disease, and a smooth-awned selection.

**Peatland** is a rough-awned variety with white aleurone which has yielded better than most other varieties of barley on peat soils as shown by several years' test. In recent years Peatland has yielded well on mineral soils and is popular in some sections of northern Minnesota. It is resistant to spot blotch, stem rust, loose smut, and moderately resistant to scab, but is susceptible to stripe. It is a selection from the variety called Switzerland.

## RYE

**Rosen** is satisfactory for southern Minnesota when the winters are not too severe. It winterkills more readily than Dakold. It was introduced from Michigan where it was developed.

**Dakold** is a very winter-hardy variety developed at the North Dakota Experiment Station. It has yielded slightly less than Emerald and Wisconsin Pedigree No. 6 when winterkilling was not severe.



AN ISOLATED SEED PLOT OF RYE

**Emerald** is pure for green color of seed. It appears well adapted for all regions when winterkilling is not severe. It was produced at University Farm by selection for pure seed color in self-pollinated lines and their combination.

**Wisconsin Pedigree No. 6** is a variety pure for colorless seed. It appears well adapted for all regions when winterkilling is not severe. It was selected at the Wisconsin Agricultural Experiment Station.

## FLAX

Wilt-resistant varieties are essential for successful flax production. If planted in late May or in June, the crop may be damaged by wilt disease; therefore sowing in April or the first part of May is necessary for the best yields. Seed of wilt-resistant varieties cannot be distinguished readily from that of susceptible varieties. To be certain that seed is of a wilt-resistant variety, it is necessary to procure registered seed from a reliable source.

**Redwing** is superior in yield to **Bison** in southern Minnesota but not in the Red River Valley. It can be distinguished from other varieties grown in the state by its characteristic light blue flowers. It is early in maturity, moderately resistant to wilt, and moderately susceptible to rust. Seed of **Redwing** is medium size, and the oil produced from it is of high quality. It was developed from a plant selected from a variety grown under Acc. No. 91.

**Bison** is superior in yield to **Redwing** in the Red River Valley. It has characteristic dark blue flowers and medium large size seeds. The oil content of the seed averages about two per cent higher than that of **Redwing** or **Buda**, but the oil produced dries slowly. It is mid-late in maturity, resistant to wilt, but susceptible to

rust. It was developed at the North Dakota Experiment Station by plant selection.

**Buda** is a desirable variety for the Red River Valley but not for other parts of the state. Seeds of Buda are medium-small to small in size, and the oil is of good drying quality. It is mid-late in maturity, resistant to wilt, and moderately resistant to rust. It was developed at the North Dakota Experiment Station by selection from a Russian variety.

## FIELD CORN

At the present time over 50 per cent of the corn acreage in Minnesota is planted to hybrid varieties. In addition to the corn hybrids released by the Minnesota Experiment Station, many hybrids have been developed by commercial seed companies. Commercial seed company hybrids have been compared with Minhybrid and open-pollinated varieties in the state corn yield trials since 1937. Hybrids that have been tested for three years in a maturity zone are recommended on the same basis as Minhybrids produced by the Minnesota Agricultural Experiment Station.

Using seed of adapted varieties is important when mature corn is desired. Seed of different hybrids cannot readily be distinguished by appearance; therefore, it is necessary either to grow the seed or purchase it from reliable sources. Growing seed of the early hybrids needed in northern Minnesota further south, under more certain seed producing conditions, makes no material difference in the time of maturity of the northern-grown commercial crop.

Recommended hybrids and varieties that are adapted to the various maturity zones are described briefly. In comparing yields and moisture content at husking, differences are considered significant when the odds are 19:1 or greater against a difference as great as that obtained, being due to chance alone; i.e., due to errors of random sampling.

### Southern Zone

#### Experiment Station Hybrids

**Minhybrid 301** is a yellow three-way cross with the pedigree (14x11) (B164). It has been grown since 1934. It is slightly earlier than Murdock and has yielded 15-20 per cent more. It has slightly lower moisture content at husking than Minhybrid 403 and in many cases the differences reach the 19:1 level of significance. In 48 replicated yield comparisons Minhybrid 301 yielded 65.3 bushels while Minhybrid 403 yielded 64.4 bushels.

**Minhybrid 403** is a yellow double cross with the pedigree (14x11) (374x375). It is similar in time of maturity to Murdock and has yielded 15-20 per cent more than farm varieties. In several comparisons Minhybrid 403 has had slightly higher moisture content in the ears at husking than Minhybrid 301.

**Minhybrid 404** is a yellow double cross with the pedigree (A322xA334) (A374xA375). Minhybrids 404 and 405 have been compared with each other and with Minhybrids 301 and 403 and Murdock in 1938 to 1940 in nine yield trials. This variety is slightly later than Minhybrid 403 and has given a significantly higher yield. Minhybrid 404 has very desirable lodging resistance and is resistant to both ear rots and smuts.

**Minhybrid 405** is a yellow double cross with the pedigree (A311xA334) (A374xA375). It is similar to Minhybrid 404 in time of maturity, yielding ability, and other characters.

## Commercial Hybrids

**Pioneer 355** is very similar to Minhybrid 301. Single cross E is used as the female parent and B164, an inbred from Reid's Yellow Dent, is used as the male parent. Four years' data on this hybrid are available from tests made in different years in Rock, Nobles, Brown, Cottonwood, Watonwan, Martin, Fillmore, Houston, and Winona counties. The hybrid has yielded slightly higher than Minhybrid 301 with a slightly higher moisture content in the ears at husking, although the differences do not reach the level that has been set up as indicating a significant difference.

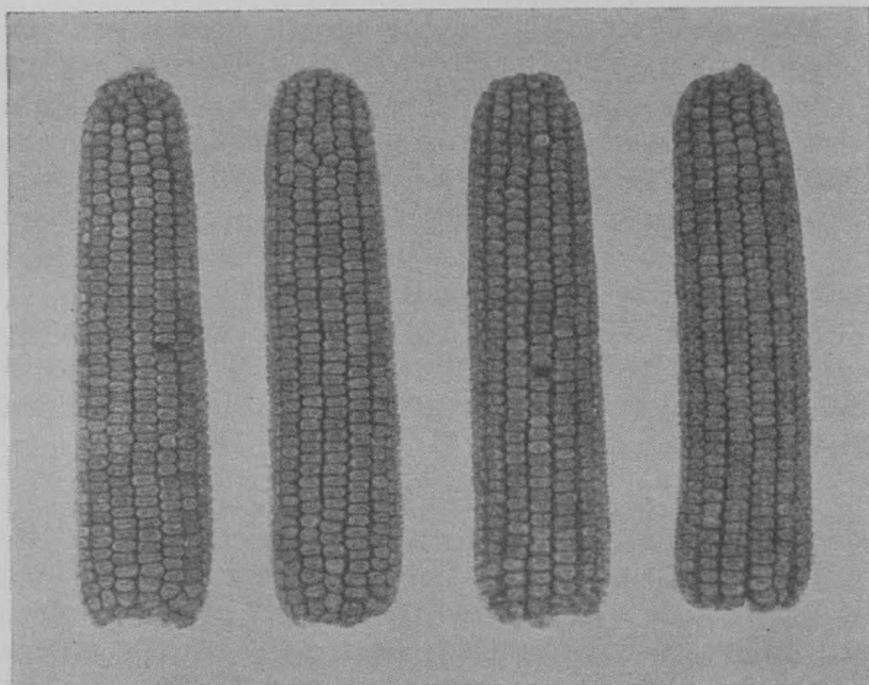
**Turner E-4** has been tested for four years in all parts of the southern zone where yield trials have been made. On the average, it has yielded slightly, although not significantly, higher than Minhybrids 301 and 403 and is significantly higher in moisture content of the ears at husking.

**DeKalb 201** has been tested for three years in Cottonwood, Watonwan, and Martin counties. It yielded slightly more than Minhybrid 301 and had a significantly higher moisture content at husking.

**Iowealth A.** has been tested for four years in both southeastern and southwestern Minnesota and for three years in the south-central part of the southern zone. It has yielded significantly higher on the average than Minhybrid 301 for an average of all trials although not significantly higher in any one region and has proven distinctly higher in moisture content of the ears at husking.

**Iowealth A.P.** has been tested for three years in the southwestern and south-central parts of the southern zone. It has yielded slightly, although not significantly, more than Iowealth A. and has averaged about the same moisture content in the ears at husking.

**National 110** has been tested for three years in Rock, Nobles, Fillmore, Houston, and Winona counties. It yielded the same as Minhybrid 301 in the trials conducted in Rock and Nobles counties and significantly more than Minhybrid 301 in Houston and Winona counties. It is significantly higher in moisture content of the ears at husking than Minhybrid 301 in the trials in both southeastern and southwestern Minnesota.



COMMERCIAL EARS OF MINHYBRID 301

### Open-pollinated Varieties

**Silver King** has an average maturity of about 110 days. Ears are 16-rowed, cobs white, kernels creamy white with wrinkled dent, moderate depth. Adapted to the most productive soils in southern Minnesota.

**Murdock** is similar to Silver King in habit of growth and maturity. Ears are 16-rowed, cobs red, kernels yellow with wrinkled dent. It has the same region of adaptation as Silver King.

**Golden Jewel** was formerly grown extensively in southern Minnesota. It is probably a selection from Murdock or has resulted from a cross of Murdock and Minnesota No. 13. It is very similar to Murdock.

**Golden King** has an average maturity of about 105 days. It is a smooth yellow dent corn with red cobs. It was obtained from William McArthur of Mason City, Iowa. It is adapted to central and southern Minnesota.

**Late Minnesota No. 13** is a later strain of Minnesota No. 13 with 14-18 rows and is somewhat rougher in type than the earlier strains previously described although not as rough as Murdock or Golden Jewel.

### South Central Zone

#### Hybrid Varieties

**Minhybrid 301** and **Pioneer 355** may be grown satisfactorily in seasons that are favorable for the maturing of late varieties for this region.

**Minhybrid 500** is a yellow hybrid with the pedigree (A73xA71) (A7xA12). It has been compared with Minhybrid 401 and U. Farm Minn. No. 13 from 1936 to 1940 in 12 yield trials. It was compared with Minhybrid 301 in four yield trials in 1940. This hybrid is slightly

earlier than Minhybrid 301 and about the same in maturity as U. Farm Minn. No. 13. This hybrid has yielded distinctly more than Minhybrid 401 and is equal to Minhybrid 301 in yield. Minhybrid 500 is outstanding in ability to withstand lodging, resistance to smut, and produces ears of a desirable yellow color.

**Minhybrid 501** is a yellow double cross with the pedigree (A73xA142) (A7xA12). It has been compared with Minhybrid 401 and U. Farm Minn. No. 13 in ten yield trials and with Minhybrid 301 in five yield trials in 1940. Minhybrid 501 is distinctly earlier than Minhybrid 500 and slightly later than Minhybrid 401. It has given a higher yield than 401. In 1940 it averaged about 11 bushels lower in yield than Minhybrid 301. It approaches Minhybrids in the 600 series in time of maturity and seems adapted in this region only when early maturity is desirable.

**Minhybrid 502** is a yellow double cross with the pedigree (A322xA334) (A344xA347). It has been compared with Minhybrids 401 and 301 and Murdock from 1938 to 1940 in 11 yield trials. Minhybrid 502 is about the same maturity as Minhybrid 301 and has excelled it in yield. It is highly resistant to lodging and smut and produces sound ears at maturity highly free from ear rots.

## Open-pollinated Varieties

**Rustler** is similar to the medium maturing strains of Minn. No. 13 in plant characters and maturity. Ears are white, comparatively smooth, and 12- to 16-rowed. Kernels are of medium depth and cobs are white. A high-yielding strain has been developed at University Farm.

**Golden King.**—See description on page 12.

**U. Farm Strain Minn. No. 13.**—This strain is somewhat similar to the other strains of this variety except that it is later than either the Haney or Morris strains. It was selected originally by C. H. Lein of Stearns County.

## Central Zone

### Experiment Station Hybrids

**Minhybrid 600** is a yellow hybrid with the pedigree (A28xA26) (A7xA12). It has been compared with Minhybrids 401 and 402 and the U. Farm strain of Minn. No. 13 from 1937 to 1940 in 16 yield trials. This hybrid is equal to Minhybrid 401 and superior to Minhybrid 402 and U. Farm Minn. No. 13 in yield. Minhybrid 600 is slightly earlier than 401 and definitely earlier than U. Farm Minn. No. 13.

**Minhybrid 601** is a yellow double cross with the pedigree (A94xA145) (A7xA12). It has been compared with Minhybrids 401 and 402 and the Morris strain of Minn. No. 13 from 1936 to 1940 in 12 yield trials. This hybrid is similar to Minhybrid 600 in yield and maturity.

**Minhybrid 602** is a yellow double cross with the pedigree (A357xA392) (A334xA344). It has been compared with Minhybrids 401 and 301 from 1938 to 1940 in 12 yield trials. This hybrid matures at about the same time as Minhybrid 401 and has given a yield as high or higher than 301. Minhybrid 602 has excellent standing ability and produces seed with a tendency to a light yellow cap. Minhybrids 602, 603, and 604 have not been compared extensively in yield trials with Minhybrids 600 and 601.

**Minhybrid 603** is a yellow double cross with the pedigree (A322xA334) (A357xA344). It has been compared with Minhybrids 401 and 301 from 1938 to 1940 in ten yield trials. In yield, maturity, and other characters it is similar to Minhybrid 602.

**Minhybrid 604** is a yellow double cross with the pedigree (A340xA322) (A344xA347). It has been compared with Minhybrids 401 and 301 and Murdock in 11 yield trials. In yield, maturity, and other characters it is similar to Minhybrids 602 and 603.

**Minhybrid 401** is a mixed color double cross with the pedigree (14x11) (15x19). The single cross (14x11) is yellow and (15x19) is white. This hybrid has been available for about ten years. It is about the same in maturity as the Morris Minn. No. 13 and has outyielded farm varieties in numerous trials by about 5 bushels per acre. It will be replaced in the near future with Minhybrids in the 600 series.

## Open-pollinated Variety

**Morris strain Minn. No. 13** is somewhat earlier than the U. Farm strain. It is 12-16 rowed, yellow, comparatively smooth with kernels of medium depth, and has red cobs.

## North Central Zone

### Experiment Station Hybrids

**Minhybrid 700** is a yellow double cross with the pedigree (A140xA155) (A7xA12). Minhybrids 700 and 701 have been compared with each other and Minhybrid 402 from 1936 to 1940 in 12 yield trials. This hybrid has outyielded Minhybrid 402 by 3.6 bushels per acre and the Morris strain of Minn. No. 13 by 8.6 bushels per acre. It is as early as Minhybrid 402 and earlier than the open-pollinated variety.

**Minhybrid 701** is a yellow double cross with the pedigree (A145xA155) (A7xA12). This hybrid has outyielded Minhybrid 402 by 5 bushels per acre and the Morris strain of Minn. No. 13 by 9.9 bushels. It is very similar to Minhybrid 700 in yielding ability and maturity.

**Minhybrid 702** is a yellow double cross with the pedigree (A158xA96) (A116xA131). Minhybrid 702 has been compared with Minhybrids 401 and 402 and the Morris strain of Minn. No. 13 from 1938 to 1940 in 12 yield trials. This hybrid gave a yield of 2.7 bushels

per acre more than Minhybrid 402 and is slightly earlier than 402. It is resistant to lodging and produces ears which are very sound and free from disease.

**Minhybrid 402** is a mixed color double cross with the pedigree (14x11) (16x20). The single cross (14x11) is yellow and (16x20) is white. This hybrid has been available to growers for ten years. The hybrid is slightly earlier than Haney's Minn. No. 13 and has outyielded it by 11 bushels per acre. It probably will be replaced soon by Minhybrids of the 700 series.

### Open-pollinated Varieties

**Haney's Strain Minnesota No. 13** is an early strain of Minn. No. 13 developed by J. G. Haney of East Grand Forks. The ears have 12-14 rows, are yellow, with kernels of medium depth and red cob.

**Northwestern Dent**, the Crookston strain, was developed at the Crookston station. It matures 7 to 10 days earlier than later strains of this variety. It is recommended for northwestern and north-central parts of the state. Ears are comparatively smooth, 12- to 14-rowed, kernels not deep, yellow-capped, red dent with considerable variation in shade of color.

### Northern Zone

#### Experiment Station Hybrid

**Minhybrid 800** is an all yellow double cross (A96x-A148) (A116xA131). This hybrid is earlier than Minhybrid 402 and Haney's Minn. No. 13. It has been compared with Minhybrid 402 from 1938 to 1940 in 12 yield trials. It is equal in yield to 402 and has outyielded the open-pollinated variety by 12 bushels per acre. Minhybrid 800 produces bright yellow ears and is resistant to disease and lodging.

### Open-pollinated Varieties

**Northwestern Dent.**—See description above.

**Dakota White** is a very early flint variety with ears borne so low that it is difficult to harvest with a corn binder. Ears have 8 to 10 rows and are smooth and white.

**Pearl Flint** is similar to Dakota White but its ears have 10 to 12 rows with large ear butts which make husking difficult. Ears are borne somewhat higher up than those of Dakota White, which makes harvesting with the binder possible.

**Gehu** is similar to Dakota White in plant and ear characters. The ears are usually 10- to 12-rowed, and the kernels are yellow.

**Rainbow Flint** matures in about the same length of time as the Haney strain of Minnesota 13 and has been widely grown in the northern region. It has yielded very well in trials at the Crookston branch station. Ears are 12- to 14-rowed, slightly longer than Pearl Flint, with kernels variable in color.

## SWEET CORN

### Hybrids

Sweet corn crosses are valuable for canning purposes and also for use by market gardeners.

**Minhybrid 201** is a cross of Golden Bantam inbred lines 77 and 78. In a 6-year trial at University Farm it has yielded 31 per cent more cut corn at canning time, and in a 4-year trial at LeSueur, 56 per cent higher than the Minnesota LeSueur canning strain of Golden Bantam. It is five to six days later than the standard Bantam, produces many suckers, has ears 5 to 7 inches long, which are 8-rowed with rather frequent 10-rowed butts. Kernels are medium size and yellow. The quality of the canned product (whole grain pack) is equal to standard Golden Bantam. It has been used extensively for canning on the ear.

**Minhybrid 202** is a cross of Golden Bantam inbred lines 38 and 42. It has been in trial six years and has yielded 25 per cent more cut corn at University Farm and 50 per cent more cut corn at LeSueur than the Minnesota LeSueur strain of Golden Bantam. It is one to two days earlier than the standard Bantam, is medium in the production of suckers, and produces ears 6 to 8 inches long. Ears are 8-rowed, occasionally 10-rowed. Kernels are medium large and yellow. This hybrid excels standard Golden Bantam in tenderness and flavor as judged from the canned product (whole grain pack).

### Open-pollinated Varieties

**Golden Bantam** is grown in many parts of the United States and has long been recognized as a high-quality sweet corn. Many strains ranging from early market garden to later canning types have been developed. Ears are golden yellow, 5 to 7 inches long, mostly 8-rowed.

**Crosby**, more commonly grown in Minnesota for canning than for home or market garden, is somewhat later than Golden Bantam. Ears are white, 6 to 8 inches long, and 12- to 16-rowed.

**Country Gentleman** is one of the leading late sweet corn varieties in southern Minnesota. Ears are white, 7 to 9 inches long. Kernels are irregularly distributed on the cob.

**Stowell's Evergreen** is a leading late-maturing variety suitable for southern Minnesota. Ears are white, 7 to 9 inches long, and 16- to 18-rowed.

## POP CORN

**Minhybrid 250** is a cross of Japanese Hull-less inbred lines 1 and 6. In trials at University Farm it has yielded 16 per cent more ear corn than standard Japanese Hull-less, has given 29 per cent greater popping volume, is somewhat earlier in time of maturity, and somewhat less susceptible to smut. Ears are white, 3 to 4 inches long, and uniformly cylindrical in shape.

**Japanese Hull-less** is one of the best standard varieties from the standpoint of tenderness and flavor. Ears are white, 3 to 4 inches long, and often have flattened, wide tips. This variety is adapted throughout central and southern Minnesota.

## SOYBEANS

**Habaro** matures in 105 to 110 days and is very upright and leafy, with an average height of 30 to 35 inches. Seeds are light yellow and are larger than those of Manchu. It is a desirable seed and forage variety for central and southern Minnesota. It was developed from a selection made at University Farm.

**Minnesota Grown Manchu** matures a few days later than Habaro and is erect and leafy. Seeds are round and yellow with black and brown hilums. It is earlier in maturity than Manchu grown farther south and is desirable for southern Minnesota.

**Wisconsin Black** matures in 80 to 90 days and reaches a height of 28 to 30 inches. Seeds are medium size and black. It is recommended for seed and hay production in northern Minnesota.

**Minsoy** matures in 80 to 90 days and reaches a height of 22 to 25 inches. It is fine stemmed, leafy, and retains leaves at maturity; high yielder; pods non-shattering; seeds small, light yellow, with brown hilums. It is recommended as a seed and hay crop in northern Minnesota and was developed from a selection made at University Farm.

## FIELD PEAS

**Chancellor** is a tall, white-flowered variety with short, narrow, curved pods well filled with small, round, yellow seeds. It is midseason in maturity, usually a week earlier than Chang. It is high in yield of seed and forage. It was developed by selection at the Dominion Experimental Farms, Ottawa, Canada.

**Chang** is a tall, white-flowered variety, with curved pods of medium length and width. The seeds are yellow, medium in size, round with black hilums (eyes). The edges of the leaves of the seedlings are serrate (toothed). It is high in yield of seed and forage. It is a pure-line selection made at University Farm from a small lot of seed bearing the same variety name, brought in from China by the United States Department of Agriculture.

## ALFALFA

**Grimm**, a winter-hardy variety developed in Carver County, is recommended for all parts of the state. It is susceptible to wilt.

**Ladak** is a winter-hardy variety introduced from northern India by the United States Department of Agriculture. It has yielded as high as Grimm and has the advantage of being fairly resistant to alfalfa wilt.

# Varieties not Considered Desirable for Minnesota

This list includes:

- (a) Improved varieties that after adequate test have been found less desirable than those in the recommended list.
- (b) Improved varieties that have not been tested long enough to be recommended.
- (c) Other much advertised varieties.

## SPRING WHEAT

**Renown** is resistant to stem rust and moderately resistant to leaf rust. On the average it yields less than Thatcher, but under conditions of heavy leaf rust it has yielded higher. It is higher in bushel weight, of better kernel appearance, but has a lower loaf volume and more yellow color when milled than Thatcher. The variety was developed from a cross of H-44 x Reward by the Canadian Rust Research Laboratory.

**Apex** is stem-rust resistant but low in yield and moderately susceptible to leaf rust. It is not so satisfactory in milling and baking characteristics as Thatcher. It was developed from a cross of (Double Cross x H-44) x Marquis at Saskatoon, Canada.

**Pilot** has yielded about the same as Thatcher, is resistant to stem rust, and moderately resistant to leaf rust. Its milling and baking characteristics are about equal to those of Thatcher. Pilot has very weak straw. It is a selection from a Hope x Ceres cross, made by the United States Department of Agriculture.

**Nordhaugen** is resistant to stem rust but susceptible to leaf rust. It yields about as well as Thatcher but is lower in bushel weight. While it has a high flour-yielding capacity, it produces a softer flour of lower loaf volume than a normal hard spring wheat. It was developed by Mr. Nordhaugen, a farmer of Leeds, North Dakota. Its origin is unknown.

**Coronation** is resistant to stem rust and leaf rust, but has not proven satisfactory in baking qualities. In Canada it is not considered equal to Marquis and is not eligible to grade higher than No. 3 Manitoba Northern.

**Ceres**, a bearded variety, has somewhat weaker straw than Thatcher, and is the equal to it in milling and baking qualities. It is moderately susceptible to stem rust and fusarial head blight, and susceptible to leaf rust, bunt, and loose smut.

**Hope**, a variety developed by E. S. McFadden, formerly of Webster, South Dakota, from a cross between Marquis and Emmer, is highly resistant to rusts and smuts but is susceptible to black chaff. It has a tendency to develop weak straw, threshes with difficulty, and has not proved a high yielder in Minnesota.

**Marquillo** is a high-yielding variety, resistant to stem rust. It yields flour with a shade of yellow color when milled.

**Marquis** has desirable milling and baking qualities, but is very susceptible to black stem rust.

**Progress** was developed at the Wisconsin station from a plant selection from Java. It produces softer grain considerably lower in milling value than the recommended varieties and is suitable only for poultry feed. It should not be grown where wheat is produced for milling purposes. It has yielded well in northeastern Minnesota.

**Reward** is an early-maturing wheat, has good milling and baking quality, yields less than Thatcher, and is susceptible to stem rust and to smuts. It is a very suitable variety to sow with early oats as a succotash crop.

**Kubanka** (durum) yields less than Mindum, lodges more severely, has amber-colored kernels, and is desirable for macaroni products.

**Pentad** (durum) is very resistant to stem rust, yields less than Mindum, and the kernels are red. It is undesirable for the manufacture of macaroni products.

## WINTER WHEAT

**Iobred** produces a high-quality grain but is less winter-hardy than Minturki and yields less.

**Iowin** was developed by the Iowa Experiment Station and is not so winter-hardy as Minturki.

**Kanred** is not so winter-hardy as Minturki and has weaker straw.

**Minhardi** is a beardless variety, more winter-hardy and stiffer-strawed than Minturki, but more susceptible to stem rust and stinking smut. It is less widely adapted than Minturki. The grain is somewhat less desirable in quality than that of Minturki.

## OATS

**Albion**, known as Iowa 103, is early, has a white hull, and yields less, as a rule, than Iogold and Gopher.

**Kherson** is a mixture of yellow and white oats, early, susceptible to rust, and yields less than Gopher.

**Liberty Hull-less** is midseason in maturity and threshes out naked. It yields less than Nakota and is very susceptible to smuts and stem rust.

**Rainbow** is a selection from Green Russian made at the North Dakota station. It is less desirable than Rusota.

**Richland**, or **Iowa 105**, is an early, yellow variety with stiff straw, resistant to stem rust. It yields less than Gopher.

**Boone, Tama, and Vicland.**—Boone and Tama were produced in Iowa from crosses of Victoria with Richland. Vicland was selected in Wisconsin from the same cross. In preliminary trials the three varieties have yielded well in southern Minnesota. They are resistant to stem rust, crown rust, and the smuts.

**Victory** is a midseason white oat. It yields less than Anthony and is susceptible to stem and crown rust and smuts.

**White Tartar** is a late, white, side oat that yields less than Victory. It is resistant to stem rust.

## BARLEY

**Minsturdi** is a 6-rowed, rough-awned, stiff-strawed variety with white aleurone and is susceptible to barley stripe.

**Trebi** is a high-yielding, 6-rowed, rough-awned variety with very poor malting quality. It is susceptible to covered smut. The kernels have blue aleurone.

**Manchuria** is a 6-rowed, rough-awned variety and yields less than Wisconsin No. 38 or Velvet. It lodges more than Velvet. The kernels have a mixture of blue and white aleurone.

**Glabron** is a 6-rowed, smooth-awned variety and is undesirable for malting. It is susceptible to scab and loose smut but has somewhat stiffer straw than Velvet or Wisconsin No. 38. About one fourth of the kernels have blue aleurone.

**Spartan** is an early stiff-strawed, two-rowed, smooth-awned variety. It yields less than Wisconsin No. 38. Two-rowed varieties have a limited market, except for feed.

## RYE

**Prolific Spring**, a spring variety, yields well at University Farm, the only station where it has been tested for several years.

## FLAX

**B. Golden** was developed by H. L. Bolley of the North Dakota Experiment Station. It has pink flowers which fade to white on exposure to light. It produces large yellow seeds. It is moderately resistant to wilt and immune from the races of rust common in the United States. This variety is too short-strawed to be generally satisfactory as a farm variety.

**Viking**.—Similar to B. Golden.

**Walsh**.—Walsh is a blue-flowered extra large brown-seeded flax developed at the North Dakota Experiment Station. This variety has not yielded higher than Bison. It is moderately resistant to wilt and immune from the races of rust common in the United States. A less valuable variety than even B. Golden or Viking.

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### UNIVERSITY FARM, ST. PAUL, MINNESOTA

Cooperative Extension Work in Agriculture and Home Economics, University of Minnesota, Agricultural Extension Division and United States Department of Agriculture Cooperating, P. E. Miller, Director. Published in furtherance of Agricultural Extension Acts of May 8 and June 30, 1914.

10M-3-41