

Results of the
KENTUCKY SOYBEAN
VARIETY PERFORMANCE
AND
ROW-WIDTH TESTS-1960

By J. F. FREEMAN, H. R. RICHARDS, and S. H. PHILLIPS

PROGRESS REPORT 101
(FILING CODE: 1-1)

UNIVERSITY OF KENTUCKY
AGRICULTURAL EXPERIMENT STATION
DEPARTMENT OF AGRONOMY
LEXINGTON

RESULTS OF THE KENTUCKY SOYBEAN
VARIETY PERFORMANCE AND WIDTH OF ROW

TESTS - 1960

Recommended Varieties:

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

The Soybean Tests

The soybean variety tests reported herein were designed to evaluate varieties which are commonly grown or appear promising for use in Kentucky. The width-of-row test was designed to compare the effect of closer row spacings with the conventional 40-inch spacing upon yield of a medium-early variety (Clark) and a late-maturing variety (Hood). The 1960 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, Ill., are reported in the current progress report of the laboratory.

The location of the various tests is indicated in Fig. 1. The Henderson county tests were located in the main soybean-producing area of the state on bottomlands of a stream which is tributary to the Ohio River. The Fayette county tests were 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. 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 row-width test at Henderson was planted with Clark and Hood varieties each at 24-inch, 32-inch, and 40-inch row spacing with 7 rows, 5 rows, and 4 rows, respectively on plots 12 feet in width. Four replications in randomized block design were used. Twelve seeds per foot of row were planted in plots of all row-widths and the 16-foot section was harvested from each of 2 inner rows for yield.

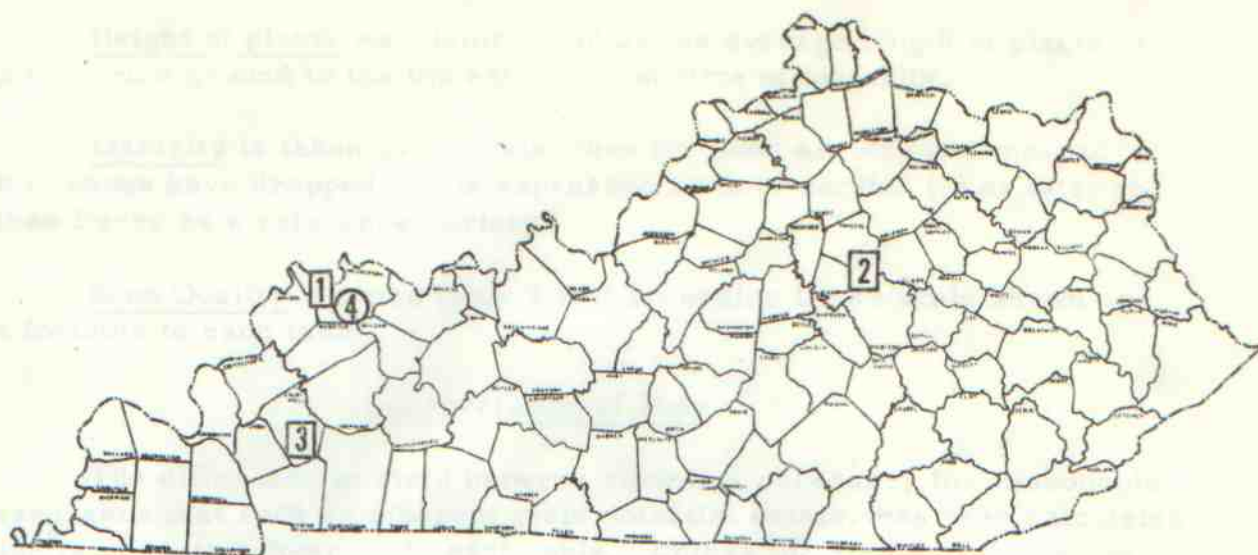


FIGURE 1. LOCATION OF TESTS

- Soybean Variety Test Locations:
- 1 Henderson County, Henderson
 - 2 Fayette County, Lexington
 - 3 Caldwell County, Princeton

- Soybean Row-Width Test Location:
- 4 Henderson County, Henderson

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 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 row spacings 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 row spacing 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 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 cultural 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 1960 except for the width-of-row test in Henderson county where this was the first year.

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.

TABLE 1.-SOYBEAN VARIETY TEST, HENDERSON COUNTY, 1960-PERFORMANCE DATA AND RELATED INFORMATION. ALSO AVERAGE YIELD FOR 7 YEARS FOR MOST VARIETIES

Cooperators: Ohio Valley Soybean Cooperative, Henderson; Owensboro Grain Co., Owensboro; 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: Fertilizer 0-0-80 in 1960. Limestone 2 T/A. Fertilizer 0-0-70 lb/A in 1958.

Date Planted: May 17, 1960 Killing Frost: October 24, 1960 Row Width: 36 inches

Comments: Test was planted near optimum date and fair to good stands resulted. Weather was showery for 6 weeks after planting, dry during July, followed by good rains during first 3 weeks of August after which dry weather prevailed until after harvest time. Downy mildew disease affected Wabash and earlier varieties and lowered quality of seed.

Variety	Yield-1960 ^{1/}		Maturity ^{2/}	Lodg- ing ^{3/}	Ht In	Seed Qual. ^{4/}	Gm/100 Beans	% Oil Test	Yield, Bu/A	
	Bu/A	Rank							Ave.	7 years, 1954-60
Shelby	32.0	10	-12	2.3	39	4	16.7	20.9	31.3	(2 yr. ave)
Lincoln	32.5	8	-11	2	38	4	14.6	21.7	32.7	
Clark	38.4	3	-6	2.2	41	4	16.6	19.8	41.0	
Wabash	29.6	12	-5	2.5	42	4	14.2	20.0	33.7	
Perry	40.0	2	9/26	2.3	45	3	17.3	20.7	37.8	
Kent	40.2	1	+2	1.3	38	3	17.5	20.5	--	
Roe	33.1	6	+4	4.3	47	4	12.2	17.9	--	
Hill	34.6	5	+9	2.7	37	2	10.6	18.8	--	
Dorman	32.0	10	+10	4	41	2	11.4	18.4	34.4	
Hood	32.6	7	+13	2.2	36	2	13.6	18.3	37.1	(5 yr. ave)
Ogden	38.3	4	+17	3.2	48	2.5	14.4	19.0	33.3	
Lee	32.1	9	+20	3.3	41	2.5	11.9	17.6	35.5	(6 yr. ave.)

^{1/} Mean data of 3 replicates for yield and performance. Oil content was determined from a composite sample from the 3 replicates. 1960 yield differences were not significant, (Odds 19:1)

^{2/} Days earlier (-) or later (+) than Perry which matured September 26.

^{3/} Rating scale of 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 - FAYETTE COUNTY, 1960 - PERFORMANCE DATA AND RELATED INFORMATION.
ALSO AVERAGE YIELDS FOR 7 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: 400 lb/A 12-12-12 fertilizer 1959
13 T/A Rotted manure plowed under 1960
Date Planted: May 24, 1960. Killing Frost: October 21, 1960. Row Width: 36 inches.
Comment: Soybeans were planted near optimum date, came up good stands and made good growth during moist weather of June to mid-August but fruiting of medium maturing varieties was hampered by dry weather of late August and early September. In the first 4 of the 7 years the tests had been located on upland soil (Maury Silt Loam)

Variety	Yield-1960 ^{1/} Bu/A	Rank	Matu ^{2/} ing ^{3/}	Lodg ^{3/} ing ^{3/}	Ht. In.	Seed Qual. ^{4/}	Gm/100 Beans	% Oil 1960 Test	Yield, bu/A Ave 7 yr. 1954-60
Shelby	38.4	1	-16	2.2	41	3	16.1	20.1	33.8 (2 yr. ave)
Lincoln	36.9	2	-14	3	37	3	15.1	20.3	28.7
Clark	34.0	5	-3	3	42	3	15.0	18.7	30.7
Wabash	27.0	11	-2	3.2	48	2.5	12.8	18.7	26.1
Perry	30.9	8	9/30	2.3	43	3	12.7	19.0	28.7
Bethel	23.1	12	0	2.8	51	3	12.2	16.8	--
Kent	34.8	4	+3	1.3	43	2	14.2	19.9	--
Hill	30.0	9	+20	4.5	41	2	14.4	18.5	--
Dorman	29.8	10	+23	4.3	44	1.5	15.5	17.9	25.2 (4 yr. ave)
Hood	36.5	3	+27	3.3	41	1	16.7	18.7	29.8 (5 yr. ave)
Ogden	32.0	7	+33	4	48	2.5	17.9	18.4	21.6
Lee	34.0	5	+38	5	44	1.5	14.9	18.7	25.1 (5 yr. ave)

^{1/} Mean data of 3 replicates for yield and performance. Oil content from 3 replications composite sample.
^{2/} 1960 yield differences of less than 5.5 bu/A not significant. (Odds 19:1).

^{3/} Days earlier (-) or later (+) than Perry.

^{4/} 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.

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

TABLE 3.- SOYBEAN VARIETY TEST, CALDWELL COUNTY, 1960 - PERFORMANCE DATA AND RELATED INFORMATION

Co-operators: West Kentucky Experiment Substation - H. R. Richards.
Location: Princeton, Kentucky Soil: Silt loam- bottomland Fertility level: high
Soil treatment: None; limed and fertilized liberally in past.
Date Planted: June 1, 1960. Killing Frost: October 21, 1960. Row Width: 36 inches
Comment: Soybeans were planted about 2 weeks after optimum date, came up good stands and grew off well during the month of hot weather following emergence. Dry weather prevailed during the remainder of the growing season with only 3.25 inches of rainfall during July, August and September.

Variety	Yield - 1960 ^{1/} Bu/A	Rank	Matu ^{2/} ity ^{2/}	Lodg ^{3/} ing ^{3/}	Ht. In.	Seed Qual. ^{4/}	Gm/100 Beans	% Oil	Yield, Bu/A Av. 3. yrs. 1958-60
Shelby	33.6	5	- 4	3	44	3.5	16.5	21.3	32.8 (2 yr ave.)
Lincoln	29.9	9	- 6	2	35	3.0	16.5	21.2	28.8
Clark	35.4	2	- 5	2	41	3.0	17.0	21.2	32.5
Wabash	35.1	4	+ 4	4	46	3.5	16.5	20.5	33.0
Perry	35.2	3	9/19	3	45	3.5	17.5	20.9	33.6
Bethel	33.3	6	+ 2	3	52	3.5	16.0	18.8	--
Kent	41.3	1	+ 6	3	41	2.5	19.5	18.8	--
Hill	28.9	11	+21	3	43	2.0	12.0	18.5	29.3
Dorman	29.8	10	+14	3	46	2.5	14.0	19.4	29.2
Hood	32.3	8	+26	3	37	2.0	14.5	19.6	28.8
Ogden	27.4	12	+26	3	41	2.0	15.0	18.3	26.2
Lee	32.7	7	+32	5	44	2.0	14.5	18.9	31.6

^{1/} Mean data of 3 replicates for yield and performance. Oil content was determined from composite sample of 3 replicates. Yield differences of less than 7.2 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 = 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 4.-SOYBEAN WIDTH-OF-ROW TEST, HENDERSON COUNTY, 1960-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: 1960 - Fertilizer 0-0-80 lb/A
 1958 - Limestone 2 T/A; Fertilizer 0-0-70 lb/A
 Date Planted: May 17, 1960
 Killing Frost: October 21, 1960

Variety	Row Spacing	Yield ^{1/} Bu/A	Days to Mature ^{2/}	Lodg- ing ^{3/}	Ht. In.	Seed Qual. ^{4/}	Cms/100 Beans	% Oil
Clark	24 inch	42.1	118	3.2	45	3	16.2	20.8
Clark	32 inch	45.5	118	2.7	44	3	16.3	20.8
Clark	40 inch	41.7	118	2.7	44	3	16.7	21.5
Hood	24 inch	37.9	148	3	37	1	14.8	19.3
Hood	32 inch	36.6	148	2.7	37	1	14.7	19.1
Hood	40 inch	38.3	148	3	36	1	14.5	18.6

Average yields, bu/A for varieties and row spacings used

Variety	Row Spacings			Mean
	24 inch	32 inch	40 inch	
Clark	42.1	45.5	41.7	43.1
Hood	37.9	36.6	38.3	37.6
Row Spacing Mean	40.0	41.0	40.0	40.3

^{1/} Yield and performance data are the means of 4 replications. Oil content was determined from samples composited from the 4 replications. Experimental plot design was randomized block. Average yield differences for 24 inch-, 32 inch-, and 40 inch row spacings were not significant for either Clark or Hood variety. For the 32 inch row spacing the average yield of Clark was significantly greater than that for Hood but was not so at the 28 inch- or 40 inch spacings. Yield differences required for significance are 5.8 bu/A (Odds 19:1).

^{2/} Days from planting to maturity. Clark matured September 12; Hood matured October 12, 1960.

^{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