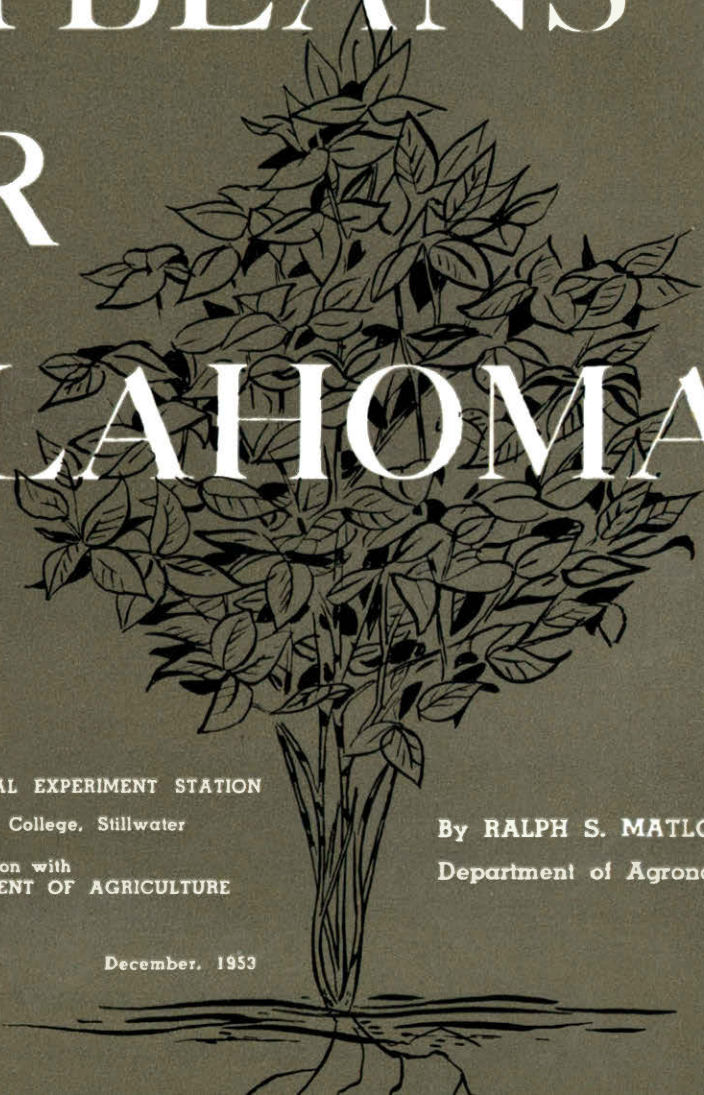
DORMAN SOYBEANS FOR OKLAHOMA



OKLAHOMA AGRICULTURAL EXPERIMENT STATION
Oklahoma A. & M. College, Stillwater
in cooperation with
UNITED STATES DEPARTMENT OF AGRICULTURE

By RALPH S. MATLOCK
Department of Agronomy

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Bureau of Plant Industry, Soils, and Agricultural Engineering

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Dorman Soybeans
For Oklahoma

By RALPH S. MATLOCK

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Dorman is a new high-yielding, medium-early soybean variety with a high oil content. The Dorman variety is adapted to the northeastern, central, and east-central sections of Oklahoma (Fig. 1). It may be planted as a full season variety in the northeastern area or used with an earlier variety, such as Perry, on part of the soybean acreage for extending the harvesting period. In the central and east-central sections of Oklahoma where fall-seeded crops follow soybeans, Dorman may be grown in place of Ogden since it matures 20 to 30 days earlier.

Dorman has been tested four years in Oklahoma (including the preliminary test in 1949). In these tests, seed yield of Dorman averaged 1 bushel per acre more than S-100, and the oil content averaged 1.7 percent higher. Dorman seed quality and ground cover during the growing season were also superior to S-100.

Seed of Dorman is expected to be available to Oklahoma Certified Seed growers for the 1954 planting. This variety has been released in Arkansas, Missouri, Mississippi, and Tennessee.

Dorman is the tenth in a series of superior varieties released through the cooperative soybean breeding program of the U. S. Department of Agriculture and Agricultural Experiment Stations.

Description

The plants of Dorman are of medium height, bushy, and broad-leaved, and they bear heavy foliage. The flowers are white, and the pods are predominantly two- and three-seeded with gray pubescence. The seed of Dorman are smaller than S-100 or Ogden. They are nearly round,

yellow, and possess a buff hilum or seed scar. On fertile soils the variety produces high yields, has an excellent oil content, and provides good ground cover.

Seed Yields

Dorman averaged 1 bushel per acre higher seed yields than S-100 during the 4-year test period from 1949 through 1952 (Table I). The superior yields of Dorman over S-100 were more evident during the favorable season of 1950, when Dorman averaged 4.5 bushels more per acre than S-100.

This bulletin reports test data through the 1952 season. A complete analysis of the 1953 data was not available in time to be included in this publication, but data from five locations showed that Dorman outyielded S-100 by 1.3 bushels per acre. Average yields were 22.8 bushels per acre for Dorman and 21.5 bushels for S-100.

Dorman yields for Payne, Grady, Tulsa, Nowata, and Sequoyah counties were 18.7, 23.6, 10.6, 18.0, 42.8 bushels per acre, respectively. Average yields for S-100 in the same counties were 16.7, 18.3, 12.2, 21.8, and 38.4 bushels per acre, respectively.

Seed yields of Dorman ranged from a high of 45.1 bushels per acre at Bixby, Oklahoma, in 1950 to a low of 6.5 bushels per acre at Perkins, Oklahoma, in 1952. Seed yields as high as 55 bushels per acre have been obtained in the Mississippi Delta region (Fig. 2). The 1950 season was exceptionally favorable for growing soybeans, but the limited rainfall during the 1951 and 1952 growing seasons caused unproductiveness in all varieties tested.

Late-maturing varieties usually outyield the earlier ones since the long-season varieties take advantage of the longer growing season. During the 4-year period 1949-1952, Ogden yields were 4 bushels per acre higher than Dorman.

Oil And Protein Content

Dorman grown in Oklahoma was consistently higher in oil content than S-100. During the 3-year period 1950-1952, Dorman averaged 1.7 percent higher oil content than S-100 (see Table II).

The superior oil content in Dorman makes this variety popular with soybean processors since oil is an important product of the soybean seed. Based on the analysis given in Table II, a bushel of Dorman

seed contains 1 pound more oil than a bushel of S-100. On the same basis, a ton of Dorman contains 34 pounds more oil than a ton of S-100.

The differences in the protein content of Dorman, S-100, and Ogden were insignificant (Table II). There was a tendency for Dorman, with the higher oil content, to be slightly lower in protein content. However, at present prices, the extra oil in a bushel of Dorman is worth 14 cents, while the loss of protein per bushel is valued at only 2 cents when compared with S-100.

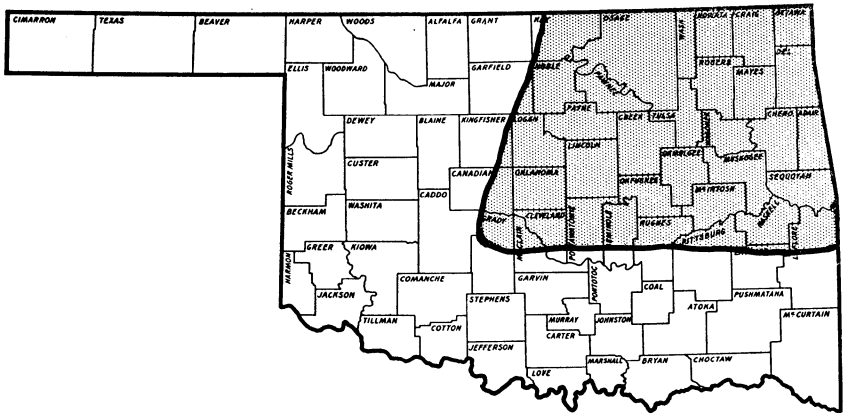

Fig.1.—Dorman is adapted to the northeastern, central, and east-central sections of Oklahoma, as shown by the shaded area of the map. This variety has been released in Arkansas, Missouri, Mississippi, and Tennessee.

Table I.—Comparison of Seed Yields of Dorman, S-100 and Ogden Soybeans; 1949-1952.*

(Average Bushels per Acre)

	Medium Early		Medium Late
Year	Dorman	S-100	Ogden
1949	17.6	18.2	29.2
1950	38.5	34.0	39.7
1951	11.6	12.9	21.3
1952	9.4	8.0	3.0
Average of all years	19.3	18.3	23.3

* The average yields for 1949 were at Perkins while those for 1950, 1951, and 1952 were from Perkins and Bixby.

Fig. 2.—Profuse podding and broad plant growth characterized plots of Dorman yielding 55 bushels per acre in the Mississippi Delta region. A high of 45.1 bushels per acre was obtained from Dorman at Bixby, Oklahoma, in 1950.

Other Characteristics

The average dates of maturity, lodging scores, plant heights, seed qualities, and numbers of seed per pound for Dorman, S-100, and Ogden at Perkins and Bixby, 1950-1952, are shown in Table III.

Maturity.—Dorman matured four days earlier than S-100 at Perkins and Bixby. The higher amount of rainfall at Bixby during the growing season probably accounts for the longer time required for the maturity of medium-early varieties. Dorman matures 20 to 30 days earlier than Ogden, depending upon the date of planting and climatic conditions. The earliness of Dorman is an advantage over Ogden where wheat or other fall-planted crops follow soybeans.

The practice of planting two varieties maturing at different dates tends to increase the harvesting period, decrease climatic risks, and reduce the acreage maturing at one time. This makes it possible to spread the date of maturity so that one combine can be used on large acreages.

Lodging.—The mean lodging scores for Dorman, S-100, and Ogden were similar. Each variety had a few plants down at the time of maturity. With a mean lodging score of approximately 2.0, these varieties were acceptable in this respect. The varieties were extremely erect during the dry seasons of 1951 and 1952.

Plant Height and Ground Cover.—Dorman was 12 and 21 inches shorter than S-100 at Perkins and Bixby, respectively. Ogden was intermediate in height between Dorman and S-100. The short branching growth, fine stems (Figs. 2 and 3), uniform drying of stems at maturity, and easier combining of Dorman made it a more desirable variety than S-100, a variety of similar maturity.

Table II.—Comparison of the Oil and Protein Contents* of Dorman, S-100, and Ogden Soybeans; 1950-1952.

(Percent)

Year	Oil			Protein		
	Dorman	S-100	Ogden	Dorman	S-100	Ogden
1950	22.7	19.8	20.9	39.0	40.7	38.6
1951	19.8	19.4	21.7	40.7	40.3	41.9
1952	19.7	18.0	18.6	43.0	43.6	45.6
Average of all years	20.7	19.0	20.4	40.9	41.5	42.0

* All chemical analyses were made by the U. S. Regional Soybean Laboratory staff. All percentages represent the mean from Bixby each year. Analysis are reported on a moisture-free basis.

Fig. 3.—In the upper pictures, Dorman (left) shows more ground cover than S-100 after the last cultivation on July 21, 1953, at Perkins, Oklahoma. The lower pictures show the greater amount of shade obtained from Dorman (left) than S-100 on August 10. Dorman was 12 inches shorter than S-100 at Perkins, and 21 inches shorter at Bixby, Oklahoma.

The ground cover provided is a very important factor in the late season control of troublesome annual weeds and grasses. Like Ogden, Dorman gives good ground cover during the period following the last cultivation. The superior ground cover of Dorman compared with that of S-100 at the same date is shown in Figure 3.

Seed Quality.—The seed quality of Dorman is superior to S-100 and Ogden. During the 3-year period 1950 through 1952, Dorman had a mean seed quality score of 1.9 as compared to 2.7 for Ogden and 3.0 for S-100. A comparison of seed quality of Dorman and S-100 grown the same year is shown in Figure 4. Good seed quality is desired to obtain the highest market grade, uniform seeding, and good germination.

Seed Size.—Although the size of seed varies with climatic conditions, there is a definite tendency for Dorman to be small, S-100 intermediate, and Ogden large. The seed size of each variety as shown in Table III is smaller than those ordinarily produced because of the unfavorable growing seasons in 1951 and 1952. The small seed of Dorman should be advantageous since small-seeded varieties show less breakage and seed-coat injury in combining than large-seeded varieties. Breakage and seed-coat injury are related to low germination percentages.

Shattering.—Dorman is superior to S-100 and Ogden in seed-holding qualities. Dorman pods will hold their seed satisfactorily as long as six weeks, depending on drought conditions. Even under extreme

Table III.—Average Dates of Maturity, Lodging Scores, Plant Heights, Seed Qualities, and Numbers of Seed Per Pound for Dorman, S-100, and Ogden Soybeans at Perkins and Bixby; 1950-1952.

Plant Characteristics	Bixby			Perkins		
	Dorman	S-100	Ogden	Dorman	S-100	Ogden
Maturity (date)[1]	9/26	9/30	10/16	9/22	9/26	10/22
Lodging (score)[2]	2.2	2.2	1.4	2.1	1.8	1.7
Plant height (inches)[3]	33	54	40	31	43	35
Seed quality (score)[4]	1.7	2.8	2.4	2.1	3.3	3.0
Seed per pound (number)[5]	4310	3564	3100	4815	4764	3184

[1] Maturity for a given variety is the date when 95 percent of the pods are dry and most of the leaves have dropped. During the testing period, the date of planting ranged from May 22 to 28 at Bixby and May 22 to June 9 at Perkins.

[2] A score of 1=almost all plants erect, and 5= all plants down badly.

[3] Average length from the ground to the top extremity at the time of maturity.

[4] A score of 1=very good, and 5=very poor.

[5] The mean of four 100-seed samples converted to the number of seed per pound.

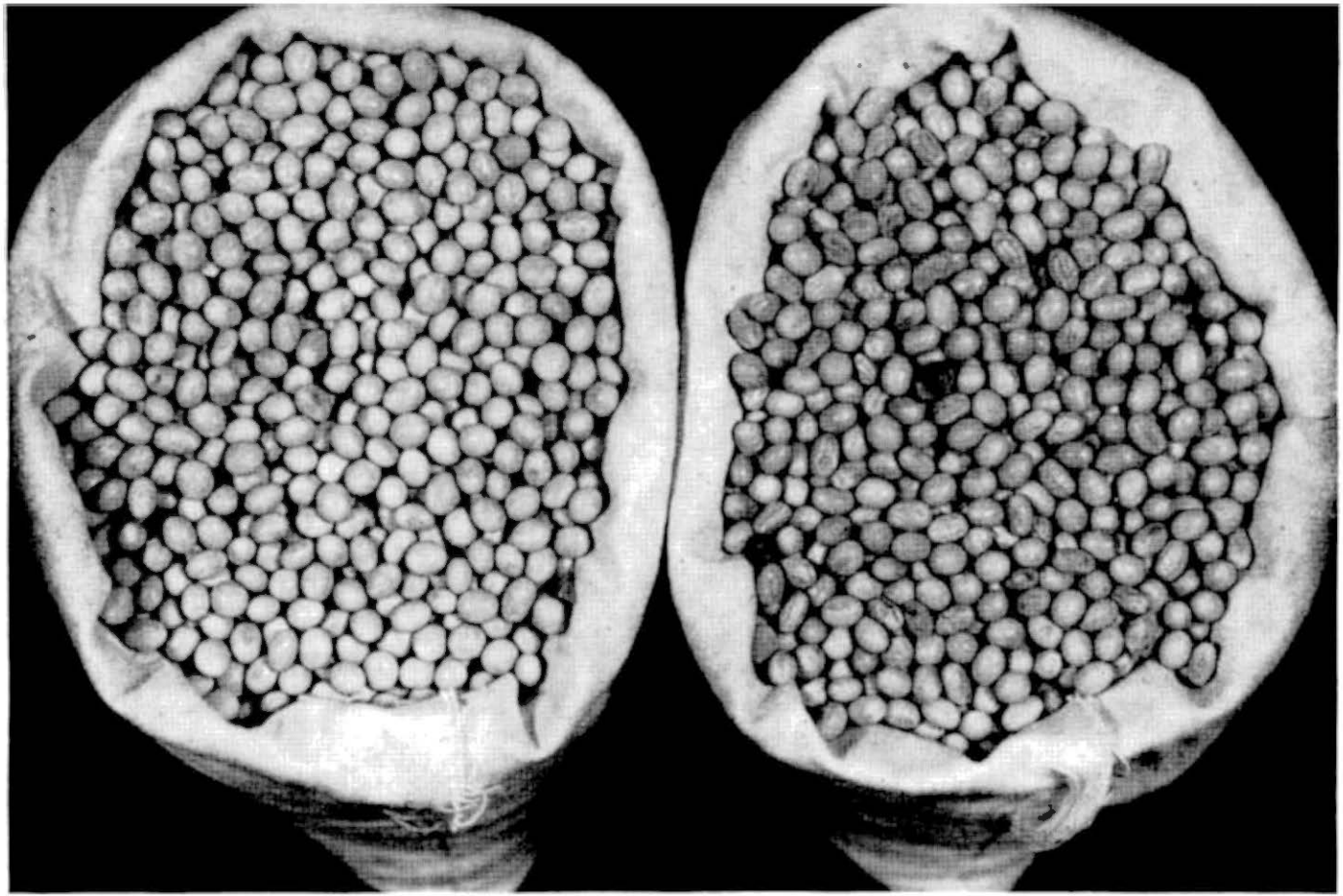

Fig. 4.—Seed samples of Dorman (left) and S-100 grown under the same conditions. The small seed of Dorman should show less breakage and seed-coat injnry in combining than large-seeded varieties.

drought conditions, genetically good strains such as Dorman have superior seed-holding qualities.

Origin And Development

This new variety is named Dorman in recognition of the contributions made to southern agriculture by the late Dr. Clarence Dorman, who was director of the Mississippi Agricultural Experiment Station from 1938 until his death in 1947.

The original cross (Dunfield x Arksoy 2913), which laid the groundwork for this new variety, was made by Dr. L. F. Williams at the U. S. Regional Soybean Laboratory at Urbana, Illinois. The second generation was grown at Stoneville, Mississippi, in 1943. The final selection and evaluation of Dorman were the work of Dr. Edgar E. Hartwig.* Soybean research workers at numerous other southern agricultural experiment stations participated in the testing variety.

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