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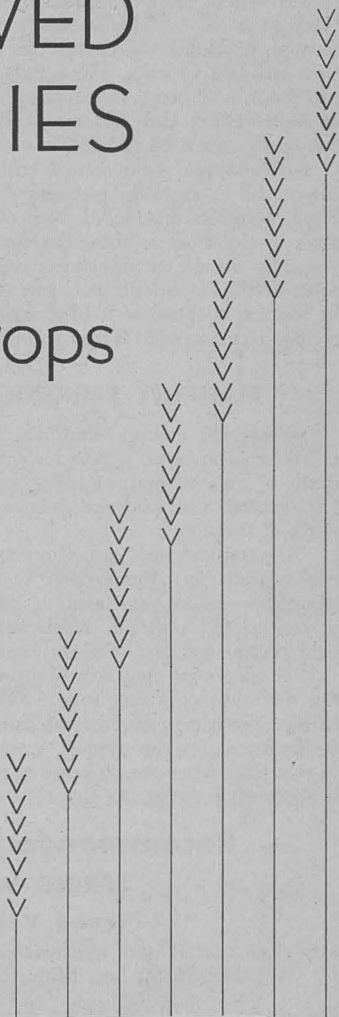
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IMPROVED VARIETIES of Farm Crops

Varieties Recommended
for Minnesota by
the Minnesota
Agricultural
Experiment
Station



UNIVERSITY OF MINNESOTA



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

Improved Varieties of Farm Crops

THIS LIST of recommended varieties for Minnesota has the joint approval of agronomists, plant breeders, plant pathologists, entomologists, and cereal technologists of the Minnesota Agricultural Experiment Station at St. Paul and of the superintendents and agronomists of the various branch stations at Waseca, Morris, Crookston, Grand Rapids, Rosemount, and Duluth.

A variety must be tested in experimental plots for at least three years to be eligible for recommendation. The basis of recommendation is satisfactory performance in competitive trials with standard varieties. These tests are conducted at the central and branch stations, in cooperation with county organizations in southwestern and extreme north central Minnesota, and in cooperative trials on farms.

In addition, comparative trials of reaction to disease are conducted in specially prepared disease nurseries at University Farm. Varieties introduced from outside the state are given the same careful trials as those developed in Minnesota.

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

MATURITY REGIONS IN MINNESOTA

For small grains, Minnesota may be subdivided into (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 that line.

Central and northern Minnesota have been subdivided into two regions: (a) the cutover region of central and northern Minnesota—called northeastern Minnesota—and (b) the rest of central and northern Minnesota subdivided into two areas, west central and northwestern Minnesota.

The corn-growing area of Minnesota has been divided into five maturity zones (see map). Days to maturity for corn refers 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 about 40 per cent. At this time the ears are well dented.

Recommended Varieties

SPRING WHEAT

Bread Varieties

For west central and northwestern Minnesota: Mida, Minn. Acc. No. 2689¹; Lee, Minn. No. 2776.

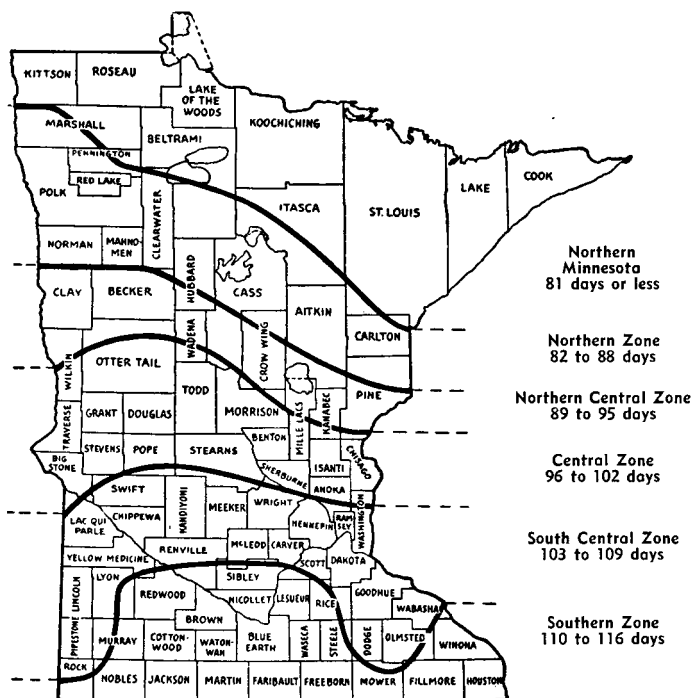
For all sections: Rival, Minn. Acc. No. 2670.

Durum Varieties

For west central and northwestern Minnesota: Carleton, Minn. Acc. No. 2707; Mindum, Minn. No. 470; Stewart, Minn. Acc. No. 2708.

¹ Accession number signifies that the variety was originated at some other experiment station but has been tested in Minnesota and found desirable in the state.

Corn Maturity Zones in Minnesota



WINTER WHEAT

For all adapted sections: Minturki, Minn. No. 1507; Minter, Minn. No. 2713.

OATS

For all sections: Bonda, Minn. No. 841; Clinton, Minn. Acc. No. 857; Mindo, Minn. No. 852; Andrew, Minn. No. 865; Shelby, Minn. Acc. No. 917; Ajax, Minn. Acc. No. 874; James, Minn. Acc. No. 939; Branch, Minn. Acc. No. 938.

BARLEY

For all sections: Kindred (L), Minn. Acc. No. 598; Moore, Minn. Acc. No. 607; Vantage, Minn. Acc. No. 617.
For northeastern section: Peatland, Minn. No. 452.

RYE

For all sections: Emerald, Minn. No. 107; Imperial (Wisconsin Pedigree No. 6), Minn. Acc. No. 115.

FLAX

For all sections: Koto, Minn. Acc. No. 214; Minerva, Minn. No. 216; Redwood, Minn. No. 218; B5128, Minn. Acc. No. 221; Marine, Minn. Acc. No. 223.

For southern section: Redwing, Minn. No. 188.

FIELD CORN

Southern Zone (110-116 days)

EXPERIMENT STATION HYBRIDS:

For Husking and Silage: Minhybrids 404, 405, 406, 408, 409, 410, 411, and 412.

For Hogging Off: Recommended hybrids in the 600, 700, and 800 series.

South Central Zone (103-109 days)

EXPERIMENT STATION HYBRIDS: Minhybrids 403, 500, 503, 504, 505, 506, 507, and 508.

Central Zone (96-102 days)

EXPERIMENT STATION HYBRIDS: Minhybrids 602, 604, 607, and 608.

North Central Zone (89-95 days)

EXPERIMENT STATION HYBRIDS: Minhybrid 706 and Wisconsin 275.

Northern Zone (82-88 days)

EXPERIMENT STATION HYBRIDS: Minhybrids 800 and 802, Nodak 301, and Wisconsin 240, 255, and 279.

Northern Minnesota (81 days and less)

EXPERIMENT STATION HYBRIDS: Wisconsin 240 and 255.

OPEN-POLLINATED VARIETIES: Haney's Strain Minn. No. 13, Dakota White Flint, Pearl Flint, Gehu Flint, and Rainbow Flint.

SWEET CORN

Minhybrids 202, 206, and 207, and Hayes' White.

POPCORN

Minhybrids 250, 251, and 252.

SOYBEANS

The corn zones outlined on the map of Minnesota on page 3 have been utilized to show in a broad way the adaptation of the soybean varieties.

For Seed

Southern and South Central Zones: Ottawa Mandarin, Minn. Acc. No. 219; Capital, Minn. Acc. No. 233; Monroe, Minn. Acc. No. 224; Blackhawk, Minn. Acc. No. 227; Renville, Minn. No. 237.

Southern Two-Thirds of Central Zone: Flambeau, Minn. Acc. No. 223; Ottawa Mandarin, Minn. Acc. No. 219; Capital, Minn. Acc. No. 233; Monroe, Minn. Acc. No. 224; Renville, Minn. No. 237.

Northern One-Third of Central Zone and all of North Central Zone: Flambeau, Minn. Acc. No. 223; Ottawa Mandarin, Minn. Acc. No. 219; Capital, Minn. Acc. No. 233.

Northern Zone: Flambeau, Minn. Acc. No. 223.

For Hay

The varieties used for seed are also recommended for hay. In general for hay it is desirable to use varieties that mature in the locality concerned about 10 days later than the varieties recommended for seed.

FIELD PEAS

For all sections: Chancellor, Minn. Acc. No. 235; Dashaway, Minn. Acc. No. 405; Multiplier, Minn. Acc. No. 403.

SUNFLOWERS

For all sections: Advance, Minn. Acc. No. 3.

ALFALFA

For all sections: Ladak and Ranger.

MEDIUM RED CLOVER

For all sections: Wegener, Minn. No. 2648; Midland, Minn. Acc. No. 2629.

BIENNIAL SWEET CLOVER

For all sections: Evergreen, Minn. Acc. No. 1806; Madrid, Minn. Acc. No. 1807.

BIRDSFOOT TREFOIL

For all sections: Empire, Minn. Acc. No. 2212.

BROME GRASS

For all sections: Achenbach, Minn. Acc. No. 1343; Fischer, Minn. Acc. No. 1348; Lincoln, Minn. Acc. No. 1351.

SUDAN GRASS

For all sections: Piper, Minn. Acc. No. 94.

TIMOTHY

For all sections: Itasca, Minn. No. 1630; Lorain, Minn. Acc. No. 1631.

Characteristics of the Recommended Varieties

SPRING WHEAT

All recommended varieties of bread wheats and the two durums, Carleton and Stewart, have been moderately resistant to stem rust before 1950. In 1950 stem rust race 15B became prevalent and all commercially grown varieties were susceptible.

The durums and Lee, a bread wheat, have continued to be resistant to leaf rust. All other varieties are susceptible to some of the races of leaf rust found in the spring wheat area. Spring wheat grown in southern Minnesota, particularly if it follows corn in the rotation, often is injured severely by scab.

Bread Wheat

WEST CENTRAL AND NORTHWESTERN SECTIONS

MIDA is a bearded, early-maturing variety with medium-strength straw. It is moderately resistant to stem rust and bunt, susceptible to loose smut, and moderately susceptible to scab. It has a high test weight per bushel and appears about equal to Thatcher in milling and baking characters, except that it has given a lower loaf volume and has a shorter fermenting and mixing time. Mida is a selection from a cross of Ceres-Double Cross x (Ceres-Hope-Florence), made at the North Dakota Agricultural Experiment Station.

LEE is an early, bearded variety, moderately resistant to bunt, leaf rust, and stem rust and moderately susceptible to loose smut. It has short, medium-strength straw. It has a good test weight and appears about equal to Thatcher in milling and baking characters. Lee is a selection from a cross of Hope x Timstein made by the Minnesota Agricultural Experiment Station in cooperation with the United States Department of Agriculture.

FOR ALL SECTIONS

RIVAL, a bearded variety, is moderately resistant to stem rust, resistant to bunt and loose smut, moderately susceptible to scab, and susceptible to black chaff. It has somewhat weaker straw than Thatcher and tends to shatter. Rival has a higher test weight than Thatcher and appears about equal to Thatcher in milling and baking qualities. It is a selection from a cross of Ceres x (Hope-Florence) made at the North Dakota Agricultural Experiment Station.

Durum Wheat

WEST CENTRAL AND NORTHWESTERN SECTIONS

CARLETON is a bearded, amber-kerneled durum wheat which yields about the same as Mindum. It is moderately resistant to leaf and stem rusts and loose smut, moderately susceptible to bunt, and susceptible to scab. It has strong straw. It is about equal to Mindum in quality for semolina products. Carleton was selected from a Mindum x Vernal Emmer backcross made by the United States Department of Agriculture in cooperation with the North Dakota Agricultural Experiment Station.

MINDUM is a bearded, amber-kerneled durum wheat with high yielding ability. It is moderately susceptible to stem rust and bunt, susceptible to scab, but resistant to leaf rust. It has weaker straw than Carleton. It has excellent quality for semolina products. Mindum resulted from a durum type selected in a common bread wheat at the Minnesota Agricultural Experiment Station.

STEWART is a bearded, amber-kerneled durum wheat that yields better than Mindum or Carleton, It is moderately resistant to leaf rust, stem rust, and loose smut, moderately susceptible to bunt, and susceptible to scab. It has weaker straw than Carleton. It is equal to Mindum in quality for semolina products. Stewart is a selection from a Mindum x Vernal Emmer backcross made by the United States Department of Agriculture in cooperation with the North Dakota Agricultural Experiment Station.

WINTER WHEAT

Winter wheat, where it can be grown successfully (as in southern Minnesota, an area in the vicinity of Grand Rapids.

and in extreme north central Minnesota), is more profitable than spring wheat. The two recommended varieties have been developed at the Minnesota Agricultural Experiment Station. Both are susceptible to stem rust race 15B.

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

MINTER is a bearded, white-chaffed winter wheat which is equal to Minturki in winter hardiness and in yielding ability. It is moderately resistant to stem rust. Minter has had a somewhat higher weight per bushel, whiter crumb color, and a lower pigment content than Minturki. It is a selection from a backcross of Hope x Minturki by Minturki.

OATS

All of the recommended varieties of oats, with the exception of Ajax, are resistant to prevalent races of the smuts and to the races of crown rust to which Bond is resistant. In recent years, however, races 45, 57, and several others of crown rust have been increasing in prevalence and all present recommended varieties are susceptible to certain prevalent races. Branch is resistant to race 45 but susceptible to some other races.

Statements made in Iowa led to the hope that Nemaha, Colo, and Cherokee would prove more tolerant to 45 and similar races of crown rust than recommended varieties which obtained their resistance from their Bond parent. The results in Minnesota in 1950 and 1951 did not show any advantage for these varieties over the standard varieties. Ajax is susceptible to crown rust and to prevalent races of smut.

Bonda, Clinton, Mindo, Shelby, and James are resistant to race 8 of stem rust to which Andrew, Ajax, and Branch are susceptible. Race 7 of stem rust was widely prevalent in the United States for the first time in 1950. Andrew, Ajax, and Branch carry resistance to race 7. The prevalence of both race 7 and 8 explains why all recommended varieties of oats were susceptible to stem rust in Minnesota in 1950.

BONDA is a good-yielding, open-panicled, early-maturing oat with a yellowish-white, large-sized grain of superior bushel weight. The straw is taller than that of Mindo or Clinton. It is about equal to Clinton and Mindo in standing ability. Bonda was selected at the Minnesota Agricultural Experiment Station from a cross of Bond x Anthony.

CLINTON is a good-yielding, open-panicled, yellow-grained, early-maturing oat with good weight per bushel. It is intermediate in height of straw between Bonda and Mindo. Both Clinton and Andrew have a lower hull percentage than other recommended varieties. It was selected at the Iowa Agricultural Experiment Station from a cross of D69 x Bond.

MINDO is a good-yielding, very early, open-panicled, yellowish oat with good weight per bushel. The straw is short and the variety has good resistance to lodging. Mindo was selected at the Minnesota Agricultural Experiment Station from a cross of Bond x [(Minota x White Russian) x Black Mesdag].

ANDREW is an open-panicled, yellow-grained, very early-maturing oat which has excelled in yielding ability in trials

arranged by the United States Department of Agriculture throughout the Corn Belt. It has good weight per bushel, excellent standing ability, and a low hull percentage. It is similar to Clinton in plant height. It was selected at the Minnesota Agricultural Experiment Station from a cross of Bond x Rainbow.

SHELBY is a yellowish-white-grained selection from a cross of Anthony x Bond made in Iowa. It is as late or slightly later in maturity than Zephyr and Ajax and does not stand up as well as some other recommended varieties although it has a good straw type. Like Ajax, it has yielded somewhat higher on the average than the other recommended varieties. It is superior in weight per bushel, although not equal to Bonda, and has intermediate size kernels.

AJAX, which is a Canadian variety of oats with white glume color, was selected from a cross of Victory x Hajira. Like Shelby, it is later in maturity than Bonda, Mindo, Clinton, and Andrew. Ajax has been outstanding in yielding ability on the average and is similar to Shelby in standing ability. It is less desirable than other recommended varieties in weight per bushel.

JAMES is a new hull-less variety from South Dakota, selected from the cross (Bond-Double Cross B) x Nakota. It has excellent standing ability, is intermediate in time of maturity between such varieties as Mindo and Zephyr, and has good yielding ability. Seed may be available in South Dakota.

BRANCH is a variety recently introduced by the Wisconsin Agricultural Experiment Station from a cross (Forward x Victoria-Richland) x Forward. It excels in height of plant and is relatively late in maturity. It has given excellent yields but has lodged somewhat more than Gopher. It also has a relatively high hull percentage.

BARLEY

Barley is grown for two main purposes: feed and malt production. Varieties differ greatly in their malting quality; hence when growing barley for malting purposes it is very important to select a good malting variety.

All of the recommended varieties are susceptible to leaf rust.

KINDRED (L) is a six-rowed, rough-awned, white aleurone variety with acceptable malting quality. It has yielded well and is medium early, but it is highly susceptible to lodging. It is resistant to stem rust and moderately resistant to spot blotch and net blotch. It is moderately susceptible to mildew and scab and is susceptible to loose smut and stripe. It was selected by a North Dakota farmer.

MOORE is a six-rowed, smooth-awned, white aleurone variety that is late in maturity, has moderately stiff straw, and has yielded well at all locations except Crookston. It is resistant to mildew and stem rust and moderately resistant to scab, but it is moderately susceptible to spot blotch and susceptible to stripe and loose smut. It also has shown unusual susceptibility to net blotch. Because Moore kernels often develop a gray color, and because a number of unsatisfactory results in brewing have been reported, Moore has not found a ready market as a malting variety. Moore was developed at the Wisconsin Agricultural Experiment Station from crosses involving Lion, Oderbrucker, Chevron, and Olli.

PEATLAND, a rough-awned variety with white aleurone, has yielded better on peat soils than most other varieties of barley, as shown by several years' trials. Peatland also has

yielded well on mineral soils and thus is popular in some sections of northern Minnesota. It is resistant to stem rust and mildew and moderately resistant to spot blotch, loose smut, and scab, but is moderately susceptible to net blotch and susceptible to stripe. Peatland has small seeds and is not generally acceptable for malting purposes. It is a selection from the variety called Switzerland.

VANTAGE is a stiff-strawed, six-rowed, smooth-awned feed barley which has a white aleurone. Of the varieties tested in the principal barley-growing areas in Minnesota during the last four years Vantage has averaged highest in yield by about three bushels per acre. It is only slightly later in maturity than Kindred. It is resistant to stem rust, moderately resistant to net blotch, and susceptible to mildew, scab, loose smut, and spot blotch. Vantage was developed at Brandon, Manitoba, from a cross (Newal x Peatland) x Plush.

RYE

EMERALD is pure for green color of seed. It appears well adapted for all regions, and is about equal to Dakold in winter hardiness. It has excelled on sandy soils. It was produced at University Farm, by selection for pure seed color in self-pollinated lines and their combination.

IMPERIAL is a variety pure for colorless seed. It appears well adapted for all regions. It is somewhat less winter hardy than Dakold. It was selected at the Wisconsin Station.

FLAX

The growing of rust-resistant varieties of flax is the most effective means of reducing the damage from flax rust. Pasmó has caused severe damage to susceptible varieties, particularly in the west central and northwestern parts of the state.

Wilt-resistant varieties are also essential for successful flax production. If sown in late May or June the crop may be damaged by the disease; therefore, sowing in April or the first part of May is necessary for producing the best yields. Crop rotation, sanitation, use of clean seed, and early sowing will aid in preventing severe damage from rust and wilt.

Seed of rust- and wilt-resistant varieties cannot always be distinguished readily from that of susceptible varieties, so it is necessary to procure seed from a reliable source.

All Sections

KOTO is a brown-seeded, high-yielding variety, mid-late in maturity, resistant to wilt, and moderately susceptible to pasmo. It can be distinguished from Redwing by its characteristic dark-blue flowers. It has medium seed size and satisfactory oil content and quality. Koto is resistant to many races of rust common in the United States but very susceptible to others. It is a selection from a cross of (Russian x Argentine) x Bison, made at the Northern Great Plains Field Station, Mandan, North Dakota.

MINERVA is a yellow-seeded, good-yielding variety, moderately resistant to rust. While this variety has been moderately susceptible to late wilt at University Farm, it has been much more resistant at Fargo. It is moderately susceptible to

pasmo. It has exceeded all varieties in percentage of oil content, and the oil quality is similar to that of Redwing, but the straw is slightly less valuable for fiber for paper production than that of other varieties. It is a selection made in Minnesota from a backcross of C.I. 649 x Bison.

REDWOOD is a brown-seeded, blue-flowered variety originating from a cross of B5128 x Redson made at the Minnesota Agricultural Experiment Station in 1941. The variety is mid-late in maturity. It is immune to races of rust found in Minnesota, moderately wilt resistant, and moderately susceptible to pasmo. It has made excellent yields in field trials and has high oil content of good quality. This variety produces straw of excellent fiber quality.

B5128 is a brown-seeded, blue-flowered variety resulting from a cross of Golden x Rio made at the North Dakota Agricultural Experiment Station. It is a late-maturing variety. The variety is immune to races of rust found in Minnesota and moderately susceptible to both wilt and pasmo. It has produced excellent yields when planted early. The variety has good oil content of only fair quality. B5128 contains a mixture of types, including a small percentage of yellow-seeded types and a small percentage of rust-susceptible types.

MARINE is a brown-seeded, blue-flowered, early-maturing flax selected from a cross of C.I.975 x Sheyenne made at the North Dakota Agricultural Experiment Station. It is immune to races of rust found in Minnesota, resistant to wilt, and moderately resistant to pasmo. Marine has not yielded as well as Redwood or B5128 when sown early, but in late sowings it seems superior to both these varieties. The variety has good oil content and the oil is of high quality. It is recommended for sowing in all areas in the state where an early-maturing, disease-resistant variety is desirable.

Southern Minnesota

REDWING is well adapted for southern and central Minnesota but not for northwestern Minnesota. It has been satisfactory also in Koochiching and Lake of the Woods Counties and in parts of Roseau County. It is early in maturity, moderately resistant to wilt, and susceptible to pasmo and rust. The seed is of medium size and produces an oil of high drying quality. It was selected at the Minnesota Station from Acc. No. 91.

FIELD CORN

At the present time over 97 per cent of the corn acreage in Minnesota is planted to hybrid varieties. In addition to the corn hybrids released by the Minnesota Agricultural Experiment Station, many hybrids have been developed by commercial companies. Over 650 hybrids are registered for sale in Minnesota. As yield trials of closed pedigree hybrids have not been extensive, only station hybrids that have been adequately tested are included in the recommended list.

Using seed of adapted varieties is important when mature corn is desired. A Minnesota Agricultural Experiment Station Miscellaneous Report, issued annually, gives a maturity rating in days for all hybrids sold in Minnesota. By studying these maturity ratings it is possible to select hybrids that may be expected to mature satisfactorily in the various corn-growing regions of Minnesota. Seed of different hybrids cannot be distinguished readily by appearance; therefore, it is necessary either to grow the seed or to purchase it from reliable sources. Producing seed

of the early-maturing hybrids in central and southern Minnesota, under more certain seed-producing conditions, makes no material difference in the time of maturity of the northern-grown commercial crop.

Recommended experiment station hybrids that are adapted to the various maturity zones are described briefly. All are well adapted to mechanical harvesting.

Southern Zone

All recommended hybrids are yellow. Minhybrid 408 is as late as believed desirable for southern Minnesota; Minhybrid 409 is as early as Minhybrids 404 and 405, equal in stalk breakage, but superior in yielding ability. Minhybrid 410 is as borer tolerant as Minhybrid 408, equal in yield, but slightly earlier in maturity. Minhybrids 411 and 412 are significantly better than other Minhybrids for resistance to the first brood of the European corn borer. They are earlier than Minhybrid 408, slightly better in yield, and equal or better in stalk quality.

NOTE—The names Minhybrid 410, 411, and 412 are tentative. The North Central Corn Conference has priority for naming combinations developed from cooperative uniform trials. If an A.E.S. (Agricultural Experiment Station) number is assigned to any one of these hybrids, it will be in the A.E.S. 500 series and will be assigned before the first seed is offered for sale.

Minhybrid 404, 108-112 days

(A322 x A334) (A374 x A375)

Minhybrid 409, 108-112 days

(A73 x A334) (Oh.5 x Oh.51A)—seed available in 1953

Minhybrid 405, 110-114 days

(A311 x A334) (A374 x A375)

Minhybrid 411, 110-114 days

(Oh.5 x A73) (Oh.43 x Oh.51A)—seed available in 1954

Minhybrid 412, 110-114 days

(Oh.5 x Oh.51A) (A73 x W22)—seed available in 1954

Minhybrid 406, 111-115 days

(A25 x A334) (A73 x A375)

Minhybrid 410, 112-116 days

(A73 x M14) (Oh.43 x Oh.51A)—seed available in 1953

Minhybrid 408, 113-117 days

(A73 x A375) (Oh.51A x Os.420)

South Central Zone

All recommended hybrids for this zone are yellow. Minhybrids 503, 504, 505, 506, and 507 have been about equal in lodging resistance and for a three-year period Minhybrid 508 has been superior in lodging resistance. Minhybrids 506, 507, and 508 have been slightly higher in yield. Seed of Minhybrids 506 and 507 will not be available for farm planting until 1953 and that of 508 in 1954.

Minhybrid 500, 104-108 days

(A71 x A73) (A7 x A12)

Minhybrid 505, 105-109 days

(Oh.51A x A375) (A334 x Ill.4226)

Minhybrid 507, 105-109 days

(W10 x A334) (B9 x Oh.51A)—seed available in 1953

Minhybrid 403, 106-110 days

(C11 x C14) (A374 x A375)

- Minhybrid 503**, 107-111 days
(A73 x A334) (Oh.51A x A375)
- Minhybrid 504**, 107-111 days
(A73 x A334) (Oh.51A x A395)
- Minhybrid 506**, 107-111 days
(Oh.51A x A334) (A73 x A221)—seed available in 1953
- Minhybrid 508**, 107-111 days
(Oh.51A x A334) (A73 x A223)—seed available in 1954

Central Zone

All recommended hybrids are yellow. Minhybrids 602, 607, and 608 are well adapted to all sections of the zone. All recommended hybrids have good standing ability although Minhybrids 602 and 607 have shown some stalk breakage under severe conditions.

- Minhybrid 607**, 97-101 days
(A357 x A385) (A334 x A344)
- Minhybrid 602**, 98-102 days
(A357 x A392) (A334 x A344)
- Minhybrid 608**, 99-103 days
(A334 x A340) (A357 x A392)

North Central Zone

Wisconsin 275 is a yellow hybrid and Minhybrid 706 is a white hybrid recommended for the North Central Zone.

The white Minhybrid 706 has outyielded yellow hybrids by about 10 per cent. It has shown an average root lodging (30° from vertical) of 20 per cent for four years' test. This lodging has not been sufficient to interfere with harvesting.

- Wisconsin 275**, 88-92 days
(W9 x M13) (W49 x WH)
- Minhybrid 706**, 90-94 days
(A34 x A171) (A166 x A188)

Northern Zone

Five yellow-dent hybrids, including Minhybrids 800 and 802, Nodak 301, Wisconsin 255, and Wisconsin 279 as well as a flint-dent hybrid Wisconsin 240, are recommended for the Northern Zone.

Early maturity and lodging resistance are two of the most important characters in this zone. Wisconsin 240 and 255 are slightly earlier in maturity than Minhybrid 802 and Nodak 301, and all four are earlier than Minhybrid 800 and Wisconsin 279. Minhybrid 800 has considerable stalk breakage under severe stalk rot conditions. Wisconsin 240 has a long ear with flinty kernels and the hybrid does not sucker profusely as do open-pollinated flint varieties.

- Wisconsin 255**, 82-86 days
(WD x W9) (WJ x WH)
- Wisconsin 240**, 82-86 days
(WD x W9) (W85 x W15)
- Nodak 301**, 82-86 days
(A90 x A111) (N.D. 203 x N.D. 230)
- Minhybrid 802**, 84-88 days
(A96 x Mt. 42) (WD x A165)
- Wisconsin 279**, 86-90 days
(W9 x M13) (WD x C49)
- Minhybrid 800**, 86-90 days
(A96 x A148) (A116 x A131)

Northern Minnesota

For northern Minnesota, including the region north of the Northern Zone, early maturing varieties are recommended.

HYBRID VARIETIES

WISCONSIN 240 and WISCONSIN 255 are the only open-pedigree hybrid varieties recommended for this area.

OPEN-POLLINATED VARIETIES

Open-pollinated varieties are recommended for the region north of the Northern Corn Zone. Early-maturing strains of the following varieties are desirable.

HANEY'S STRAIN MINNESOTA NO. 13 is an early strain of Minnesota No. 13 developed by J. G. Haney of East Grand Forks. The ears have 12 to 14 rows, yellow endosperm, kernels of medium depth, and red cob. An early selection should be used.

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 the Dakota White, making harvesting with the binder possible.

GEHU FLINT 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 Haney's Strain Minnesota No. 13 and has been widely grown in northern Minnesota. It has yielded very well in trials at the Crookston Station. Ears are 12- to 14-rowed, slightly longer than Pearl Flint, with kernels variable in color.

SWEET CORN

Hybrids

MINHYBRID 202 is a cross of Golden Bantam inbred lines 38 and 42 and is valuable for canning and home or market garden use. 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.

MINHYBRID 206 (S4 x S8) and MINHYBRID 207 (S8 x S43) are single cross hybrids for home garden use. They are placed on the recommended variety list primarily because of their exceptionally fine flavor and tenderness. They are about four days later in silking than Minhybrid 202. Minhybrid 206 produces tapered ears about 5½ inches long, with approximately 14 rows of kernels arranged in slightly irregular manner. It has a slightly better flavor than Minhybrid 207. Minhybrid 207 produces ears of a desirable uniform appearance, approximately 6.3 inches long and containing 12 kernel rows. Limited quantities of seed of these hybrids will be available for planting in 1952.

Open-Pollinated Variety

HAYES' WHITE is recommended for home garden use if the grower is willing to sacrifice ear appearance, uniformity, and size for the best in quality and tenderness. This white variety is a farmer selection obtained from Harold M. Hayes at

Granby, Connecticut, and has been used as a parental strain in developing the inbreds of Minhybrids 206 and 207. The ear size is slightly less than 5 inches long, with a variable number of kernel rows frequently occurring in an irregular pattern. Limited quantities of seed are available for planting in 1952.

POPCORN

MINHYBRID 250 is a white single cross between Japanese hull-less inbred lines 1 and 6. Minhybrid 250 is adapted to growing in the South Central and Southern Zones. It is superior to the Japanese hull-less variety in yield and popping volume and has excellent quality. It is susceptible to stalk rot and should be harvested relatively early in the fall.

MINHYBRID 251 is a yellow double cross with the pedigree (P1 x P5) (P18 x P40). It may be satisfactorily grown in the South Central and Southern Zones. Under good growing conditions it has yielded better than 45 bushels per acre for a two-year period. It has an excellent plant growth and appears well adapted to mechanical picking. It is a hull-less type and almost the equal of Minhybrid 250 in popping volume and quality. The single cross P1 x P5 must be used as the seed parent in production of the double cross seed. Any attempt at using P18 x P40 as the seed parent will result in failure of seed set because of sterility. Seed will be available in 1953.

MINHYBRID 252 is a yellow single cross P18 x P40 and may be grown satisfactorily in the South Central and Southern Zones. It has exceeded Minhybrid 250 in yield by 40 per cent—the average of four years' tests. It produces ears which are 5 to 5½ inches long with 22 to 26 kernel rows. It appears better adapted to mechanical picking than Minhybrid 250 and has good popping expansion and quality. A limited amount of seed will be available for planting in 1952.

SOYBEANS

Maturity before frost is an important consideration in soybean varieties used for seed production. The varieties must be earlier as the average growing season becomes shorter. For this reason the regions of adaptation for seed production are included in the description of varieties. Varieties used for hay can be somewhat later maturing than those used for seed. In general, a variety can be used about one maturity zone (see map, page 3) farther north for hay than for seed.

FLAMBEAU grows 24 to 26 inches tall and has a considerable tendency to lodge. It has been a high yielder among the early varieties. The seeds are yellow with black seed scars and have a medium oil content. The variety is a selection made at the Wisconsin Agricultural Experiment Station from an introduction from Russia. It is recommended for planting in the Central, North Central, and Northern Corn Maturity Zones.

OTTAWA MANDARIN grows to a height of 24 to 28 inches and is highly resistant to lodging. The seeds are fairly large, yellow with light buff seed scars, and have a relatively good oil content. This variety is a selection made at the Central Experimental Farm, Ottawa, Canada, from the variety Mandarin. It is recommended in areas of the state south of the Northern Corn Maturity Zone.

CAPITAL is a high-yielding variety that averages 30 to 32 inches in height and has a distinct tendency to lodge. The seeds are small and yellow with light brown seed scars, and

they have a relatively high oil content. Capital was selected at the Central Experimental Farm, Ottawa, Canada, from a cross of 171 x A.K. (Harrow). It is recommended for areas of the state south of the Northern Corn Maturity Zone.

MONROE grows to a height of 35 to 42 inches and lodges to some extent. The lowest pods as a rule are borne somewhat higher from the ground than are those of Flambeau, Ottawa Mandarin, Capital, or Habaro. The seeds are medium to small in size. They are yellow with very light buff seed scars; their oil content is medium. Monroe was selected at the Ohio Agricultural Experiment Station from a cross of Mukden x Mandarin. It is recommended in the South Central and Southern Corn Maturity Zones and in the southern two-thirds of the Central Zone.

BLACKHAWK gives high yields, grows 34 to 38 inches tall, and has considerable resistance to lodging. Like Monroe it tends to bear its lowest pods fairly well above the ground. The seeds are medium in size and yellow except for the light brown seed scars. The oil content of the seed is relatively high. This variety is a selection made at the Iowa Agricultural Experiment Station from a cross of Mukden x Richland. It is recommended for the Southern and South Central Corn Maturity Zones.

RENVILLE grows from 26 to 31 inches tall and is highly resistant to lodging. The seeds are medium in size and are yellow with light brown seed scars. This variety has the highest oil content of any of the varieties tested in Minnesota in recent years. It was selected at the Minnesota Agricultural Experiment Station from a cross of Lincoln x (Lincoln x Richland) made at the United States Regional Soybean Laboratory at Urbana, Illinois. It averages a few days earlier in maturity than Monroe and is recommended for the South Central and Southern Corn Maturity Zones and for the southern two-thirds of the Central Zone. No seed will be available to the general public before the 1955 season.

FIELD PEAS

The recommended varieties of field peas produce long vines, white flowers, and small, smooth, cream-colored seeds. They are mid-season in maturity, ripening at about the same time as mid-season varieties of oats. These varieties of peas are satisfactory for forage purposes, and their mature, dry seed is suitable for soup-making and livestock feed.

CHANCELLOR has been a dependable variety for many years. It was developed by the Dominion Experimental Farm at Ottawa, Canada.

DASHAWAY was distributed by the University of Saskatchewan. It was selected from Golden Vine by a Saskatchewan farmer.

MULTIPLIER has slightly larger seeds and is a day or two later than Chancellor and Dashaway. It has been high in yield of seed and is thought to be of Canadian origin.

SUNFLOWERS

ADVANCE is a high-yielding, combine-type sunflower with a single head, strong stalk, and seed of high oil content. It grows about 5 feet tall and matures later than flax but is earlier than the recommended varieties of soybeans. Advance is a top-cross hybrid developed in Canada by the Dominion Experimental Farm and is produced by crossing the inbred,

S-37-388, with the variety, Sunrise. Only seed harvested from S-37-388 in the crossing field should be used for commercial seed. Later generations produce much less than the first.

ALFALFA

Minnesota is one of the leading states in alfalfa production. Of the two varieties recommended for the state, Ladak is moderately resistant to bacterial wilt and Ranger is somewhat more resistant than Ladak. At the present time alfalfa wilt has become widely distributed in the alfalfa-producing areas of the state. In Minnesota trials Ladak or Ranger have proved superior to other varieties in persistence, probably due to their wilt resistance and winter hardiness.

LADAK is a winter-hardy variety introduced by the United States Department of Agriculture from northern India. It has averaged slightly higher in yield than Ranger. It recovers somewhat more slowly after cutting than Ranger, but the yield of the second cutting of Ladak has not been lower than that of Ranger. It is recommended for hay production in all parts of the state.

RANGER is a winter-hardy variety developed by the United States Department of Agriculture and the Nebraska Agricultural Experiment Station. Slightly superior to Ladak in wilt resistance, Ranger is recommended for hay production in all parts of the state.

MEDIUM RED CLOVER

WEGENER is a strain grown for a number of years by E. C. Wegener, Bertha, Minnesota. It is adapted to Minnesota conditions, is a good forage and seed yielder, and provides a good second cutting.

MIDLAND is a blend of strains from Ohio, Indiana, Illinois, and Iowa, produced by cooperation of several Midwest experiment stations and the United States Department of Agriculture. Under Minnesota conditions, it is equal to Wegener in forage yield for both first and second cuttings and is a good seed producer.

BIENNIAL SWEET CLOVER

EVERGREEN is a white-blossomed sweet clover introduction from Ohio. It produces a larger growth than common types the fall of the first year, is a heavy forage producer the second year, and comes to full bloom two to three weeks later than common types. Therefore it has a longer grazing season.

MADRID is a yellow-blossomed, biennial type introduced into the United States from Madrid, Spain, in 1910. The first-year growth of Madrid is superior to common types and the forage and seed production the second year are satisfactory.

BIRDSFOOT TREFOIL

Birdsfoot trefoil is a perennial legume resembling alfalfa except that it has yellow flowers and brown seed pods borne in clusters resembling a bird's foot. One of its most important characteristics is that it will withstand grazing better than most legumes such as alfalfa. It has small, weak seedlings which are hard to establish and need about two years to be productive.

Alfalfa-grass mixtures that are well managed for pasture are more productive during the first years after seeding than

birdsfoot trefoil. Therefore, where pasture is used in the regular crop rotation, alfalfa-grass mixtures are more desirable.

Birdsfoot trefoil's place is in permanent pasture mixtures and on sites not suitable for other crop production. Pasture renovation experiments in southeastern Minnesota in cooperation with the Soil Conservation Service have shown birdsfoot trefoil will improve the quality of permanent bluegrass pastures and maintain a stand under grazing conditions. Care should be exercised to insure proper inoculation.

EMPIRE is a variety of broadleaf birdsfoot trefoil grown in New York State. It is winter hardy under Minnesota conditions. Birdsfoot trefoil of Italian origin is being offered for sale at a considerably lower price than Empire, but preliminary trials indicate it is not as winter hardy as Empire.

BROME GRASS

Brome grass has proved of value in mixtures with alfalfa and other legumes for both hay and pasture.

LINCOLN, ACHENBACH, and FISCHER are recommended varieties. These southern strains start growth earlier in the spring than Canadian brome and are somewhat more productive. Lincoln was selected in Nebraska, Achenbach in Kansas, and Fischer in Iowa.

SUDAN GRASS

Sudan grass is one of the best supplementary or emergency pasture crops for Minnesota. When seeded shortly after corn-planting time, it will support about two cows per acre during July and August when most pastures are rather unproductive.

PIPER sudan is a new variety developed at the Wisconsin Agricultural Experiment Station. It is more vigorous than commercial types, has a lower level of hydrocyanic acid (HCN) potential, and is more resistant to leaf blight and anthracnose than other varieties. HCN is the glucoside which causes poisoning in livestock. Less livestock poisoning occurs when livestock are pastured on Piper sudan than when pastured on commercial types. Caution should still be exercised in grazing sudan.

TIMOTHY

ITASCA is a synthetic variety composed of six inbred lines: one from Minnesota commercial seed, two from Cornell No. 1620, and three from Cornell No. 1777. It is superior to commercial timothy in hay production and about equal in seed production, and it matures at about the same time.

LORAIN was introduced from Ohio. It blooms and matures and the leaves stay green six to eight days later than Itasca or commercial timothy. In Minnesota tests, Lorain has been superior to commercial timothy in hay production and somewhat lower in seed production.

Varieties Not Recommended for Minnesota

This list includes the following:

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

SPRING WHEAT

APEX is moderately resistant to stem rust but low in yield and moderately susceptible to leaf rust. It is not as satisfactory in milling and baking characters as Thatcher. It was developed from a cross of (Double Cross x H-44) x Marquis.

CADET, an awnless variety moderately resistant to stem rust, has been lower in yield than the best-yielding wheats. It is satisfactory in milling and baking characters except that it has a low test weight, similar to Newthatch. It was developed cooperatively by the United States Department of Agriculture and the North Dakota Agricultural Experiment Station.

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

HENRY, a bearded variety developed by the Wisconsin Station, is good yielding, moderately resistant to stem rust, moderately susceptible to bunt, and susceptible to scab. It is unsatisfactory in milling and baking characters.

NEWTATCH is a high-quality variety but is not satisfactory in yield or leaf-rust resistance. It is susceptible to scab. It is a combination of a series of selections from a cross of Hope x Thatcher backcrossed to Thatcher. It was developed at the Minnesota Agricultural Experiment Station.

PILOT is a bearded variety, moderately resistant to stem rust, but it is susceptible to leaf rust and has weak straw. It is lower in yield and bushel weight than the best-yielding wheats, but it is satisfactory in milling and baking characters. It is a selection from a cross of Hope x Ceres developed by the United States Agriculture Department and the North Dakota Station.

PREMIER is moderately resistant to stem rust and bunt, but it is susceptible to loose smut, scab, and black chaff. It is unsatisfactory in milling and baking characters. This variety is a selection from a cross of Ceres-Hope-Florence x Double Cross R.L. No. 625 developed by the North Dakota Station.

REGENT is an early-maturing, beardless variety which has been lower in yield than the recommended varieties. It is susceptible to leaf rust and scab. This variety is equal to Thatcher in milling and baking qualities. Regent is a selection from a cross of H-44 x Reward, made at the Dominion Laboratory of Cereal Breeding, Winnipeg, Canada.

RESCUE is a beardless, low-yielding variety which has been developed for the area where sawfly is present. Rescue shatters easily and is weak strawed, rust susceptible, and of poor quality. It should be grown only in sawfly-infested areas. It is a selection from a cross of Apex x S615 (a solid stem line of common wheat) developed by the Dominion Department of Agriculture at Swift Current, Canada.

REDMAN is an awnless variety which appears slightly superior to Regent but not equal to the recommended varieties. It was selected from the cross of Canus x Regent made at the Dominion Laboratory of Cereal Breeding at Winnipeg, Canada.

SPINKCOTA is a bearded variety which is susceptible to stem rust and bunt. It is a selection of Velvet Chaff or Preston developed by a farmer in South Dakota.

Durum

VERNUM is a bearded, early-maturing variety resistant to stem and leaf rusts. It is lower yielding than Mindum, Carle-

ton, and Stewart. Its quality for the making of semolina products is not equal to Carleton and Stewart. It is a selection from Mindum x Vernal Emmer backcrossed to Mindum, developed cooperatively by the United States Department of Agriculture and the North Dakota Agricultural Experiment Station.

WINTER WHEAT

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

IOWIN, developed by the Iowa Station, is not as winter hardy as Minturki.

KANRED is not as 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 bunt. It is less widely adapted than Minturki, and the grain is somewhat less desirable in quality than that of Minturki.

BLACKHAWK is a bearded variety of winter wheat of good quality. It is less winter hardy than Minturki, Marmin, or Minter, so yields less than these varieties when winter injury is severe. It is a selection of a Fultz x Minturki cross developed by the Wisconsin Agricultural Experiment Station.

IOHARDI is an awned variety which was released to Iowa farmers in the fall of 1948. It is a selection from an Iobred x Minhardi cross developed at the Iowa Agricultural Experiment Station.

MARMIN is a bearded winter wheat similar to Minturki but has been poorer in milling and baking characters. It was selected from a cross of Minturki x Marquis.

OATS

There are several selections from Bond crosses that have been tested only in rod-row trials and in some cases only for a limited period. Data obtained so far give no reason to conclude that these varieties are superior to those on the recommended list.

Three of these varieties, Cherokee, Nemaha, and Colo, were grown in field plots at all stations in 1950-51 as they were reported in Iowa to be more tolerant to crown rust than recommended varieties. They did not yield better than the recommended varieties in the trials.

TAMA, VICLAND, VIKOTA, CONTROL, BOONE, and FORVIC are varieties of oats that carry the Victoria type of crown rust resistance. All are susceptible to *Helminthosporium victoriae*.

BEAVER is a Canadian variety selected from a cross of Vanguard x Erban. It has given good yields in rod-row trials but is not superior to the recommended varieties. It is susceptible to crown rust and smuts.

BENTON is a tall-growing variety of oats produced from a cross of D69 x Bond at the Iowa Station. It has been increased in Illinois and Indiana. It has the same resistance to diseases as Clinton but in three-year trials has yielded less in Minnesota than the recommended varieties.

BONHAM, C.I. 4676, is a mass selection made in Michigan from C.I. 3664, a cross of Bond x D69. It has been increased and distributed by the Michigan Station.

CHEROKEE, C.I. 3846, is a selection from a cross of D69 x Bond which has been increased in Iowa and Kansas.

COLO, C.I. 3972, is a cross of Hancock x Morota-Bond.

EATON is a selection from a cross of Bond x Iogold that has been increased in Michigan. It is resistant to crown rust, the smuts, and most races of stem rust, although it is susceptible to race 8 like its Iogold parent.

EXETER is somewhat later in maturity than Gopher. It has given good yields in rod-row trials though not superior to those of recommended varieties. It is susceptible to crown rust. It was selected in Canada from a cross of Victory x Rusota.

FORTUNE was selected at the University of Saskatchewan from the double cross, Victory (Victoria x Richland) x (Markton x Victory). It is resistant to race 7 of stem rust but susceptible to race 8. In rod-row trials in 1950-51 it was susceptible to crown rust. It was somewhat later in maturity than most of the other varieties grown and in 1950 gave a relatively good yield.

GOPHER is an early oat with a white hull and stiff straw. It is susceptible to stem rust, crown rust, and the smuts.

KENT is an early-maturing oat variety selected from the cross Bond x D69 that has been increased at the Michigan Station. It has not proved superior to recommended varieties in preliminary trials in Minnesota.

LARAIN was selected from a cross between Gold Rain and Alaska made at the Cereal Division, Central Experimental Farm, Ottawa. It was susceptible to the rusts and smuts and did not yield especially well in rod-row trials.

MARION is an early variety selected in Iowa several years ago from a cross of Markton x Rainbow. It was tested extensively in Minnesota several years ago. In these trials it yielded somewhat less than Vicland, but it has given good yields in rod-row trials in recent years. It had slightly greater resistance to prevalent races of crown rust than recommended varieties selected from Bond crosses.

NEMAHA, C.I. 4301, has been distributed by the Kansas and Nebraska Stations. It is a selection from a cross of Victoria-Richland x Morota-Bond that is resistant to *Helminthosporium victoriae*.

ZEPHYR matures medium early, is gray in color, and has good yielding ability. It also has good weight per bushel. Its standing ability is good although not equal to that of Bonda, Mindo, and Clinton. It grows about the same height as Bonda and has large grain and a heavy, strong awn. It was selected at the Minnesota Agricultural Experiment Station from a cross of Bond x Anthony.

BARLEY

BARBLESS (WISCONSIN NO. 38) is a six-rowed, smooth-awned, white aleurone variety of acceptable malting quality. The variety yields well under favorable conditions, but it produced a very low yield of poor quality grain during the relatively wet seasons of 1943 and 1944. Barbless is moderately resistant to barley stripe, moderately susceptible to spot blotch and net blotch, and susceptible to scab, loose smut, stem rust, and mildew. It has weak straw and lodges badly when seeded on heavy or fertile soils. It is late in maturity.

BAY is a six-rowed, smooth-awned variety which is acceptable for malting, but it is susceptible to stem rust and gives only fair yields.

COMPANA is a two-rowed, smooth-awned variety which was developed for the dry conditions of Montana. It is considered undesirable for Minnesota.

FEEBAR is a high-yielding, stiff-strawed, stem rust-resistant feed barley developed for the dry conditions of central and western South Dakota.

GALORE is a six-rowed, smooth-awned variety developed in Canada for certain localized conditions. It is unsuitable for malting and is of little value for Minnesota.

KEMBLE is a six-rowed, rough-awned variety selected by a farmer. The seed is small, and the plants have a marked tendency to lodge. It has been low in yield in Minnesota trials.

MANCHURIA is a six-rowed, rough-awned variety and yields less than Barbless (Wis. 38). Part of the kernels have white aleurone, and part have blue.

MARS is a six-rowed, smooth-awned, stiff-strawed, white aleurone variety that produces plump, well-filled kernels. It is early in maturity and has high weight per bushel. Mars is resistant to stem rust, moderately resistant to net blotch, moderately susceptible to mildew, scab, and spot blotch, and susceptible to loose smut and stripe. The seeds of Mars are small and low in diastatic activity and are therefore considered undesirable for malting purposes.

MONTCALM is a six-rowed, smooth-awned, blue aleurone variety, that is finding considerable favor in the malting and brewing industries. It has yielded well in Minnesota. It is fairly weak strawed, is a day or two earlier than Barbless, and is susceptible to stem rust and a number of other diseases.

OAC 21 is a blue-aleurone selection from the Manchuria variety. It yields moderately well, has rough awns and weak straw, and is susceptible to stem rust. It has limited acceptance in the American malting trade.

PLAINS is a very early, six-rowed, smooth-awned variety developed for the plains country of South Dakota. It has yielded well in Minnesota but is not acceptable for malting. It has short, stiff straw and is resistant to stem rust.

PLUSH is a six-rowed, smooth-awned variety which resembles Barbless except for somewhat stronger straw. It has not yielded satisfactorily in Minnesota and is unsuitable for malting.

SPARTAN is an early, stiff-strawed, two-rowed, smooth-awned variety that is very susceptible to loose smut. Yields of the variety have been low in Minnesota. Two-rowed varieties such as Compana and Spartan when grown in Minnesota have a limited market except for feed.

TREBI is a high-yielding, six-rowed, rough-awned variety with very poor malting quality. It is resistant to certain common races of loose smut but is susceptible to stem rust, covered smut, and a number of other diseases. The kernels have blue aleurone.

TREGAL is a six-rowed, smooth-awned variety which has yielded relatively well in Minnesota, but it is unsuited for malting purposes. Its disease reaction is like that of its parent, Trebi.

RYE

BALBO is much less winter-hardy than Imperial or Emerald. It is usually recommended for pasture. It has yielded somewhat more fall pasture than Emerald and less in the spring than Emerald.

PROLIFIC SPRING, a spring variety, yields well at University Farm, the only station where it has been tested for several years. In 1951 in sandy-soil trials it yielded much less than fall-sown varieties.

DAKOLD is a very winter-hardy variety developed at the North Dakota Station. It has yielded slightly less than Emerald

and Imperial. It has not been grown extensively in recent years and for this reason has been dropped from the recommended list.

PIERRE is a new, hardy variety of winter rye developed in South Dakota and tested since 1949 on sandy soils in Minnesota. It yielded somewhat less than Emerald and Imperial.

FLAX

B. GOLDEN is a yellow-seeded variety with pink flowers that fade to white on exposure to light. It is moderately susceptible to wilt. It is immune from races of rust common to the United States but is very susceptible to pasmo. The oil content of the seed is high and the oil is of good drying quality. It has not been recommended for general production because its short straw limits its ability to compete with weeds and causes some difficulty in harvesting. It was developed by H. L. Bolley at the North Dakota Agricultural Experiment Station.

BISON is susceptible to rust and has yielded well in the Red River Valley except when rust is severe. It is resistant to wilt and moderately susceptible to pasmo. It is high in oil content but lower in oil quality than Redwing. It was developed at the North Dakota Station by plant selection.

BIWING is resistant to wilt but is moderately susceptible to rust and pasmo. It has fair oil content and quality. This variety has not yielded as well as Koto or Dakota.

BUDA is resistant to wilt, moderately resistant to rust, and moderately susceptible to pasmo. It has not yielded as well as Koto or Dakota.

CRYSTAL was dropped from the list of recommended varieties in 1951 because of lack of popularity among flax growers. It has been difficult at times to obtain good stands of Crystal. The variety is immune to races of rust found in Minnesota, moderately resistant to pasmo, and susceptible to late wilt. The seed is yellow, with high oil content of good quality.

DAKOTA was removed from the list of flax varieties recommended for Minnesota because it is susceptible to races of rust now prevalent in the state. This variety was heavily rusted in 1951. Dakota is a selection from a cross of Renew x Bison that was first introduced in North Dakota.

ROYAL is a mid-late-maturing variety that is moderately susceptible to rust and wilt and susceptible to pasmo. The oil content and quality are similar to Bison. This variety had a tendency toward weak straw in uniform nursery tests. It was developed at Saskatoon, Saskatchewan, Canada, as C.A.N. 1727.

ROCKET is a variety of flax developed in Canada. In trials in Minnesota it has been only fair in yield, resistant to rust, but moderately susceptible to wilt and pasmo. It has brown seeds with good oil content of good quality.

SHEYENNE is an early variety, immune to races of rust found in Minnesota. It is resistant to wilt but moderately susceptible to pasmo. In trials in the state it has yielded less than have the recommended varieties when both were planted at an early date.

VICTORY is a high-yielding variety, moderately susceptible to rust and wilt and very susceptible to pasmo. The variety lacks uniformity of type. It is easily distinguished by the characteristic large white flowers and large brown seed. It was developed at the North Dakota Station by H. L. Bolley.

VIKING is very similar to B. Golden.

WALSH is a blue-flowered, extra-large, brown-seeded flax developed at the North Dakota Station. This variety has yielded

lower than Bison. It is moderately resistant to wilt, immune to races of rust common in the United States, and very susceptible to pasmo. It is even less valuable than B. Golden or Viking.

CORN

Open-pollinated varieties are not recommended for any of the five corn maturity zones of Minnesota.

Hybrid varieties having an average maturity rating exceeding the upper limit of a zone are not recommended in that zone.

SOYBEANS

ADAMS is a variety recently developed cooperatively by the Iowa Agricultural Experiment Station and the United States Regional Soybean Laboratory. It is too late for Minnesota conditions.

BAVENDER SPECIAL was selected by an Iowa farmer. It is very late in maturity, lodges excessively, and is rather low in oil content.

EARLYANA is a variety of about the same maturity as Habaro. Its yields have been only fair in Minnesota and it lodges rather badly.

HABARO has been tested and used in Minnesota longer than any other variety. It has yielded well and is well adapted to southern Minnesota. However, it is low in oil content, tends to lodge, and in dry falls often gives trouble from shattering.

HARLY was selected at the Central Experimental Farm, Ottawa, Canada, from a cross of Mandarin x A.K. (Harrow). It is medium early and grows rather tall. In three years of testing in Minnesota it has given relatively low yields.

HAWKEYE is a variety developed cooperatively by the Iowa Agricultural Experiment Station and the United States Regional Soybean Laboratory. It matures a day or two later than Richland and is considered too late for general planting in Minnesota.

HOKIEN has been tested only two years in Minnesota. It appears to be identical to the variety Capital.

KOREAN was selected in Canada from an importation from the Orient; a Mr. Rickard of Champaign, Illinois, brought it to the United States. It gives relatively good yields in southern Minnesota. Oil content of this variety is only fair. It matures at about the same time and grows to about the same height as Richland. The seeds are very large.

LINCOLN was developed by the United States Regional Soybean Laboratory. It is too late for Minnesota.

MANCHU WIS. 606 is similar to Habaro in yielding ability, maturity, and height. It lodges somewhat more than Habaro. The oil content of this variety is relatively good.

PRIDESOY 57 is an early variety with good standing ability. The plants are slightly shorter than those of Ottawa Mandarin, and its oil content is lower than that of Ottawa Mandarin. It is a selection from the older variety, Pridesoy.

ALFALFA

GRIMM is a winter-hardy variety developed in Carver County by Wendelin Grimm. Where bacterial wilt is prevalent, the persistence of Grimm is decidedly less than that of Ranger or Ladak. Grimm is satisfactory when grown in rotations using alfalfa for two years or less.

BROME GRASS

MARTIN is a recombination of 21 clonal lines selected from seed collected in 1936 from an old brome stand in Martin County, Minnesota. Martin has proved inferior to the southern strains in southern Minnesota and in recent years has been no better in northern Minnesota.

FIELD PEAS

CHANG is a good-yielding pea for feed and forage; however, processors of dry edible peas do not like it because of its black hilum (eye).

SUNFLOWERS

ARROWHEAD is an early-maturing, combine-type variety selected at the Duluth Station. At Crookston it has yielded slightly more oil per acre than Advance. In oil percentage at Crookston it is about 1.4 per cent lower than Advance though.

COMMERCIAL ADVANCE or "Advance second generation" is less uniform and yields considerably less than Advance.

SUNRISE yields much less than Advance and is very susceptible to bird damage because of its small seed. Although Sunrise is not a satisfactory variety for commercial production, it must be used as the pollen parent in producing Advance seed.

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