

Results of the
KENTUCKY SOYBEAN VARIETY
PERFORMANCE AND FERTILIZER TESTS
1957

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VARIETY PERFORMANCE AND FERTILIZER TESTS

1957

Recommended Varieties:

CLARK, WABASH, LINCOLN - Northern and Eastern Kentucky
CLARK, PERRY, OGDEN - Southern and Western Kentucky

Recommended Soil Treatment:

If quick tests indicate that the soil is moderately or strongly acid use ground limestone at rate of 2 or 3 tons per acre respectively; if low in available phosphorus use fertilizers to supply up to 80 pounds of P_2O_5 per acre; and if low in available potassium use fertilizers to supply up to 80 pounds of K_2O per acre. Apply limestone and fertilizers either before or after plowing. To avoid injury to seedling soybeans, do not drill fertilizer in contact with the seed. Soybeans respond well to the use of needed lime and fertilizers on other crops in the rotation ahead of the soybean crop.

The soybean variety tests reported herein were designed for the evaluation of varieties which are commonly grown or appear promising for use in Kentucky. The fertilizer test was designed to test the response of soybeans to the addition of lime, phosphorus, and potassium to the soil, either singly or in various combinations and according to the need as indicated by rapid chemical tests of the soil. The 1957 results of the uniform tests of experimental strains of soybeans conducted at Henderson and Lexington in cooperation with the U.S. Regional Soybean Laboratory, Urbana, Illinois, will be reported in their Progress Report to be issued in 1958.

The location of the various tests is indicated in Fig. 1. The Henderson county and Hickman county tests were located in the main soybean-producing areas of the state on bottomlands of streams which are tributary to the Ohio and Mississippi Rivers respectively. The Fayette county test was located on upland soil of central Kentucky.

Methods Used:

The variety tests were planted in 4-row plots with three replications and in a randomized block design. The rows were 19 feet long and 36 inches apart except at Hickman where rows were 42 inches apart. A 16-foot section was harvested from each of the two center rows. Beans were planted at a rate of 12 seeds per foot of row. The fertilizer test at Henderson was planted with Clark variety in the same manner as the variety test at that location except that rows were 25 feet long, and the treatments were in quadruplicate. Commercial inoculant was not used on

seeds at time of planting because inoculated beans had been grown on the land the preceding year. The attempt was made to follow best cultural practices at all locations.

Yields: Seed weights were recorded after the seed of all plots had reached a uniform moisture content. Then weights were calculated to bushels-per-acre basis.

Oil Content: Percent of oil was determined from a composite sample of seed from all replications in each test in 1955 and are shown with yield data for that year. Analyses were made at the Experiment Station chemical laboratory. Percent oil is expressed on moisture-free basis.

Seed Size is reported as weight in grams per 100 seeds.

Lodging notes were recorded at or near maturity according to the scale shown in footnote to each table.

Height of plants was determined as the average length of plants in a plot from ground to the top extremity at time of maturity.

Maturity is taken as the date when the pods are dry and most of the leaves have dropped. It is expressed as days earlier (-) or later (+) than Perry as a reference variety.

Seed Quality is rated from 1 to 5 according to the scale shown as a footnote to each table.

Interpretation of Data

The difference in yield between varieties or soil treatments necessary for reasonable assurance that such an inherent yield potential exists, has been calculated and is given in a footnote to each table. Unless the yields of the two varieties or the two soil treatments being compared differ by as much as or more than the figures shown, little confidence can be placed in the apparent superiority of one variety or soil treatment over the other under the conditions of the particular test.

Data on agronomic characteristics other than yield have not been analyzed statistically; however, small differences between any two varieties or treatments are likely to be of little importance and should not be considered strongly indicative of a true difference.

Duration of Tests: The results of evaluating varieties or soil treatments over a period of several years are more trustworthy than those from a single year. A given variety may be outstanding in performance one year and show less desirable characteristics another year. Results over a period of years tend to average these fluctuations. Yield data for more than a single year are given in the tables along with those of 1957.

Table 1-Soybean Variety Test, Henderson County, 1957-Performance data and related information. Also average yields for 4 years for most varieties.
 Co-operators: Ohio Valley Soybean Cooperative, Henderson; Owensboro Grain Co.; J.S.Priest and Herman Wood.
 Location: 5 miles S.E. of Henderson, Ky. on Airline Highway; Farm: J.S.Priest; Herman Wood, operator.
 Soil: Silt loam (Walaya local alluvium) on Elam Flat Creek Drainage Ditch - bottomland.

Soil Treatment: 1957 - 300 lbs/A of 0-30-30 fertilizer. 1955 - Limestone 2 T/A.

Date Planted: June 3, 1957 Killing Frost: October 21, 1957 Row Width: 36 inches
 Comment: Test was planted near optimum date. Soybeans came up a good stand and grew under good conditions of weather and culture except for wet weather early in season. 1957 was 3rd year for test on this land.

Variety	Yield-1957 ^{1/} Bu/A	Rank	Maturity ^{2/}	Lodging ^{3/}	Ht. In.	Seed Qual. ^{4/}	Gm/100 Beans	% Oil 1955 Test	Yield, Bu/A Ave. 4 yrs. 1954-57
Lincoln	32.6	7	-12	2	41	3	14.6	21.6	33.9
Clark	41.4	2	-6	1	40	2	17.0	21.5	42.7
Wabash	34.6	4	-4	1.3	43	1.3	15.2	22.4	35.0
Perry	42.5	1	10/10	1.7	40	3	16.9	21.6	37.0
Dorman	39.9	3	+11	2.3	42	1	13.8	21.9	35.2
Ogden	33.3	6	+29	2	46	3	15.4	19.3	31.7
Lee	33.9	5	+27	3.7	43	3	12.9	19.0	35.3(3 yr. Ave.)

^{1/} Mean data of 3 replicates for yield and performance. Oil content in 1955 test was determined from composite sample of 3 replications. 1957 yield differences of less than 5.9 bu/A not significant (Odds 19:1)

^{2/} Days earlier (-) or later (+) than Perry.
^{3/} Rating scale plant lodging: 1 = almost all plants erect; 2 = either all plants over slightly or a few down; 3 = all plants over moderately or 25% -50% down; 4 = either all plants over considerably or 50%-80% down; 5 = all plants down badly.

^{4/} Rating scale of seed quality: 1 = very good; 2 = good; 3 = fair; 4 = poor; 5 = very poor.

Table 2 - Soybean Variety Test - Hickman County, 1957 - Performance data and related information. Also 1956 and 1955 yield data and average yields 1955, 1956, and 1957.

Co-operator: J. T. Workman Location: R. 1, Columbus, Ky. Soil: Silty clay loam (overflow bottom)
Soil Treatment: None.

Date Planted: June 25, 1957 Killing Frost: October 18, 1957 Row Width: 42 inches.

Comment: Wet weather delayed planting of soybeans for about 5 weeks after optimum date in 1957 and about 4 weeks in 1955. Planting was at optimum time in 1956. Under conditions of late planting the late varieties are likely to produce higher yields than early or medium maturing ones unless killing frosts occur before the late varieties mature as was true in 1957.

Variety	Yield-1957 ^{1/} Bu/A	Rank	Maturity ^{2/}	Lodging ^{3/}	Ht. In.	Seed Qual. ^{4/}	Gm/100 Beans	% Oil 1955 Test	Yield, Bu/A		
									1955	1956 Ave. 1955-57	
Lincoln	---	---	---	---	---	---	---	22.0	22.1	27.6	24.8(2 yr av.)
Clark	38.6	1	-5	1	30	2	18.0	22.4	25.4	41.7	35.2
Wabash	36.2	2	-11	2	33	2	15.6	20.5	24.7	38.0	33.0
Perry	33.9	5	10/15	1	26	3	18.0	21.1	24.5	39.2	32.5
Dorman	35.8	3	0	1.3	30	1	14.5	20.1	30.0	41.8	35.9
Ogden	29.3	6	+15	1.5	34	3	15.3	21.2	31.9	39.4	33.2
Lee	34.7	4	+15	3	32	2	13.4	21.9	32.5	39.7	35.3

^{1/} Yield and performance data are the mean of 3 replications. Oil content in 1955 test was determined from composite sample of 3 replications. 1957 Yield differences of less than 4.5 bu/A are not significant. (Odds 19:1)

^{2/} Days earlier (-) or later (+) than Perry.
^{3/} Rating scale of plant lodging: 1 = almost all plants erect; 2 = either all plants over slightly or a few down; 3 = either all plants over moderately or 25%-50% down; 4 = either all plants over considerably or 50% to 80% down; 5 = all plants down badly.

^{4/} Rating scale seed quality: 1 = very good; 2 = good; 3 = fair; 4 = poor; 5 = very poor.

Table 3 - Soybean Variety Test - Fayette County, 1957 - Performance data and related information.
 Also, 1954 - 57 average yields.

Location: Lexington, Ky. Farm: Experiment Station - Agronomy Farm. Fertility Level: High
 1957: 500 lb/A 6-12-12 fertilizer plowed under

Soil Type: Maury silt loam - level. Soil Treatments: 1956: 2 Tons/A limestone

Date Planted: May 28, 1957 Killing Frost: October 20, 1957 Row Width: 36 inches.

Comment: Soybeans were planted near optimum date in 1957, came up, good stands and made good growth during moist weather of June. However, periods of dry weather in July, August, and September resulted in small seed and many poorly filled pods. Low yields in 1955 & 1954 resulted from late summer drought. Only in 1956 were moisture conditions favorable to good soybean yields.

Variety	Yield-1957 ¹ Bu/A	Rank	Matur- ity ²	Lodg- ing ³	Ht. In.	Seed. ⁴ Qual.	Gm/100 Beans	% Oil 1955 Test	Yield, Bu/A Ave. 4 yr. 1954-57
Lincoln	26.4	2	-13	1	27	2	12.6	21.3	25.0
Clark	30.6	1	-8	1	33	2	13.9	21.2	26.5
Wabash	25.5	4	-5	1	32	1	12.4	21.0	23.7
Perry	26.3	3	9/28	1	33	3	13.5	19.9	25.3
Dorman	23.1	5	+27	3.7	42	1	12.6	-----	20.4 2 yr. ave.
Ogden	18.3	7	+43	2	46	2	14.7	19.3	17.7
Lee	18.6	6	+46	3.3	43	2	11.2	-----	-----

(6)

¹/Mean data of 3 replicates for yield and performance. Oil content from 3 replications composite sample.
 1957 yield differences of less than 3.6 Bu/A not significant. (Odds 19:1).

²/Days earlier (-) or later (+) than Perry.

³/Rating scale of plant lodging: 1 = almost all plants erect; 2 = either all plants over slightly or a few down; 3 = either all plants over moderately or 25%-50% down; 4 = either all plants over considerably or 50% to 80% down; 5 = all plants down badly.

⁴/Rating scale of seed quality: 1 = very good; 2 = good; 3 = fair; 4 = poor; 5 = very poor.

Table 4 - Effects on yield of soybeans of limestone and fertilizers used directly for 1957 and 1955 crops and the residual from 1955 use on 1956 crop.

Information regarding cooperators, location of test farm, soil description, dates of planting, killing frost and width of rows is the same as that shown in Table 1.

Soybean Variety used: Clark, Seed Inoculated both years.

1957 Soil Test Results Before Treatment: Moderately acid (pH 5.9); P = low; K = low.

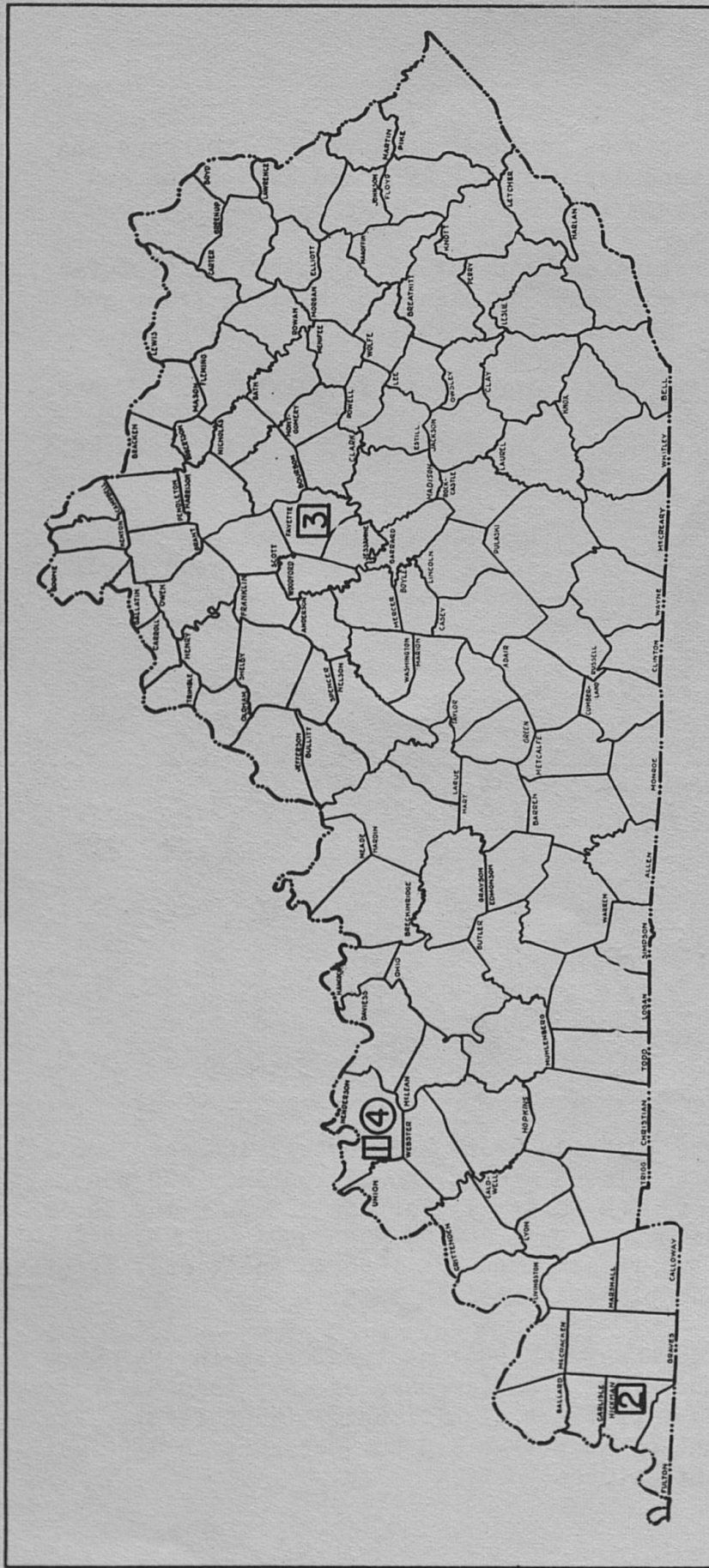
Comment: Test was planted near optimum date and soybeans came up good stands and grew under good conditions of weather and culture during all three years.

Treatment, Rate/Acre ^{1/}				Mean Yield 4 Reps. Bu/A ^{2/}			
Lime- stone	Fertilizer -- lb.		Direct Effect	Residual			
	N - P ₂ O ₅	- K ₂ O		1957	1955	Ave 2 yrs	Effect 1956
0	0	0	33.4	34.6	34.0	31.1	
2T	0	0	34.3	37.5	35.9	27.6	
2T	0	80	33.9	36.6	35.2	32.8	
2T	0	0	37.7	38.9	38.3	30.4	
0	0	80	35.9	39.9	37.9	29.9	
2T	0	80	36.6	44.2	40.4	34.8	

^{1/} In 1957 and 1955 limestone and fertilizers were applied broadcast on plowed ground and disked in. 400 pounds per acre of 0-20-20 fertilizer would supply the equivalent of 80 pounds P₂O₅ and 80 pounds of K₂O as used for for last two treatments. In 1956 no additional treatment was made on plots treated in 1955.

^{2/} Yield differences for various treatments in 1957 were not significant. Yield differences of less than 5.5 bu. per acre in 1955 were not significant. (Odds 19:1). Yield differences of less than 5.3 bu. per acre in 1956 not significant. (Odds 19:1).

Figure 1. Location of Tests



Soybean Variety Test Locations:

- 1 Henderson County, Henderson, Kentucky
- 2 Hickman County, Columbus, Kentucky
- 3 Fayette County, Lexington, Kentucky

Soybean Fertilizer Test Location:

- 4 Henderson County, Henderson, Kentucky