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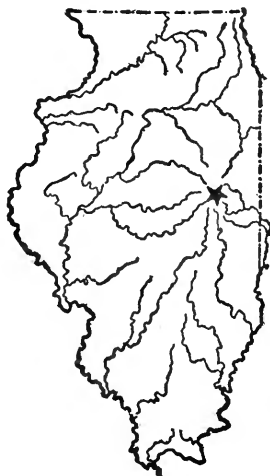
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BULLETIN No. 276

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PRODUCTIVENESS OF VARIETIES OF  
WINTER WHEAT IN ILLINOIS

BY ROBERT W. STARK



URBANA, ILLINOIS, JUNE, 1926

## SUMMARY

Wheat is decidedly susceptible to climatic conditions and varieties differ widely in their adaptation to environment. As Illinois extends nearly 400 miles from north to south, marked variations in climate occur, and one of the problems in successful wheat production is to find those varieties that are particularly suited to the different sections.

Tests at DeKalb, in the northern part of the state, indicate the superior winter resistance and high yielding capacity of the hard wheats of the Turkey Red type, such as Ilred (Turkey Red 10-110), Minnesota Reliable, Kanred, Red Russian, and Turkey Red (Station strain). Soft varieties that have made a satisfactory record are Hardy Northern and Red Cross. These tests have been conducted since 1907. During this time 44 varieties have been grown, 19 of which were hard, 23 soft, 1 of unknown origin, and 1 hybrid, one parent of which was a hard wheat.

In central Illinois also winter resistance frequently is the deciding factor in successful wheat production. Among the 57 varieties and strains tested at Urbana since 1904, those of the Turkey Red type have proved superior in this characteristic. Minnesota Reliable, Worlds Champion, Ilred (Turkey Red 10-110), Kanred, Malakof 5-460, and Turkey Red (Station strain) comprise the hard wheats with the best records for a period of eight years or more. Other hard varieties tested for a shorter period which deserve mention are Red Russian, Malakof C. I. No. 4898, Minturki, Kanred 2401, Michikoff, and Blackhull. Soft varieties which have made good records are Indiana Swamp, Dawson Golden Chaff 9-225, Red Rock, Red Cross, Michigan Amber, and Gladden.

Soft varieties seem best adapted to the southern section of the state. At Fairfield in Wayne county 41 varieties and strains of wheat were tested from 1906 to 1923. Eight of the varieties were of the Turkey Red type and one was a hybrid, one parent of which was Turkey Red; the remainder were soft varieties. Fulcaster, a soft variety, which was taken as the standard variety with which to compare all others, was exceeded only by Illini Chief, also a soft variety, in average yield. Other varieties which were grown for six years or more and which made favorable records on this field are Red Cross (synonym for Harvest Queen), Economy, Marvelous (synonym for Fulcaster), and Jersey Fultz.

On the Alhambra field in Madison county Fulcaster has been slightly exceeded by Mediterranean, as a six-year average, while Rudy, Gipsy, Illini Chief, Red Wave, Marvelous, and Jersey Fultz, all soft varieties, during five-year periods have yielded but slightly less than Fulcaster.

A description of the varieties used in these tests, together with a summary of their performance on the above fields, will be found on pages 27 to 35.



# PRODUCTIVENESS OF VARIETIES OF WINTER WHEAT IN ILLINOIS

BY ROBERT W. STARK, Associate in Crop Production

From the early settlement of Illinois to the present date, wheat has been one of the most important crops grown in the state. Some conception of the magnitude of the industry and the distribution of the wheat-growing sections may be derived from the map on page 4, which shows the acreage by counties grown in 1923. In that year the total production of winter wheat in the state was 60,534,000 bushels, and this crop was harvested from 3,363,000 acres.

Extensive wheat growing is confined to certain fairly well-defined areas. In general, the principal wheat-growing counties lie east of the Illinois river and east of the Mississippi river south of the mouth of the Illinois. The wheat sections, therefore, include practically all the region covered by the Middle Illinoian glaciation, the western portion of the Lower Illinoian glaciation, and a smaller area in the same glaciation bordering on the Wabash river. These constitute the two oldest glaciated regions in the state.

Variety trials of winter wheat have been conducted at DeKalb in DeKalb county, at Urbana in Champaign county, at Fairfield in Wayne county, at Alhambra in Madison county, and at Cutler in Perry county. The results of these investigations up to and including 1916 are given in Bulletin 201, "Yields of Winter Wheat in Illinois." In the present publication the previous data from the DeKalb, Urbana, and Fairfield fields are repeated, and the further data from these fields for the years 1917 to 1925 inclusive are added. The yields from the Alhambra tests, which were begun in 1919, are also given, but the results of the tests at Cutler, which were begun in 1902 and discontinued in 1907, are not repeated.

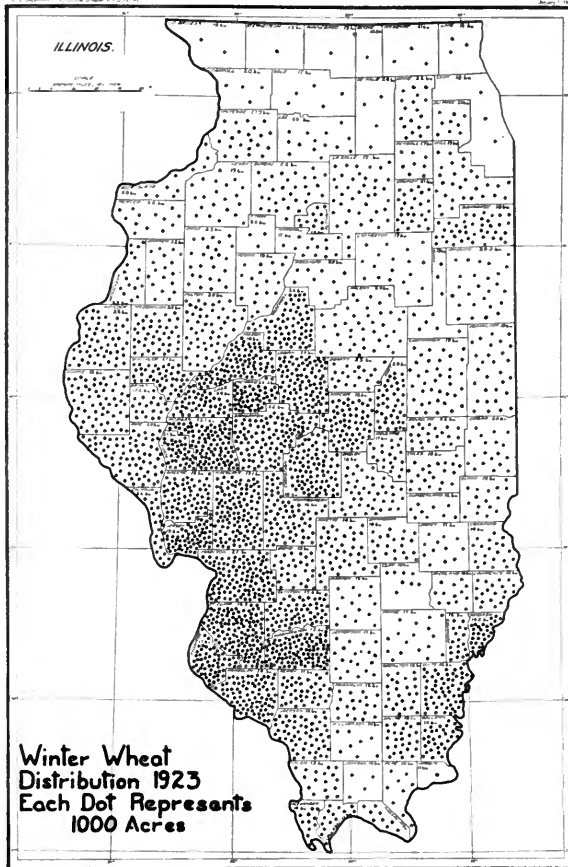
## TESTS IN NORTHERN ILLINOIS

### DEKALB IN DEKALB COUNTY

The character of the varieties of wheat adapted to the different sections of Illinois are influenced materially by the wide variations in climatic conditions occurring between the northern and southern boundaries of the state.

DeKalb is situated in the northern part of the north-central district of the state. The average annual precipitation for this section

is about 34 inches.<sup>1</sup> The average temperature for the winter months is approximately 24.7° F., while the average annual minimum temperature is 16.3° F. below zero. The effect of the long continued low temperature is usually lessened by a snowfall of 30 to 35 inches.



#### WINTER WHEAT DISTRIBUTION IN ILLINOIS

Data taken from Illinois Crop Statistics for 1923 issued by the Bureau of Agricultural Economics, U. S. Department of Agriculture.

A number of soil types occur on this field, but they are all common to the region and are productive. The wheat is grown in a rota-

<sup>1</sup>Meteorological data taken from Bulletin 208 of this Station, "Climate of Illinois," issued in 1918.

tion of corn, oats, wheat, and alsike clover. The soil treatment consists of applications of crop residues and rock phosphate and manure and rock phosphate. Each variety is represented an equal number of times on each system of soil treatment.

Variety trials of wheat were begun in 1907 and have been continued to date. During this period 44 different varieties and strains have been tested; of this number, 19 are hard varieties and 23 are soft. The character of one designated as native is unknown, while another is a hybrid, one parent of which was a hard wheat.

During the period of these trials inferior varieties or lesser known strains have been discontinued and other untried varieties substituted. This process of elimination has resulted in the gradual casting out of all but the highest-yielding varieties. The varieties that are now in the test, and have been for a number of years past, constitute, therefore, with one or two exceptions, the hardiest and most prolific varieties tried.

The annual yield of the entire list of varieties that have been grown at DeKalb is given in Table 1. Since the different varieties have been grown for irregular periods, average yields manifestly are not comparable. Turkey Red, however, is one of the best varieties tried, and it has been grown during the entire period. The percentage yield of each of the other varieties, with Turkey Red as the standard for comparison, may therefore be calculated by dividing its average yield by the average yield of Turkey Red for the same period. This percentage rating appears in the last column. A summary showing the number of years each variety was grown, together with its average yield and the average yield of the standard variety for the same period, is given in Table 2.

During the entire period covered by these tests, 1907 to 1925, seven varieties were tested for six years or more, each of which has a percentage rating greater than Turkey Red (Station strain<sup>1</sup>). These varieties are, in order of rating, Red Russian, Ilred,<sup>2</sup> (Turkey Red 10-110), Kanred, Hardy Northern, Wisconsin No. 18, Minnesota Reliable, and Worlds Champion. With the exception of Hardy Northern, these are all strains of the Turkey Red type.

In 1922 a considerable number of varieties were discontinued. Those retained were either the highest-yielding varieties or they possessed characteristics which made it desirable to give them a further trial. The performances of the nine varieties which have been grown continuously during the last six-year period, 1919-1925, are directly comparable (Table 3).

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<sup>1</sup>The Turkey Red designated as "Station" strain has been grown continuously for many years on the University farm and is of no known special selection.

<sup>2</sup>Turkey Red 10-110 has recently been given the name Ilred.





TABLE 2.—DEKALB FIELD: COMPARABLE AVERAGE YIELDS OF VARIETIES OF WINTER WHEAT USING TURKEY RED AS A STANDARD FOR COMPARISON (Bushels per acre)

Varieties	Number of years compared <sup>1</sup>	Years on which comparisons are based	Average yield
Turkey Red (Station).....	13	1910, 1911, 1913, and 1915-1925 except 1920.....	35.7
Minnesota Reliable.....	13	1910, 1911, 1913, and 1915-1925 except 1920.....	36.1
Turkey Red (Station).....	11	1907-1921 except 1908, 1909, 1912, 1920.....	32.7
Dawson Golden Chaff.....	11	1907-1921 except 1908, 1909, 1912, 1920.....	27.1
Turkey Red (Station).....	10	1915-1925 except 1920.....	35.6
Red Cross.....	10	1915-1925 except 1920.....	33.7
Wisconsin No. 18.....	10	1915-1925 except 1920.....	36.8
Turkey Red (Station).....	9	1907, 1913-1921 except 1920....	32.1
Kharkof (U. S. D. A. No. 11603)	9	1907, 1913-1921 except 1920....	28.7
Turkey Red (Station).....	9	1916-1925 except 1920.....	35.0
Hardy Northern.....	9	1916-1925 except 1920.....	36.6
Red Russian.....	9	1916-1925 except 1920.....	37.9
Turkey Red (Station).....	7	1914-1921 except 1920.....	32.5
Malakof 5-458.....	7	1914-1921 except 1920.....	31.3
Wheedling 5-464.....	7	1914-1921 except 1920.....	32.0
Turkey Red (Station).....	7	1915-1922 except 1920.....	33.6
Worlds Champion.....	7	1915-1922 except 1920.....	33.9
Turkey Red (Station).....	7	1918-1925 except 1920.....	35.7
Red Rock.....	7	1918-1925 except 1920.....	34.1
Turkey Red (Station).....	6	1915-1921 except 1920.....	31.4
Miracle.....	6	1915-1921 except 1920.....	20.5
Turkey Red (Station).....	6	1919-1925 except 1920.....	37.8
Kanred.....	6	1919-1925 except 1920.....	39.7
Ired (Turkey Red 10-110).....	6	1919-1925 except 1920.....	40.0
Turkey Red (Station).....	5	1907-1914 except 1908, 1909, 1912.....	34.3
Wheedling.....	5	1907-1914 except 1908, 1909, 1912.....	26.0
Indiana Swamp.....	5	1907-1914 except 1908, 1909, 1912.....	27.4
Turkey Red (Station).....	5	1914-1918.....	33.7
Turkey Red 9-233.....	5	1914-1918.....	33.7
Turkey Red (Station).....	5	1916-1921 except 1920.....	29.4
Early Red Clawson.....	5	1916-1921 except 1920.....	21.4
Turkey Hybrid 509.....	5	1916-1921 except 1920.....	26.2
Canadian Hybrid.....	5	1916-1921 except 1920.....	28.1

<sup>1</sup>In each case the number of years given for the variety compared with Turkey Red is the total number of years the variety was grown.

TABLE 2.—*Concluded*  
(Bushels per acre)

Varieties	Number of years compared <sup>1</sup>	Years on which comparisons are based	Average yield
Turkey Red (Station).....	4	1915-1918.....	32.3
Mediterranean.....	4	1915-1918.....	17.0
Gipsy.....	4	1915-1918.....	19.5
Turkey Red (Station).....	4	1913, 1914, 1919, 1921.....	33.9
Red Hussar.....	4	1913, 1914, 1919, 1921.....	32.6
Hungarian.....	4	1913, 1914, 1919, 1921.....	33.3
Turkey Red (Station).....	3	1916-1918.....	29.2
Marvelous.....	3	1916-1918.....	5.1
Rudy.....	3	1916-1918.....	9.8
Prize Taker.....	3	1916-1918.....	14.5
Turkey Red (Station).....	3	1913, 1919, 1921.....	32.1
Pesterboden.....	3	1913, 1919, 1921.....	29.0
Beloglina.....	3	1913, 1919, 1921.....	30.2
Turkey Red (Station).....	3	1923-1925.....	40.3
Blackhull.....	3	1923-1925.....	37.1
Turkey Red (Station).....	2	1907, 1913.....	30.5
Malakof.....	2	1907, 1913.....	28.2
Turkey Red (Station).....	2	1917, 1918.....	26.3
Red Wave.....	2	1917, 1918.....	10.6
Turkey Red (Station).....	2	1924, 1925.....	39.6
Trumbull.....	2	1924, 1925.....	37.9
Michikoff.....	2	1924, 1925.....	40.7
Fulhio.....	2	1924, 1925.....	41.3
Turkey Red (Station).....	1	1907.....	24.3
Padi.....	1	1907.....	18.6
K. B. No. 2.....	1	1907.....	21.8
Turkey Red (Station).....	1	1910.....	37.4
Native wheat.....	1	1910.....	29.5
Turkey Red (Station).....	1	1914.....	39.2
Dawson Golden Chaff 9-211...	1	1914.....	22.6
Fultz.....	1	1914.....	30.6
Gold Coin.....	1	1914.....	32.5
Turkey Red (Station).....	1	1910.....	33.9
Turkey Red (native).....	1	1910.....	30.1
Turkey Red (Station).....	1	1924.....	46.1
Wheat Mixture.....	1	1924.....	37.7
Turkey Red (Station).....	1	1925.....	33.0
Minturki.....	1	1925.....	43.7

<sup>1</sup>In each case the number of years given for the variety compared with Turkey Red is the total number of years the variety was grown.

During this period, Ilred (Turkey Red 10-110) produced an average of 40.0 bushels an acre and ranked first in average yield, altho in no single year was it the highest-yielding variety. Red Rock produced nearly 40 bushels an acre and exceeded Turkey Red (Station strain) during this period, notwithstanding the fact that it was given a percentage rating in Table 1 of only 95.5. This low percentage yield is

TABLE 3.—DEKALB FIELD: COMPARATIVE TEST OF VARIETIES OF WINTER WHEAT GROWN DURING THE SIX-YEAR PERIOD 1919-1925  
(Bushels per acre)

Varieties	1919	1921	1922	1923	1924	1925	Average yield
Ilred (Turkey Red 10-110)	33.4	33.1	45.2	42.2	44.1	42.2	40.0
Minnesota Reliable	31.0	36.7	44.0	37.8	45.9	44.2	39.9
Kanred	29.1	30.6	44.4	42.5	45.5	46.1	39.7
Red Rock	38.0	38.2	48.0	38.3	42.9	31.9	39.6
Wisconsin No. 18	32.2	31.4	44.6	39.9	45.3	43.6	39.5
Red Russian	23.5	29.3	49.3	42.2	46.4	44.7	39.2
<b>Turkey Red (Station)</b>	<b>21.8</b>	<b>37.7</b>	<b>46.9</b>	<b>41.7</b>	<b>46.1</b>	<b>33.0</b>	<b>37.9</b>
Red Cross	26.5	32.8	40.5	38.3	45.3	36.8	36.7
Hardy Northern	24.1	24.9	45.5	38.5	44.0	37.8	35.8

due to its having made practically a complete failure in 1918, which year is not included in this table. In 1920 (the data for which also are not included<sup>1</sup>) it was again almost an entire failure. Red Rock has shown a decided tendency to be seriously injured in this section by unfavorable winter conditions. When it has survived the winter successfully, it has proved a heavy yielder.

Of the varieties given in Table 3, all belong to the Turkey Red type and are hard red winter wheats, except Red Rock, Red Cross, and Hardy Northern. These latter varieties are awned except Red Cross.

Sufficient data concerning the more recent entries in these tests (see yields in columns for 1923, 1924, and 1925, Table 1) have not yet been secured to warrant drawing definite conclusions as to their relative adaptation to the conditions which obtain in this section.

### TESTS IN CENTRAL ILLINOIS URBANA IN CHAMPAIGN COUNTY

The Urbana experiment field lies in the eastern part of central Illinois. This section has an average annual precipitation of about 37 inches. The average temperature for the winter months is approximately 28.8° F. At Urbana, during a 25-year period, the average an-

<sup>1</sup>The data for all varieties grown in 1920 were discarded because of the unreliability of the threshing records.



nual minimum temperature has been 13° F. below zero. This section has an average annual snowfall of 20 to 25 inches. Frequently the snow melts quickly so that it affords little protection to the wheat.

The soil of the field on which the Urbana variety trials are conducted is Brown Silt Loam, which represents fairly well the better soils of this type thruout this section of the state.

In these experiments wheat constitutes one of the crops in a rotation of corn, oats, wheat, and red clover. Each variety has been equally represented on plots fertilized with crop residues and rock phosphate, crop residues with rock phosphate and limestone, manure and rock phosphate, and manure with rock phosphate and limestone.

Fifty-seven varieties and strains of wheat have been tested during the period 1904 to 1925. Of these varieties 18 are hard wheats, 33 are soft varieties, and 6 are hybrids, one parent of which was a hard wheat. The complete list of these varieties, together with their annual yields and percentage ratings based upon the average yield of Turkey Red (Station strain) for the same periods, is shown in Table 4. A summary showing the number of years each has been tried, and the average yield of each variety compared with the average yield of Turkey Red for the same years, is given in Table 5.

If the behavior of these wheats on the Urbana field may be taken as a criterion of their probable performance thruout central Illinois, then it may be concluded that strains of Turkey Red or hybrids of that variety are dependable high-yielding varieties for that section as well as for the northern section. In Table 4 Turkey Red (Station strain) ranks nineteenth. Of the 18 varieties having a higher percentage rating, Michigan Amber, Dawson Golden Chaff 9-225, and Gladden are the only ones which are not either of the Turkey type or hybrids with a hard Russian wheat as one parent.

A considerable number of the varieties at present competing in these trials have been grown for too short a period to permit definite conclusions concerning their relative productiveness. Those varieties which have been grown for a period of not less than eight years, from 1918 to 1925 inclusive, are shown in Table 6.

Six of the 10 varieties listed in this table are hard wheats; the other 4, Indiana Swamp, Dawson Golden Chaff 9-225, Red Rock, and Red Cross, are soft varieties. During this eight-year period, Indiana Swamp exceeded Turkey Red by 2.3 bushels an acre, tho its average yield for a period of twenty-one years was 2 bushels an acre less than Turkey Red (Table 5). Indiana Swamp has never been extensively grown. It is produced to a limited extent in Illinois, Indiana, Ohio, Kansas, and Texas, under a number of different names.

Dawson Golden Chaff 9-225, which ties Minnesota Reliable in ranking second in yield, is a selection from Dawson Golden Chaff. The parent stock is a white wheat, whereas this strain, while containing





TABLE 5.—URBANA FIELD: COMPARABLE AVERAGE YIELDS OF VARIETIES OF WINTER WHEAT USING TURKEY RED AS THE STANDARD FOR COMPARISON (Bushels per acre)

Varieties	Number of years compared <sup>1</sup>	Years on which comparisons are based	Average yield
Turkey Red (Station).....	21	1904-1925 except 1912.....	41.0
Indiana Swamp.....	21	1904-1925 except 1912.....	39.0
Turkey Red (Station).....	18	1904-1922 except 1912.....	41.1
Hungarian.....	18	1904-1922 except 1912.....	37.5
Turkey Red (Station).....	18	1905-1923 except 1912.....	41.3
Beloglina.....	18	1905-1923 except 1912.....	39.2
Turkey Red (Station).....	18	1904-1925 except 1908, 1909, 1910, 1912.....	40.5
Malakof.....	18	1904-1905 except 1908, 1909, 1910, 1912.....	40.1
Turkey Red (Station).....	17	1905-1922 except 1912.....	41.6
Red Hussar.....	17	1905-1922 except 1912.....	37.0
Turkey Red (Station).....	14	1906-1920 except 1912.....	43.6
Pesterboden.....	14	1906-1920 except 1912.....	39.4
Turkey Red (Station).....	12	1904-1917 except 1910 and 1912	42.3
Dawson Golden Chaff.....	12	1904-1917 except 1910 and 1912	38.7
Turkey Red (Station).....	12	1905-1917 except 1912.....	43.5
K. B. No. 2.....	12	1905-1917 except 1912.....	37.9
Turkey Red (Station).....	12	1914-1925.....	40.0
Red Cross.....	12	1914-1925.....	38.1
Turkey Red (Station).....	11	1915-1925.....	40.1
Dawson Golden Chaff 9-225....	11	1915-1925.....	41.2
Turkey Red (Station).....	10	1904-1914, except 1912.....	42.0
Wheedling.....	10	1904-1914, except 1912.....	35.6
Turkey Red (Station).....	10	1904-1910 and 1916-1918.....	41.2
Rudy.....	10	1904-1910 and 1916-1918.....	27.0
Turkey Red (Station).....	10	1916-1925.....	39.1
Minnesota Reliable.....	10	1916-1925.....	39.4
Worlds Champion.....	10	1916-1925.....	39.4
Turkey Red (Station).....	9	1915-1923.....	39.5
Turkey Hybrid 402.....	9	1915-1923.....	39.6
Turkey Hybrid 509.....	9	1915-1923.....	43.8
Turkey Red (Station).....	9	1916-1924.....	39.1
Mediterranean.....	9	1916-1924.....	32.4
Turkey Red (Station).....	8	1916-1923.....	38.3
Red Wave.....	8	1916-1923.....	33.2
Wisconsin No. 18.....	8	1916-1923.....	36.6

<sup>1</sup>In each case the number of years given for the variety compared with Turkey Red is the total number of years the variety was grown.

TABLE 5.—*Continued*  
(Bushels per acre)

Varieties	Number of years compared <sup>1</sup>	Years on which comparisons are based	Average yield
Turkey Red (Station).....	8	1918-1925.....	38.4
Red Rock.....	8	1918-1925.....	38.3
Kanred.....	8	1918-1925.....	39.1
Ilred (Turkey Red 10-110).....	8	1918-1925.....	39.2
Turkey Red (Station).....	6	1906-1911.....	46.3
Kharkof (U. S. D. A. 11603).....	6	1906-1911.....	42.6
Turkey Red (Station).....	6	1916-1921.....	39.2
Gipsy.....	6	1916-1921.....	28.2
Turkey Red (Station).....	6	1918-1923.....	37.0
Turkey Red 12-41.....	6	1918-1923.....	39.1
Turkey Red (Station).....	6	1920-1925.....	38.8
Gladden.....	6	1920-1925.....	39.2
Turkey Red (Station).....	5	1908-1913 except 1912.....	44.6
Fultz.....	5	1908-1913 except 1912.....	42.1
Turkey Red (Station).....	5	1921-1925.....	37.7
Michigan Amber.....	5	1921-1925.....	39.7
Turkey Red (Station).....	4	1910-1914 except 1912.....	44.3
Gold Coin.....	4	1910-1914 except 1912.....	38.7
Turkey Red (Station).....	4	1916-1919.....	39.6
Miracle.....	4	1916-1919.....	18.7
Turkey Red (Station).....	4	1917-1920.....	39.9
Illini Chief.....	4	1917-1920.....	23.1
Turkey Red (Station).....	4	1919-1922.....	36.7
Turkey Hybrid 514.....	4	1919-1922.....	37.6
Turkey Red (Station).....	4	1922-1925.....	39.0
Blackhull.....	4	1922-1925.....	45.0
Turkey Red (Station).....	3	1906-1908.....	46.5
Padi.....	3	1906-1908.....	32.1
Turkey Red (Station).....	3	1916-1918.....	41.3
Marvelous.....	3	1916-1918.....	15.7
Turkey Red (Station).....	3	1923-1925.....	40.2
Hardy Northern.....	3	1923-1925.....	37.7
Forward.....	3	1923-1925.....	38.1
Malakof (C. I. No. 4898).....	3	1923-1925.....	42.8
Red Russian.....	3	1923-1925.....	45.0
Turkey Red (Station).....	2	1904, 1905.....	31.1
Jones Longberry.....	2	1904, 1905.....	18.5
Satisfaction.....	2	1904, 1905.....	19.1

<sup>1</sup>In each case the number of years given for the variety compared with Turkey Red is the total number of years the variety was grown.

TABLE 5.—*Concluded*  
(Bushels per acre)

Varieties	Number of years compared <sup>1</sup>	Years on which comparisons are based	Average yield
Turkey Red (Station).....	2	1909, 1910.....	43.5
Economy.....	2	1909, 1910.....	39.5
Turkey Red (Station).....	2	1921, 1922.....	33.9
Jones Climax.....	2	1921, 1922.....	27.6
Turkey Red (Station).....	2	1924, 1925.....	42.4
Berkeley Rock.....	2	1924, 1925.....	30.1
Fulcaster (Missouri selection).....	2	1924, 1925.....	31.5
Poole (Missouri selection).....	2	1924, 1925.....	32.0
Trumbull.....	2	1924, 1925.....	33.2
Fulhio.....	2	1924, 1925.....	39.0
Altara 2048.....	2	1924, 1925.....	42.2
Michikoff.....	2	1924, 1925.....	42.7
Kanred 2401.....	2	1924, 1925.....	44.3
Minturki.....	2	1924, 1925.....	44.5
Turkey Red (Station).....	1	1904.....	32.2
Poole.....	1	1904.....	7.8
European.....	1	1904.....	11.9
Turkey Red (Station).....	1	1925.....	44.5
Honor.....	1	1925.....	38.7
Purkoff.....	1	1925.....	46.4

<sup>1</sup>In each case the number of years given for the variety compared with Turkey Red is the total number of years the variety was grown.

some white kernels, is for the most part amber and red. It has not been distributed.

Red Rock has given an average yield practically equal to Turkey Red. It has been subject, however, to rather wide annual fluctuations in yield.

Red Cross has averaged during this eight-year period only 1.9 bushels an acre less than Turkey Red. It has been rather consistently inferior to Turkey Red, however, the latter exceeding it in yield six of the eight years. Red Cross is susceptible both to the rosette disease and to flag smut, and therefore should not be grown in localities where these diseases are known to exist.

Other promising varieties which have been grown from one to five years are Red Russian, Blackhull, Minturki, Kanred 2401, Michigan Amber, Malakof C.I. No. 4898, Michikoff, Gladden, and Hardy Northern. Michigan Amber, Gladden, and Hardy Northern are soft wheats; the others are hard varieties.

TABLE 6.—URBANA FIELD: COMPARATIVE TEST OF VARIETIES OF WINTER WHEAT GROWN DURING THE EIGHT-YEAR PERIOD 1918-1925  
(Bushels per acre)

Varieties	1918	1919	1920	1921	1922	1923	1924	1925	Average yield
Indiana Swamp.....	38.1	34.0	44.5	35.6	40.3	44.3	45.5	43.5	40.7
Dawson Golden Chaff 9-225.....	36.3	36.7	46.4	30.9	37.2	47.7	40.5	43.8	39.9
Minnesota Reliable.....	35.5	30.6	44.1	35.9	43.9	43.0	41.6	44.2	39.9
Worlds Champion.....	37.9	33.9	43.7	31.9	40.4	44.2	43.2	42.1	39.7
Ilred (Turkey Red 10-110).....	39.2	33.1	45.8	30.9	35.7	40.6	43.8	44.6	39.2
Kanred.....	42.3	33.5	44.4	33.3	35.6	35.3	41.7	46.3	39.1
Malakof 5-460.....	36.1	32.8	44.6	31.5	36.3	43.3	43.3	38.9	38.4
Turkey Red (Station).....	39.8	34.7	44.2	32.2	35.6	35.7	40.3	44.5	38.4
Red Rock.....	28.4	29.0	40.7	33.6	40.2	45.8	43.1	45.4	38.2
Red Cross.....	34.8	30.4	40.9	25.5	35.8	42.4	39.1	42.8	36.5

## TESTS IN SOUTHERN ILLINOIS FAIRFIELD, WAYNE COUNTY

Wayne county is situated in the east side of the south-central section of the state. The average annual rainfall in this district is 41.5 inches. The winter months have an average annual temperature of 33.1° F., while the average annual minimum temperature is approximately 7° F. below zero. Over most of this section the snowfall ranges between 15 and 20 inches. At Fairfield, however, the records indicate less than 15 inches.

The soil of this field is Gray Silt Loam On Tight Clay, which represents large areas of relatively infertile land thruout this section.

The rotation on this field consisted of two years of legumes alternating with one each of corn and wheat. During the last six years the order was as follows: corn, soybeans, wheat, sweet clover. One half the field was tile-drained, while the other remained untilled. The fertilization consisted of crop residues supplemented with rock phosphate and limestone, and manure with rock phosphate and limestone. Each variety was equally represented on the tiled and untilled land, and on the plots receiving residues with mineral fertilizers, and those receiving manure with mineral fertilizers.

This land is normally strongly acid and deficient in organic matter and nitrogen. Very few attempts to grow wheat are made on much of the land of this type thruout Marion, Clay, and Wayne counties. The yields obtained, particularly from 1917 to 1922, clearly indicate the possibilities of producing wheat on such land when the soil is limed and properly fertilized, such fertilization being accomplished partly by means of mineral fertilizers but more especially by the growing and turning under of legume crops. Liming, however, is first necessary in order to produce the legumes abundantly.

Variety trials were conducted on this field from 1906 to 1923, at which time the field was discontinued. Altho wheat makes a less vigorous fall growth in this section than in the more fertile regions, still there was but one year in which the crop was a complete failure.

During the seventeen years that wheat was grown at Fairfield, 41 varieties and strains were tested. Fulcaster was taken as the standard variety, and is the only one continued thruout the entire period. The annual yields are given in Table 7, and the percentage rating of each variety based upon the average yield of Fulcaster for the same period is shown in the last column. A summary showing the years each variety was grown, and the average yield compared with the average yield of Fulcaster for the same period, is given in Table 8.

Illini Chief is the only variety which gave a percentage rating greater than Fulcaster. It will be observed from Table 8 that in many



TABLE 7.—FAIRFIELD FIELD: ANNUAL YIELDS OF VARIETIES OF WINTER WHEAT AND PERCENTAGE RATING USING FULCASTER AS A STANDARD FOR COMPARISON  
(Bushels per acre)

Varieties	1906	1907	1908	1910	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	Per-centage rating
Fulcaster (Carlinsville field)	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	109.3
Illini Chief.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	104.7
Fulcaster.....	3.0	16.3	16.2	33.3	15.7	12.4	17.0	17.0	6.3	22.1	27.2	23.9	24.2	18.4	30.1	22.9	18.3	100.0
Harvest Queen.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	19.7	33.6	22.1	22.5	24.9	27.2	18.3	.....	99.7
Trumbull.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	89.4
Economy.....	.....	.....	.....	35.1	18.2	13.6	19.7	19.6	3.9	8.0	35.4	21.3	24.5	19.6	28.5	20.6	.....	99.1
Canadian Hybrid.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	97.9
Nigger.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	97.2
Poole (Ohio Station).....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	96.7
Marvelous.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	95.1
Gipsy.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	94.6
Red Cross.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	94.5
Portage.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	94.2
Rudy.....	2.9	16.5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	93.0
Wheedling.....	6.9	16.1	12.1	30.3	21.6	13.3	21.8	20.7	2.5	0.0	28.9	24.0	21.2	13.2	29.8	.....	.....	91.9
Jersey Fultz.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	91.8
Indiana Swamp.....	2.2	14.5	.....	25.8	17.1	14.8	15.4	14.4	4.2	9.5	24.4	21.3	25.8	20.6	.....	.....	.....	90.8
Gladden.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	90.6
Fultz.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	89.5
Missouri Pride.....	.....	20.4	.....	34.7	20.6	10.5	22.1	20.1	2.8	0.0	.....	.....	.....	.....	.....	.....	.....	89.5
Poole.....	.....	6.2	11.6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	89.1
Harvest King.....	.....	3.5	16.8	33.9	17.7	13.0	18.4	16.0	3.2	6.2	20.6	20.6	21.4	18.3	26.3	.....	.....	88.2
Turkey Hybrid 509.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	85.4
Early Red Clawson.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	85.1

(Table concluded on page 20.)



TABLE 8.—FAIRFIELD FIELD: COMPARABLE AVERAGE YIELDS OF VARIETIES OF WINTER WHEAT USING FULCASTER AS A STANDARD FOR COMPARISON (Bushels per acre)

Varieties	Number of years compared <sup>1</sup>	Years on which comparisons are based	Average yield
Fulcaster.....	15	1906-1921 except 1909.....	18.9
Harvest King.....	15	1906-1921 except 1909.....	16.6
Fulcaster.....	14	1906-1920 except 1909.....	18.1
Wheedling.....	14	1906-1920 except 1909.....	16.6
Fulcaster.....	13	1906-1920 except 1909, 1915....	19.0
Dawson Golden Chaff.....	13	1906-1920 except 1909, 1915....	15.2
Fulcaster.....	13	1910-1922.....	20.8
Economy.....	13	1910-1922.....	20.6
Fulcaster.....	9	1906, 1907, 1916-1922.....	20.9
Poole.....	9	1906, 1907, 1916-1922.....	18.6
Fulcaster.....	9	1914-1922.....	21.3
Jersey Fultz.....	9	1914-1922.....	19.6
Fulcaster.....	8	1906, 1907, 1916-1921.....	20.7
Rudy.....	8	1906, 1907, 1916-1921.....	19.2
Fulcaster.....	8	1907, 1910-1916.....	17.5
Missouri Pride.....	8	1907, 1910-1916.....	16.4
Fulcaster.....	8	1915-1922.....	21.9
Gipsy.....	8	1915-1922.....	20.7
Red Cross.....	8	1915-1922.....	20.7
Fulcaster.....	7	1906, 1907, 1910-1914.....	16.4
Indiana Swamp.....	7	1906, 1907, 1910-1914.....	14.9
Fulcaster.....	7	1915-1921.....	21.7
Miracle.....	7	1915-1921.....	16.7
Mediterranean.....	7	1915-1921.....	17.4
Fulcaster.....	7	1916-1922.....	24.1
Marvelous.....	7	1916-1922.....	22.9
Harvest Queen.....	7	1916-1922.....	24.0
Fulcaster.....	6	1916-1921.....	24.3
Early Red Clawson.....	6	1916-1921.....	20.7
Turkey Hybrid 509.....	6	1916-1921.....	20.8
Fulcaster.....	6	1917-1922.....	24.5
Illini Chief.....	6	1917-1922.....	25.6
Fulcaster.....	5	1906, 1907, 1912-1914.....	13.2
Red Hussar.....	5	1906, 1907, 1912-1914.....	10.7
Fulcaster.....	5	1915, 1917-1920.....	20.0
Red Wave.....	5	1915, 1917-1920.....	15.7

<sup>1</sup>In each case the number of years given for the variety compared with Turkey Red is the total number of years the variety was grown.

(Table concluded on page 22.)

TABLE 8.—*Concluded*  
(Bushels per acre)

Varieties	Number of years compared <sup>1</sup>	Years on which comparisons are based	Average yield
Fulcaster.....	4	1908, 1912-1914.....	15.7
Fultz.....	4	1908, 1912-1914.....	14.0
Fulcaster.....	4	1914, 1915, 1921, 1922.....	19.1
Nigger.....	4	1914, 1915, 1921, 1922.....	18.6
Fulcaster.....	4	1917-1920.....	23.4
Canadian Hybrid.....	4	1917-1920.....	22.9
Fulcaster.....	4	1917-1920.....	23.4
Marvelous, ½ seeding.....	4	1917-1920.....	15.4
Fulcaster.....	3	1906-1908.....	11.8
Theiss (U. S. D. A. No. 12004).....	3	1906-1908.....	4.7
Malakof.....	3	1906-1908.....	7.9
Fulcaster.....	3	1912-1914.....	15.5
Kharkof.....	3	1912-1914.....	9.1
Hungarian.....	3	1912-1914.....	12.8
Fulcaster.....	3	1917-1919.....	25.1
Prize Taker.....	3	1917-1919.....	20.4
Fulcaster.....	3	1918-1920.....	22.2
Ilred (Turkey Red 10-110).....	3	1918-1920.....	17.2
Fulcaster.....	3	1921-1923.....	23.8
Trumbull.....	3	1921-1923.....	23.6
Fulcaster.....	2	1906-1907.....	9.7
Turkey Red.....	2	1906-1907.....	6.3
K. B. No. 2.....	2	1906-1907.....	7.4
Fulcaster.....	2	1912, 1913.....	14.7
Beloglina.....	2	1912, 1913.....	8.5
Pesterboden.....	2	1912, 1913.....	11.1
Fulcaster.....	2	1920, 1921.....	24.3
Big Harvest Fultz.....	2	1920, 1921.....	16.2
Fulcaster.....	2	1921, 1922.....	26.5
Gladden.....	2	1921, 1922.....	24.0
Portage.....	2	1921, 1922.....	25.0
Fulcaster.....	1	1921.....	30.1
Dawson Golden Chaff 9-225.....	1	1921.....	18.2
Poole (Ohio Station).....	1	1921.....	29.1
Fulcaster (Soil Field).....	1	1921.....	32.9

<sup>1</sup>In each case the number of years given for the variety compared with Turkey Red is the total number of years the variety was grown.

instances the average yield of any particular variety is not greatly surpassed by Fulcaster. Probably in most instances the differences are within the range of experimental error; still the constancy with which Fulcaster has exceeded the yields of other varieties is strong evidence of its reliability.

Of the 41 varieties grown on this field, 8 were of the Turkey Red type and 1 was a hybrid of that variety. None of these varieties proved to be adapted to the conditions on this field.

The yields of 9 varieties, each of which was grown during the six-year period 1917 to 1922, are given in Table 9. Compared in this manner, Illini Chief retained its position at the head of the list. Fulcaster, however, dropped to sixth place tho, excepting Illini Chief, it

TABLE 9.—FAIRFIELD FIELD: COMPARATIVE TEST OF VARIETIES OF WINTER WHEAT GROWN DURING THE SIX-YEAR PERIOD 1917-1922  
(Bushels per acre)

Varieties	1917	1918	1919	1920	1921	1922	Average yield
Illini Chief.....	31.0	26.3	25.6	19.8	27.8	23.1	25.6
Red Cross.....	34.5	26.1	23.2	23.0	26.2	17.3	25.1
Economy.....	35.4	21.3	24.5	19.6	28.5	20.6	25.0
Harvest Queen.....	33.6	22.1	22.5	24.9	27.2	18.3	24.8
Marvelous.....	26.2	23.1	26.0	19.8	31.8	21.9	24.8
Fulcaster.....	27.2	23.9	24.2	18.4	30.1	22.9	24.5
Jersey Fultz.....	24.4	21.3	25.8	20.6	29.8	22.1	24.0
Gipsy.....	30.4	22.2	26.2	13.1	27.4	20.7	23.3
Poole.....	28.7	20.2	20.5	20.1	23.8	22.8	22.7

was not exceeded in average yield by any variety more than 0.6 bushel, which difference is easily within the limits of experimental error.

#### ALHAMBRA IN MADISON COUNTY

This field is located in the western part of the south-central section of the state. The soil is classified as Brown-Gray Silt Loam On Tight Clay. "Scald spots" or "slick spots," the nature and cause of which are not well understood, are numerous. The soil of the field is representative of a considerable area in this section of the state.

A four-year rotation consisting of corn, oats, mammoth clover, and wheat is employed. In case the clover fails, soybeans are grown in their stead. All plots from which variety yields are taken are fertilized with crop residues, ground limestone, and rock phosphate. A catch crop of sweet clover is sown with the wheat to be plowed under for corn.

Wheat has been grown on this field since 1919, except during the season of 1924 when, owing to a series of unfortunate circumstances at seeding time in the autumn of 1923, no crop was produced. In all, 21 varieties of wheat have been tested on this field for one to six years.

The annual yields and the percentage ratings with Fulcaster as the standard for comparison are given in Table 10, while in Table 11 are given the number of years each variety has been tried and the average yields compared with Fulcaster for the same years.

Of the varieties grown for three to six years, Mediterranean has made the highest record, Fulcaster ranking a close second. The hard varieties have been represented by Blackhull and Ilred (Turkey Red

TABLE 10.—ALHAMBRA FIELD: ANNUAL YIELDS OF VARIETIES OF WINTER WHEAT AND PERCENTAGE RATINGS USING FULCASTER AS A STANDARD FOR COMPARISON  
(Bushels per acre)

Varieties	1919	1920	1921	1922	1923	1925	Percentage rating
Forward.....	....	....	....	....	....	27.0	121.6
Fulhio.....	....	....	....	....	....	26.4	118.9
Michigan Amber.....	....	....	....	....	....	25.7	115.8
Gladden.....	....	....	....	....	....	25.1	113.1
Shepherd.....	....	....	....	....	....	24.9	112.2
Red Rock.....	....	....	....	....	39.0	22.5	108.3
Fulcaster (Missouri selection).....	....	....	....	....	....	23.9	107.7
Trumbull.....	....	....	....	....	....	23.9	107.7
Poole (Missouri selection).....	....	....	....	....	....	23.6	106.3
Mediterranean.....	14.9	16.5	15.2	28.9	39.6	23.9	102.9
<b>Fulcaster.....</b>	<b>15.6</b>	<b>15.7</b>	<b>15.2</b>	<b>31.8</b>	<b>34.6</b>	<b>22.2</b>	<b>100.0</b>
Rudy.....	13.0	11.5	16.6	31.4	38.6	....	98.4
Gipsy.....	16.6	16.8	14.3	23.4	38.5	....	97.1
Blackhull.....	....	....	....	33.7	27.8	24.3	96.8
Illini Chief.....	....	15.0	16.2	29.1	31.9	22.5	96.0
Red Wave.....	15.1	14.6	13.4	26.0	38.4	....	95.2
Marvelous.....	13.1	16.4	15.5	23.3	37.7	....	93.9
Jersey Fultz.....	15.2	12.5	16.0	25.2	36.1	....	93.0
Ilred (Turkey Red 10-110).....	17.6	14.4	12.9	21.3	31.9	22.6	89.4
Harvest King.....	11.5	10.9	13.0	....	....	....	76.1
Harvest Queen.....	....	....	....	17.1	32.9	....	75.3

10-110). Blackhull has exceeded the standard variety, Fulcaster, two of the three years it was grown, and its average yield was but 0.9 bushel less. Ilred (Turkey Red 10-110) was out-yielded by Fulcaster four of the six years it has been tested.

A number of varieties not hitherto grown on this field were introduced in 1925. Some of these, such as Forward, Fulhio, Michigan Amber, Gladden, and Shepherd, have made rather promising preliminary records.

#### HARD VS. SOFT VARIETIES IN CENTRAL ILLINOIS

The data that have been presented show that the hard Crimean wheats are well adapted to the central section of the state. Further-

more, because of their recognized reliability and productiveness they have come to be very largely grown thruout this section. There are many growers, however, who still adhere to the soft varieties.

The growing of the two classes of wheat in the same community leads inevitably to more or less mixing. This mixing may result from the transfer of seed from one farm to another by the threshing outfits, or it may occur at the elevators. For most purposes mixed wheat is inferior to its component classes of the same grade.

A considerable portion of the central section, as well as the entire southern part of the state, is tributary to soft wheat markets. For

TABLE 11.—ALHAMBRA FIELD: COMPARABLE AVERAGE YIELDS OF WINTER WHEAT USING FULCASTER AS A STANDARD FOR COMPARISON  
(Bushels per acre)

Varieties	Number of years compared <sup>1</sup>	Years on which comparisons are based	Average yield
Fulcaster.....	6	1919-1925 except 1924.....	22.5
Ired (Turkey Red 10-110).....	6	1919-1925 except 1924.....	20.1
Mediterranean.....	6	1919-1925 except 1924.....	23.2
Fulcaster.....	5	1919-1923.....	22.6
Jersey Fultz.....	5	1919-1923.....	21.0
Marvelous.....	5	1919-1923.....	21.2
Red Wave.....	5	1919-1923.....	21.5
Gipsy.....	5	1919-1923.....	21.9
Rudy.....	5	1919-1923.....	22.2
Fulcaster.....	5	1920-1925 except 1924.....	23.9
Illini Chief.....	5	1920-1925 except 1924.....	22.9
Fulcaster.....	3	1919-1921.....	15.5
Harvest King.....	3	1919-1921.....	11.8
Fulcaster.....	3	1922, 1923, 1925.....	29.5
Blackhull.....	3	1922, 1923, 1925.....	28.6
Fulcaster.....	2	1922, 1923.....	33.2
Harvest Queen.....	2	1922, 1923.....	25.0
Fulcaster.....	2	1923, 1925.....	28.4
Red Rock.....	2	1923, 1925.....	30.8
Fulcaster.....	1	1925.....	22.2
Forward.....	1	1925.....	27.0
Fulhio.....	1	1925.....	26.4
Michigan Amber.....	1	1925.....	25.7
Gladden.....	1	1925.....	25.1
Shepherd.....	1	1925.....	24.9
Fulcaster (Missouri selection).....	1	1925.....	23.9
Trumbull.....	1	1925.....	23.9
Poole (Missouri selection).....	1	1925.....	23.6

<sup>1</sup>In each case the number of years given for the variety compared with Turkey Red is the total number of years the variety was grown.

some time these markets have paid a premium for soft wheat, and at times the spread in prices has been rather wide. Whether this condition will continue indefinitely is difficult to predict. At the present time, however, there is considerable complaint from certain marketing agencies concerning the amount of hard and mixed wheat which is being shipped from the central section of the state. Likewise, because of the premium paid for soft wheat, a renewal of interest in soft wheat has recently been shown by the growers residing in this section.

As the situation exists at present it would appear that the farmers in this section will have to choose between a lower price for their wheat or the possibility of a lower yield of grain. The hazard involved in the latter contingency may be minimized by growing the hardiest and most productive varieties of soft wheat. Of the commercial varieties more or less extensively grown, the following have proved reasonably dependable in these tests: Red Rock, Red Cross, Michigan Amber, and Gladden.

Within recent years the only season at Urbana which has given the varieties a severe test of their relative winter resistance was the season of 1923-24. Red Rock proved to be rather the more resistant of the four varieties mentioned above, which are listed in the order of their resistance and which yielded in the same order. The average yield of all four varieties for that season was 39.5 bushels an acre, while the average yield of 10 varieties of hard wheat was 43.3 bushels. Red Rock produced 43.1 bushels an acre. The highest-yielding hard wheat that year was Red Russian, which produced 48.5 bushels an acre. Red Rock is a bearded variety, while Red Cross and Michigan Amber are smooth. Most growers of soft wheat prefer awnless varieties.



## DESCRIPTION OF VARIETIES<sup>1</sup>

### Including Origin, Source of Seed, and Performance on Experiment Fields

**Altara 2048.** A selection from Alberta Red made by the Kansas Station. Similar to Turkey Red. In Kansas it has been found to produce very hard red kernels which usually do not show a yellow berry. Has not made a high yield record as compared with other hard wheats. Not yet grown commercially.

Seed obtained from the Kansas Station in summer of 1923, from which a crop was grown at Urbana in 1924. Average yield for two-year period 42.2 bushels an acre, Turkey Red (Station) same period 42.4 bushels. Proved winter resistant during severe winter of 1923-24.

**Beloglina.** Similar to Turkey Red (see page 34). Introduced by the U. S. Department of Agriculture in 1900 from Russia, where it was grown near Beloglinkskaya in northern Stavropol. This section of Russia is subject to extreme conditions of both temperature and moisture.

Seed obtained from U. S. Department of Agriculture in 1904. First crop produced at Urbana in 1905. Yields: eighteen-year average at Urbana 39.2 bushels, Turkey Red 41.3<sup>2</sup>; three-year average at DeKalb 30.2 bushels, Turkey Red 32.1; two-year average at Fairfield 8.5 bushels, Fulcaster 14.7. Winter hardy; weak straw.

**Berkeley Rock.** Originated at the Michigan Station. Is the result of a cross between Berkeley and Red Rock made in 1915. Considered at the Michigan Station to be winter hardy and of outstanding quality. Awned; chaff white, glabrous; straw purple; kernels red, soft.

Seed obtained from the Michigan Station. First crop harvested at Urbana in 1924; seriously injured during winter of 1923-24. Average yield for two-year period 30.1 bushels, Turkey Red 42.4.

**Big Harvest Fultz.** A selection from Fultz (see page 28). Has longer and stronger straw and larger heads than the original Fultz.

Seed obtained from Everitt's O. K. Seed Store, Indianapolis, Indiana, in 1919. Two-year average yield at Fairfield 16.2 bushels, Fulcaster 24.3. The variety is late and proved susceptible to scab.

**Blackhull.** Resembles Turkey Red but differs from it in having black markings on the chaff; is also less resistant to winterkilling and produces softer grain. Selected from a field of Turkey Red in 1912 by E. G. Clark of Sedgwick, Kansas.

Grown first at Urbana and Alhambra in 1922 from seed secured from W. H. Miller of Williamsville, Sangamon county, Illinois. Winterkilled seriously in the season of 1923-24. Yields: four-year average at Urbana 45.0 bushels, Turkey Red 39.0; three-year average at Alhambra 28.6 bushels, Fulcaster 29.5; three-year average at DeKalb 37.1 bushels, Turkey Red 40.3.

**Canadian Hybrid.** Synonym for Jones Fife, which is said to be a hybrid resulting from crossing Fultz, Russian Velvet, and Mediterranean. Was originated by A. N. Jones of Newark, Wayne county, New York, in 1889. Awnless; chaff white, pubescent; straw white, medium strong; kernels red, soft to semi-hard. Inferior for bread making.

Seed obtained from the John A. Salzer Seed Company, La Crosse, Wisconsin, in 1915. Yields: five-year average at DeKalb 28.1 bushels, Turkey Red 29.4; four-year average at Fairfield 22.9 bushels, Fulcaster 23.4.

<sup>1</sup>For description of varieties and history of their origin, the writer has drawn freely upon Bulletin 1074 of the U. S. Department of Agriculture, "Classification of American Wheat Varieties," by J. Allen Clark, John H. Martin, and Carleton R. Ball. 1922.

<sup>2</sup>All yields are given in terms of bushels an acre. All comparisons of yields are based on averages of the same seasons.

**Dawson Golden Chaff.** Originated in 1881 by Robert Dawson of Paris, Ontario, Canada, who found a single superior plant in a field of Seneca or Clawson. Awnless; chaff brown, glabrous; stem white, strong; kernels white, soft.

Seed obtained from the Michigan Station in 1892. Yields: twelve-year average at Urbana 38.7 bushels, Turkey Red 42.3; eleven-year average at DeKalb 27.1 bushels, Turkey Red 32.7; thirteen-year average at Fairfield 15.2 bushels, Fulcaster 19.0.

**Dawson Golden Chaff 9-211.** Pure-line selection made by the Plant Breeding Division of the Illinois Station. Tested at DeKalb; one-year yield 22.6 bushels, Turkey Red 39.2.

**Dawson Golden Chaff 9-225.** Originated from a single head selected from a plot of Dawson Golden Chaff in 1909 at the Illinois Station; introduced in crops variety trials in 1915; differs from Dawson Golden Chaff in producing for the most part red kernels. Stands well.

Yields: eleven-year average at Urbana 41.2 bushels, Turkey Red 40.1; one year at Fairfield 18.2 bushels, Fulcaster 30.1.

**Early Red Clawson.** Originated by A. N. Jones of Newark, Wayne county, New York, in 1888 by crossing Clawson and Golden Cross. Awnless; chaff brown, glabrous; straw purple, strong; kernels pale red, soft.

Seed obtained from the John A. Salzer Seed Company, La Crosse, Wisconsin, in 1915. Yields: five-year average at DeKalb 21.4 bushels, Turkey Red 29.4; six-year average at Fairfield 20.7 bushels, Fulcaster 24.3.

**Economy.** Synonym for Fultz (see Fultz). Origin of seed sown by Station unknown; grown at Urbana in 1909 and 1910.

Yields: two-year average at Urbana 39.5 bushels, Turkey Red 43.5; thirteen-year average at Fairfield 20.6 bushels, Fulcaster 20.8.

**Forward.** A selection made from a commercial lot of Fulcaster grown at the Cornell Station. Awnless; chaff white; kernels soft, red; stems white.

Grown first at Urbana in 1923 from seed secured thru Professor H. H. Love of Cornell. Yields: three-year average at Urbana 38.1 bushels, Turkey Red 40.2; one year at Alhambra 27.0 bushels, Fulcaster 22.2. Very badly winterkilled at Urbana in 1924. Stands well.

**Fulcaster.** This variety resulted from a cross of Fultz and Lancaster made by S. M. Schindel of Hagerstown, Maryland, in 1886. Awned; chaff white, glabrous; straw strong, purple; kernels red, semi-hard.

Seed secured from W. E. Braden, Sparta, Illinois, in 1915; later from southern Illinois soil experiment fields. Grown at Fairfield seventeen years, average yield 19.1 bushels; six-year average at Alhambra 22.5. Used as standard on both fields.

**Fulcaster** (Missouri selection). A superior strain grown by the Missouri Station.

Seed secured from the Missouri Station in 1923. Winterkilled very seriously at Urbana in 1923-24. Yields: two-year average at Urbana 31.5 bushels, Turkey Red 42.4; one year at Alhambra, 23.9, Fulcaster (Station strain) 22.2.

**Fulhio.** Pure-line selection made by the Ohio Station from Fultz.

Seed secured from Dan Davies of Jonesboro, Illinois. Yields: two-year average at DeKalb 41.3 bushels, Turkey Red 39.6; two-year average at Urbana 39 bushels, Turkey Red 42.4; one year at Alhambra 26.4 bushels, Fulcaster 22.2.

**Fultz.** Selected by Abraham Fultz of Mifflin county, Pennsylvania, in 1862 from a field of Lancaster. Three spikes of awnless wheat found in a field of bearded wheat constituted the foundation stock. Variety named after the originator. Awnless; chaff white, glabrous; kernels red, semi-hard; straw medium strong, purple; fairly hardy.

Origin of Station stock of seed unknown. Yields: five-year average at Urbana 42.1 bushels, Turkey Red 44.6; one year at DeKalb 30.6 bushels, Turkey Red 39.2; four-year average at Fairfield 14.0 bushels, Fulcaster 15.7.

**Gipsy.** Origin not definitely known. Awned; chaff white, glabrous; straw white, medium strong; kernels red and soft to semi-hard.

Seed obtained from the Wing Seed Company, Mechanicsburg, Ohio. Grown first at DeKalb and Fairfield in 1915. Yields: four-year average at DeKalb 19.5 bushels, Turkey Red 32.3; eight-year average at Fairfield 20.7 bushels, Fulcaster 21.9; six-year average at Urbana 28.2 bushels, Turkey Red 39.2; five-year average at Alhambra 21.9 bushels, Fulcaster 22.6. Complete failure at Urbana in 1917 due to winterkilling.

**Gladden.** Pure-line selection from the Gipsy variety made by the Ohio Station in 1905. Has stronger straw and in Ohio has proved superior to Gipsy in yield and quality.

Seed obtained from the Ohio Seed Company, Wapakoneta, Ohio, in 1919. Yields: six-year average at Urbana 39.2 bushels, Turkey Red 38.8; two-year average at Fairfield 24.0 bushels, Fulcaster 26.5; one year at Alhambra 25.1 bushels, Fulcaster 22.2. Winterkilled at Urbana very seriously in season of 1923-24. Stands very well.

**Gold Coin.** Origin not definitely known but probably a descendant of the Redchaff variety grown at a very early date in the Genesee valley of New York. Awnless, clavate; chaff brown, glabrous; straw strong, purple; kernels white and soft.

Source of seed unknown. Grown first at Urbana in 1910. Yields: four-year average at Urbana 38.7 bushels, Turkey Red 44.3; one year at DeKalb 32.5 bushels, Turkey Red 39.2.

**Hardy Northern.** Origin unknown. Awned; chaff brown, glabrous; straw white, strong; kernels red and semi-hard.

Seed obtained from the John A. Salzer Seed Company, La Crosse, Wisconsin, in 1915. Grown first at DeKalb in 1916. Yields: nine-year average at DeKalb 36.6 bushels, Turkey Red 35.0; three-year average at Urbana 37.7 bushels, Turkey Red 40.2. Very winter hardy and stands well.

**Harvest King.** Synonym for Poole (see page 32). Seed obtained from W. E. Branden, Sparta, Illinois, in 1904 and 1910; also from the John A. Salzer Seed Company, La Crosse, Wisconsin, in 1915. Yields: fifteen-year average at Fairfield 16.6 bushels; Fulcaster 18.9; three-year average at Alhambra 11.8 bushels, Fulcaster 15.5.

**Harvest Queen.** This variety is said to have been originated by E. S. Marshall of De Soto, Kansas, who in 1895 found a superior appearing plant growing in a field of some other variety. He saved the seed from this plant and increased it. Grown chiefly in Kansas, Missouri, Oklahoma, and Illinois. Awnless; chaff white, glabrous; kernels red, soft; straw white, stands well.

Seed secured from the John A. Salzer Seed Company, La Crosse, Wisconsin. Yields: seven-year average at Fairfield 24.0 bushels, Fulcaster 24.1; two-year average at Alhambra 25.0 bushels, Fulcaster 33.2.

**Honor.** This variety is a selection made from Dawson Golden Chaff at the Cornell Station. There is no difference in the appearance of the two varieties. Honor, however, is said to have somewhat stronger straw, to be more winter resistant, and to yield more.

Seed secured thru Professor H. H. Love of the Cornell Station in 1924. Yield at Urbana in 1925, 38.7 bushels, Turkey Red 44.5.

**Hungarian.** Synonym for Turkey Red (see page 34). Seed obtained from the Kentucky Station in 1902. Yields: eighteen-year average at Urbana 37.5

bushels, Turkey Red 41.1; four-year average at DeKalb 33.3 bushels, Turkey Red 33.9; three-year average at Fairfield 12.8 bushels, Fulcaster 15.5. Hardy; straw weak.

**Illini Chief.** Introduced in the fall of 1915 by E. L. Gillham of Edwardsville, Illinois, who advertised it as being resistant to Hessian fly. His stock came originally from Ohio, where it was known locally as Early Carlyle. Awnless; chaff brown, glabrous; straw long, strong, purple; kernels soft, red.

Seed obtained from E. L. Gillham, Edwardsville, Illinois. Yields: four-year average at Urbana 23.1 bushels, Turkey Red 39.9; six-year average at Fairfield 25.6 bushels, Fulcaster 24.5; five-year average at Alhambra 22.9 bushels, Fulcaster 23.9. Not winter hardy at Urbana; in 1917 complete failure.

**Ired.** See Turkey Red 10-110 (page 35).

**Indiana Swamp.** Synonym for Valley. Exact origin unknown. The Ohio Station obtained seed in 1883 from Elias Tetter of Pleasant Plain, Ohio. Resembles Gipsy but is taller, slightly earlier, and has somewhat longer spikes and glumes.

Seed obtained from the Kentucky Station in 1902. Yields: twenty-one-year average at Urbana 39.0 bushels, Turkey Red 41.0; five-year average at DeKalb 27.4 bushels, Turkey Red 34.3; seven-year average at Fairfield 14.9 bushels, Fulcaster 16.4. Hardy; straw medium strong.

**Jersey Fultz.** Synonym for Fultz (see page 28). Seed secured from the Kentucky Station in 1913. Yields: nine-year average at Fairfield 19.6 bushels, Fulcaster 21.3; five-year average at Alhambra 21.0 bushels, Fulcaster 22.6.

**Jones Climax.** The origin of this variety is somewhat in doubt. Distributed by Everett's O. K. Seed Store, Indianapolis, Indiana. Apparently the same as K. B. No. 2. Awnless; chaff white, glabrous; straw white, medium strong, long; kernels red, soft.

Seed obtained from Everett's O. K. Seed Store, Indianapolis, Indiana. First grown in trials at Urbana, 1921. Two-year average yield 27.6 bushels, Turkey Red 33.9.

**Jones Longberry.** Synonym for Red May. Probably was selected from Virginia May, a white-kerneled wheat, by General Harmon about 1830. Has been grown extensively under the name of Red May and numerous other synonyms. Awnless; chaff brown, glabrous; straw purple, medium strong; kernels red and soft.

Seed obtained from J. A. Everitt, Indianapolis, Indiana, in 1902. Two-year average yield at Urbana 18.5 bushels, Turkey Red 31.1.

**Kanred.** A pure-line selection made at the Kansas Station in 1906 from a Crimean wheat, C.I. No. 1435. Practically identical in appearance with Turkey Red except that the beaks on outer glumes are somewhat longer. Resistant to certain forms of leaf and stem rust, and said to be somewhat more winter hardy and earlier. Awned; chaff white, glabrous; straw white, weak; kernels red and hard.

Seed obtained from the Kansas Station in 1917. Grown at Urbana first in 1918. Yields: eight-year average 39.1 bushels, Turkey Red 38.4; six-year average at DeKalb 39.7 bushels, Turkey Red 37.8. Straw weak.

**Kanred 2401.** A selection of Kanred secured in 1923 from the Kansas Station for the purpose of studying the effect of change of environment upon the composition and the bread-making quality of the flour. Two-year yield at Urbana 44.3 bushels, Turkey Red 42.4. Proved very hardy during severe winter of 1923-24.

**K. B. No. 2.** Similar to Jones Climax. Originated from a single head of wheat found growing in field of Long Berry Clawson belonging to the Knight

and Bostwick Seed Company, Rochester, New York. Awnless; chaff white, glabrous; straw white, medium strong, long; kernels red, soft.

Seed obtained from Knight and Bostwick, Rochester, New York, in 1904. Yields: twelve-year average at Urbana 37.9 bushels, Turkey Red 43.5; one year at DeKalb 21.8 bushels, Turkey Red 24.3; two-year average at Fairfield 7.4 bushels, Fulcaster 9.7.

**Kharkof (U. S. D. A. No. 11603).** Similar to Turkey Red (see page 34). Kharkof seed was imported by the U. S. Department of Agriculture from Starobielsk, Kharkof, which is much farther north than the region from which Turkey Red originally came. For this reason it was thought to be more winter resistant.

Seed obtained from the U. S. Department of Agriculture in 1905. Yields: six-year average at Urbana 42.6 bushels, Turkey Red 46.3; nine-year average at DeKalb 28.7 bushels, Turkey Red 32.1; three-year average at Fairfield 9.1 bushels, Fulcaster 15.5.

**Malakof.** Synonym for Turkey Red (see page 34). Malakof is a name applied to a number of strains of wheat which came from Russia.

Seed obtained from the Ratekin Seed Company of Iowa. J. W. Ratekin stated that his firm imported 35 bushels of the original wheat from the Russian town of Malakof near the Black Sea. Yields: eighteen-year average at Urbana of Malakof and Illinois selection, Malakof 5-460, combined, 40.1 bushels, Turkey Red 40.5; two-year average at DeKalb 28.2 bushels, Turkey Red 30.5; three-year average at Fairfield 7.9 bushels, Fulcaster 11.8. Also seven-year average at DeKalb of Malakof 5-458, 31.3 bushels, Turkey Red 32.5.

**Malakof (C.I. No. 4898).** A selection of Malakof made by the Bureau of Cereal Investigations, U. S. Department of Agriculture (see Malakof).

Seed obtained from the Indiana Station in 1922. Three-year average at Urbana 42.8 bushels, Turkey Red 40.2. Lodges badly on fertile soil.

**Marvelous.** Synonym for Fulcaster (see page 28). One of the numerous synonyms for the Miracle or Stoner wheat. Distributed under the name Marvelous by Everitt's O. K. Seed Store, Indianapolis, Indiana.

Seed obtained from Clark Brothers, Freeport, Ohio, in 1915. Yields: three-year average at DeKalb 5.1 bushels, Turkey Red 29.2; seven-year average at Fairfield 22.9 bushels, Fulcaster 24.1; three-year average at Urbana 15.7 bushels, Turkey Red 41.3; five-year average at Alhambra 21.2 bushels, Fulcaster 22.6. Not winter hardy in central and northern Illinois.

**Mediterranean.** Probably introduced into the United States from the Mediterranean region early in the nineteenth century. Became important in New York between 1845 and 1855. Is a few days earlier than many varieties and is said to be somewhat resistant to Hessian fly and to rust. Awned; chaff brown, glabrous; straw purple, medium strong, coarse; kernels red, soft.

Seed obtained from G. N. Scarff, New Carlisle, Ohio, in 1914. Yields: seven-year average at Fairfield 17.4 bushels, Fulcaster 21.7; nine-year average at Urbana 32.4 bushels, Turkey Red 39.1; four-year average at DeKalb 17.0 bushels, Turkey Red 32.3; six-year average at Alhambra 23.2 bushels, Fulcaster 22.5. At times Mediterranean has been severely or entirely winterkilled at DeKalb, Urbana, and Fairfield.

**Michigan Amber.** Synonym for Red May (see Jones Longberry). Yields: five-year average at Urbana 39.7 bushels, Turkey Red 37.7; one year at Alhambra 25.7 bushels, Fulcaster 22.2. Stands well; medium hardy.

**Michikoff.** Originated at the Purdue Station by crossing Malakof and Michigan Amber. Awnless; chaff white, glabrous; straw white; kernels red, hard.

Seed obtained from the Purdue Station in 1922. Yields: two-year average at Urbana 42.7 bushels, Turkey Red 42.4; two-year average at DeKalb 40.7 bushels, Turkey Red 39.6.

**Minnesota Reliable.** Synonym for Turkey Red (see page 34). Seed obtained from the Northrup King Seed Company, Minneapolis, Minnesota, in 1909. Yields: thirteen-year average at DeKalb 36.1 bushels, Turkey Red 35.7; ten-year average at Urbana 39.4 bushels, Turkey Red 39.1. Straw weak.

**Minturki.** Originated at the Minnesota Station as a result of a cross of Turkey Red and Odessa, the latter a soft Russian wheat. Awned; chaff white, glabrous; straw white, weak; kernels red, semi-hard to hard. Plant very much resembles Turkey Red; very winter hardy.

Seed obtained from the Minnesota Station in 1923. Yields: two-year average at Urbana 44.5 bushels, Turkey Red 42.4; one year at DeKalb 43.7 bushels, Turkey Red 33.0.

**Miracle.** Synonym for Fulcaster (see page 28). In 1904, K. B. Stoner of Fincastle, Virginia, discovered a single wheat plant growing in his garden. He became particularly interested in the plant because of the great number of tillers it produced. There were 142 stems. He increased his seed in 1905 and 1906 and put it on the market in 1907. At first it was usually distributed under the name Miracle because of its supposedly remarkable ability to tiller. It has been widely advertised and distributed under many different names. Miracle closely resembles Fulcaster morphologically, and as the latter was grown commonly in that section, it doubtless came from a single plant of that variety.

Seed obtained from J. J. Haubert, Bala, Pennsylvania, in 1914. Yields: six-year average at DeKalb 20.5 bushels, Turkey Red 31.4; seven-year average at Fairfield 16.7 bushels, Fulcaster 21.7; four-year average at Urbana 18.7 bushels, Turkey Red 39.6. Very badly winterkilled at times on all of these fields.

**Nigger.** Origin undetermined. It is said to have been distributed first under that name from a farm belonging to a Negro living in Darke county, Ohio. Awned; chaff white, glabrous; straw medium strong, purple; kernels red, soft.

Source of seed secured in 1913 unknown; that secured in 1920 was purchased from the Ohio Seed Company, Wapakeneta, Ohio. Four-year average yield at Fairfield 18.6 bushels, Fulcaster 19.1.

**Pesterboden.** Almost indistinguishable from Turkey Red; is slightly taller and has somewhat larger and softer kernels. Seed imported from Budapest by the U. S. Department of Agriculture in 1900.

Seed obtained from the U. S. Department of Agriculture in 1904. Yields: fourteen-year average at Urbana 39.4 bushels, Turkey Red 43.6; three-year average at DeKalb 29.0 bushels, Turkey Red 32.1; two-year average at Fairfield 11.1 bushels, Fulcaster 14.7.

**Poole.** Origin not definitely known. The Ohio Station grew it as early as 1884. Important variety in Ohio and Indiana. Awnless; chaff brown, glabrous; straw purple, medium strong; kernels red, soft.

Seed for Urbana secured from the Michigan and the Missouri Stations. Seed from the Michigan Station in 1904 produced 7.8 bushels at Urbana, Turkey Red 32.2. Seed from the Missouri Station made a two-year average yield at Urbana of 32.0 bushels, Turkey Red 42.4; one year at Alhambra 23.6 bushels, Fulcaster 22.2. Very badly winterkilled in 1924 at Urbana.

Native-grown seed used at Fairfield for two years. In 1915 seed was secured from the Wing Seed Company, Mechanicsburg, Ohio, and in 1920 from the Ohio Station. Yields: nine-year average of native and Wing Seed Company wheat, 18.6 bushels, Fulcaster 20.9; one year from seed originating at the Ohio Station 29.1 bushels, Fulcaster 30.1.

**Portage.** A pure-line selection from Poole; differs in having a stiffer straw and produces larger crops of better quality (see Poole).

Seed obtained from the Ohio Seed Company, Wapakeneta, Ohio. Two-year average yield at Fairfield 25.0 bushels, Fulcaster 26.5.

**Prize Taker.** Synonym for Gold Coin (see page 29). Seed obtained from the John A. Salzer Seed Company, La Crosse, Wisconsin, in 1915. Yields: three-year average at DeKalb 14.5 bushels, Turkey Red 29.2; three-year average at Fairfield 20.4 bushels, Fulcaster 25.1.

**Purkoff.** Originated at the Purdue Station as a result of crossing Malakof and Michigan Amber. Awnless; chaff white; kernels red, semi-hard; straw white, strong.

Seed obtained in 1924 from the Purdue Station. Yield at Urbana in 1925 46.4 bushels, Turkey Red 44.5.

**Red Cross.** Synonym for Harvest Queen (see page 29). Seed obtained from the John A. Salzer Seed Company in 1913. Yields: twelve-year average at Urbana 38.1 bushels, Turkey Red 40.0; ten-year average at DeKalb 33.7 bushels, Turkey Red 35.6; eight-year average at Fairfield 20.7 bushels, Fulcaster 21.9. Hardy; stands well.

**Red Hussar.** Similar to Turkey Red (see page 34); softer and has more humped kernels.

Seed obtained from William Rennie, Canada, in 1904. Yields: seventeen-year average at Urbana 37.0 bushels, Turkey Red 41.6; four-year average at DeKalb 32.6 bushels, Turkey Red 33.9; five-year average at Fairfield 10.7 bushels, Fulcaster 13.2.

**Red Rock.** Origin, a single red kernel found in a lot of white wheat known as Plymouth Rock. Selection made at the Michigan Station in 1908. By 1914 the increase was sufficient to permit the Station to distribute 60 bushels of the seed. Closely resembles Mediterranean (see page 31); differs in having slightly longer, wider, and laxer spike and harder kernel; yields better and produces stronger flour.

Seed obtained from the Michigan Station in 1917. Yields: eight-year average at Urbana 38.3 bushels, Turkey Red 38.4; seven-year average at DeKalb 34.1 bushels, Turkey Red 35.7; two-year average at Alhambra 30.8 bushels, Fulcaster 28.4. Has been practically a complete failure at DeKalb two seasons. When not winterkilled, is very productive. Does not lodge readily.

**Red Russian.** Synonym for Turkey Red (see page 34). Imported from northern Russia by the John A. Salzer Seed Company, La Crosse, Wisconsin.

Seed obtained from the John A. Salzer Seed Company in 1915. Yields: nine-year average at DeKalb 37.9 bushels, Turkey Red 35.0; three-year average at Urbana 45.0 bushels, Turkey Red 40.2. Seems to have a little stiffer straw than Turkey Red.

**Red Wave.** This variety is said to have resulted from crossing Early Red Clawson and a hybrid wheat of Russian ancestry. A. N. Jones of Le Roy, Genesee county, New York, is the originator. Awnless; chaff brown, glabrous; straw white, medium tall to tall, medium strong; kernels red, soft; inferior for milling and bread making.

Seed obtained from Everitt's O. K. Seed Store, Indianapolis, Indiana, in 1914-15. Yields: eight-year average at Urbana 33.2 bushels, Turkey Red 38.3; two-year average at DeKalb 10.6 bushels, Turkey Red 26.3; five-year average at Fairfield 15.7 bushels, Fulcaster 20.0; five-year average at Alhambra 21.5 bushels, Fulcaster 22.6. Not winter hardy in central and northern Illinois. Stands well.

**Rudy.** Originated by M. Rudy of Troy, Ohio, in 1871. The variety is descended from a single superior plant which Mr. Rudy found in a large field. Awned; chaff yellowish-white with black-striped margins; straw white, weak to medium strong; kernels red, long, and soft.

Original source of seed sown at Urbana unknown; seed for DeKalb and Fairfield later secured from F. P. Hoopgardner, Ossian, Indiana, in 1915; a third lot of seed was purchased for Alhambra in 1920 from the Ohio Seed Company, Wapakeneta, Ohio. Yields: three-year average at DeKalb 9.8 bushels, Turkey Red 29.2 bushels; ten-year average at Urbana 27.0 bushels, Turkey Red 41.2; eight-year average at Fairfield 19.2 bushels, Fulcaster 20.7; five-year average at Alhambra 22.2 bushels, Fulcaster 22.6.

**Shepherd.** A strain of wheat developed by the U. S. Department of Agriculture which is resistant both to flag smut and to rosette diseases. At the present time there is no large supply of seed but the stock is being increased. Awnless; chaff light brown, glabrous; straw white, kernels red, soft.

Seed obtained in 1924 from John Segar of Granite City, Illinois. Crop at Alhambra in 1925 yielded 24.9 bushels, Fulcaster 22.2.

**Theiss (U. S. D. A. No. 12004).** Synonym for Turkey Red (see Turkey Red). This strain of Turkey Red was introduced by the U. S. Department from Budapest, Austria-Hungary, in 1900.

Seed obtained presumably from the U. S. Department of Agriculture in 1905. Three-year average yield at Fairfield 4.7 bushels, Fulcaster 11.8.

**Trumbull.** Originated by the Ohio Station about 1908. Is a pure-line selection of Fultz and in Ohio tests out-yielded the original Fultz stock. Trumbull is taller than Fultz, has stronger and less purple straw, and the heads are more erect.

Seed obtained from the Ohio Seed Company, Wapekeneta, Ohio, in 1920. Yields: three-year average at Fairfield 23.6 bushels, Fulcaster 23.8; two-year average at DeKalb 37.9 bushels, Turkey Red 39.6; two-year average at Urbana 33.2 bushels, Turkey Red 42.4; one year at Alhambra 23.9 bushels, Fulcaster 22.2.

**Turkey Hybrid 402.** Originated from an accidental cross discovered in a Turkey Red head row in the wheat nursery of the Plant Breeding Division of the Illinois Station. The original hybrid plant was awnless. It is supposed that the male parent was Dawson Golden Chaff. Awned; chaff white, glabrous; straw white, medium tall; kernels originally white and soft, in later years became red and most of them hard.

Nine-year average yield at Urbana 39.6 bushels, Turkey Red 39.5.

**Turkey Hybrid 509.** Origin similar to that of Turkey Hybrid 402. Awnless; chaff white, glabrous; straw white, medium tall, medium strong; kernels originally white and soft; in later years became red and most of them hard.

Yields: nine-year average at Urbana 43.8 bushels, Turkey Red 39.5; five-year average at DeKalb 26.2 bushels, Turkey Red 29.4; six-year average at Fairfield 20.8 bushels, Fulcaster 24.3. This variety was finally removed from the trials because it continued to segregate, producing both awned and awnless spikes and both red and white kernels. The red kernels finally greatly predominated.

**Turkey Hybrid 514.** Origin similar to that of Turkey Hybrid 402. Closely resembles Turkey Red. Four-year average yield at Urbana 37.6 bushels, Turkey Red 36.7.

**Turkey Red (Station strain).** The original Turkey Red seed was brought to Kansas by Mennonite immigrants about 1873 from Southern Russia. The original source of Turkey wheat is that region north and east of the Black Sea and north of the Caucasus Mountains. Awned; chaff white, glabrous, straw white, weak, rather short; kernels red, hard, winter hardy and drought resistant.

Seed obtained from the South Dakota Station in 1901. Yields: twenty-one-year average at Urbana 41.0 bushels; fifteen-year average at DeKalb 35.2 bushels; two-year average at Fairfield 6.3 bushels, Fulcaster 9.7. Very hardy and is pro-



ductive in central and northern sections of the state. Not adapted to the southern section; straw weak.

**Turkey Red 10-110.**<sup>1</sup> Originated by the Plant Breeding Division of the Illinois Station in 1910 from a single head selection. In the Plant Breeding trials it made such an excellent record that eventually it was distributed as a superior strain of Turkey Red.

Yields: eight-year average at Urbana 39.2 bushels, Turkey Red 38.4; six-year average at DeKalb 40.0 bushels, Turkey Red 37.8; three-year average at Fairfield 17.2 bushels, Fulcaster 22.2; six-year average at Alhambra 20.1 bushels, Fulcaster 22.5. Straw weak.

**Turkey Red 12-41.** Originated by the Plant Breeding Division of the Illinois Station from a single head selection in 1912. Has never been distributed. Six-year average yield at Urbana 39.1 bushels, Turkey Red 37.0.

**Turkey Red 9-233.** Originated by the Plant Breeding Division of the Illinois Station from a single head selection in 1909. Has never been distributed. Five-year average yield at DeKalb 33.7 bushels, Turkey Red 33.7.

**Wheedling.** Originated about 1890 by Louis Wheedling of Indiana, who discovered some heads in his wheat field differing slightly from the others. Awnless; chaff light brown, glabrous; straw medium long, strong, purple; kernels red, soft.

Source of seed unknown. Yields: ten-year average at Urbana 35.6 bushels, Turkey Red 42.0; five-year average at DeKalb 26.0 bushels, Turkey Red 34.3; fourteen-year average at Fairfield 16.6 bushels, Fulcaster 18.1.

**Wheedling 5-464.** A selection made by the Plant Breeding Division of the Illinois Station. Strain discontinued. Seven-year average yield at DeKalb 32.0 bushels, Turkey Red 32.5.

**Wisconsin No. 18.** Synonym for Turkey Red (see page 34). A strain of Turkey Red distributed by the Wisconsin Station.

Seed obtained from the L. L. Olds Seed Company, Madison, Wisconsin, in 1914. Yields: ten-year average at DeKalb 36.8 bushels, Turkey Red 35.6; eight-year average at Urbana 36.6 bushels, Turkey Red 38.3. Straw weak.

**Worlds Champion.** Synonym for Turkey Red (see page 34). Seed obtained from the L. L. Olds Seed Company, Madison, Wisconsin, in 1914. Yields: seven-year average at DeKalb 33.9 bushels, Turkey Red 33.6; ten-year average at Urbana 39.4 bushels, Turkey Red 39.1. Straw weak.

<sup>1</sup>Recently named Ilred.













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