

Results of the
KENTUCKY SOYBEAN VARIETY
PERFORMANCE AND FERTILIZER TESTS
1958

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RESULTS OF THE KENTUCKY SOYBEAN

VARIETY PERFORMANCE, DATE OF PLANTING, AND FERTILIZER

TESTS 1958

Recommended Varieties:

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

Recommended Soil Treatments

If soil 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, and potassium to the soil, either singly or in combination and according to the need as indicated by rapid chemical tests of the soil. The 1958 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, are reported in their Progress Report RSLM 200, March 1959.

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 bottom land soil of central Kentucky. The Caldwell county test was located on branch-bottom soil.

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 40 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 and the treatments were in quadruplicate.

The date of planting test at Henderson was designed to test the effect of early, medium, and late planting upon the yield and agronomic characteristics of the early, medium, and late maturing varieties - Clark, experimental Strain, and Hood. These varieties represent maturity groups IV, V, and VI respectively. 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. Analyses were made at the Kentucky Agricultural 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 1958 except for Caldwell county where this was the first year.

Table 1-Soybean Variety Test, Henderson County, 1958-Performance data and related information. Also average yields for 5 years for most varieties.

Co-operators: Ohio Valley Soybean Cooperative, Henderson; Owensboro Grain Co.; J. S. Priest and Herman Wood.
 Location: 7 miles S.E. of Henderson, Ky. near Airline Highway; Farm: J. S. Priest; Herman Wood, operator.
 Soil: Silt loam (Falaya local alluvium) on drainage ditch - bottomland

Soil Treatment: Limestone 2 T/A; Fertilizer 0-0-70 lb/A.

Date Planted: May 16, 1958

Killing Frost: November 6, 1958

Row Width: 36 inches

Comment: Test was planted about 1 week before optimum date. Soybeans came up a good stand and grew under good conditions of weather and culture except for wet weather early in season. 1958 was 1st year for test on this land.

Variety	Yield-1958 ¹ / Bu/A	Rank	Matur- ity ² / -	Lodg- ing ³ / -	Ht. In.	Seed Qual. ⁴ / -	Gm/100 Beans	% Oil Test	Yield, Bu/A Ave. 5 yrs. 1954-58
Lincoln	35.6	7	-10	1	36	3	14.6	22.6	34.3
Clark	44.4	1	-3	2	42	2	15.5	22.2	43.0
Wabash	40.6	3	-5	2	48	2	16.2	20.8	36.2
Perry	42.2	2	9/20	2	40	2	16.1	23.4	38.0
Dorman	36.4	5	+22	4.6	44	1	13.9	21.6	35.5
Hood	37.9	4	+39	3	39	2	14.5	21.0	38.2 (3 yr. Ave)
Ogden	32.5	8	+42	2.6	46	3	14.7	19.6	31.9
Lee	35.7	6	+45	3.6	40	3	12.9	20.4	35.4 (4 yr. Ave)

¹/ Mean data of 3 replicates for yield and performance. Oil content was determined from composite sample of 3 replications. 1958 yield differences of less than 7.3 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, 1958 - Performance data and related information. Also average yields for 4 years for most varieties.

Co-operator: J. T. Workman Location: R. 1, Columbus, Ky. Soil: Silty clay loam (overflow bottom)

Soil Treatment: None Row Width: 40 inches

Date Planted: May 27, 1958 Killing Frost: October 30, 1958 Comment: Soybeans were planted about one week after optimum date but the crop grew under nearly ideal conditions of weather and culture.

Variety	Yield-1958/ Bu/A	Rank	Matur- ity ^{2/}	Lodg- ing ^{3/}	Ht. In.	Seed Qual. ^{4/}	Gm/100 Beans	% Oil 1958 Test	Yield, Bu/A Ave. 4 yrs. 1955-58
Clark	52.2	1	-14	1	46	2	16.5	23.9	39.5
Wabash	36.8	6	-14	1	46	2	14.9	22.7	33.9
Perry	40.6	4	10/14	1	45	2.5	15.9	24.5	34.6
Dorman	45.1	3	+10	4	43	1.5	14.2	22.6	38.2
Hood	47.8	2	+10	1	40	1.5	14.9	23.7	40.2 (3Yr.Ave.)
Ogden	38.5	5	+17	1	42	2.5	14.7	20.6	34.8
Lee	33.8	7	+21	1	39	2.5	12.3	20.5	35.2

1/ Yield and performance data are the mean of 3 replications. Oil content was determined from composite sample of 3 replications. Yield data could not be analyzed statistically because replicates were not properly identified at harvest.

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, 1958 - Performance data and related information. Also average yields for 5 years for most varieties.

Location: Lexington, Ky. Farm: Experiment Station - Agronomy Farm. Fertility Level: High

Soil Type: Guthrie silt loam - tile-drained bottomland. Soil Treatment: 8 T Manure/A.

Date Planted: May 26, 1958. Killing Frost: November 7, 1958. Row Width: 36 inches.

Comment: Soybeans were planted near optimum date, came up good stands and made good growth during moist weather of July and August. In the 4 preceding years the tests had been located on upland soil (Maury Silt Loam).

Variety	Yield-1958 ¹ / Bu/A	Rank	Maturity ² / ity	Lodging ³ / ing	Ht. In.	Seed Qual. ⁴	Gm/100 Beans	% Oil 1958 Test	Yield, Bu/A Ave. 5 yr. 1954-58
Lincoln	35.5	4	-10.6	2	47	2	16.5	21.4	27.1
Clark	42.2	1	-9.3	2.3	49	2.5	17.5	21.3	29.7
Wabash	33.2	8	-9.6	2	48	1.5	14.8	20.4	25.6
Perry	38.5	2	10/10	2.6	48	3	16.3	21.0	27.8
Dorman	33.3	7	+16.3	5	51	1	13.3	19.9	24.7 (3 yr. ave)
Hood	38.4	3	+25.3	3	43	1.5	13.2	21.2	31.0 (3 yr. ave)
Ogden	33.6	6	+33	2.6	55	2	16.0	20.4	20.9
Lee	34.9	5	+31	3.3	44	2	14.1	21.1	25.3 (3 yr. ave)

¹/ Mean data of 3 replicates for yield and performance. Oil content from 3 replications composite sample. 1958 yield differences of less than 6.2 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-Soybean Variety Test, Caldwell County, 1958-Performance data and related information.
 Co-operators: West Kentucky Experiment Substation - H. R. Richards & Leo Link
 Location: Princeton, Kentucky.
 Soil: Silt loam - Bottomland.

Soil Treatment: None in 1958; Limed and fertilized liberally in past.

Date Planted: May 22, 1958 Killing Frost: October 29, 1958 Row Width: 36 inches.
 Comment: Test was planted near optimum date. Soybeans came up good stands and grew under good conditions of weather and culture until early August. Drought conditions prevailed after mid-August excepting the 3d week of September and resulted in reduced yields.

Variety	Yield-1958 ^{1/} Bu/A	Rank	Maturity ^{2/}	Lodging ^{3/} In.	Ht. In.	Seed Qual. ^{4/}	Gm/100 Beans	% Oil
Lincoln	26.6	4	- 8	1	49	3	13.2	23.0
Clark	28.4	3	- 4	1	49	2	13.8	23.9
Wabash	31.0	1	- 4	1	50	2	13.4	23.8
Perry	28.8	2	9/24	1	49	3	14.5	22.7
Dorman	20.2	7	+17	2.8	46	1	10.7	22.5
Hood	23.4	6	+25	2	44	2.5	10.8	22.3
Ogden	18.4	8	+36	2	49	2.5	10.7	19.6
Lee	24.5	5	+37	2.6	44	3	9.9	20.9

- ^{1/} Mean data of 3 replicates for yield and performance. Oil Content was determined from composite sample of 3 replications. Yield differences of less than 6.3 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 5-Soybean Dates-of-Planting Test, Henderson County, 1958-Performance data and related information.
 Co-operators: Ohio Valley Soybean Cooperative, Henderson; Owensboro Grain Co.; J. S. Priest and Herman Wood.
 Location: 7 miles S.E. of Henderson, Ky. near Airline Highway: Farm: J. S. Priest; Herman Wood, operator
 Soil: Silt loam (Falaya local alluvium) on drainage ditch - bottomland.

Soil Treatment: Limestone 2 T/A; Fertilizer 0-0-70 lb/A Killing Frost: November 6, 1958 Row Width: 36 in.

Planting Date and Variety	Yield ^{1/} Bu./A	Days to ^{2/} Mature	Lodg- ing ^{3/}	Ht. In.	Seed Qual. ^{4/}	Gms/100 Beans
May 16						
Clark (early maturity)	46.9	123	2	42	2.5	16.3
Exp. Strain (med. maturity)	44.5	152	3.7	41	2.5	12.9
Hood (late maturity)	37.2	168	3.2	40	2	14.5
June 9						
Clark (early maturity)	41.9	114	1.7	37	2.5	16.2
Exp. Strain (med. maturity)	37.3	122	3.5	41	2.5	12.2
Hood (late maturity)	32.0	149	3	40	2	13.6
July 3						
Clark (early maturity)	26.3	121	1.5	24	4	16.4
Exp. Strain (med. maturity)	28.8	131	3.5	29	3	12.3
Hood (late maturity)	25.7	139	2.1	26	2.5	14.8

Mean yields (bu/A) for Dates of Planting and Varieties used

Variety	Planting Date			Variety Means
	May 16	June 9	July 3	
Clark (early maturity)	46.9	41.9	26.3	38.4
Exp. Strain (med. maturity)	44.5	37.3	28.8	36.9
Hood (late maturity)	37.2	32.0	25.7	31.6**
Date Means	42.9	37.1	26.9*	

- ^{1/} Yield & performance data are the mean of 4 replications Experimental design was split-plot. Yield differences required for significance: Date Means = 6.7 bu/A (odds 19:1); Variety Means = 2.7 bu/A (odds 19:1) and 3.7 bu/A (odds 99:1). Thus, only latest date of planting, or use of Hood variety resulted in significantly lower yields.
- ^{2/} Days from planting to maturity.
- ^{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 6 - Soybean yield in Lime & Fertilizer Test. Henderson County 1958

Information on location, co-operators, fertility level, soil type and killing frost date are same as shown in Table 1.

Variety used: Clark

Results of soil test before soil treatment: moderately acid (pH 6.9)

P = High; K = Low

Date planted: May 17, 1958 Row Width: 36 inches

Method of Treatment: Ground limestone and Potash fertilizer were applied broadcast on proper plots after plowing, then disked in lightly to incorporate with soil, just ahead of planting. Phosphate fertilizer treatment was not included because soil tested high in P.

Comment: Soybeans were planted about 1 week before optimum date. They came up good stands and grew under excellent conditions of weather and culture. Plants of all treatments matured at about the same time - September 16 and varied little in height or other visible characteristics.

Treatment	Rate/Acre			Mean Yield Repl. Bu/A
	Limestone, tons	Fertilizer, lb		
	N	P ₂ O ₅	K ₂ O	
0	0	0	0	40.2
2	0	0	0	43.9
0	0	0	80	45.5*
2	0	0	80	45.0*

Yield differences of less than 3.8 bu/A are not significant. (Odds 19:1). Thus, potash treatments with or without limestone resulted in significant yield increases in comparison to the untreated check but limestone alone did not.

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