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Variety Tests of Wheat

By

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VARIETY TESTS OF WHEAT*

By

E. F. CAUTHEN

Owing to the urgent need of wheat to meet the conditions that have grown out of the European War, the farmers of Alabama are advised to increase the wheat acreage—especially where the land is fairly well adapted to this important crop. They are advised to sow wheat not as a money crop, but to supply their own farm needs with wheat bread. To grow it is the only sure way for Alabama farmers to have a supply next year.

Experiments with varieties of wheat have been made almost continuously for 20 years on the Alabama Experiment Station farm at Auburn. They show that a reasonable crop may be expected almost every year when planted under conditions like those here. The fertilizer per acre applied at planting time usually consisted of 240 pounds of acid phosphate, 160 pounds of cotton seed meal and 160 pounds of kainit, or its equivalent of potash in some form, per acre. Between March 10 and 25 a top dressing of 100 pounds of nitrate of soda per acre was usually given.

Some years the wheat was planted on cowpea stubble; other years, on cotton or corn land. In all cases the land was plowed well, seed sown broadcast by hand, and covered about two inches deep with a disk harrow.

The varieties of seed were obtained from different sources and planted at the rate of one bushel per acre. The average date of planting for the last 10 years was November 11; the average date of harvesting for the same period of years was May 29 for all varieties except the Alabama Blue Stem, which was harvested about 10 days earlier.

*This bulletin contains the results of the variety tests reported in bulletin No. 179 and similar data that have accumulated since its publication.

TABLE I.—Varieties of Wheat; Yields at Auburn in Bushels per acre

Years	1899	1901	1902	1903	1906	1907	1909	1910	1911	1912	1913	1914	1915	1916	1917	1918	Av.
Variety																	
Alaska							12.6	6.4									
Acme									14.5								
Beardless Fulcaster	6.5																
Blue Stem or Purple Straw from seedsmen	4.	11.3	15.7		21.1	1.7	24.8	17.6	15.6	9.1	10.4	34.9	14.6	12.1	14.2	13.9	14.8
Blue Stem or Purple Straw Alabama Strain		18.3	16.5	7.8	23.2	7.0	24.3	19.9	19.2	14.4		31.5	13.1	16.8	17.0	14.0	15.9
Currell		16.6	13.7	6.8		3.7	23.5	19.8									14.0
China Wheat													13.7	12.4			
Deitz or Deitz Mediterranean			16.8						15.1	8.5	14.0		13.4	16.9	17.4	15.0	14.6
Fultz	7.4	16.5	15.0	6.5	20.0	2.4	20.7	15.6			14.4	35.9	13.0	16.4	13.9	13.9	16.3
Fulcaster	5.8	17.0	18.1	6.1	17.0	4.6	23.2	15.6	14.1	9.8	13.1	29.5	11.5	12.8	17.9	12.1	13.0
Fultz Mediterranean													12.6				
Fultz No. 1923																	14.7
Golden Chaff			15.5	6.8	20.0	4.6	21.6	22.2	17.1	6.5	12.4	34.0		16.6	13.4	16.2	15.9
Harvest King				4.6							12.9						
Klondyke									8.6	6.6							
Lancaster											12.2	28.1			14.4		
Leap									18.0	6.7	11.0	25.6	12.3	17.2	12.5	13.8	14.6
Leap No. 4823																	
Monarch			16.2	4.5													
Macaroni														12.8			
Red May (or Early May)	5.4	17.0	12.0		19.1	2.2	22.7	21.9	15.4	7.5	11.4		14.0	16.1			12.6
Red Wonder									17.2	9.0	16.0	26.1	13.8	18.1	16.9	17.0	16.9
Stoner or Miracle												28.4	14.1	16.5	15.5	14.4	17.8
Velvet Chaff																13.5	
Average Yields—All Varieties Bushels per acre	5.9	16.3	15.5	6.2	20.1	3.7	21.7	17.4	15.5	8.7	12.8	30.4	13.2	15.4	15.3	14.3	

TABLE II.—Varieties of Wheat Planted Four or More Years; Yields in Comparison with that of Fulcaster, Taken as 100 per cent

Years -----	1899	1901	1902	1903	1906	1907	1909	1910	1911	1912	1913	1914	1915	1916	1917	1918	Av.	Rank of Avs.
Variety																		
Blue Stem or Purple Straw from seedsmen -----	69	66	89		124	37	107	113	111	93	79	118	127	95	75	115	95	9
Blue Stem (Alabama Strain) -----		108	91	128	132	152	105	128	136	147		107	113	131	95	116	121	1
Currell -----		98	76	111	126	80	101	127									103	6
Deitz Mediterranean -----			93					107	87	107			117	132	97	124	108	4
Fultz -----	131	97	83	107	118	52	87	100			110	122	113	128	78	115	103	6
Fulcaster -----	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	7
Golden Chaff -----			86	111	118	100	93	142	121	66	95	115		130	75	134	107	5
Leap -----									128	68	84	87	107	134	70	114	99	8
Red May or (Early May) -----	93	105	66		112	48	98	140	109	77	87		122	126		104	99	8
Red Wonder -----									122	92	122	88	120	141	94	140	115	2
Stoner or Miracle -----												96	123	129	87	127	112	3

TABLE III.—The Average Yield of all Bearded and all Beardless Varieties of Each Year

Year -----	1899	1901	1902	1903	1906	1907	1909	1910	1911	1912	1913	1914	1915	1916	1917	1918	Av.
Variety ---																	
Bearded --	5.8	16.5	17.5	6.1	20.0	4.6	16.7	15.6	14.5	9.1	13.8	28.0	13.2	15.8	16.4	14.6	14.2
Beardless	5.8	15.9	14.7	6.5	20.7	3.7	22.9	19.5	15.6	8.3	11.9	32.4	13.0	15.9	14.2	14.0	14.7

Table I shows the yield of grain of each variety each year that it was tested; also the average yield of grain of each variety tested four years or more. Of those tested four years or more, the yield ranged from 13.0 bushels to 17.8 bushels per acre.

The yield of all varieties was low in 1899, 1903, 1907, 1912—four lean years out of the 16 years of experimentation. A study of other crops, like cotton and corn, shows that they suffer lean years in about the same proportions. So the wheat grower should not expect a good crop each year.

To make a fair comparison between two varieties or a comparison of averages of varieties, the varieties should be grown the same year, on the same kind of soil, and receive the same treatment. By observing Table I, it is noted that some varieties were not continuous; therefore, their averages should be compared with those of varieties that were continuous.

Table II shows a comparison with Fulcaster of all varieties planted four or more years. The yield of Fulcaster each year is taken as 100 per cent, and the yield of each other variety is compared with it.

In the column of averages Blue Stem or Purple Straw (Alabama Strain) ranked first. The commercial Blue Stem or Purple Straw variety closely resembles it, except in earliness, and a comparison of yields shows that in only 3 years of the 13 that they were tested together did the commercial Blue Stem surpass the Alabama Strain in yield. The Alabama Blue Stem variety has been grown continuously in this section for a quarter of a century or more, and has become well adapted to the locality. Other varieties that rank closely to the Alabama Blue Stem are Red Wonder, Stoner or Miracle, Fultz Mediterranean and Golden Chaff.

BEARDLESS AND BEARDED TYPES

The varieties of wheat tested may be divided into two great classes—beardless and bearded. The following belong to the beardless class: Blue Stem or Purple Straw (both Commercial and Alabama Strains), Currell, Fultz, Golden Chaff, Leap, Red May, Klondyke, Velvet Chaff, Leap No. 4823; and the following to the bearded class: Acme, Fulcaster, Deitz Mediterranean, Alaska, Red Wonder, Lancaster and Stoner.

The question is sometimes asked, "Which produces the larger yield, bearded or beardless varieties?" The average yield of all bearded and of all beardless varieties of each year is shown in Table III.

During the first years of the tests only one or two bearded varieties were planted, but in later years the number of bearded varieties was nearly equal to that of the beardless. The difference in yield between bearded and beardless varieties is negligible.

The choice between a bearded and a beardless variety is a matter of convenience in handling and the use to which the straw is to be put. To the casual observer the bearded varieties in the field look more promising because the awns make the heads appear larger than those of beardless varieties. If a crop is to be harvested for hay instead of grain, a beardless variety is more desirable.

CULTURAL SUGGESTIONS

Soils: Wheat is not suited to poor land that is extremely sandy or poorly drained. It does best on loam, silt loam, and clay soils well supplied with humus. In the mountainous sections and the Tennessee Valley are considerable areas that are suited to the growth of wheat. In the Coastal Plain section the soils that are well supplied with vegetable matter will produce good crops under favorable seasons, even though they may be sandy.

Preparation: The land should be thoroughly plowed for wheat. The plowing should be done long enough before planting to allow the surface to become moderately well compacted by rainfall, rolling and repeated harrowing; but in case it cannot be done sufficiently early, the seed may be planted on a freshly plowed surface. Where corn or cotton stalks or peavines or velvet bean vines are present, they should be cut to pieces with a stalk-cutter or disk-harrow, so that the plows can turn them under completely.

Cotton and corn lands that are soft, mellow and free from a heavy cover of grass and weeds may be planted by sowing the seed and fertilizer broadcast and covering them with a disk-harrow or some other shallow cultivating implement. Land where the cotton was picked off early and the stalks destroyed to kill the boll weevil may be planted in the same way; but it is believed that most soils should be plowed in preparation for wheat, if time and labor will permit.

Planting: The time of planting should be early enough to allow the plants to get a good root system established before heavy freezes. Where the Hessian fly is present, it is recommended that the planting be postponed until after the first frost. Too early planting may cause the wheat to reach the booting stage before the danger of freezing has passed, but in case the wheat is growing into danger from a late freeze, it may be judiciously grazed in January or February. Do not graze the wheat when the ground is wet nor after the first of March.

The following dates of planting are suggested, though the planting may be two weeks earlier or later, depending upon the seasons and other factors: North Alabama, October 10 to November 1; Central Alabama, November 1 to 15; South Alabama, November 15 to 30.

Seed at the rate of four or five pecks per acre may be sowed broadcast and covered with a disk-harrow or some other shallow clutivating implement; or better it may be planted with an ordinary grain drill, if one is available. Planting with a grain drill is desirable, because it saves about one peck of seed per acre as compared with broadcast sowing and distributes the fertilizer with the wheat, thus economizing labor. The drills plant to a uniform depth and usually results in a more uniform stand.

All broken and shriveled grains and weed seed should be removed by running the seed through a fanning mill. If a fanning mill is not available, the seed may be fanned by dropping it in a current of air. Well cleaned seed has less disease and gives a better stand.

Treatment for Smut: The following treatment for stinking smut of wheat is recommended. "Soak seed for 10 to 20 minutes in an open tub containing a solution of 1 pint of formaldehyde to 40 gallons of water, or use one ounce to 2½ gallons. Forty gallons will treat 40 bushels.

Stir vigorously and skim off the refuse and grains rising to the surface.

After treatment drain off the solution, *dry immediately and thoroughly*, by spreading out the wet seed in a thin layer, and stirring occasionally.

Disinfect sacks, bins and drills to prevent reinfection."^{*}

^{*}Card 1, E—Seed Treatment for Cereal Smuts, Department of Plant Pathology, Alabama Extension Service, Auburn, Ala.

Fertilizer: On most lands some form of nitrogen is essential. If it is not already in the soil, it should be put there in the most economical way—through the plowing under of cowpeas, or velvet beans, or red clover. When a good crop of these is plowed under as a preparation for wheat, 200 or 250 pounds of acid phosphate per acre is recommended at planting time, and in the early part of March a top dressing of 50 or 75 pounds of nitrate of soda, if available. Other forms of fertilizer containing nitrogen like calcium cyanamid or sulphate of ammonia may be used in its stead. When calcium cyanamid is used as a top dressing, its application should be made about March 1.

When wheat is planted on land that has had no leguminous crop plowed under for soil improvement and the amount of available nitrogen in the soil is small, 75 or 100 pounds of cotton seed meal with 200 pounds of acid phosphate per acre is recommended. They should be applied at planting time.

About every farm is some barnyard manure that can be used to supply a part of the nitrogen for the wheat. Six or eight tons scattered broadcast as a top dressing in the fall or early winter will greatly increase the yield and lessen the expense of buying commercial fertilizer. Where stable manure is used, it should not be applied too thickly, as it may cause a heavy growth of straw and consequently, lodging.

Kind of Seed: In Table I, is listed with their yields, the leading varieties that are adapted to Alabama conditions. They are the soft winter wheats. The hard red wheats grown in the northwest are not recommended for Alabama.

A variety that has been grown for several years in a locality and has done well is probably the safest to plant in that locality. The Blue Stem or Purple Straw marked Alabama Strain in Table I is one of those varieties that has become adapted to middle Eastern Alabama.

It is a smooth variety, about ten days earlier than the Blue Stem or Purple Straw, sold by most seedsmen and is recommended especially for Central and South Alabama. Seed of this variety is scarce and hence the choice must usually be made of one of the other standard varieties.

Other good beardless varieties are Fultz, Golden Chaff, Leap, Red May and Currell, and good bearded

varieties are Red Wonder, Fulcaster and Dietz. Seed of most of these varieties can be obtained from reliable southern seedsmen.

Harvesting: The best implement for cutting wheat is the binder. Where only a few acres are planted the wheat may be cut with a cradle and tied into bundles by hand. The bundles are shocked in the field and left there until they become dry.

If the community grows sufficient wheat to justify the buying of a thrasher, some farmer who has an engine will usually buy one and thrash for toll. The wheat can be fed to stock in sheaf in case no thrasher can be obtained. If no regular wheat mills are in the neighborhood, the wheat can be ground on a corn mill into good whole wheat flour. Five bushels of wheat make one barrel of white flour. Will you try to make sure of flour for next year? If so, plant some wheat this fall.