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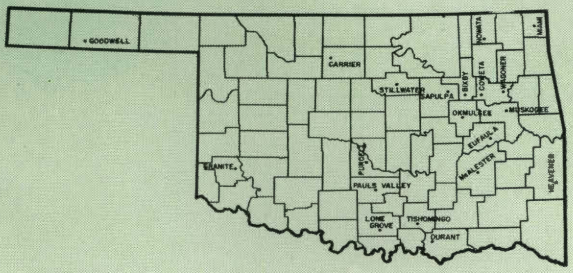

Soybean Variety Tests, 1926 to 1949

By CHESTER L. CANODE and JAMES E. WEBSTER

OKLAHOMA AGRICULTURAL EXPERIMENT STATION
in cooperation with
UNITED STATES DEPARTMENT OF AGRICULTURE

OKLAHOMA AGRICULTURAL EXPERIMENT STATION
Oklahoma A. & M. College, Stillwater
W. L. Blizzard, Director Louis E. Hawkins, Vice Director
in cooperation with
Regional Soybean Laboratory
Bureau of Plant Industry, Soils and Agricultural Engineering
UNITED STATES DEPARTMENT OF AGRICULTURE

ON THE COVER

A seed increase field of S-100 soybeans on the Experiment Station Farm at Perkins, Okla. Map shows the locations of tests which have been conducted by the Experiment Station. Soybean experiments are now in progress at Nowata, Bixby, Heavener, Tishomingo, and Perkins.

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Soybean variety tests were conducted by the Oklahoma Agricultural Experiment Station as early as 1918. It was not until 1926, however, that a large number of varieties were available for testing. During the period 1926 to 1934, experiment station workers conducted tests at many different locations in the State to determine the reaction of soybean varieties to different climatic and soil conditions. These tests were located at Granite, Goodwell, Lone Grove, Pauls Valley, Purcell, Carrier, Eufaula, Durant, Okmulgee, Sapulpa, Nowata, McAlester, Heavener and Stillwater.

VARIETY TEST PRIOR TO 1940

The varieties that were tested for a number of years between 1926 and 1940 are listed in Table 1. A complete description of most of these varieties is given in U.S.D.A. Farmers' Bulletin No. 1520. This description includes the origin of the variety, synonyms, use, maturity classification, flower color, number of seeds per pod, shattering, seed color, hilum markings, number of seeds per pound, color of germ, oil content of the seed, protein content of the seed, and the iodine number of the oil.

The forage yields of some of the better soybean varieties tested at Stillwater during the period 1926 to 1940 are given in Table 2. This table also shows the total rainfall for each year, and indicates its distribution.

Laredo was one of the outstanding forage varieties in the early testing program, and two other varieties, Virginia and Mammoth Yellow, were widely used for hay production. The yields for 1936 and 1938 are not shown as the soybean crop was almost a complete failure due to weather conditions during those two years.

It is interesting to note that Laredo produced almost a ton of hay per acre on good upland even in the dry years of 1935 and 1937 and that the average yield over a period of 12 years was 1.5 tons per acre. This yield of hay compares favorably with the yield produced by the better varieties of cowpeas grown on the same soil and under similar climatic conditions.

In 1930 the forage yield of the three varieties was more than doubled when planted on a bottomland soil of medium fertility. The rainfall in

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* Respectively: Assistant Agronomist, and Associate Research Chemist. The authors gratefully acknowledge the assistance of farmers, county agents and agronomists who have cooperated in soybean testing in Oklahoma. Credit is due especially to Prof. Hi W. Staten, who was in charge of soybean research from 1942 to 1948 for the Oklahoma Agricultural Experiment Station.

TABLE 1.—Soybean Varieties Tested in Oklahoma, 1926 to 1940.

A. K.	Easycook	Manchu	Matthews	Sable
Arksoy	Ebony	Illini	Merko	Siegenthaler
Arlington	Geo. Washington	Ilsoy	Midwest	Soysota
Avoyelles	Goshen Prolific	Ito San	Mikado	Tanloxi
Biloxi	Grunchy	Jet	Minsoy	Tarheel
Black Eyebrow	Habaro	Kingwa	Mongol	Tarheel Black
Charbin	Haberlandt	Laredo	Morse	Tokyo
Chestnut	Hahto	Lexington	Ohio 9035	Transcaucasin
Chiquita	Hamilton	Mamloxi	Old Dominion	Virginia
Columbia	Harbinsoy	Mammoth	Otootan	White Biloxi
Delnoshat	Herman	Mammoth Brown	Peking	Wilson
Delsta	Hollybrook	Mammoth Yellow	Pekwa	Wilson Early Black
Dixie	Hongkong	Mamredo	Pine Dell	Wilson-five
Dunfield	Hoosier	Mandarin	Perfection	Wis. Early Black
			Pinpu	Yokotenn

TABLE 2.—Forage Yields in Tons Per Acre for Three of the Best Varieties of Soybeans Tested at Stillwater, Oklahoma, 1926-1940.

Year	Rainfall* Total (in.)	Distribution	Laredo	Virginia	Mammoth Yellow	Yearly Average
			Good Upland Soil			
1926	20.38	good	1.55	0.95	1.00	1.17
1927	25.09	fair	2.09	1.48	1.89	1.82
1928	18.11	fair	1.49	1.27	1.11	1.29
1929	24.82	poor	1.80	1.62	1.53	1.65
1930	15.55	fair	1.10	0.79	0.80	0.90
1931	16.35	poor	0.76	0.87	0.82	0.82
1932	25.19	good	2.23	1.06	1.61	1.63
1933	17.18	good	2.57	1.28	1.71	1.85
1934	20.28	poor	1.43	0.77	1.26	1.15
1935	22.20	poor	0.83	0.34	0.50	0.56
1937	18.65	poor	0.82	0.17	0.62	0.54
1939	17.74	good	1.35	0.66	1.03	1.01
AVERAGE			1.50	0.94	1.16	1.20
			Bottom Land (Medium Fertility)			
1930	15.55	fair	2.31	2.44	2.10	2.28
1932	25.19	good	1.98	1.27	0.99	1.41
AVERAGE			2.15	1.86	1.55	1.85

* From Aprii to September, inclusive.

this year was very low and the distribution of rainfall unfavorable for the production of summer legumes. However, in 1932 when rainfall conditions were very favorable for the production of soybeans the three varieties averaged more on good upland soil than they did on the bottomland of medium fertility.

The data in this table indicate that the older forage varieties would produce about 1 to 1.5 tons of hay per acre on good upland soils and between 2 to 3 tons per acre on good bottomland in seasons when rainfall conditions were not decidedly unfavorable.

The seed yields for Manchu and the three varieties used in the previous table are given in Table 3. The low seed yield of these forage type varieties, even when planted on bottomland and grown under favorable rainfall conditions, presents a good picture of the seed yielding ability of the early soybean varieties.

It is also apparent that the oil content (Table 4) was very low in the older varieties. Illini and Hongkong were two of the outstanding varieties from the standpoint of seed yield and oil content of the seed before 1940. These two varieties are being grown to a limited extent today, but tests in recent years have shown them to be inferior to the better varieties now available in both seed yield and oil content.

The influence of the amount and distribution of rainfall on the oil and protein content of soybean seed was very evident in the analyses made from 1929 to 1934, and has been confirmed by more recent investigation. In years when rainfall conditions are favorable for the production of high quality seed, the oil content of the seed is generally increased and the protein content lowered (Table 5). The fertility of the soil seems to have little influence on the oil content, as long as moisture conditions are favorable enough to produce good quality seed. (Further evidence of this relationship was shown in the tests in 1943 and following years. There is a definite tendency for the oil content to be higher in seed grown in the eastern part of the state, where rainfall is usually higher, regardless of the fertility level of the soil.)

U. S. D. A. REGIONAL SOYBEAN LABORATORY AND SOYBEAN VARIETY TESTING IN 1942

During the early years of World War II it became apparent that there would be a serious shortage of vegetable oils, fats and high protein feed due to reduction in imports and the increased demands of war time needs. To meet this need the work of the U. S. Regional Soybean Laboratory of Urbana, Illinois, was expanded in 1942 to include cooperation with Okla-

TABLE 3.—Seed Yields in Bushels Per Acre of Four Soybean Varieties Grown at Stillwater, Oklahoma, from 1926-1936.

Year	Rainfall* Total (in.)	Distribution	Laredo	Virginia	Mammoth Yellow	Manchu	Yearly Average
			Good Upland Soil				
1927	25.09	fair	6.7	11.6	5.0	11.2	8.6
1928	18.11	fair	1.1	12.4	0.4	15.0	7.2
1929	24.82	poor	8.7	7.3	7.5	10.0	8.4
1930**	15.55	fair	---	---	---	---	---
1931	16.35	poor	2.2	0.9	0.0	1.2	1.1
1932	25.19	good	10.6	13.5	1.7	12.0	9.5
1933	17.18	good	12.1	10.5	6.0	17.9	11.6
1934	20.28	poor	7.8	1.4	9.3	5.5	6.0
1935	22.20	poor	7.1	5.6	6.5	7.4	6.7
AVERAGE			7.0	7.9	4.6	10.0	7.4
			Bottom Land (Medium Fertility)				
1930	15.55	fair	14.3	10.4	12.5	16.7	13.5
1932	25.19	good	15.0	17.1	10.0	18.0	15.0
AVERAGE			14.7	13.8	11.3	17.4	14.3

* From April to September, inclusive.
** Seed yields damaged by insects.

TABLE 4.—Chemical Analysis of Soybean Seed Grown at Stillwater, Oklahoma, (Five-Year Average—1929 to 1930, Inclusive).

Variety	% protein	% Oil
Laredo	42.67	13.84
Pine Dell Perfection	42.97	16.84
Columbia	40.42	18.75
Morse	42.24	18.76
Wilson	43.42	16.77
Illini	41.31	19.75
Haberlandt	43.41	19.12
Dixie	43.04	18.80
Virginia	43.06	17.47
Pinpu	41.34	20.10
Old Dominion	44.50	16.29
Manchu	41.29	18.15
Hongkong	42.60	18.43
AVERAGE	42.48	17.93

TABLE 5.—Annual Variation in the Oil and Protein Content of Seed of the Illini Variety of Soybeans Grown at Stillwater, Oklahoma.

Year	Rainfall* Total (in.)	Distribution	Percent Oil	Percent Protein
1929	24.82	poor	20.83	40.99
1930	15.55	fair	18.81	42.55
1931	16.35	poor	17.88	44.69
1932	25.19	good	21.06	37.44
1933	17.18	good	20.19	40.90

* From April to September, inclusive.

homa and eleven other southern states. This laboratory is a cooperative agency of the Bureau of Plant Industry, Soils and Agricultural Engineering of the U. S. Department of Agriculture and also twelve Agricultural Experiment Stations of the North Central States, having been established in 1936 in that region.

The chief objective of this regional soybean program is the development of adapted varieties making high yields of seed suitable for industrial uses. To achieve this objective soybean breeding was greatly increased by all cooperating agencies and many new varieties and strains were developed that not only produced good seed yields but also had a much higher oil content.

In order that new varieties and strains, developed through this program, could be tested and evaluated more rapidly and accurately, uniform nurseries were organized. The varieties being grown in the United States were divided into nine maturity groups (O through VIII). Group O and Group I are adapted to the northern part of the country and as the numbers increase the groups are adapted farther south, with Group VIII being grown in the extreme southern part of the U. S. If an early maturing variety (Group O to III) is grown in the South, the plants do not make full use of the growing season. They mature in the summer during dry hot weather and the seed and forage yields are usually very low. On the other hand, if late maturing varieties (Group VI to VIII) are grown in the north they will not mature seed before frost. Consequently, the varieties in the uniform nurseries were placed into groups of varieties of similar maturity. Each of these maturity groups is tested at several locations in states where they are adapted as full season crops.

Although Oklahoma was not a cooperator of the Regional Soybean Laboratory until 1943, several of the new strains and varieties were made available to the state for testing in 1942. On the basis of these tests at Perkins and Stillwater, Oklahoma (Table 6.) and other locations throughout the South, nearly all of the older varieties were dropped from the testing program because of their low seed yields. Ogden was not only the outstanding seed yielding variety in the Oklahoma tests but also produced more hay than the best forage type varieties commonly recommended.

VARIETY TESTING 1943 TO 1950

An extensive program to determine the best adapted varieties of high oil content soybeans for Oklahoma was started in 1943, when the station entered into cooperative testing with the U. S. Regional Soybean Laboratory and 23 other agricultural experiment stations. Numerous varieties and

TABLE 6.—Seed and Forage Yields of Soybean Varieties Tested at Stillwater and Perkins, Oklahoma, in 1942.

Variety	Seed Yields Bu. Per Acre Perkins*	Forage Yields Tons Per Acre Perkins*	Forage Yields Tons Per Acre Stillwater*
Ogden	14.24	1.83	2.57
Arksoy	12.03	1.52	2.12
Arksoy 2913	10.78	1.56	1.85
Hollybrook	10.36	1.40	1.62
Delsta	10.23	1.61	2.15
Ralsoy	10.04	1.43	---
Haberlandt	8.57	1.70	2.82
Macoupin	7.47	1.45	1.99
Arkan 87050	7.05	1.56	2.43
Mammoth Brown	6.91	1.56	---
Scioto	6.50	1.01	2.04
A. K. (Topeka)	6.22	1.18	2.17
Mammoth Yellow	5.80	1.68	1.98
A. K. (Roseman)	5.53	1.18	2.53
Manchu	5.48	---	---
Chiquita	5.11	1.57	2.54
Tokyo	4.99	1.75	---
Virginia	4.29	1.18	---
Mamloxi	4.28	1.49	2.26
Illini	4.15	1.05	1.96
Red Tanner	2.93	1.64	---
Laredo**	***	1.34	---
Avoyelles	***	1.61	---
Otootan	***	1.35	---

*Perkins nursery was planted on upland soil of above average fertility. The Stillwater nursery was planted on bottom land soil of medium fertility.

** The southern strain of Laredo probably would have produced better yields than the northern strain used in this test.

*** Did not mature seed.

strains of maturity groups IV, V, VI, and VII have been grown at several locations in the eastern half of the State. Careful records have been taken on yield, height of plant, disease resistance, lodging, shattering of seed, date of maturity, seed quality, and size of seed. Analyses made by the U. S. Regional Laboratory for oil content, protein content and iodine number of the oil have added information of great value in the evaluation of these varieties and strains.

In addition to the regular uniform test, hundreds of hybrids, new introductions, and selections have been evaluated in preliminary test nurseries on the Experiment Station farms at Stillwater. As the more desirable strains are found in these preliminary nurseries, they will be entered into the regional test groups to be compared with the standard varieties for a period of two to three years. If these strains prove to be superior in yield, oil content and other characteristics, they will be given variety names and the seed increased and made available to growers.

Variety test plots of soybeans (at Stillwater, Okla.,1949) showing full vegetative growth.

The soil description and the notes on annual precipitation given in Table 7 are helpful in clarifying the variation in variety yields at different locations as well as the yearly fluctuation.

Early Maturing Varieties (Group IV and V)

In the first few years of this testing period all of the early maturing varieties adapted to Oklahoma were in maturity Group IV. However, due to the wide variation in maturity dates they were later divided into two groups. S-100 and Hongkong were placed in Group V, which is adapted to the northeast quarter of the state. The other early maturing varieties listed in Tables 8 and 9 were put into Group IV, which is adapted to only a few counties in the extreme northeastern part of the state.

Table 8 gives the seed yields and oil content of the best varieties of early maturity tested from 1943 to 1946. S-100 produced the highest average yield during this period; however, at some locations the earlier varieties yielded slightly more in years when they were favored by moisture conditions.

In 1945 Boone and Macoupin were dropped and Hongkong was added to this group. During the four year period, from 1946 to 1949 inclusive, S-100 was again the outstanding variety (Table 9). Hongkong compared

TABLE 7.—Soil Descriptions at Locations Where Soybean Variety Tests Were Conducted from 1943 to 1949 and Notes on Annual Precipitation for Those Years.

Nursery Location	Soil Type		Fertility Level	Estimated corn yield bu/acre
Coweta	Yahola F. S. L.	Bottomland	high	50-60
Nowata	Verdigris F.S.L.	Bottomland	high	50-60
Stillwater	Miller F.S.L.	Bottomland	medium	20-30
Tishomingo		2nd Bottom	medium	20-30
Wagoner	Parson Silt L.	Upland	low	15-20
Fairland	Parson Silt L.	Upland	low	15-20
Miami	Parson Silt L.	Upland	low	10-15
Heavener	Hanceville F.S.L.	Upland	low	10-15

1943 Summer was very dry. Wagoner was the only location receiving an effective rain in July.
1944 Precipitation from May to November was generally low, but the rains occurred at a time when it was needed by the crops.
1945 Rainfall conditions were favorable. Stillwater was the only location having a long period of dry weather. Heavener had a very high rainfall with good distribution.
1946 Total rainfall was low; however, the distribution was good at all locations. Rain late in September favored the late maturing varieties, especially at Stillwater.
1947 High total rainfall of poor distribution with no effective rains in July and August favored the early maturing varieties.
1948 Rainfall was very high during the growing season. An exceptionally dry September seriously injured seed production of the late maturing varieties at all locations except Nowata.
1949 Total rainfall and distribution were good at all locations.

TABLE 8.—Seed Yields and Oil Content of the Early Maturing Varieties of Soybeans Tested in Oklahoma from 1943 to 1945, Inclusive.

Location	S-100		Gibson		Patoka		Boone		Chief		Macoupin	
	Yield	Oil	Yield	Oil	Yield	Oil	Yield	Oil	Yield	Oil	Yield	Oil
	(bu/A)	%	(bu/A)	%	(bu/A)	%	(bu/A)	%	(bu/A)	%	(bu/A)	%
					1943							
Stillwater	14.0	16.1	13.4	18.2	12.0	15.9	10.2	16.7	6.1	18.3	6.9	18.8
Miami	5.1	16.5	7.4	20.4	6.1	18.3	5.4	18.0	6.1	20.5	4.6	19.7
Wagoner	12.1	17.1	9.6	18.0	9.2	18.2	5.5	17.0	5.0	17.8	7.4	18.7
AVERAGE	10.4	16.6	10.1	18.9	9.1	17.5	7.0	17.2	5.7	18.9	6.3	19.1
					1944							
Stillwater	14.0	17.3	8.2	19.2	10.8	18.7	13.5	18.3	12.7	20.6	10.5	20.4
Coweta	33.7	19.3	31.5	22.2	22.3	22.2	29.3	21.2	24.8	22.2	27.7	22.4
Wagoner	15.0	18.9	16.9	20.9	15.5	19.7	13.1	18.9	11.5	20.8	14.6	21.6
Fairland	17.5	18.9	15.5	19.7	15.7	18.4	15.4	18.7	8.2	19.5	15.1	19.6
Miami	9.2	18.2	11.6	18.8	10.6	17.9	9.6	17.6	4.1	20.2	9.3	19.0
AVERAGE	17.9	18.5	16.7	20.1	15.0	19.4	16.2	18.9	12.3	20.7	15.4	20.6
					1945							
Stillwater	12.1	19.9	12.7	21.9	11.7	21.2	9.5	22.9	10.4	19.8	10.3	21.7
Coweta	29.7	20.9	24.4	24.8	27.4	23.2	27.6	22.9	31.3	23.5	28.0	23.9
Fairland	17.0	20.7	18.9	21.7	17.6	20.6	17.4	21.5	19.3	23.1	17.1	22.0
Miami	8.5	21.1	7.3	23.4	6.6	24.5	8.8	27.2	8.9	26.0	9.1	25.4
AVERAGE	16.8	20.7	15.8	23.0	15.8	22.4	15.8	23.6	17.5	23.1	16.1	23.3
GRAND AVERAGE	15.0	18.6	14.2	20.7	13.3	19.8	13.0	19.9	11.8	20.9	12.6	21.0

favorably with S-100 in yield; but it was inclined to lodge, especially when grown on soils of high fertility.

Late Maturing Varieties (Group VI and VII)

The medium late maturing varieties of Group VI are adapted to all of the eastern half of the state, while the varieties of Group VII which are a few days later in maturity are adapted to only the extreme southern section. Group VI varieties, in general, have made higher yields even in the southeast. (Up to the present time no outstanding variety for Oklahoma conditions has been found in Group VII.)

From 1943 to 1945 Ogden produced the highest average seed yield in Group VI at all locations, with Arksoy 2913 being the nearest competitor (Table 10). Magnolia, Manredo, Ralsoy and other varieties and strains

TABLE 9.—Seed Yields in Bushels Per Acre and Oil Content of the Early Maturing Varieties of Soybeans Tested in Oklahoma from 1946 to 1949, Inclusive.

Location	S-100		Hongkong		Gibson		Patoka	
	Yield	% Oil	Yield	% Oil	Yield	% Oil	Yield	% Oil
			1946					
Stillwater*	12.7	16.8	10.1	19.0	7.0	19.7	6.2	19.4
Stillwater**	27.4	18.3	23.5	19.4	26.6	19.2	19.1	19.5
Muskogee	10.2	19.1	9.8	20.8	10.8	20.9	3.9	19.4
Coweta	28.0	20.2	29.7	20.9	24.9	20.5	19.8	20.1
Vinita	4.6	16.9	5.4	18.1	5.4	16.6	5.7	17.4
Nowata	18.0	17.3	18.7	18.8	15.5	17.6	16.9	18.6
AVERAGE	16.8	18.1	16.2	19.5	15.0	19.1	11.9	19.1
			1947					
Stillwater	15.2	19.2	11.6	19.8	9.2	20.2	10.5	20.3
Nowata	19.6	18.6	17.7	19.4	16.0	20.3	13.6	18.9
Miami	8.9	---	7.9	---	6.6	---	6.2	---
AVERAGE	14.6	18.9	12.4	19.6	10.6	20.3	10.1	19.6
			1948					
Stillwater	25.0		22.9					
Nowata	32.9	18.5	27.0	19.6				
Wagoner	9.8		11.0					
AVERAGE	22.6	18.5	20.3	19.6				
			1949					
Stillwater	20.0		14.4					
Nowata	33.2		32.6		28.5		27.3	
Bixby	22.4		23.5					
AVERAGE	25.2		23.5					
GRAND AVERAGE	19.8	18.5	18.1	19.6				

* Planted May 1, 1946.
** Planted June 1, 1946.

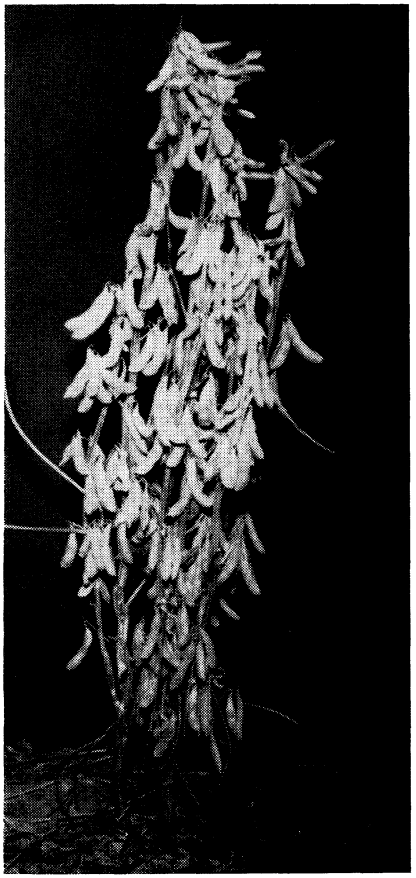
TABLE 10.—Seed Yields in Bushels Per Acre and Oil Content of the Best Late Maturing Varieties Tested in Oklahoma from 1943 to 1945, Inclusive.

Location	Ogden		Arksoy 2913		Magnolia		Manredo		Ralsoy	
	Yield	% Oil	Yield	% Oil	Yield	% Oil	Yield	% Oil	Yield	% Oil
				1943						
Stillwater	8.1	16.4	7.1	15.3	5.1	16.6	7.2	16.9	7.9	15.5
Wagoner	17.2	18.0	12.0	16.9	13.4	18.5	15.8	17.0	12.7	17.4
Heavener	8.2	18.4	7.6	18.5	6.1	18.6	8.2	18.1	8.8	---
AVERAGE	11.2	17.6	8.9	16.9	8.2	17.9	10.4	17.3	9.8	16.5
				1944						
Stillwater	21.3	19.4	17.2	17.9	14.3	19.0	13.7	18.1	---*	17.9
Coweta	43.2	21.1	33.6	19.9	28.5	22.1	24.0	19.5	---*	21.3
Wagoner	16.4	21.1	15.4	19.5	16.3	21.2	10.7	18.6	13.3	19.6
Heavener	9.5	22.5	9.6	20.5	9.1	22.1	10.9	20.3	9.0	20.8
AVERAGE	22.6	21.0	19.0	19.5	17.1	21.1	14.8	19.1	11.2	19.9
				1945						
Stillwater	12.1	19.3	8.0	18.6	7.9	18.5	6.7	19.7	9.1	18.9
Coweta	37.5	19.8	24.0	19.8	22.8	22.0	24.4	20.2	28.0	19.7
Heavener	18.4	20.7	17.2	21.0	13.7	20.7	17.9	21.1	16.9	20.8
AVERAGE	22.7	19.9	16.4	19.8	14.8	20.4	16.3	20.3	18.0	19.8
GRAND AVERAGE	18.8	19.5	14.8	18.7	13.4	19.8	13.8	18.9	---	18.7

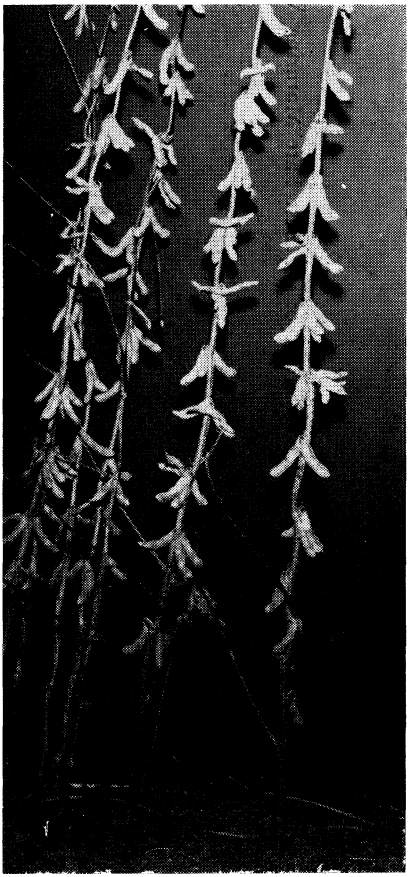
*Poor stands.

tested were inferior in yield and therefore were removed from the test.

Many new strains and the new varieties Dortchsoy No. 2, Dortchsoy No. 7 and Hale Ogden No. 2 were compared with Arksoy 2913 and Ogden during the period 1946 to 1949. These three new varieties are selections from Ogden and, as shown in Table 11, they were very similar in yield and oil content. Ogden was the outstanding variety in the testing program since 1943.



Ogden soybeans fully matured and ready for combining. Ogden and S-100 are the only varieties recommended for Oklahoma at present. In tests the past eight years, both have made high seed yields.



Mature S-100 plants showing the growth habit. On more fertile soils and in years when rainfall is favorable, this variety will grow several side branches which also produce pods.

TABLE 11.—Seed Yields in Bushels Per Acre and Oil Content of the Best Late Maturing Varieties Tested in Oklahoma from 1946 to 1949, Inclusive

Location	Ogden		Dortchsoy No. 2		Arksoy 2913		Dortchsoy No. 7.		Hale Ogden No. 2	
	Yield	% Oil	Yield	% Oil	Yield	% Oil	Yield	% Oil	Yield	% Oil
1946										
Stillwater*	18.7	19.3	19.3	19.5	16.0	19.3	13.8	19.0		
Stillwater**	31.7	20.0	26.2	19.2	23.7	19.4	27.3	19.8		
Muskogee	12.8	21.8	11.2	22.2	9.7	19.9	11.7	20.7		
Coweta	33.9	20.5	34.9	21.9	27.9	20.3	31.6	19.7		
Heavener*	7.7	19.4	7.6	20.2	6.5	17.9	6.9	19.5		
Heavener**	11.6	19.5	10.6	19.7	10.5	19.1	9.5	20.0		
AVERAGE	19.4	20.1	18.3	20.5	15.7	19.3	16.8	19.8		
1947										
Stillwater	6.4	---	6.5	---	4.2	---				
Heavener	7.8	23.4	7.6	23.0	7.0	22.3				
Tishomingo	15.9	22.7	14.2	22.5	13.6	21.4				
AVERAGE	10.0	23.1	9.4	22.8	8.3	21.9				
1948										
Stillwater	8.9	---	5.7	---	3.0	---	---	---	6.2	---
Heavener	13.9	---	12.0	---	11.8	---	---	---	13.2	---
Wagoner	10.6	---	9.7	---	9.8	---	---	---	9.9	---
AVERAGE	11.1		9.1		8.2				9.8	
1949										
Stillwater	33.0	20.6	32.3	20.9	21.6	18.9	---	---	31.6	20.9
Bixby	36.7	---	34.6	---	22.7	---	---	---	39.1	---
AVERAGE	34.9	20.6	33.5	20.9	22.2	18.9			35.4	20.9
GRAND AVERAGE	18.9	21.3	17.6	21.4	13.6	20.0				

*Planted May 1, 1946.
** Planted June 1, 1946.

COMPARISON OF S-100 TO OGDEN

In summarizing the results of soybean variety testing in Oklahoma, it seems desirable to compare S-100, the outstanding early maturing variety, to Ogden, the outstanding late maturing variety. These two varieties have made the highest seed yields in their respective groups for the past eight years and are the only varieties being recommended in this state at the present time.

In addition to high seed yield, Ogden is also one of the outstanding forage varieties for this state. It is a medium late variety, maturing about October 15th in Oklahoma. The seeds are olive yellow with a light brown to brown hilum and averages about 3,000 seeds per pound. The average oil content is 20.5 percent and the average protein content is 43.4 percent*. The plants have an upright bunchy type of growth and are not inclined to lodge even when grown on soils of high fertility.

S-100 is primarily a grain type plant. It is earlier than Ogden, maturing about September 25th in this state. The seeds are straw yellow with a light brown hilum and average about 3,400 seeds to the pound. The average oil content of the seed is 19.0 percent and the average protein content is about 42.4 percent.* The plants have an erect upright growth with few side branches which makes the variety very desirable for combine harvesting.

The yields in Table 12 indicate that Ogden is superior to S-100 at most of the locations where they have been tested. However, in the western edge of the area of soybean adaptation in this state (Stillwater, Oklahoma) the two varieties produced approximately the same average yields over a period of eight years. In 1943, 1947 and 1948, rainfall was low during the months of July, August and September. Under these conditions S-100, because of its early maturity, outyielded Ogden.

Although Ogden, in general, has been superior in both seed yields and oil content, S-100 is a very desirable variety due to its early maturity. S-100 fits well in rotations where the soybean crop is to be followed by small grains, as it can be harvested at an early date. Also, under Stillwater conditions, S-100 has been a more reliable variety than Ogden from the standpoint of producing a fair to good grain yield every year. The yields of Ogden have fluctuated more widely. For example, from 1943 to 1949 the grain yields of Ogden ranged from 6.4 bushels (1947) to 33.0 bushels (1949); whereas, the yields of S-100 ranged from 12.1 bushels (1945) to 27.4 bushels (June 1 planting in 1946).

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*Morse, W. J., Cartter, J. L., and Williams, L. F. Soybeans: Culture and Varieties, U.S.D.A. Farmers' Bulletin No. 1520.

If a grower is producing a large acreage of soybeans, it would be desirable to plant both Ogden and S-100. In using varieties of different maturities, the labor of harvesting the crop is divided into two periods, and there is some insurance against yearly fluctuations in climatic conditions.

SUMMARY

Soybeans have been tested at several different locations in Oklahoma since 1918. Until about 1940, the major emphasis was on forage-type varieties. Since that time, the emphasis has been on varieties which would produce a good yield of seed of high oil content. This publication summarizes the earlier tests briefly, and presents the results of the more recent tests in greater detail.

The data presented for the forage type varieties indicate they would produce between 1 to 1.5 tons of hay per acre on good upland and 2 to 3 tons per acre on good bottom land in years when rainfall was not decidedly unfavorable. The seed yields and the oil content of the seed of the forage varieties were low in comparison with the varieties now being recommended.

Test since 1942 shows that Ogden and S-100 are the best varieties of soybeans for seed production in Oklahoma. Ogden was the outstanding

TABLE 12.—Comparison of Seed Yields and Oil Content of S-100 and Ogden Soybeans Grown at Different Locations in Oklahoma.

Year	Stillwater		Nowata		Coweta		Wagoner	
	S-100	Ogden	S-100	Ogden	S-100	Ogden	S-100	Ogden
	Yield in bushel per acre							
1949	20.0	33.0						
1948	25.0	8.9	32.9	40.0			9.8	10.6
1947	15.2	6.4						
1946*	12.7	18.7	18.0	34.0	28.0	33.9		
1946**	27.4	31.7						
1945	12.1	12.1			29.7	37.5		
1944	14.0	21.3			33.7	43.2	15.0	16.4
1943	14.0	8.1					12.1	17.2
AVERAGE YIELD	17.6	17.5	25.5	37.0	30.5	38.2	12.3	14.7
	Oil content of the seed							
1946*	16.8	19.3			20.2	20.5		
1946**	18.3	20.0						
1945	19.9	19.3			20.9	19.8		
1944	17.3	19.4			19.3	21.1	18.9	22.5
1943	16.1	16.4					17.1	18.4
AVERAGE	17.7	18.9			20.1	20.4	18.0	20.5

*Planted May, 1946.
** Planted June 1, 1946.

variety for seed production and has made excellent forage yields. This variety is medium late in maturity and is well adapted to all of the eastern half of the state.

S-100 has made the highest seed yields in the early maturing groups, but has been slightly inferior to Ogden in both seed yields and oil content. This variety, however, is a very desirable one for Oklahoma because of its early maturity.

A comparison of the yields of Ogden and S-100 indicates the desirability of growing both varieties on the same farm in order to divide the time of harvesting and to secure some insurance against yearly fluctuations in climatic conditions.

The influence of the amount and distribution of rainfall on the oil and protein content of the soybean varieties was very evident. The oil content was generally higher when grown under more favorable rainfall conditions regardless of the fertility level of the soil.

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