

CORN HYBRID and Variety Performance

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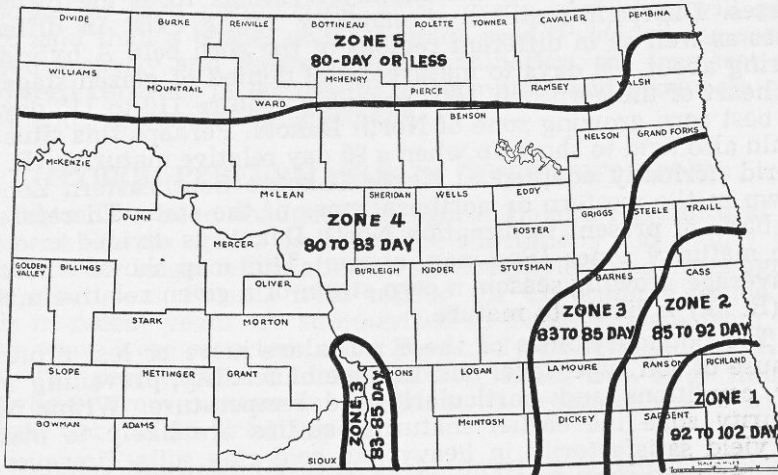


FIG. 1. - CORN MATURITY ZONES OF NORTH DAKOTA

North Dakota harvested 1,318,000 acres of corn in 1950, and 1,220,000 acres in 1949. The 10 year average (1939-1948) was 1,143,000 acres.² Slightly more than 53 per cent of the 1950 acreage was planted with hybrid seed.³ Hybrid varieties are widely used in the southeastern area where about 80 per cent of corn acreage is planted to hybrids; in the southwestern area hybrids occupy a low 25 per cent of corn acreage. A large assortment of hybrids are offered to farmers. Some of these were originated in the state experiment stations. The seed of many of these experiment station hybrids is produced by commercial seedsmen and sold under different trade names. Other hybrids, originated by the commercial seed companies, are sold under their trade names and numbers.

CORN HYBRIDS ARE SPECIFIC IN ADAPTABILITY

Corn adapted to an area should meet the following requirements: (1) adequate maturity in an average growing season, (2) satisfactory yield of grain or fodder depending on which it is grown for, (3) adequate resistance to lodging and broken plants, (4) freedom from troublesome diseases—smut, ear and stalk rots, and (5) desirable plant type—expressed in ear height and looseness of husk—to facilitate efficient use of mechanical harvesters.

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²Data from North Dakota Annual Crop Summary, December, 1950-USDA, Bureau of Agr. Economics; Office of Agr. Statistician, Fargo, N. Dak.

³Percentage figure from Press Release of Bureau of Agr. Economics, USDA, July 12, 1950.

EARLY MATURITY IMPORTANT

North Dakota is in the northern fringe of the corn belt and selection of the corn that meets the maturity requirement is of prime consideration. Some hybrids are early enough to mature in the western and northern parts of the state. Other hybrids require the full growing season even in the best corn growing zones—such as Southeastern Zone 1. Still others are too late even in this best corn growing zone and under ideal growing conditions. It is impossible to accept all the maturity ratings from the different sources. Different systems of maturity rating exist in different states as well as in different regions of the corn belt. A hybrid requiring about 100 days to mature (well dented or glazed stage) in the heart of the corn belt, will probably require 110 to 115 days in the best corn growing zone of North Dakota. Perhaps this situation would also tend to show up when a 95 day relative maturity (R. M.) hybrid normally adapted to North Dakota's Southeastern Zone is grown in the western or northern zones of the state. Therefore on the basis of present information North Dakota is divided into five corn maturity zones (See map, above.) This map shows where, in an average growing season, a corn strain of a given relative maturity (R. M.) is likely to mature.

The boundary lines of these zones are more or less arbitrary because of soil type, level and balance of fertility, prevailing weather conditions and particularly the temperature. Within each maturity zone the earlier maturing strains are likely to mature and yield satisfactorily in heavy and cold clay soils. However, in light textured fertile soils, well sheltered and irrigated fields, or other conditions that promote a rapid growth and early maturity, the later maturing strains are likely to mature satisfactorily and yield high. **While a variety should use all of the available growing season it should mature satisfactorily in an average growing season.**

CORN FOR GRAIN OR FODDER

Corn is generally grown for grain, silage or fodder. For grain production a variety used must mature satisfactorily, have well filled deep kernels and low moisture content in ears in order to permit safe storage. In addition it must be at least moderately resistant to lodging, and the ears should be high enough from the soil level to facilitate efficient use of mechanical harvesters. A most satisfactory variety must mature in an average season and offer a reasonable margin of safety to avoid serious losses in unfavorable seasons.

Corn used for silage or fodder production may be slightly later maturing. It must, however, produce well developed ears (early dent stage) and turn out high yields. The fodder or silage corn is cut when the plants are yet green. At this stage the root lodging and stalk breakage is not as extensive as in the fully matured corn. Some open-pollinated varieties (Rainbow flint and Falconer), Nodakhybrid 208 and some other hybrids which return high yields but lack the resistance to lodging in mature stage can be used to advantage for silage production in northern and western zones.

SEED SIZE IS NOT AN INDEX TO YIELD

The seed size is not a reliable index to yield capacity. Four to five different seed grades of the same hybrids are sold at varying prices. Differences of seed size and color also exist in different hybrids depending on how the final cross was made. Some hybrid seed is small because of the inherent nature of the foundation parents. The seed of another hybrid may be large but may not germinate high or may be susceptible to seed rot in cold, wet soil. A bushel of high germinating, small grade seed corn will plant more land than a bushel of large grade seed. Provided the seed is graded properly and shows a high germination, the true test of a good seed corn lies in the ability to germinate and produce a good stand and vigorous seedling growth.

HYBRID PERFORMANCE IN DIFFERENT ZONES

Tests have been conducted by North Dakota Agricultural Experiment Station at the main station, substations and county trial plots in order to get information on maturity, yield and other agronomic characters. Results from testing the experiment station hybrids in recent years are summarized in Table 1. Data from previous years were reported in the Bimonthly Bulletin No. XI, No. 5, 1949. The performance in four maturity zones of a large number of hybrids from commercial seedsmen is reported yearly in the Hybrid Corn Field Trial Report.

Relative Maturity (N. Dak. R. M. days) as assigned to hybrids or varieties in Table 1, is comparative and shows the maturity of a hybrid or variety relative to the standard of known adaptation. It also shows in what maturity zone (Fig. 1) a variety is likely to mature in an average growing season. Even though the seasonal variations in maturity are common, the relative maturity of one variety to another does not change materially.

As a rule, good adapted hybrids return higher yields than comparable open pollinated varieties. Comparing Nodakhybrid 301 with the standard open-pollinated Minnesota 13 (Haney) in the eastern trials (five locations—29 tests) it returned 20% higher yield. In western trials (four locations—24 tests) when compared with Minnesota 13, Nodakhybrid 301 returned a 21% higher yield. In the northern upland and western trials, early maturing Falconer, Nodakhybrid 208 and semi-late maturing Rainbow flint have returned high yields, but the extensive lodging and breaking of plants has been the serious drawback in using these strains for grain production.

VARIETIES BEST SUITED TO DIFFERENT ZONES

Southeastern, 92 to 100 day zone 1 (Fig. 1) trials were conducted near Barney, Richland county. In this area corn of 90 to 102 day R. M. has matured in normal growing seasons, and returned high yields. In unfavorable growing seasons however, some earlier maturing hybrids, 83 to 85 day R. M., have also returned high yields and matured better.

In the 85 to 92 day, Zone 2, trial at Fargo and Mapleton in Cass county, hybrids of 83 to 90 day R. M. not only yielded as well or better but also matured better than those of 95 to 100 day R. M. Eighty to 82 day R. M. hybrids have matured every year but have returned lower yields.

In the 83 to 85 day, Zone 3, trials near Larimore or Gilby in Grand Forks county and at Edgeley substation in LaMoure county, 81 to 83 day R. M. hybrids on the average matured satisfactorily and with high yields. Hybrids in 85 to 90 day R. M. matured and yielded satisfactorily when the growing seasons were favorable but were immature when the seasons were unfavorable. Rainbow Flint (early Mandan strain) returned high yields, but it was late, lodged extensively and many ears were too low for efficient mechanical picking. Rainbow, therefore, is best suited for fodder and silage production in this maturity zone.

Central and Western 80 to 83 day, Zone 4, is represented by the county trials near Bismarck, substation tests at Minot, Dickinson and Williston (irrigated). The open-pollinated Falconer variety has been a standard early maturing and high yielding variety in this area. In the Falconer variety, however, ears were too low and plants lodged and broke down severely under adverse conditions with a resulting loss of 10 to 30 per cent of ears when harvested with the mechanical corn picker. Rainbow Flint (Mandan strain, 85 to 90 day R. M.) returned high yields but it was late maturing, lodged extensively, was tight husked, and many ears were too low for efficient harvesting with the mechanical corn pickers. Both Falconer and Rainbow varieties are best suited for fodder and silage production in this area.

Hybrids, 80 to 83 day R. M. have matured in the average growing seasons in this area, ears were higher, plants were more resistant to lodging and in many cases ears dried out more rapidly than Falconer. Hybrids of 83 day R. M. represented by Nodakhybrid 301 and 304 may be considered as semi-late strains in this maturity zone. Hybrids of 85 day R. M. matured satisfactorily and yielded well only in very favorable seasons. When early maturing hybrids are compared with Falconer in this western zone the advantages of hybrids are greater resistance to lodging, more uniformity and higher ears, and in most cases the husks open up allowing the ears to dry more rapidly, all of which qualities contribute to the efficient and easy harvesting of the crop with the mechanical picker.

In 80 day or less maturity, Zone 5, only the earliest hybrids and varieties are adapted. Most dependable in this zone have been very early open-pollinated Dakota White and Gehu flints—also Falconer and Northwestern semidents. Very early maturing hybrids, Nodakhybrid 203, 208, 201, and Wis. hybrid 240 or comparable commercial hybrids have matured and yielded satisfactorily in favorable seasons.

Comparative Maturity and Description of Corn Varieties and Hybrids

A brief comparative description and recommended use of corn varieties and of open pedigree hybrids tested in the experiment stations and outlying trials are given below. Some corn hybrids were originated in the state experiment stations but the seed is produced and sold under a number of commercial brand names. These are listed as *similar* to the experiment station hybrids. They differ only in genetic purity or the seed quality resulting from the care given during the seed production processes which include isolation, detasseling, harvesting, drying, shelling and grading. Other commercial hybrids, that were either originated by the commercial seed companies or are of unknown origin are designated as *comparable* in maturity and other agronomic characters. The North Dakota relative maturity (R. M.) is based on the date of silking, maturity as observed in the field and moisture content in ears at harvest. The maturity thus designated may differ a few days from the maturity days given on the seed bag. Varieties and hybrids listed below are arranged in order of approximate maturity.

Dakota White—70 to 75 day R. M.: Very short suckering plants, very low ears, lodges extensively and breaks down when mature. Hard white flint kernel, dependably fair yielder in western and northern areas, zones 4 and 5, where it is grown for fodder, early pasture and hogging-off purposes. Because of low ears and plant breakage it cannot be harvested efficiently with the mechanical corn picker.

Gehu—70 to 75 day R. M.: Yellow flint, otherwise comparable to Dakota White.

Falconer—80 day R. M.: Short suckering plants, early maturing and high yielder in western areas. Slow ear drying because of tight husk. Many ears are too low, and stalk lodges extensively and breaks down when fully mature, resulting in a considerable ear loss when harvested with the mechanical picker (for grain).

Because of dependable high yielding capacity this yellow semi-dent variety is extensively grown for fodder, pasture and grain production in the western zone 4 and northern zone 5. But because of extensive lodging in mature stage, it is best adapted for early pasture and fodder production (when cut on the green side) in central, western zone 4 and northern zone 5. Wills Pioneer K and Newday Falconer Select are comparable to Falconer.

Nodakhybrid 203—80 day R. M.: Taller non-suckering plants, higher ear, higher lodging resistance, looser husk, and more rapid ear drying than Falconer. Fair yielding capacity, good yellow dent kernel. Because of fair lodging resistance, higher ear, and rapid drying of ears, it is best adapted for grain production in zone 4 and 5 or where very early yellow dent corn is needed. *Similar commercial hybrids:* Agsco 203, Magill 813, Newday N3.

Nodakhybrid 208—81 day R. M.: A cross between Falconer lines and yellow dent lines. Taller plant, higher ears, less lodging and breaking of plants than Falconer but has tendency to lodge, long ear shank and somewhat medium tight husk. Deep kerneled, yellow dent, early maturing and high yielding capacity in zone 4. Best adapted for early pasture in 83 to 85 day zone 3 and 85 to 92 day zone 2 and for grain and fodder production in 80 to 83 day zone 4 and 80 day zone 5. The seed supply is very limited.

Nodakhybrid 201—82 day R. M.: Fair plant and ear height, medium lodging resistance. Yellow dent of fair to good yielding capacity. Adapted for grain production in short season areas where moisture is adequate. Newday N11, is similar.

Wis. hybrid 240—82 day R. M.: Yellow dent-flint hybrid with semi-dent to flint kernel, otherwise comparable to Nodakhybrid 201. Adapted for grain production in zones 3, 4, and 5. Magill 810, Jaques 803, Newday NF 10, Pride D1 are similar.

Nodakhybrid 304—83 day R. M.: Yellow dent-flint hybrid. Leafy, medium plant and ear height, good lodging resistance, yellow semi-dent kernel, high yielder particularly in cool growing seasons in zones 3 and 4. Newday NF 12 is similar. Kingscrot KF 1, is comparable dent-flint hybrid.

Nodakhybrid 301—83 day R. M.: Good emergence and seedling growth in cool soil, good plant and ear height, very good lodging resistance, yellow dent kernel and high yielding capacity. This hybrid is adapted to a wide range of conditions. It has been a high yielding early maturing hybrid in the 85 to 92 and 92 to 102 day zones 1 and 2. It is also high yielding and of medium maturity in the 83 to 85 day zone 3 and high yielding semi-late maturity in 80 to 83 day zone 4. Because of good standability and good picking quality it is particularly adapted for grain production. Agsco 301, Magill 828, Newday N21, are similar. Wills Pioneer J., Dornacker A80 Kingscrot KE3, Pride PN2, Pride B2, and Dornacker B83 are comparable.

Wis. hybrid 255—83 day R. M.: Tall plants, high ears, good lodging resistance, fair yielding capacity, yellow dent. Adapted to eastern zones 2 and 3. L.O.L. 80, Haapala 270 are similar. United 17, Minhybrid 802 are comparable

Minnesota 13 variety—(Haney Strain)—85 day R. M.: Tall plants, high ears, moderate lodging, good quality yellow dent kernel, low yields. Grown for grain production in eastern and better growing areas in central parts of North Dakota. Boyd and Alta strains are similar.

Wis. hybrid 279—85 day R. M.: Tall plants, high ears, good lodging resistance, tendency for tight husks, good quality yellow dent kernel, high yielding capacity. Adapted for grain production as semi-early hybrid in zone 1, mid-early in zone 2 and semi-late in zone 3. Magill 825, Newday N 22, Pride B5, Haapala 852 are similar.

Minhybrid 800—85 day R. M.: Tall plants, high ears good lodging resistance, yellow dent kernel, good grain yields in fertile soils and good growing conditions in eastern North Dakota zones 1 and 2. Land o' Lakes 85, Kingscrost KE 2, Jacques 851, Haapala 854, Wis. hybrid 275, Master F 21, Agsco 275, Dornacker C85, Haapala 858, are comparable to Wis. hybrid 279 and Minhybrid 800.

Rainbow flint variety (Mandan strain)—85 to 90 day R. M.: Suckering plants, poor lodging resistance, long tight husk, heavy shank, some ears are low, mixed colored flint, high yielding capacity in zone 3 and zone 4. High yielding variety, best suited for fodder or silage production.

Minhybrid 706—90 day R. M.: White dent hybrid. Tall plants, high ears, fair lodging resistance, high yielding white dent in eastern parts of zone 1 and zone 2.

Yellow dent hybrids of 90 to 93 day R. M.: Kingscrost KH 3, Funks G35, Funks G17, Kingscrost KH, Kingscrost KE 1, Master F31, Funks G9, United 20, Funks G187.

Wis. hybrid 355—95 day R. M.: Tall plants, high ears, good lodging resistance, good quality yellow dent. High yielding capacity on the light texture soils in the southeastern parts of zone 1 where it is grown for grain production. Magill 900, Agsco 501, Newday N31 are similar. Comparable in maturity and yield are Wis. hybrid 341, Magill 902, Kingscrost KA4. Pride B3A, Funks G 188, Dekalb 41, Funks G 11.

Wis. hybrid 416—98 days R. M.: Tall plants, high ears, good lodging resistance, yellow dent, high yielding capacity. Used for grain production on the light texture fertile soils and in good corn growing areas of Zone 1. Similar is Magill 950. Comparable are: Dekalb 56, Dekalb 43, Pride PN 16, Pride B15, L. O. L. 90, L. O. L. 95, Jacques 907, Haapala 375, Haapala 400, Newday S41, DeKalb 46, Master F41.

Very late yellow dent hybrids listed below were tested and may be grown for silage or grain production in sandy, fertile soils and under good growing conditions in zone 1.

100 to 104 day R. M.: Wis. hybrid 464A, Minhybrid 608, Pride 38A, DeKalb 63, Wis. hybrid 464, Agsco 464, L.O.L. 100, Jacques 956J, DeKalb 62, Pride PN 22, Pride PN 34, United 18.

104 to 105 day R. M.: Funks G68, Funks G18, Pride PN 33, DeKalb 65, Kingscrost KS3, Kingscrost KS2, Jacques 1003 J, Haapala 409, Pride B 45A, Kingscrost KS4.

FEWER CHICKENS RAISED IN 1950

North Dakota farmers raised 13 per cent fewer chickens in 1950 than in 1949 according to C. J. Heltemes, agricultural statistician at Fargo. His preliminary estimate of 6,468,000 raised in 1950 compares with 7,434,000 in 1949 and a 10-year average of 9,234,000. In 1950, North Dakota ranked 30th in number of chickens being raised for layers. Iowa led with 43,625,000. North Dakota's top year in chicken raising was 1943 with 12,251,000.