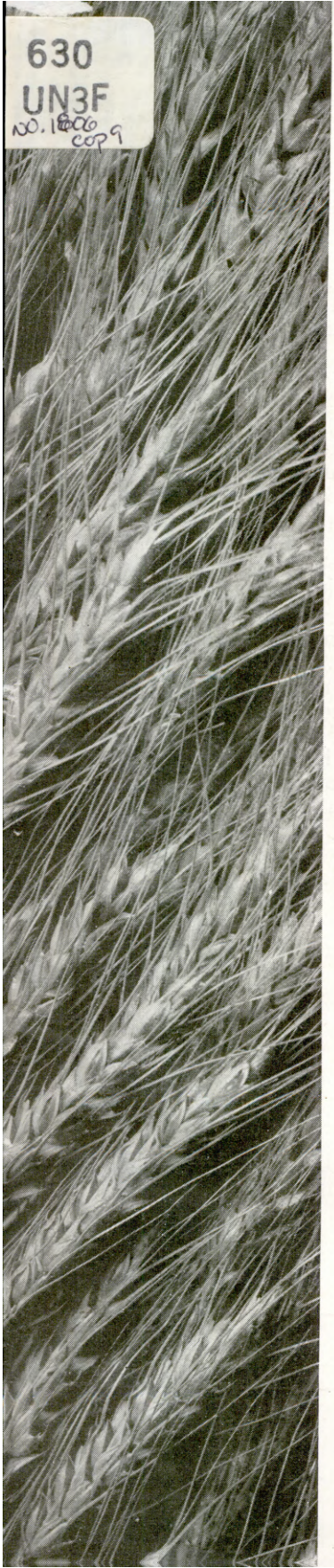

HARD RED WINTER WHEAT VARIETIES

FARMERS' BULLETIN
No. 1806
U.S. DEPARTMENT
OF AGRICULTURE

HARD RED WINTER WHEAT is grown principally in the central and southern Great Plains area, where hot summers and rather severe, dry winters prevail. Kansas, Texas, Oklahoma, and Nebraska lead in the production of hard red winter wheat. More than 27 million acres are grown annually in the United States, comprising nearly one-half of the total wheat acreage.

Thirty-four varieties are grown commercially in the United States and these are known under many different names. Of these, the leading varieties are Turkey, Kharkof, Blackhull, Kanred, and Nebraska No. 60. Turkey and Kharkof are nearly identical and, prior to the wide distribution of Blackhull, Kanred, and other newer varieties, made up nearly all of the hard winter wheat acreage.

Blackhull has proved to be a high-yielding variety in southern Kansas, Oklahoma, and the Panhandle of Texas, principally because of its earlier maturity, vigorous growth, and stiff straw. It now ranks next to Turkey in total acreage.

Kanred has been grown commercially during the last 20 years, and for a time exceeded Blackhull in acreage. It is resistant to some of the forms of leaf rust and stem rust that occur in the hard winter wheat area. It is slightly more winter hardy than Turkey, ripens a few days earlier, and outyields it in most sections.

Tenmarq, an early, high-quality wheat, has given good yields in southern Kansas, Oklahoma, and Texas. Minturki has outyielded other hard red winter wheats in Minnesota because of its winter hardiness. Early Blackhull has gained some popularity in south-central Kansas because of its extreme earliness, but it is not sufficiently winter hardy to be grown with safety. Cheyenne, a stiff-strawed, erect-headed, high-yielding variety, is increasing in popularity in Nebraska.

Among the beardless varieties, Ridit is most extensively grown. It is popular in Washington because it is resistant to some forms of bunt and because it has stiff straw and is nonshattering. Other beardless varieties are Michikof, in Indiana and Illinois; Newturk in Montana; and Mosida in Idaho.

This bulletin is a revision of and supersedes Farmers' Bulletin No. 1585, Varieties of Hard Red Winter Wheat.

Washington, D. C. Issued December 1938

HARD RED WINTER WHEAT VARIETIES[1]

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CONTENTS

THE HARD RED WINTER CLASS OF WHEAT

THE HARD RED WINTER WHEATS make up the largest and, in many respects, the most important commercial class of wheat in the United States. More than 27,000,000 acres, or nearly half of the total wheat acreage in the United States, was occupied by this class of wheat in 1934. The varieties of the class are among the most winter hardy and drought- and heat-resistant of any grown in the world. With the possible exception of the hard red spring wheats, they also have the highest protein content and are among the best for bread making. The grain is also used extensively for blending with softer varieties and wheats of low protein content.

The original seed of the hard red winter wheats was introduced from Russia in 1873. Many varieties have been brought in from Russia and other foreign countries since that time, and a number have been produced in the United States by selection and hybridization. Some of these are very similar and cannot be distinguished from each other by their outward appearances. Most of them are

[1] The information given in this bulletin is based on (1) varietal experiments conducted by the Division of Cereal Crops and Diseases, Bureau of Plant Industry, U. S. Department of Agriculture, and the State agricultural experiment stations, either independently or in cooperation; (2) classification studies of all American wheat varieties; (3) surveys of the wheat varieties of the United States in cooperation with the Bureau of Agricultural Economics, based on returns from questionnaires sent to crop correspondents at 5-year intervals; (4) several years of personal observations of the wheatfields in the States where these varieties are grown; and (5) milling and baking experiments conducted by the Division of Cereal Crops and Diseases in the Milling, Baking, and Chemical Laboratory of the Bureau of Agricultural Economics, in cooperation with State agricultural experiment stations.

bearded and have white glumes, hard red kernels, and rather weak straw. Largely because of their winter hardiness, drought resistance, and early maturity they are able to produce fairly high yields under the extremely variable climatic conditions of the Great Plains.

AREAS TO WHICH HARD RED WINTER WHEATS ARE ADAPTED

The hard red winter wheats are best adapted to the central and southern sections of the Great Plains, where the annual rainfall is less than 35 inches. The States leading in production are Kansas, Nebraska, Texas, and Oklahoma (fig. 1). In this region there is little competition with other classes of wheat. Eastward, where there is a higher annual rainfall, they come into competition with the soft red winter wheats. In eastern Kansas and Oklahoma and northern

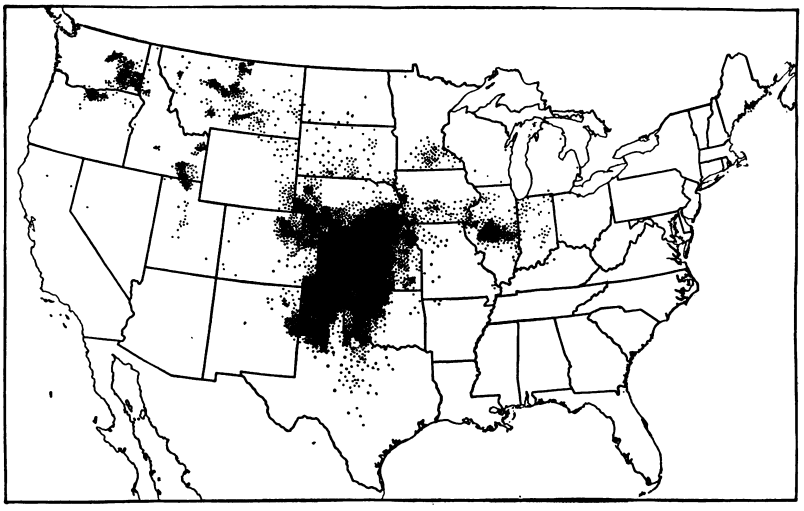

FIGURE 1.—Distribution of hard red winter wheat in 1934. Each dot represents 2,000 acres. Estimated area, 27,170,453 acres.

Missouri, where the annual rainfall varies from 35 to 40 inches, they are found mostly on the higher, drier, and less fertile soils, whereas the soft wheats occupy the lower, more productive soils where lodging is quite likely to occur. The hard red winter wheats are also grown to a considerable extent in northern Illinois and northwestern Indiana because of their greater winter hardiness as compared with other classes. They are also grown in some of the drier sections of Oregon, Washington, and Idaho, where the annual rainfall is approximately 15 inches. A relatively small acreage is grown in Minnesota, South Dakota, Wyoming, and Montana, since the hard winter wheats are practically the only winter wheats that will survive the extreme winter temperatures of those States. In recent years the acreage of winter wheat in these northern areas has tended to increase somewhat because of the development of more winter-hardy varieties and better methods of growing them. In most parts of the latter group of States spring wheats are more important.

VARIETIES AND DISTINGUISHING CHARACTERS

The number of distinct varieties of hard red winter wheat grown in the United States has gradually increased from a single variety in 1873 to 34 in 1937. Some of these have been introduced from foreign countries, especially Russia (the Union of Soviet Socialist Republics), and others have been produced in the United States by selection and breeding. During the last 30 years thousands of selections and hybrid strains have been tested at agricultural experiment stations throughout the area, but only a few of the best have been named and increased for distribution. The varieties are known under a large number of names. Their identification is often difficult, since only a few can be definitely identified by external characters. However, some of those which appear to be the same, really differ with respect to their adaptation to climatic conditions and resistance to disease, or in such characters as winter hardiness, drought resistance, and yield. Since the ability to survive and to produce a high yield of good quality of grain can be determined only by growing a variety for a number of years, new varieties should not be grown extensively until they have been thoroughly tested.

For convenience in discussion, the varieties of hard red winter wheat are divided into two groups on the basis of head characters: (1) Those that have beards or awns and (2) those that do not.

GROUP 1.—HEADS BEARDED

Group 1 is by far the most important, both with respect to number of varieties and acreage. All varieties of this group have bearded heads, with glabrous (not velvety) chaff and hard, dark-red kernels. They are sometimes referred to as the Crimean group of hard red winter wheat. Most of them have white chaff, but some have black chaff under certain conditions; others have brown chaff; and a few have yellowish chaff with brown stripes. The plants are of medium height and, with one or two exceptions, have slender stems which lodge easily in wet seasons. The leaves are dark green and rather narrow. The heads are about 3 to 3½ inches long and rather narrow and tapering. The chaff usually is sufficiently firm to prevent loss from shattering. The grain differs from that of hard spring wheat in having greater length, rounded edges, and a smaller area of the germ or embryo, and from that of soft winter wheats in having smaller, harder grain. Most of the varieties ripen medium early and are winter hardy. The principal varieties of this group are: Turkey, Kharkof, Blackhull, Kanred, Nebraska No. 60, Tenmarq, Minturki, Superhard, Iobred, Karmont, Redhull, Early Blackhull, Cheyenne, Cooperatorka, Utah Kanred, Eagle Chief, Montana No. 36, Ioturk, Iowin, Ilred, Sherman, Oro, Ashkof, Wisconsin Pedigree No. 2, Nebraska No. 6, Ukrainka, Rio, Relief, and Yogo.

TURKEY

The most important variety of hard red winter wheat is Turkey (Turkey Red). It is known also by many other names, some of the more common being Alberta Red, Crimean, Defiance, Egyptian, Hard

Winter, Hundred and One, Improved Turkey, Malakof, Minnesota Red Cross, Minnesota Reliable, Pioneer Turkey, Red Russian, Red Winter, Russian, Ulta, and World Champion. Other names, such as Argentine, Bulgarian, Hungarian, Romanella, and Theiss, have been applied to introductions of wheat apparently identical with Turkey which are grown only experimentally. The variety as originally introduced and as now grown contains a number of strains. Some of these have been separated by plant or head selection and distributed as new varieties or improved varieties.

Turkey has the general characteristics of the varieties of the Crimean group. The heads are bearded, the chaff is white, and the grains are hard and dark red. The "beaks" (short beards on the outer chaff) are about one-eighth to three-eighths of an inch long (fig. 2, *A*). As in other varieties of this group, the straw is rather weak and inclined to lodge when grown on fertile soil in areas of high rainfall. Turkey is comparatively winter hardy and drought-resistant. It is also more resistant to bunt or stinking smut than are certain other varieties, especially some of those grown in the Pacific Northwest.

Turkey wheat was introduced into the United States by Mennonite immigrants from Russia about 1873. Its original home is just north and east of the Black Sea and north of the Caucasus Mountains in the Union of Soviet Socialist Republics, where soil and climatic conditions are very similar to those in the southern Great Plains. It was first grown in this country in Kansas and Nebraska. At first it was discriminated against by millers because of its hard grain and the difficulties encountered in milling it. After the steel-roller mills were perfected, these objections ceased, and its acreage increased rapidly. Today it is the most widely grown variety in the United States. More than 15,000,000 acres of Turkey wheat were grown in 28 States in 1934. The distribution is shown in figure 3. In 1934 about 5,500,000 acres were grown in Kansas; 2,000,000 acres in Texas; 1,900,000 acres in Nebraska; and 1,500,000 acres in Oklahoma. The wide adaptation of the variety is emphasized by the fact that it is recommended by the agricultural experiment stations of 14 States. Turkey is best adapted to the areas shown in solid black on the map (fig. 3). Until the recent distribution of a number of new varieties it was regarded as the highest yielding variety for most of this area. It is still considered as among the best. It is also considered the best variety north and west of the area of heavy production of hard red winter wheat, in Wyoming and South Dakota and in certain sections of North Dakota and Montana. In the more humid portions of the hard red winter wheat belt, as in northern Missouri, northeastern Kansas, southern Iowa, and central Illinois in which both hard and soft red winter wheats are grown, the value of Turkey in comparison with other varieties depends on the soil, elevation, rainfall, and seasonal and local conditions. In general, several varieties of soft or semihard red winter wheat are equal to or better than Turkey in this area.

Turkey is a high-yielding variety in southeastern Idaho and the adjoining section of Utah and is well adapted to the western part of the Columbia River basin of Oregon and to the drier portions of eastern Washington. In the latter section it is not so susceptible to

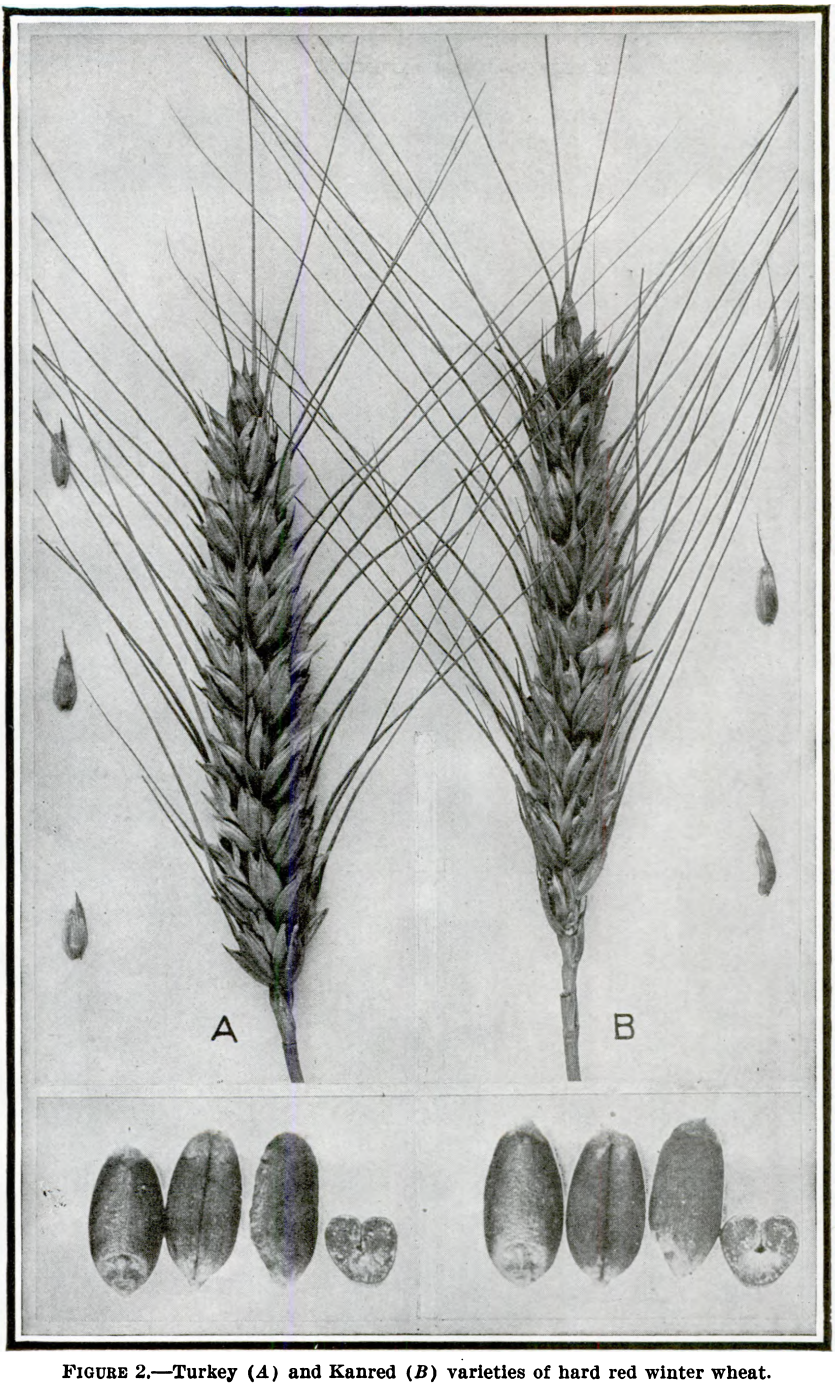

FIGURE 2.—Turkey (*A*) and Kanred (*B*) varieties of hard red winter wheat.

bunt or stinking smut as some of the club and soft red winter wheats commonly grown.

The name Kharkof is applied to an introduction of Crimean wheat brought to this country from Starobielsk, Kharkof, Russia, in 1900, by the late Mark Alfred Carleton, of the United States Department of Agriculture. This section of the Union of Soviet Socialist Republics is north of that in which Turkey wheat was grown, and consequently it was thought that Kharkof would be more winter hardy than Turkey. In the earlier experiments it gave better yields than Turkey, but in recent years very little difference in hardiness or yield has been observed. The variety was widely distributed by the Department of Agriculture and several State agricultural experiment stations in the early years of the present century. Since Kharkof in

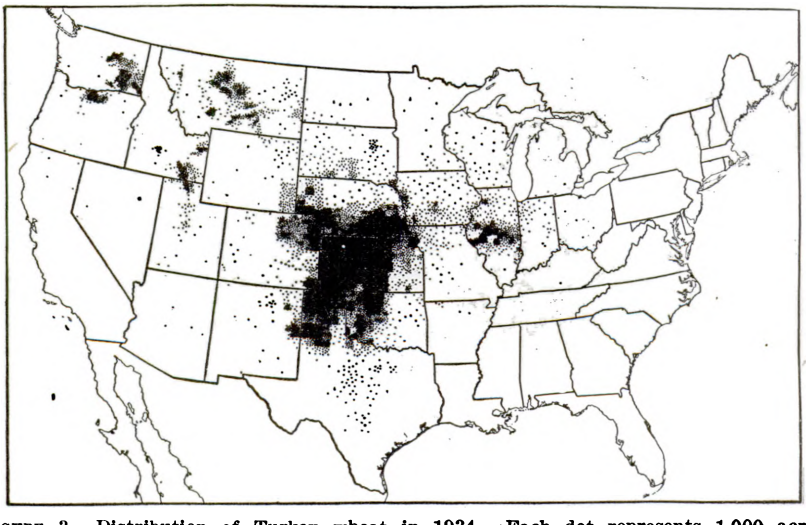

FIGURE 3.—Distribution of Turkey wheat in 1934. Each dot represents 1,000 acres. Estimated area, 15,114,395 acres.

general cannot be distinguished from Turkey by any observable characteristics and since it does not differ from Turkey in winter hardiness, yield, or quality it should properly be considered as identical with that variety. It is grown in the same area as Turkey, and in recent years the two varieties usually have been considered as one.

BLACKHULL

Blackhull (known also as Clark's Black-hulled and Black Chaff) usually can be distinguished from Turkey by the black stripes or solid black color of the outer chaff. Under some conditions, however, this black color does not develop, in which case the chaff is white. Blackhull also differs from Turkey in being a little earlier and taller and in having slightly stiffer straw and somewhat larger and softer kernels. It heads relatively early but ripens only a few days earlier than Turkey, thus having a longer fruiting period. It is not resistant to rust or bunt, but its earliness may enable it to escape severe rust injury. It is decidedly less winter hardy than Turkey.

The variety originated from three heads found by Earl G. Clark in a field of Turkey wheat near Sedgwick, Harvey County, Kans., in 1912. These heads were grown separately, and the seed was increased by Mr. Clark and first distributed in 1917. Since that time it has become widely grown in the southern Great Plains area. In 1934 it was reported from 10 States, with a total of more than 6,000,000 acres, ranking second among the hard red winter wheat varieties. The distribution of the variety is shown in figure 4. The largest acreages of Blackhull are in Kansas (4,400,000 acres), Oklahoma (1,100,000 acres), and Texas (900,000 acres).

Blackhull has given yields equal to or better than those of Turkey in central and eastern Kansas but somewhat less in northwestern Kansas. It has replaced much of the Turkey in southern Kansas,

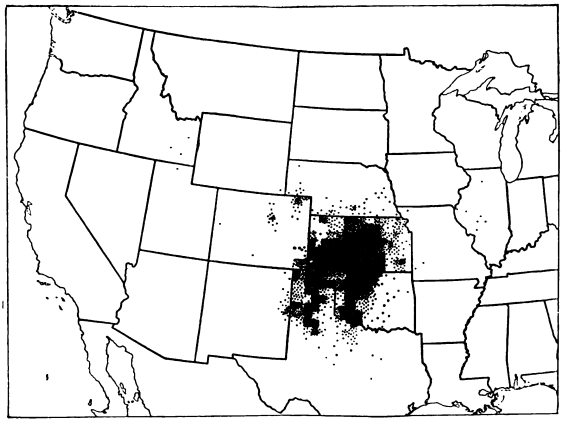

FIGURE 4.—Distribution of Blackhull wheat in 1934. Estimated area, 6,617,379 acres.

Oklahoma, and the Texas Panhandle. In comparative experimental trials it has given good yields in northeastern Colorado and eastern Oregon. For a time it was grown commercially in central Illinois, but the acreage there is gradually decreasing. Owing to its lack of winter hardiness it should not be grown in sections having severe winters. It is probably safe to grow Blackhull from central Kansas southward, but north of this area there is danger of severe winter-killing and heavy losses. Because of a series of winters with very little winter-killing, Blackhull is now grown much farther north and west than is considered safe.

When Blackhull was first distributed there was some doubt as to its milling and baking quality. The Kansas Agricultural Experiment Station demonstrated that it was less tolerant to severe mixing than other hard winter wheats, and it seemed that this might limit its usefulness for commercial bakeries. In recent years the trade has learned how to use Blackhull, and the objections to it are neither so numerous nor so great as formerly. In the household the mixing of the dough is not severe, and for home baking Blackhull produces bread as satisfactory as that from Turkey or Kanred. In experimental trials Blackhull has a consistently heavier test weight than Turkey or Kanred but produces a lower percentage of straight flour for a given test weight.

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SUPERHARD

Superhard (Super-hard Blackhull) is identical with Blackhull except that it has slightly harder kernels and is decidedly poorer in milling and baking quality. It is the result of a selection made from Blackhull by Earl G. Clark, Sedgwick, Kans., the originator of Blackhull, in 1920. The variety spread rather rapidly in south-central Kansas and in Oklahoma for a year or two, but it became mixed with Blackhull and its identity has been lost. The acreage at the present time probably is not large. The variety cannot be recommended in preference to Blackhull, and its production should be discouraged.

KANRED

Kanred differs from Turkey chiefly in being resistant to some forms of leaf and stem rust, especially in the seedling stage. It also is slightly earlier and a little more winter hardy than Turkey. Usually it can be distinguished from Turkey by the longer beaks on its outer chaff. These vary from one-eighth to 1 inch in length as compared with one-eighth to three-eighths of an inch for Turkey and Kharkof (fig. 2, *B*).

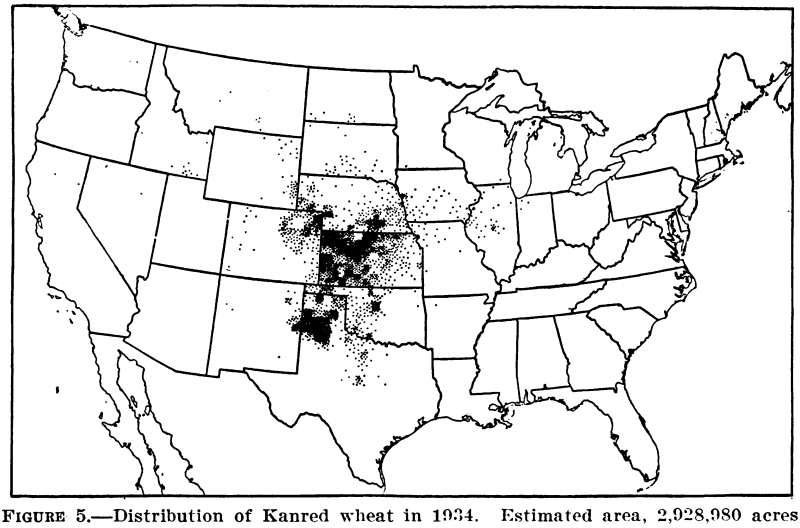

FIGURE 5.—Distribution of Kanred wheat in 1934. Estimated area, 2,928,980 acres.

Kanred originated from a head selected from a plot of Crimean wheat at the Kansas Agricultural Experiment Station in 1906. Crimean is identical with Turkey and had been imported from Russia in 1900 by the United States Department of Agriculture. After being thoroughly tested by the agronomists of the Kansas station, Kanred was distributed in 1917. The acreage increased very rapidly from 1917 to 1924, when it occupied more than 21 percent of the total hard red winter wheat acreage in the United States. Since that time the popularity of the variety has been gradually diminishing, owing to its weak straw and the distribution of better adapted varieties. In 1934, it was estimated that Kanred occupied nearly 3 million acres.

It was reported from 23 States; the largest acreage was in Kansas where it was grown on 1,351,000 acres, about 10 percent of the total acreage for the State (fig. 5).

Kanred may be grown with success wherever Turkey is grown. In Kansas, Texas, Nebraska, Colorado, Oklahoma, and New Mexico it has partly replaced Turkey and Kharkof, and in all of these States except Nebraska it is a recommended variety. Outside of this area it has shown little advantage over Turkey.

In experiments Kanred has been found to be about equal to and much the same as Turkey in milling and bread-baking value. It has a slightly higher bushel weight and produces a greater percentage of straight flour than Turkey or Kharkof grown under the same conditions but has a slightly lower percentage of protein and produces a loaf of bread with a slightly smaller volume. In weight, texture, and color of loaf produced Kanred is about equal to Turkey or Kharkof. Kanred is now considered by the trade as equal to Turkey in quality.

NEBRASKA NO. 60

Nebraska No. 60 is a high-yielding selection of Turkey made at the Nebraska Agricultural Experiment Station in 1907 and distributed in 1918. It is later than Turkey, more winter hardy, and identical in appearance. It is as susceptible to rust and hessian fly attack as is Turkey. In milling and baking value it is equal to Turkey. This variety, rather than Turkey, is recommended where a little more winter hardiness is desired and where earliness is not so important.

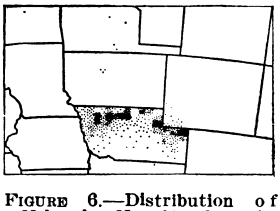

FIGURE 6.—Distribution of Nebraska No. 60 wheat in 1934. Estimated area, 649,839 acres.

Nebraska No. 60 is now grown in Nebraska, Colorado, Kansas, Oklahoma, and on a small acreage in South Dakota (fig. 6). Most of the acreage, however, is confined to Nebraska, where the variety is well adapted and popular, especially in the western part. It is recommended by the respective State agricultural experiment stations for growing in Nebraska and Oklahoma. In some cases Nebraska No. 60 and Turkey have become mixed, and the identity of the former has been partly lost.

TENMARQ

Tenmarq was produced from a hybrid between Marquis spring wheat and P1066 winter wheat, the latter being a sister selection of Kanred made from Crimean wheat. The cross was made at Manhattan, Kans., in 1917. Tenmarq is the result of a selection made in 1921 by John H. Parker. The variety may be distinguished from Turkey by the longer beaks, slightly larger heads, stronger straw, earlier maturity, and shorter, plumper kernels.

Tenmarq is 3 to 5 days earlier than Kanred in maturity, but it is less winter hardy, being only slightly more hardy than Blackhull. It is resistant to some but not all forms of stem rust, has a stiffer straw, and lodges less easily than Turkey or Kanred. It is very susceptible to attack by the hessian fly. The milling and baking

quality of Tenmarq is very good, being equal to or better than that of Kanred and Turkey.

Tenmarq was distributed in 1932, and in 1934 was reported as being grown in Kansas, Texas, and Oklahoma; most of the acreage was in south-central Kansas, as shown in figure 7. The total acreage in 1934 was reported to be more than 177,000 acres. It is estimated that more than 200,000 acres were grown in Kansas alone in 1936. From central Kansas south through Oklahoma and Texas, Tenmarq has given very good results in experiments, being one of the highest yielding varieties. Farther north it has given high yields only in years when there was no winter-killing and when early wheats were able to escape hot, dry winds. It appears that the variety may spread rather rapidly and replace much of the Blackhull acreage, owing to slightly better yields and a more desirable quality for baking. Tenmarq is a variety recommended by the agricultural experiment stations of Kansas, Oklahoma, Texas, and Illinois.

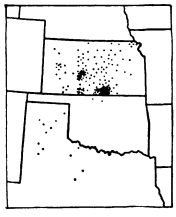

FIGURE 7.—Distribution of Tenmarq wheat in 1934. Estimated area, 177,746 acres.

MINTURKI

Minturki is the most winter hardy of any variety grown commercially, although others that are being grown for experimental purposes are able to survive severe winters. Minturki originated from a cross between Turkey and Odessa (the latter a beardless, soft red winter wheat) made at the Minnesota Agricultural Experiment Station in 1902. The variety was increased and was first distributed in 1919. It has gradually increased in acreage, mostly in southern Minnesota. Smaller acreages were reported from Illinois, Michigan, Ohio, Nebraska, Wisconsin, South Dakota, and Montana, as shown in figure 8.

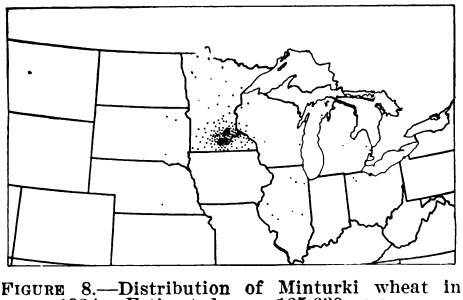

FIGURE 8.—Distribution of Minturki wheat in 1934. Estimated area, 165,630 acres.

Minturki has given very good yields in Minnesota and has done fairly well in experimental trials in central Utah and central Montana. It finds favor in that area also because of its resistance to the forms of stinking smut or bunt so far found in the Plains and its moderate resistance to stem rust. It ripens later than most varieties of hard red winter wheat and for this reason is often injured by heat and drought, especially when grown south of Minnesota. The variety resembles Turkey, but has a more slender head and longer, softer, and more slender kernels. Where severe winter-killing may be expected, Minturki offers considerable promise, especially in the sub-humid and humid sections of the upper Mississippi Valley. Bread from Minturki is satisfactory in

volume and texture, but is inclined to be slightly yellow. The agricultural experiment stations of Minnesota, South Dakota, and Illinois recommend it for growing in those States.

IOBRED

Iobred was developed from a variety or a hybrid mixed with Banat and separated in 1915 by L. C. Burnett at the Iowa Agricultural Experiment Station. It is a brown-chaffed variety with much shorter and broader kernels than most varieties of the hard red winter class. In Iowa, it is considered superior to many other varieties with respect to winter hardiness, strength of straw, resistance to stem rust, and yields.

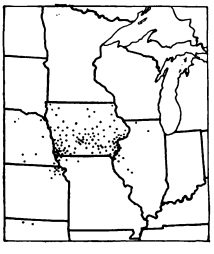

FIGURE 9. — Distribution of Iobred wheat in 1934. Estimated area, 112,874 acres.

Iobred is grown in Iowa, Kansas, Illinois, Nebraska, Missouri, and Oklahoma. The greatest acreage is in Iowa, as is shown in figure 9. Because of its rust resistance and stiff straw, Iobred has become popular in a small area of southeastern Nebraska and northeastern Kansas on bottom land where other varieties lodge badly and become infected with rust. It may become more widely grown in Iowa because of its ability to withstand lodging. It is doubtful whether it should ever be extensively grown in drier regions because of its tendency to shatter. It is recommended for growing only in Iowa.

KARMONT

Karmont is the result of a selection from Kharkof made in 1911 at the Judith Basin Branch Station, Moccasin, Mont. It was first grown commercially in Montana in 1921. The variety is very similar in appearance to Turkey and Kharkof, although it usually outyields these varieties under Montana conditions. In milling and baking it is equal to Turkey and Kharkof. Karmont is becoming generally grown in the Judith Basin of Montana, the area to which it is adapted and where it is recommended (fig. 10).

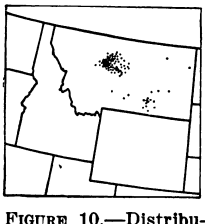

FIGURE 10.—Distribution of Karmont wheat in 1934. Estimated area, 90,448 acres.

REDHULL

Redhull, as commercially grown, is a mixture of types of hard red winter wheat. The predominating type is awned and has brown glumes with black stripes, whereas Blackhull has white glumes with black stripes. Redhull was selected from a field of Blackhull at Haven, Kans., by F. F. Tonn in 1921. It is now grown only in south-central Kansas and north-central Oklahoma and there only to a limited extent. In experimental trials it has produced lower yields than Blackhull. In quality it is about the same as Blackhull. It appears to have no superior qualities to justify growing it in preference to other varieties.

EARLY BLACKHULL

Early Blackhull differs from Blackhull principally in being about 8 days earlier and in having shorter straw. It is the earliest variety of hard red winter wheat now raised on farms. In comparative experiments it has been less winter hardy and also has yielded less on the average than Blackhull. Owing to the fact that it starts growth very early in the spring, late frosts may injure the variety, especially in southern States. In seasons of very mild winters followed by hot, dry summers Early Blackhull has given good yields, because of its ability to escape the damaging effect of heat and drought.

Early Blackhull was selected from a field of Blackhull in 1921 by A. P. Haeberle, Clearwater, Kans., who later increased and distributed it. It is grown on a limited area south and west of Wichita, Kans., where it is fairly popular because of its earliness. Rather disappointing results in 1935 caused many farmers to stop growing it. In quality it is probably poorer than Blackhull although generally, like Blackhull, it has a good test weight. It is probably too early and too easily winter-killed for use over a very wide area.

CHEYENNE

Cheyenne is the result of a plant selection made from Crimean (the same strain from which Kanred was selected) at the Nebraska Agricultural Experiment Station, Lincoln, Nebr., in 1922. It differs from Turkey in being more winter hardy, having shorter and stronger straw, denser and more erect heads, wider shoulders, and shorter beaks on the outer glumes. It does not shatter easily and is considered to be a good "combine" variety. It is tolerant of hessian-fly attack but is susceptible to bunt and stem rust. There is some evidence to indicate that Cheyenne is excellent for fall and winter pasture.

The protein content of Cheyenne usually is lower than that of Turkey, owing in part to its higher yield. Its baking characteristics appear to differ somewhat from those of Turkey. The Nebraska station has found that the dough requires more mixing than that of Turkey, but that, if mixed and fermented properly, Cheyenne will produce as good bread as that made from other varieties of hard red winter wheat.

In experiments dating back to 1927, Cheyenne has been a high yielder in plots at Lincoln and at other stations in Nebraska, Kansas, and Oklahoma. It was distributed in 1930 as Nebraska No. 50, but the seed became mixed, and a purified supply was distributed in 1933 as Cheyenne; since that time it has spread rapidly in Nebraska. It was estimated that in 1936 there were 100,000 acres of Cheyenne wheat in the State. It was reported in Kansas in 1934 as well as in Oklahoma, and the acreage is known to be increasing rapidly. The 1935 rust epidemic gave it a temporary set-back, but the variety has so many desirable characters that it is still popular. Cheyenne is recommended by the agricultural experiment stations of Nebraska, Oklahoma, and Illinois for growing in those States.

COOPERATORKA

Cooperatorka differs from Turkey principally in being taller and later, with a head inclined to nod, having purple stems, softer kernels, and in being less winter hardy. It is also resistant to certain forms of bunt. It was introduced from the Odessa Experiment Station, U. S. S. R., in 1928 by J. W. Pincus, then of the seed division of the Amtorg Trading Corporation, New York City. This seed was distributed to experiment stations and seed growers in the United States. The variety was also introduced from U. S. S. R. in 1927; it was increased and sold as Kooperatka in Kansas. It is also known in Kansas as Russian and Improved Turkey. The variety is grown on a limited acreage in Kansas, but has never become popular because of its lack of winter hardiness.

UTAH KANRED

Utah Kanred differs from Kanred in having longer, laxer, and more nodding spikes, darker glumes, and more variable and shorter beaks, and in being less winter hardy. In experiments in the Nephi Dry-Land Substation, at Nephi, Utah, this wheat proved to be a high-yielding variety and was distributed in 1922. The original source is unknown. When distributed, it was thought to be Kanred and, having been grown commercially as Kanred for many years is now designated as Utah Kanred. It is grown in Utah only.

EAGLE CHIEF

Eagle Chief is a mixture or a segregating population from a field cross of Turkey and Fulcaster or some other soft wheat. The original bulk section was made by C. H. Hyde, at Alva, Okla., in 1920 from a field of Kharkof. The seed was increased until 1927 when about 2,000 bushels were sold by the originator. The variety, which is a mixture of types, is grown in Oklahoma and on a limited acreage in Texas. It has little to recommend it.

MONTANA NO. 36

Montana No. 36 is identical with Turkey and Kharkof in all observable characters. It is a selection from Kharkof, made at the Montana Agricultural Experiment Station, from which it was distributed in 1915. The wheat has been grown for a number of years in Montana, the acreage remaining fairly constant over a 10-year period. It is as winter hardy as Turkey or Kharkof and has given slightly higher yields in some sections of Montana. It also is equal to these varieties in milling and baking quality. The variety is on the recommended list for Montana.

IOTURK

Ioturk is similar to Turkey, differing from it in consistently higher yields in Iowa. It is also resistant to some forms of bunt. Ioturk is a Turkey selection made by the farm crops section of the Iowa Agricultural Experiment Station, Ames, Iowa. It was distributed

in 1926 but has never become very popular, being grown on only about 9,000 acres in 1934; nearly all of this was in Iowa, with very small acreages in Illinois and Missouri. In Iowa and Illinois, Ioturk is an approved variety.

IOWIN

Iowin is a selection from Theiss wheat made by L. C. Burnett at the Iowa Agricultural Experiment Station. It was first grown commercially in 1930. It differs from Turkey in being taller and later, in having longer beaks, purple stems, and slightly softer kernels. It is also resistant to stem rust. Under Iowa conditions it has given higher yields than Turkey. Nearly all of the acreage of Iowin is in Iowa, where it is an approved variety, and it occupied slightly more than 8,500 acres in 1934. In the same year it was reported as being grown on a few acres in Kentucky.

ILRED

Ilred is a pure-line selection from Turkey made at the Illinois Agricultural Experiment Station, Urbana, Ill., in 1910. It was first grown commercially in 1923 as Turkey 10–110. It has not become an important variety, and all of the acreage is confined to Illinois, where it is a recommended variety, as it seems to have the ability to outyield Turkey.

SHERMAN

Sherman differs from Turkey in that it has stronger straw, shatters more easily, and has longer beaks and softer kernels. It is resistant to some forms of bunt. Sherman was first distributed from the Sherman County Branch Station, Moro, Oreg. It is the result of a selection made in 1915 by J. A. Clark at Moccasin, Mont., from a double cross between Budapest × Turkey and Zimmerman × Turkey made by M. A. Carleton in 1908. It was distributed in southern Idaho by the Idaho Agricultural Experiment Station in 1928. The variety is now grown on small acreages in Utah and Idaho, although it has not been formally recommended by the agricultural experiment station in either State.

OTHER BEARDED VARIETIES

In addition to the varieties discussed above, other bearded varieties are grown on limited acreages in various parts of the United States. Some of these are new, just coming into production and others are old ones slowly being dropped. In no case is any one variety being grown on as many as 5,000 acres.

Oro, a selection from Turkey developed by D. E. Stephens, of the station at Moro, is resistant to many forms of bunt and is grown sparingly in Oregon and Idaho. Although it is a recommended variety in Oregon, it has not yet become widely grown, but it has been very extensively and successfully used as a parent in hybrids. It has many desirable characteristics, but has not been able to equal other good varieties in yield.

Yogo is another smut-resistant variety first distributed from the Judith Basin Branch Station, Moccasin, Mont., in 1932. It also is a

high-yielding, winter-hardy variety. It is the result of a Minturki × Beloglina-Buffum cross made in 1919 at Manhattan, Kans., by J. H. Martin and K. S. Quisenberry, of the United States Department of Agriculture. The selecting and testing work at Moccasin was done largely by K. S. Quisenberry, B. B. Bayles, and J. L. Sutherland. Yogo is now recommended by the Montana Agricultural Experiment Station and is becoming a commercially grown variety.

Ashkof was developed at the Ashland branch station of the Wisconsin Agricultural Experiment Station. It is a selection from Malakof and has brown glumes. It is fairly winter hardy, gives a good yield under Wisconsin conditions, and is resistant to some forms of bunt. Ashkof is a recommended variety in Wisconsin, and a small acreage was reported in Tennessee in 1934.

Wisconsin Pedigree No. 2 is a selection from Turkey developed by the Wisconsin Agricultural Experiment Station and distributed as a high-yielding strain in 1918. The variety is now recommended and grown only in Wisconsin and Illinois.

Nebraska No. 6 is nearly identical with Nebraska No. 60 and has the same history as that selection. In both yield and quality it is slightly inferior to Nebraska No. 60. It is now grown on a very small and decreasing acreage in Nebraska but is no longer recommended for that State.

Ukrainka is a Turkey-type introduction from Russia. It is similar to Turkey except that the kernel is somewhat softer. This variety has been distributed by the Illinois Agricultural Experiment Station and is grown only in Illinois.

Rio is a selection made by D. E. Stephens at Moro, Oreg., from Argentina, a Crimean wheat. The variety is resistant to many forms of bunt and for that reason was distributed in 1931 and still is a recommended variety for growing in Oregon.

Relief differs from Turkey in being taller, having a longer and laxer spike, darker glumes, shorter beaks, and a slightly longer kernel, and in being resistant to some forms of bunt. The variety was selected from a cross between Hussar and a Turkey selection (Utah No. 26) by D. C. Tingey, of the Utah Agricultural Experiment Station, Logan, Utah. It has shown resistance to the forms of bunt that cause heavy losses in the Cache Valley of Utah. Relief was distributed in 1934 and is now recommended for growing in Utah.

Four other bearded varieties, Beloglina, Bacska, Iowa No. 404, and Regal, are grown on very small acreages in isolated places in the United States, but are not recommended in any State.

GROUP 2.—HEADS BEARDLESS

Only five beardless varieties of hard red winter wheat are grown on a commercial scale. These are described in the following paragraphs.

RIDIT

Ridit was developed at the Washington Agricultural Experiment Station from a cross between Turkey and Florence, made by E. F.

Gaines in an effort to produce a variety of winter wheat resistant to bunt or stinking smut. The cross was made in 1915, and a selection made from it in 1919 resulted in Ridit. Its outstanding characteristics are resistance to many but not all forms of bunt and resistance to shattering; it produces high yields and has good milling qualities. Ridit was first distributed for commercial growing in Washington in 1923, and since that time it has rapidly increased in acreage (fig. 11).

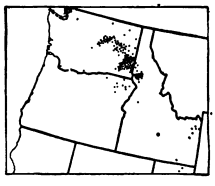

FIGURE 11.—Distribution of Ridit wheat in 1934. Estimated area, 159,402 acres.

According to the 1934 survey, Ridit was grown on nearly 160,000 acres, mostly in Washington, Idaho, and Oregon. Ridit is grown more extensively than any other beardless variety of hard red winter wheat. It is recommended in Washington and is best adapted to eastern Washington and the adjacent Panhandle of Idaho, where winters are rather mild. It is not able to withstand severe winter conditions.

MICHIKOF

Michikof was developed at the Indiana Agricultural Experiment Station from a cross made in 1912 between Michigan Amber and Malakof. The selection from which the variety originated was made in 1915, and the variety has been grown commercially since 1920. The acreage is confined to Indiana and Illinois, the total in 1934 being slightly more than 90,000 acres. It is not now a recommended variety in either State. Its outstanding characteristics are winter hardiness and hard kernels of high-test weight which make flour of good quality for bread making. There has been some opposition to Michikof from millers of Indiana, since they prefer soft wheats for local milling.

NEWTURK

Newturk is a selection from a cross between Newton and Turkey, made at Moro, Oreg., in 1916. In the fall of 1920 many beardless selections of this cross, made by J. A. Clark, were sent to and seeded at Moccasin, Mont. One of these, later named Newturk, which proved to be the best, was distributed in 1925 for commercial growing in Montana. Its acreage has increased steadily, but the variety is not grown in any other State.

Newturk was developed to satisfy a demand for a beardless variety of hard red winter wheat which would yield as well as Turkey or Kharkof. It yields as well as or slightly better than Kharkof in Montana, is resistant to shattering, and has good quality for milling and bread making. While it has been tested in States other than Montana and has given fairly good results, it probably is best adapted to Montana, where it is a recommended variety. In Montana it may safely be used to replace Kharkof by those farmers who desire to grow a beardless variety rather than a bearded one.

MOSIDA

Mosida is a variety having strong straw; it is fairly winter hardy and gives high yields on the cut-over lands of northern Idaho. It should not be grown where shattering is likely to occur.

Mosida originated from a cross between Fultzo-Mediterranean and Turkey made in 1916 at the Colorado Agricultural College. The crossed material was taken to the Idaho Agricultural Experiment Station, Moscow, Idaho, where the selection that is now called Mosida was made in 1918. It was released for commercial growing in northern Idaho in 1924. In 1934 it was reported as grown in Idaho, Oregon, Washington, and Montana, the largest acreage being in Idaho.

ALTON

Alton (Ghirka Winter) differs from Turkey in having beardless heads and shorter and softer kernels with a very small germ. It is of medium height and is midearly in ripening, being usually a day or two later than Turkey. The straw is stiffer than that of Turkey, and the heads are slender and tapering.

Alton was introduced into the United States from Russia by the United States Department of Agriculture in 1900. It has been grown to a limited extent in Colorado, Wyoming, and Kansas under other names, principally Ghirka Winter, but is not grown extensively in any State. The popularity of the variety has decreased until in 1934 only a small acreage in Oklahoma was reported. It has been unable to compete with the better bearded varieties. In milling and baking Alton is not the equal of most other hard winter wheats, and it should be eliminated.

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