

KENTUCKY  
AGRICULTURAL EXPERIMENT STATION

OF THE

*State College of Kentucky.*

BULLETIN No. 89.

**WHEAT.**

1. Test of Varieties.
2. Test of Fertilizers.
3. Descriptions of Varieties.

LEXINGTON, KENTUCKY.

September, 1900.

KENTUCKY  
Agricultural Experiment Station.

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KENTUCKY AGRICULTURAL EXPERIMENT STATION,  
LEXINGTON, KY.

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## BULLETIN No. 89.

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### WHEAT.

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#### I—Test of Varieties.

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Thirty-six varieties were tested during the season of 1899 and 1900. Each variety was planted on one-twentieth of an acre plot in drills eight inches apart. The amount of seed sown was at the rate of six pecks per acre. All of the varieties were planted October 7. The stand was perfect and none of the wheat was winter killed. The wheat was planted on two separate acres, the fertility of which was not exactly the same, and in the table of comparative yields, corrections have been made to overcome as far as possible the unevenness of fertility. Each variety was harvested as soon as fully ripe.

Especial care was taken in determining the weight per bushel and a method was adopted which it is believed will yield much more uniform results than that used heretofore. A Fairbanks standard tester was used and the wheat was run into the measure through a funnel with opening  $\frac{1}{2}$ -inch in diameter placed exactly 6 inches above the top of the measure. When full the measure was "struck" without jarring and balanced on the scale. Duplicate tests by this method gave practically identical results.

The following table gives the yield per acre of grain in bushels and straw in pounds, together with the weight per bushel:

Comparative Yield of Varieties.

Number.	NAME.	Yield Per Acre.		Weight Per Bushel.
		Bush. Grain, 60 lb. per bu.	Lbs. Straw.	
1	Jones's Winter Fife.....	37.9	3690.	62¼
2	American Bronze.....	46.5	4072.5	62
3	Beech-wood Hybrid.....	47.2	4395.5	63¾
4	Pride of Genesee.....	42.4	4995.	62
5	Indiana Swamp.....	46.5	4522.5	64
6	Rice Wheat.....	39.6	4331.3	64
7	Jones's Bearded.....	40.7	4396.3	61
8	Pride.....	42.8	4562.	63
9	Kansas Mortgage Lifter.....	41.3	4835.3	65
10	Fultz-Mediterranean.....	48.2	4308.8	62
11	Rudy.....	48.5	4388.5	63
12	Diamond Grit.....	47.1	5161.5	63½
13	Turkish Red.....	45.9	4443.8	65
14	Lancaster Red.....	49.9	5782.5	62½
15	Fulcaster.....	45.2	5563.8	63½
16	Harvest King.....	50.3	5082.8	63½
17	Fultz.....	52.2	5415.8	63½
18	Jersey Fultz.....	47.2	4707.	64
19	Extra Early Oakley.....	48.6	4396.7	64
20	Democrat.....	42.	4230.	62½
21	Early White Leader.....	40.2	2295.	60
22	Harvest Queen.....	49.5	2500.	60
23	Oatka Chief.....	43.9	2700.	61½
24	Longberry Amber.....	38.4	2175.8	61¾
25	Gold Coin.....	38.2	2047.5	61½
26	Early Genesee Giant.....	41.3	5586.4	62
27	Early Arcadian.....	37.1	1755.	60
28	Bearded Winter Fife.....	37.9	1833.8	61½
29	Gold Coin (?).....	41.8	2210.	60¾
30	White-seeded Golden Cross.....	49.7	2722.5	61
31	Jones's Longberry No. 1.....	47.7	3118.5	62½
32	Long Amber.....	44.4	2673.	62
33	Dawson's Golden Chaff.....	46.5	2272.5	60¼
34	Pearl Prolific.....	46.5	2212.5	64½
35	Improved Rice Wheat.....	37.1	3217.5	64
36	Hungarian Wheat.....	36.5	2683.3	64

## Character of Straw, Height and Time of Ripening.

Number.	NAME.	Character of Straw.	Height of Plant.		When Fully Ripe.
			Feet.	Inches.	
1	Jones's Winter Fife .....	Good.	4	4	June 23
2	American Bronze .....	"	4	2	" 23
3	Beech-wood Hybrid .....	"	4	3	" 21
4	Pride of Genesee .....	"	4	10	" 23
5	Indiana Swamp .....	Weak.	4	5	" 19
6	Rice Wheat .....	Good.	4	5	" 19
7	Jones's Bearded .....	"	4	8	" 23
8	Pride .....	"	4	6	" 23
9	Kansas Mortgage Lifter .....	"	4	2	" 19
10	Fultzo-Mediterranean .....	"	4	0	" 19
11	Rudy .....	Very weak.	4	2	" 23
12	Diamond Grit .....	Good.	4	8	" 23
13	Turkish Red .....	Weak.	3	11	" 23
14	Lancaster Red .....	Good.	4	7	" 21
15	Fulcaster .....	Weak.	4	3	" 21
16	Harvest King .....	"	4	0	" 21
17	Fultz .....	Good.	4	5	" 19
18	Jersey Fultz .....	"	4	3	" 19
19	Extra Early Oakley .....	"	4	2	" 19
20	Democrat .....	"	4	3	" 19
21	Early White Leader .....	"	4	0	" 23
22	Harvest Queen .....	"	3	10	" 23
23	Oatka Chief .....	"	4	0	" 23
24	Longberry Amber .....	"	4	0	" 23
25	Gold Coin .....	"	3	6	" 23
26	Early Genesee Giant .....	"	3	5	" 19
27	Early Arcadian .....	"	3	5	" 23
28	Bearded Winter Fife .....	Very weak.	3	7	" 23
29	Gold Coin (?) .....	Good.	4	0	" 23
30	White-Seeded Golden Cross .....	"	3	8	" 23
31	Jone's Longberry No. 1 .....	"	4	3	" 23
32	Long Amber .....	Very weak.	4	5	" 23
33	Dawson's Golden Chaff .....	Good.	4	1	" 23
34	Pearl Prolific .....	"	3	7	" 19
35	Improved Rice Wheat .....	"	3	10	" 19
36	Hungarian Wheat .....	Weak.	3	8	" 23

Milling Qualities.—Through the kindness of Mr. W. W. Patterson, of the Lexington Roller Mills, the different varieties of wheat were scored as to their milling qualities with the following results:

No. 13.—Very fine milling wheat, but too hard for our mills; No. 5.—98 per cent.; No. 11.—98 per cent.; No. 15.—

98 per cent.; No. 8.—98 per cent.; No. 16.—97 per cent.; No. 14.—96 per cent.; No. 34.—96 per cent.; No. 9.—94 per cent.; No. 3.—93 per cent.; No. 6.—92 per cent.; No. 17.—91 per cent.; No. 18.—91 per cent.; No. 34.—91 per cent.; No. 35.—91 per cent.; No. 12.—89 per cent. All of the other varieties were poor milling wheat.

The season was very favorable. To show something of its character a summary is given of the observations on temperature, rainfall and sunshine taken at the United States Weather Bureau Station on the College Campus.

#### Meteorological Summary.

MONTHS, 1893-1900.	Per Ct. Sunshine.	Cloudiness.	Amount of Rain-fall in Inches.	TEMPERATURE, Degrees.		
				Mean.	Highest.	Lowest.
July, 1899.....	77.	23.	0.97	77.	95.	53.
August.....	78.	22.	4.18	77.	95.	59.
September.....	78.	22.	1.90	68.	98.	53.
October.....	64.	36.	2.09	61.	84.	37.
November.....	43.	57.	1.70	48.	70.	32.
December.....	45.	55.	2.92	33.	62.	-1.
January, 1900.....	41.	59.	2.13	36.	62.	-1.
February.....	38.	62.	3.17	31.	68.	-4.
March.....	49.	51.	1.98	39.	67.	4.
April.....	65.	35.	1.23	55.	79.	26.
May.....	67.	33.	3.54	66.	91.	36.
June.....	66.	34.	2.19	72.	89.	53.

**2—Test of Fertilizers.**

Mr. E. G. Austin, of Prentiss, Ohio Co., continued his experiments with fertilizers on land similar in character to that on which his former experiments were made, the results confirming the conclusion already reached that phosphates are needed upon the soil of that vicinity (coal measures). The application of acid phosphate produced a profitable increase in the yield of wheat, while the use of nitrate of soda or potash salts, either separately or in connection with phosphates, produced but little effect. The results reported by Mr. Austin are given in the following table, the yield being

**Results Obtained with Fertilizers by Mr. Austin.**

Number of Plot.	FERTILIZER USED AND RATE PER ACRE.	Yield of Wheat, Bu. per Acre.	Value of Wheat @ 60c per bu.	Cost of Fertilizer per Acre.	Value of Wheat less cost of Fertilizer.
1	None .....	3 $\frac{1}{3}$	\$2.00	0	\$2.00
2	Nitrate of Soda, 160 lbs.....	3 $\frac{1}{2}$	2.10	\$3.60	(1.50)*
3	Acid Phosphate, 320 lbs.....	15 $\frac{1}{3}$	9.20	2.60	6.60
4	Muriate of Potash, 160 lbs .....	2 5-6	1.70	3.60	(1.90)*
5	None .....	3 1-6	1.90	0	1.90
6	{ Nitrate of Soda, 160 lbs. } { Acid Phosphate, 320 lbs. } .....	15	9.00	6.20	2.80
7	{ Nitrate of Soda, 160 lbs. } { Muriate of Potash, 160 lbs. } .....	3 5-6	2.30	7.20	(4.90)*
8	{ Acid Phosphate, 320 lbs. } { Muriate of Potash, 160 lbs. } .....	14 $\frac{1}{2}$	8.70	6.20	2.50
9	{ Nitrate of Soda, 160 lbs. } { Acid Phosphate, 320 lbs. } { Muriate of Potash, 160 lbs. } .....	17 $\frac{1}{2}$	10.50	9.80	0.70
10	Bone Meal, 300 lbs .....	15 $\frac{1}{2}$	9.30	4.50	4.80

\*Less than cost of Fertilizer.

calculated in bushels of 60 pounds and its value at 60 cents a bushel. The cost of the fertilizer per acre is calculated at \$45 per ton for nitrate of soda, \$16 for acid phosphate, \$45 for muriate of potash and \$30 per ton for bone meal.

Mr. Austin's wheat was sown October 21st with a disc drill and the fertilizer was sown the next day by hand, great care being taken to get it evenly distributed. The wheat was up well on the plots within 10 days after sowing, and no difference was observed between the plots until the last of November, when plots 3, 6, 8, 9 and 10 began to show a better color and a much ranker growth than the others and this difference continued to increase until harvest time. Plots 1, 2, 4, 5 and 7 made but little growth of straw and very short, poorly filled heads of inferior wheat.

The results obtained by Mr. Austin in the past three seasons should be valuable to the farmers of Ohio county and to many others whose lands are situated upon the coal measures formation, both in Eastern and Western Kentucky. The experiments were made each year upon a different piece of ground, but always upon land of the same character and, Mr. Austin says, fairly representative of the land in that part of the State.



## Mr. Austin's Results for Three Seasons.

Number of Plot.	FERTILIZER USED EACH SEASON AND RATE PER ACRE.	YIELD OF WHEAT PER ACRE IN BUSHELS OF 60 LBS.			
		1897-8	1898-9	1899-1900	Average.
1	None.....	3.9	6 $\frac{2}{3}$	3 $\frac{1}{3}$	4.6
2	Nitrate of Soda, 160 lbs.....	9.4	10 5-6	3 $\frac{1}{2}$	7.9
3	Acid Phosphate, 320 lbs.....	15.3	11 $\frac{1}{2}$	15 $\frac{1}{3}$	14.0
4	Muriate of Potash, 160 lbs.....	6.4	8 5-6	2 5-6	6.0
5	None.....	7.6	7	3 $\frac{1}{6}$	5.9
6	{ Nitrate of Soda, 160 lbs. Acid Phosphate, 320 lbs. }	19.6	15 $\frac{1}{6}$	15.	16.6
7	{ Nitrate of Soda, 160 lbs. Muriate of Potash, 160 lbs. }	8.3	11 $\frac{1}{3}$	3 5-6	7.8
8	{ Acid Phosphate, 320 lbs. Muriate of Potash, 160 lbs. }	16.2	14 $\frac{1}{2}$	14 $\frac{1}{2}$	15.4
9	{ Nitrate of Soda, 160 lbs. Acid Phosphate, 320 lbs. Muriate of Potash, 160 lbs. }	20.7	12	17 $\frac{1}{2}$	16.7
10	None.....	8.1	10 $\frac{1}{6}$	.....	9.1
11	Floats, 400 lbs.....	.....	10 $\frac{1}{2}$	.....	.....
12	Bone Meal, 160 and 300 lbs.....	.....	10 $\frac{1}{3}$	15 $\frac{1}{2}$	12.9

The figures show clearly the considerable increase resulting from the use of phosphates. They show also a slight but very evident increase from the use of nitrate of soda, which, while not enough to pay for the nitrate used, may be considered as indicating that these soils might be further improved by growing cow peas or clover upon them to increase the vegetable matter or humus they contain.

### 3—Descriptions of all the Varieties of Wheat Grown on the Farm.

BY H. GARMAN, ENTOMOLOGIST AND BOTANIST.

As a matter of convenience it has been thought best to bring together in this bulletin descriptions of all the varieties grown on the Experiment Farm. With the exception of 34, 35 and 36 which are described for the first time in this bulletin, all have been printed as here republished, in Bulletins 69, 77 and 83. The year in which the wheat described was harvested is added in parenthesis after each description.

It is recognized that these descriptions might be made more complete by the addition of facts with reference to the number of stalks produced by the plant, the height, and more definite statements with reference to the hardness of the seed. But all these characters vary widely in the same variety with soil, season, and climate, so that it is impossible to make a good description without comparing specimens grown at different times and places. This will be done at some future time when it becomes desirable to summarize the results of our observations on wheats. It is to be hoped that before such a summary is given some instrument will be invented, and generally adopted, for determining the relative hardness of the seeds. The chemical tests with reference to the constituents may answer well enough in the laboratory, but I believe that some more simple test, that will enable practical men to bring their judgment of wheats into comparison, is desirable.

*No. 1. Jones's Winter Fife.*

Beardless. Seeds white\*. Spike long and slender, tapering slightly towards the upper end, flattened. Average length of four spikes, 5.125 inches; greater diameter, 0.5 inch; lesser diameter, 0.375. Glumes covered with a fine whitish, velvety pubescence. Empty glumes, with very short, blunt promi-

\*The terms white and red are used in these descriptions as they are by millers and seedsmen. Strictly speaking, the white wheats are pale ochraceous, while red wheats, so-called, are generally of a light leather color.

nences at tips. Flowering glumes with claw-like tips, which become gradually longer towards the upper end of the spike, where a few become straight, sharp bristles about 0.25 inch long. Color of spike and stem, pale yellow. Average number of seeds from a spike, 86.75. Average weight of seeds from a spike, 3.2875 grams.

Rust on stem and blade frequent. (1897.)

*No. 2. American Bronze.*

Beardless. Seeds red. Spike very long and slender, the spikelets separated so that the axis of the spike can sometimes be seen between them, flattened, tapering towards both extremities. Average length of four spikes, 5.3125 inches; greater diameter, 0.625 inch; lesser diameter, 0.375 inch. Glumes not pubescent. Empty outer glumes with short, rounded tips, the keels on their backs more decided than in many other varieties. Flowering glumes, with claw-like tips, which increase in length towards the upper end of the spike, where a few become bristles one-half inch long. Color of spike and stem, pale yellow. Average number of seeds from one spike, 56.5. Average weight of seeds from one spike, 2.4 grams.

This wheat bears a general resemblance to No. 1, but the spike is more slender and the glumes without pubescence. Rust frequent. (1897.)

*No. 3. Beech-wood Hybrid.*

Beardless. Seeds red. Spike (head) not pubescent, tapering to the tip, at which are a few bristles one-half inch long and less. Length of spike 3 inches; diameters equal, about 0.37 inch. Color of spike umber-brown. Stem a trifle purplish. Average number of seeds from a spike, 25.25. Average weight of seeds from a spike, .975 gram. Weight of 10 cubic centimeters of seed, 7.8 grams.

Rust frequent on stem. This is a handsome wheat recognizable in the field by the rather slender brown heads, the spikelets being loosely placed on the axis. The wheat produced is among the best, the seeds being moderately hard, of a deep brown color, and rather above medium size. The

variety resembles very closely our number 16 (Harvest king) and may be the same.

The seed of this variety was received from the U. S. Department of Agriculture, and was grown in Ohio. (1899.)

*No. 4. Pride of Genesee.*

Heavily bearded. Seeds red. Spike long and slender, tapering to the upper end, flattened. Average length of four spikes, 5.81 inches; greater diameter, 0.62 inch; lesser diameter, 0.37 inch. Glumes pubescent. Empty glumes with a bristle at the tip varying from 0.25 to 0.62 inch in length. Flowering glumes with long bristles varying from 1 inch long at the base to more than 4 inches on the upper half of the spike. Color of spike and stem pale yellow. Average number of seeds from one spike, 79.5. Average weight of seeds from one spike, 2.95 grams.

A very striking variety, to be recognized by its shaggy beard and pubescent glumes. Rust frequent. (1897.)

*No. 5. Indiana Swamp.*

Bearded. Seeds red and large. Spike of medium size, rather slender and tapering, not pubescent, its bristles as much as 3 inches long. Length 3.05 inches; greater diameter 0.50 inch; lesser diameter 0.375 inch. Spike yellow. Stem slightly purple. Average number of seeds to a spike, 26. Average weight of seeds from a spike, 1.3 grams. Weight of 10 cubic centimeters of seeds, 7.8 grams.

Rust rare. A good wheat, with rather slender head, the chaff disposed to separate so as to show the seed in ripening. Seeds large and of good color. Seed obtained from J. A. Everitt, of Indianapolis, Indiana. (1899.)

*No. 6. Rice Wheat.*

Beardless. Seeds red and large. Spike not pubescent, rather small, tapering, with a few short bristles at tip. Length of spike, 2.5875 inches; diameters alike, .375 inch. Color of spike and stem, pale yellow. Seeds from a spike, 24.5. Weight of seeds from a spike, 1.3 gram. Weight of 10 cubic centimeters of seeds, 8.1 grams.

Rust rare. While lacking in showiness in the field, this variety possesses many desirable qualities, and judging by the fine appearance and quality of its seeds, I am disposed to rate it as the best wheat grown on the Experiment Farm this year. The head is somewhat insignificant in appearance, resembling in this respect Fultz and Extra early oakley (Nos. 17 and 19). The seed was obtained from G. V. Green, of Hopkinsville. (1899.)

*No. 7. Jones's Bearded.*

Bearded. Seeds white, but darker in tint than some other varieties (Nos. 10 and 17, for example). Spike moderately stout, not flattened, enlarging at the upper end. Average length of four spikes, 4.53 inches; both diameters, 0.50 inch, but one of them enlarging to 0.62 inch near the tip. Glumes without pubescence. Empty glumes with tips produced into short bristles about 0.25 inch long. Flowering glumes armed with bristles from 1 to 3.87 inches long. General color of spike and stem yellow, but both glumes and stem with reddish tinge. Average number of seeds from a spike, 85.75. Average weight of seeds from a spike, 3.04 grams.

This variety bears a close resemblance to Oatka chief (No. 23), having the same reddish tinge and the spike of the same general shape. About the only differences apparent in the samples before me are the greater coarseness of No. 7 and the slightly greater average size. The seed of No. 7 is a little less plump and averages darker in color. All these differences might, however, be due to differences in the soil in which the two samples grew or to differences in seed planted. The wheats grown under these two numbers are certainly very closely related, if they are not one and the same. Rust rare. (1897.)

*No. 8. Pride.*

Heavily bearded. Seeds red. Spike long and slender, tapering gradually towards the tip, flattened. Average length of four spikes, 5.06 inches; greater diameter, 0.62 inch; lesser diameter, 0.37 inch. Glumes pubescent. Empty glumes with bristles ranging in length from 0.25 to 0.62 inch.

Flowering glumes with bristles ranging from 1 to 3.25 inches in length. Color of spike and stem pale yellow. Average number of seeds from a spike, 70.5. Average weight of seeds from one spike, 2.65 grams.

Probably identical with No. 4. I can see no difference of importance between the two samples. Rust abundant. (1897.)

*No. 9. Kansas Mortgage Lifter.*

Bearded. Seeds red and very large. Spike slender, tapering, not pubescent; average length 3.125 inches; greater diameter, 0.50 inch; lesser diameter, 0.375 inch. Chaff yellow. Stem purplish. Seeds from spike, 29. Weight of seeds from a spike, 1.3 gram. Weight of 10 cubic centimeters of seeds, 7.95 grams.

Rust frequent on the stems. The Mortgage lifter is a more showy wheat than No. 6, and might sell better because of the fine appearance of its very large seeds. It is not quite as hard as No. 6, and has this year been more affected with rust. It yielded more by weight than any other wheat grown on the farm.

The seed was obtained from Hon. G. V. Green, of Hopkinsville, a member of the Board of Trustees. (1899.)

*No. 10. Fultz-Mediterranean.*

Beardless. Seeds red. Spike short and compact, sometimes a little widened at tip, not pubescent, spikelets crowded. Length of spike 2.3125 inches; diameters 0.50 and 0.37 inch. Color of spike yellow; of stem, purple. Number of seeds from a spike, 34.75. Weight of seeds from a spike, 1.275 gram. Weight of 10 cubic centimeters of seeds, 7.7 grams.

Rust common. Seed obtained from J. A. Everitt, of Indianapolis, Indiana. (1899.)

*No. 11. Rudy.*

Strongly bearded. Seeds red and large. Spike rather large, the spikelets loosely placed, no pubescent. Length of spike 3 inches; diameters 0.50 and 0.375 inch. Color of spike and stem yellow. Seeds from a spike, 24.25. Weight

of seeds from a spike, 1.125 gram. Weight of 10 cubic centimeters of seed, 7.75 grams.

Rust frequent. This is a showy wheat, with large brown seeds, but ripened later than some of the preceding varieties. Seed obtained from J. A. Everitt, of Indianapolis. (1899.)

*No. 12. Diamond Grit.*

Heavily bearded. Seeds red. Spike rather slight and short, tapering to the upper extremity. Average length of four spikes, 4.19 inches; both diameters about 0.37 inch. Glumes not pubescent. Empty outer glumes with a short acute bristle at tip. Flowering glumes varying in length from 1.25 inch to 3.50 inches. Color of spike pale yellow, of stem purplish. Average number of seeds from a spike, 60. Average weight of seeds from a spike, 2.2 grams.

Rust frequent. (1897.)

*No. 13. Turkish Red.*

Strongly bearded. Seeds red, small. Spike small and tapering decidedly to the tip, not pubescent, the spikelets somewhat loosely placed. Length of spike, 2.3125 inches; diameters 0.375 and 0.25 inch. Color of spike and stem pale yellow. Average number of seeds from a spike, 22. Average weight of seeds from a spike, 0.675 gram. Weight of 10 cubic centimeters of seeds, 8.25 grams.

Rust rare. This differs from all other varieties grown on the farm in the small size of its spikes, their noticeable contraction in diameter towards the tips, and the small size and extreme hardness of the seeds. Only No. 6 approaches it in the latter quality.

The seed was obtained from the U. S. Department of Agriculture. (1899.)

*No. 14. Lancaster Red.*

Bearded. Seeds red. Spike small, slender, somewhat flattened, tapering to upper end. Average length of four spikes, 4.34 inches; greater diameter, 0.50 inch; lesser diameter, 0.37 inch. Glumes not pubescent. Spines on outer glumes short, straight, acute, becoming as much as 0.50 inch in length towards the apex of the spike. Bristles on flower-

ing glumes ranging from 2.37 to 3.62 inches in length. Color of spike brown, of stem purplish. Average number of seeds from a spike, 49.25. Average weight of seeds from a spike, 1.95 gram.

The spike of this variety is very slight and small and tapers quite decidedly towards the tip. The glumes show a disposition to separate in the ripened head, so that the seed becomes visible. In the sample examined by me I find some spikes clothed with fine pubescence, while in every other respect they resemble closely the other spikes. It seems hardly probable that the same variety should vary to this extent, but it may be that the wheat from which the sample was grown was mixed. No rust. (1897.)

*No. 15. Fulcaster.*

Bearded. Seeds red. Spike of medium size, flattened, tapering, not pubescent. Length of spike, 3 inches; diameters 0.50 and 0.375 inch. Color of spike obscure yellow. Stem purplish. Seeds from a spike, 26.5. Weight of seeds from a spike, 1.2 gram. Weight of 10 cubic centimeters of seeds, 7.7 grams.

Rust frequent. A good wheat, of rather large size. The sample shows some evidence of mixing with No. 16, in occasional brown heads among the others.

The seed was sent to the Station by the U. S. Department of Agriculture.

*No. 16. Harvest King.*

Beardless. Seeds red, of medium size. Spike moderately large, but slender, flattened and tapering, not pubescent. Length of a spike 3 inches; diameter 0.50 and 0.375 inch. Color of chaff, umber-brown; of stem, yellow. Seeds from a spike, 31. Weight of seeds from a spike, 1.225 gram. Weight of 10 cubic centimeters of seeds, 6.65 grams.

Rust frequent. A rather handsome wheat, closely like No. 3 (Beech-wood hybrid), and possibly the same. Occasional pale heads interspersed among the sample indicate some crossing with No. 15, such heads even bearing occasional long bristles. Seed obtained from J. A. Everitt, Indianapolis. (1899.)



*No. 17. Fultz.*

Beardless. Seeds red. Spike rather small and slight, tapering, not pubescent. Average length 2.6875 inches, diameters, 0.375 and 0.375. Color of chaff and stem, yellow. Number of seeds from a spike, 33.5. Weight of seeds from a spike, 1.125 gram. Weight of 10 cubic centimeters of seeds, 8 grams.

Rust frequent. One of the best of the varieties grown, closely resembling in every respect the Rice wheat already described, but not so hard. Seed obtained from J. A. Everitt, Indianapolis. (1899.)

*No. 18. Jersey Fultz.*

Beardless. Seeds red. Spike small, tapering, the two diameters equal, about 0.375 inch. Length of spike, 3.6875 inches. Glumes not pubescent. Empty outer glumes terminating in a short blunt claw. Flowering glumes with a slightly longer claw-like tip, a few at the upper extremity sometimes three-fourths inch long. Color of spike and stem, yellow. Average number of seeds from a spike, 33.75. Average weight of seeds from a spike, 1.175 grams.

This wheat seems to me to be identical with No. 19. The size and character of the head is the same, but the seed of this is a little heavier. It was rated first, or among the first, by every practical man who saw it. It is the heaviest wheat grown on the farm. Rust rare. (1898.)

*No. 19. Extra Early Oakley.*

Beardless. Seeds red. Spike small, tapering, the two diameters equal, about 0.375 inch. Length of spike, 3.781 inches. Glumes not pubescent. Empty outer glumes terminating in short claws. Inner glumes with acute tips which in some cases reach a length of three-fourths inch at the extremities of spikes. Color of spike and stem, yellow. Average number of seeds from a spike, 43. Average weight of seeds from a spike, 1.55 gram.

This variety is in high favor in this section, and is always rated well by millers. It seems to me to be the same as No.

18, although its seeds do not weigh quite as much, bulk for bulk, and average a trifle larger. Rust rare. (1898.)

*No. 20. Democrat.*

Strongly bearded. Seeds white. Spike rather slender, of medium length, flattened, tapering decidedly to the upper extremity. Average length of four spikes, 4.43 inches. Glumes without pubescence. The empty outer glumes with short, claw-like tips at the base of the spike and at its upper extremity with bristles nearly 0.25 inch in length. Flowering glumes with bristles ranging in length from one to three inches. Color of spike and stem pale yellow. Average number of seeds from a spike, 51.75. Average weight of seeds from spike, 2 grams.

No rust. (1897.)

*No. 21. Early White Leader.*

Beardless. Seeds white. Spike long and slender, the spikelets becoming crowded at the upper end of the spike so that it is a little widened at the extremity. Average length of four spikes, 5.34 inches; greater diameter, 0.50 inch; lesser diameter at middle of spike, 0.37 inch, but widened to 0.50 inch at tip. Glumes not pubescent. Empty glumes with short, rounded tips. Flowering glumes with claw-like tips, a few at the extremity of the spike with the tips produced into short spines, as much as one-fourth inch long. Color of spike and stem pale yellow. Average number of seeds from one spike, 74.25. Average weight of seeds from one spike, 2.85 grams.

Closely resembles No. 2, but readily distinguished by its white seed and the slight enlargement of the tip of the spike. Rust very abundant. (1897.)

*No. 22. Harvest Queen.*

Beardless. Seeds white. Spike stout, and thickened at upper end, the spikelets crowded, not pubescent. Length of spike, 2.6875 inches; diameters 0.50 and from 0.37 to 0.50 inch. Color of chaff and stem yellow. Number of seeds from a spike, 36.5. Weight of seeds from a spike, 1.2 gram. Weight of 10 cubic centimeters of seeds, 7.6 grams.

Rust rare. The short, stout, whitish yellow head of this variety is characteristic. The seeds are large, but soft. Not to be recommended for this region, if judgment may be based on our sample. Seed obtained from J. A. Everitt, Indianapolis. (1899.)

*No. 23. Oatka Chief.*

Bearded. Seeds white. Spike short and thick, widened in one direction at the tip. Average length of four spikes, 4.44 inches; greater diameter, 0.50; lesser diameter, 0.37 inch, increasing to 0.50 inch at the tip. Glumes not pubescent. Empty glumes tipped with a short but decided bristle which reaches a length of about 0.25 inch at the upper end of the spike. Flowering glumes tipped with long bristles varying from 1.25 to 3.25 inches in length. General color of spike and stem yellow, but both with an evident reddish cast. Average number of seeds from a spike, 74. Average weight of seeds from one spike, 2.67 grams.

Rust rare. (1897.)

*No. 24. Longberry Amber.*

Beardless. Seeds white. Spike rather long and stout, flat, tapering, not pubescent. Length of spike, 3.3120 inches; diameters 0.50 and 0.375 inch. Color of stem and spike yellow. Number of seeds from a spike, 36.25. Weight of seeds from a spike, 1.123 gram. Weight of 10 cubic centimeters of seeds, 7.55 grams.

Rust very rare. This wheat was not well ripened in the sample, but I can see nothing in it calculated to place it in competition with such varieties as Fultz, Harvest king, Rice wheat, and others, for this region. Seed obtained from J. A. Everitt, Indianapolis. (1899.)

*No. 25. Gold Coin.*

Beardless. Seeds white. Spike of medium size, enlarging a little to the upper extremity. Average length of four spikes, 4.06 inches; greater diameter, 0.50 inch; lesser diameter, 0.37 inch below, increasing a little above. Glumes not pubescent. Empty outer glumes everywhere with rather short, blunt tips. Flowering glumes with claw-like tips at

base of spike which become gradually longer upward until at the upper end of the spike a few reach a length of one-half inch. Color of spike umber-brown, of stem purplish. Average number of seeds from a spike, 60. Average weight of seeds from a spike, 2.44 grams.

Rust rare. (1897.)

No. 26. *Early Genesee Giant.*

Strongly bearded, especially on the upper fourth of the spike. Seeds white. Spike short, thick, enlarging to the upper extremity, not flattened. Average length of four spikes, 3.18 inches; both diameters, 0.37 inch at base, one of them increasing to 0.62 inch at tip. Glumes not pubescent. Empty glumes with claw-like tips on the basal portion of the spike, these increasing in length towards the upper end, where some are nearly 0.25 inch in length. Flowering glumes with long bristles, varying from 0.37 inch in length at the base to 4 inches in length at the upper extremity of the spike. Color of spike umber-brown, of stem obscure lilac. Average number of seeds from a spike, 72.5. Average weight of seeds from a spike, 3.2 grams.

No rust. (1897.)

No. 27. *Early Arcadian.*

Beardless. Seeds white, rather short, plump. Spike short, thick, enlarging towards the upper extremity. Average length of four spikes, 3.37 inches; greater diameter, 0.50 inch; lesser diameter, 0.37 inch at base, but increasing to 0.75 inch at upper end. Glumes not pubescent. Empty outer glumes with short, blunt tips. Flowering glumes with claw-like tips, these increasing in length towards the upper extremity of the spike, where a few are nearly 0.50 inch in length. Color of spike umber-brown, this color being confined, however, to the exposed parts of the glumes, the covered portions being pale yellow. Stem pale yellow. Average number of seeds from a spike, 65. Average weight of seeds from a spike, 2.5 grams. Very distinct from any of those described above in the short, thick, club like spikes, with brown glumes. Rust rare. (1897.)

*No. 28. Bearded Winter Fife.*

Bearded. Seeds white and plump. Spike rather small and slender, flattened, tapering to the upper extremity. Average length of four spikes, 4.80 inches; greater diameter, 0.50 inch; lesser diameter, 0.37 inch. Glumes finely pubescent. Empty outer glumes provided with short bristles ranging from about 0.12 to 0.37 inch in length, the longest being, as is common, at the upper end of the spike. Flowering glumes bearing bristles which gradually increase in length from the base to the upper end, ranging from 1 to 3.25 inches long. Color of spike and stem pale yellow. Average number of seeds from a spike, 61. Average weight of seeds from one spike, 2.57 grams.

Rust frequent. (1897.)

*No. 29. Gold Coin (?).*

Beardless. Seeds white. Spike rather small, enlarging slightly at tip; greater diameter, 0.50 inch; lesser diameter, 0.375 inch. Length, 3.935 inches. Not pubescent. A few bristles on inner glumes at tip of spike one-fourth inch long, the rest with short and mostly blunt tips. Color of spike, bronzy; of stem, purplish. Average number of seeds from a spike, 42.75. Average weight of seeds from a spike, 1.525 grams.

This variety was obtained from a local dealer in seeds, and was marked No. 6, but appears to be the same as No. 25, which has been grown at the Station for some time. It is not liked by the millers. Rust rare. (1897.)

*No. 30. White-seeded Golden Cross.*

Bearded. Seeds white. Spike short and thick, enlarging towards the upper extremity. Average length of four spikes, 3.19 inches; greater diameter, 0.50 inch; lesser diameter, 0.37 inch at base, increasing to 0.62 inch at upper extremity. Glumes not pubescent. Empty outer glumes with short, acute spine at tip. Flowering glumes tipped with bristles, about one inch long at base and as much as four inches in length at the upper extremity of the spike. Color of spike, umber-brown; of stem, purplish. Average number of seeds

from a spike, 63.5. Average weight of seeds from a spike, 2.85 grams.

Closely resembles Number 26 in every respect, but in the sample before me the length of spike averaging less. (1897.)

*No. 31. Jones's Longberry, No. 1.*

Strongly bearded. Seeds white. Spike rather large, not thickened at extremity, not pubescent. Length of spike, 3.1875 inches; diameters, 0.50 and 0.375 inch. Color of chaff umber-brown where exposed, pale where covered. Stem yellow. Seeds from a spike, 29.25. Weight of seeds from a spike, 1 gram. Weight of 10 cubic centimeters of seeds, 7.7 grams.

Rust rare. Perhaps the best of the three new white wheats. Seed obtained from J. A. Everitt, Indianapolis. (1899.)

*No. 32. Long Amber.*

Beardless. Seeds white. Spike long and slender, tapering to upper end, flattened. Average length of four spikes, 5.53 inches; greater diameter 0.50; lesser diameter, 0.37 inch. Glumes not pubescent. Empty glumes with short, rather blunt tips. Flowering glumes with short bristles, varying from 0.12 to 0.50 inch long, the latter being situated at the apex of the spike. Color of spike and stem pale yellow. Average number of seeds from a spike, 59.25. Average weight of seeds from one spike, 2.32 grams.

The spike of this wheat resembles No. 2 very closely and might be considered identical were it not for the color of the seeds. Rust frequent. (1897.)

*No. 33. Dawson's Golden Chaff.*

Beardless. Seeds white and plump. Spike rather small and slender, scarcely flattened, tapering to the upper extremity. Average length of four spikes, 3.81 inches; both diameters about 0.37 inch. Glumes not pubescent. Empty outer glumes with very short, blunt tips. Flowering glumes at base of spike with claw-like tips and at its apex with bristles which may in a few cases reach a length of 0.62 inch. Color of spike umber-brown, of the stem pale yellow. Average

number of seeds from a spike, 43.75. Average weight of seeds from one spike, 1.82 gram.

The seeds of this variety are exceptionally plump and light in color. No rust. (1897.)

*No. 34. Pearl Prolific.*

Beardless. Seeds red, of medium size. Length of spike 3.17 inch; greater diameter, 0.50 inch; lesser diameter, 0.21 inch. Color of spike umber-brown. Stem sometimes faintly purplish. Seeds from one spike, 32.83. Weight of seeds from one spike, 1.27 gram. Weight of 10 cubic centimeters of seeds, 7.85 grams. Height of mature plant about 42 inches. Red rust rare.

This variety is much like the next, and may be the same. Its yield was much better, however, and there are some differences between plants of the two now before me. They are so slight, however, as to be explainable as the result of difference in the seed planted, or in the soil of the two plots. The spike of this averages a little larger, and only a portion of the stems are of a purplish color, whereas in the next this color is quite a marked feature. The seed was obtained from Mr. C. D. Miller, of Hodgenville, Kentucky. (1900.)

*No. 35. Improved Rice Wheat.*

Beardless. Seeds red, of medium size. Length of spike, 3 inches; greater diameter, 0.375 inch; lesser diameter, 0.31 inch. Color of spike, umber-brown; of stem purplish. Seeds from one spike, 25.5. Weight of seeds from one spike, 0.92 gram. Weight of 10 cubic centimeters of seeds, 7.8 grams. Height of mature plant about 41 inches. Red rust rare.

While this variety resembles Rice wheat (No. 6), it presents in our plot differences that entitle it to the rank of a distinct variety. It is not as tall by about 9 inches, while the brown color of the outer chaff of the spike and the purple stem enable one to separate it readily. From No. 34 it is less readily distinguished, as already noted. The seed was obtained from Hon. G. V. Green, of Hopkinsville. (1900.)

*No. 36. Hungarian Wheat.*

Strongly bearded. Seeds red, of medium size, hard. Length of spike, 3.25 inches; greater diameter, 0.375 inch; lesser diameter, 0.32 inch. Spike and stem yellow when mature. Seeds from one spike, 27.3. Weight of seeds from one spike, 0.80 gram; weight of 10 cubic centimeters of seeds, 7.7 grams. Height of mature plant about 39 inches. Red rust not rare.

Judging by the character of the plant, its spike, and seeds, this variety is not as desirable for this region as either of the preceding. The long bristles of the spike render it more likely to lose its seeds in handling, and the spike itself is rather small and light of weight. Judging by our plants again, it is a little more subject to red rust. The results of such comparisons are justified by those obtained in the field, this variety yielding at the rate of only 36.48 bushels per acre, while the Improved rice wheat yielded at the rate of 37.12 bushels, and the Pearl prolific at the rate of 46.5 bushels per acre, but one must keep in mind in this connection the fact that poor seed may result in a poor stand and a consequent light yield per acre. The seeds planted were obtained from the United States Department of Agriculture. (1900.)

NOTE.—Since this bulletin was put into the hands of the printer information has come to the Station from the United States Department of Agriculture to the effect that flour made from No. 36 (Hungarian wheat) sells in the London market for from 80 cents to \$1.00 per barrel more than the best American flours. Through an oversight this wheat is not included among those rated by Mr. Patterson (page 179). A sample just submitted to him is rated 93.



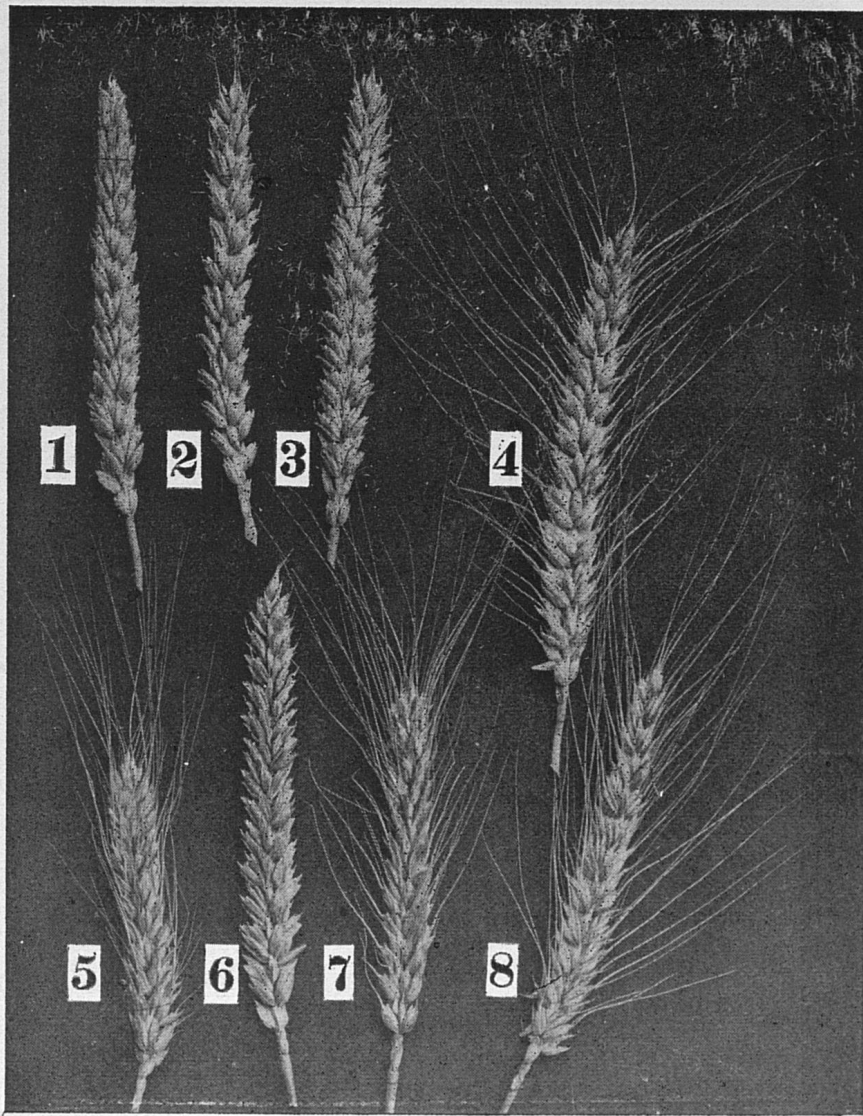


Plate I.—1. Jones's winter fife; 2, American bronze; 3, Early white leader; 4, Pride of Genesee; 5, Oatka chief; 6, Long amber; 7, Jones's bearded; 8, Pride. Reduced to about one-half natural size. Photographed by H. Garman.

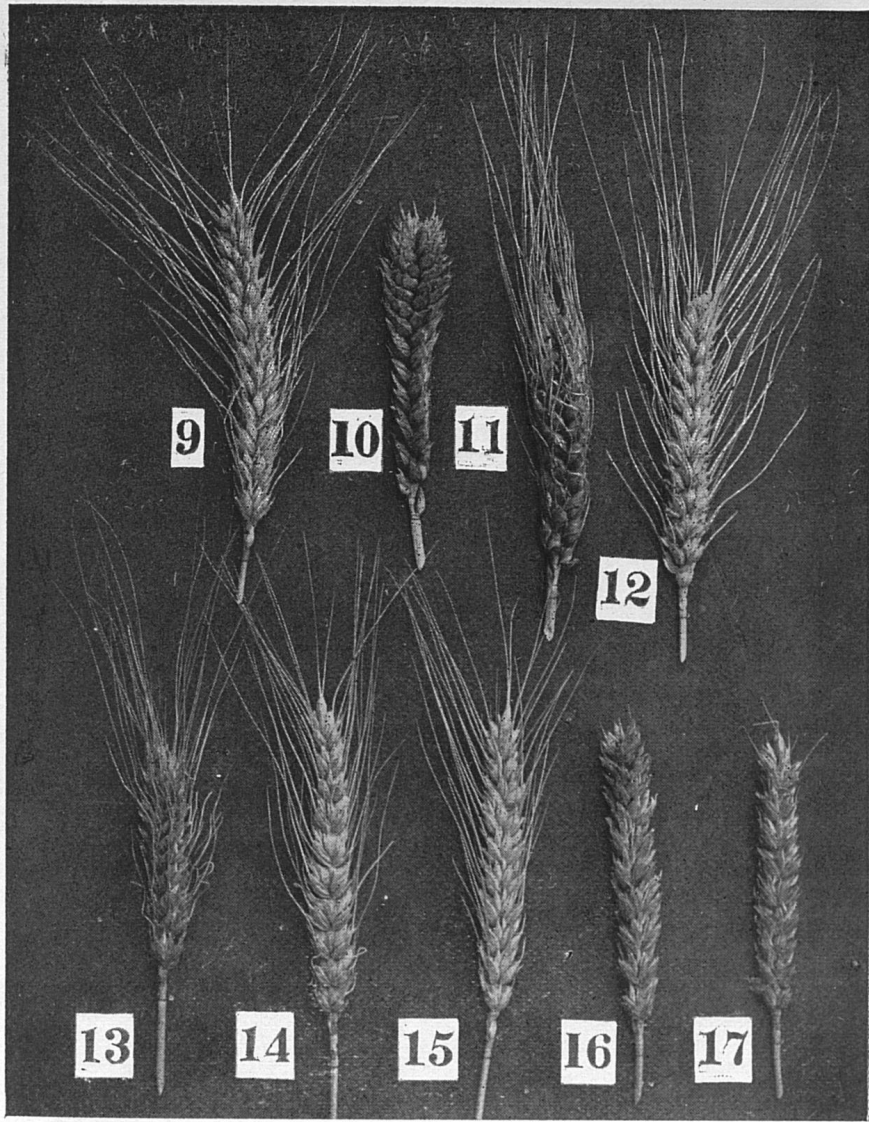


Plate II.—9, Bearded winter fife; 10, Early arcadian; 11, Early Genesee giant; 12, Diamond grit; 13, White seeded golden cross; 14, Lancaster red; 15, Democrat; 16, Gold coin; 17, Dawson's golden chaff. Reduced to about one-half natural size. Photographed by H. Garman.

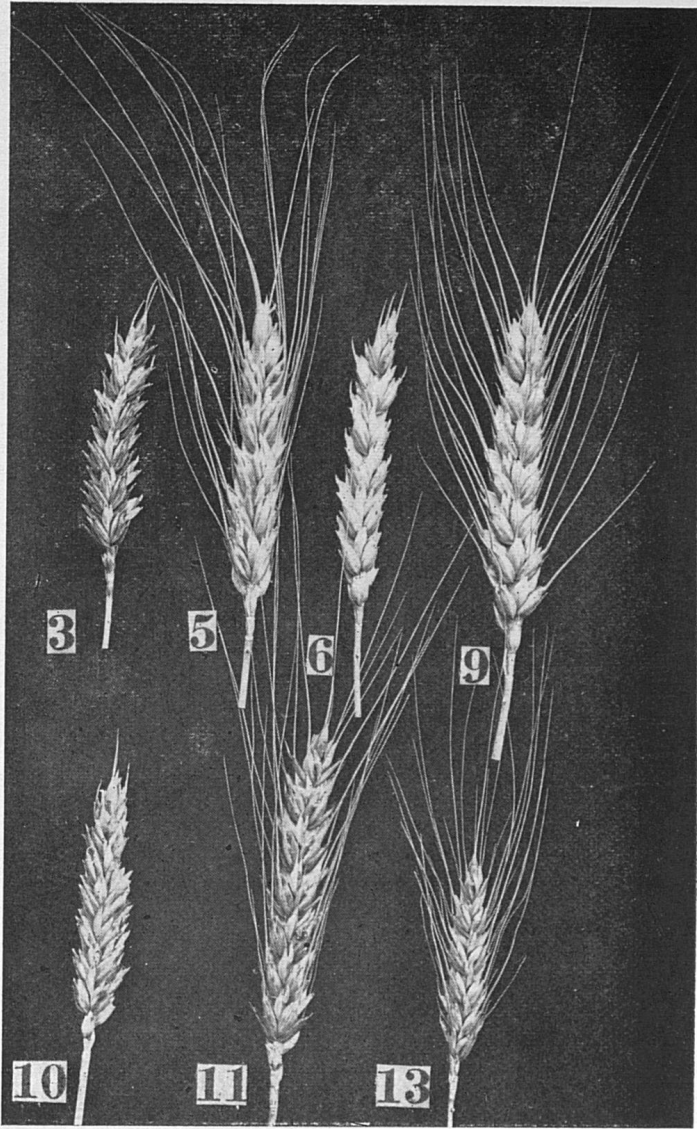


Plate III.—3, Beech-wood hybrid; 5, Indiana swamp; 6, Rice wheat-  
9, Kansas mortgage lifter; 10, Fultzo-Mediterranean; 11, Rudy; 13, Turk-  
ish red. One-half natural size. Photographed by H. Garman.

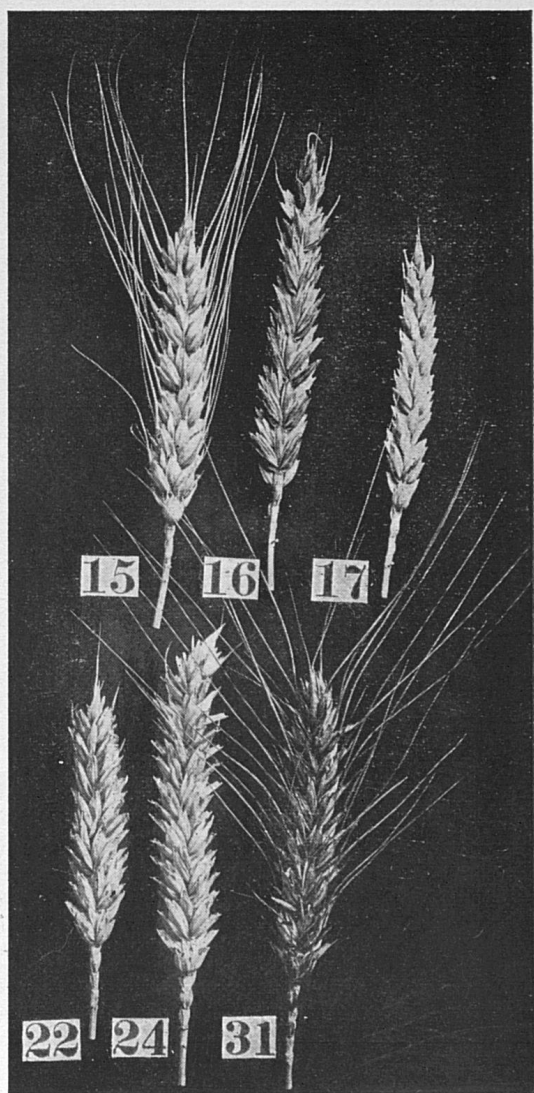


Plate IV.—15, Fulcaster; 16, Harvest king; 17, Fultz; 22, Harvest queen; 24, Longberry amber; 31, Jones's longberry, No. 1. One-half natural size. Photographed by H. Garman.