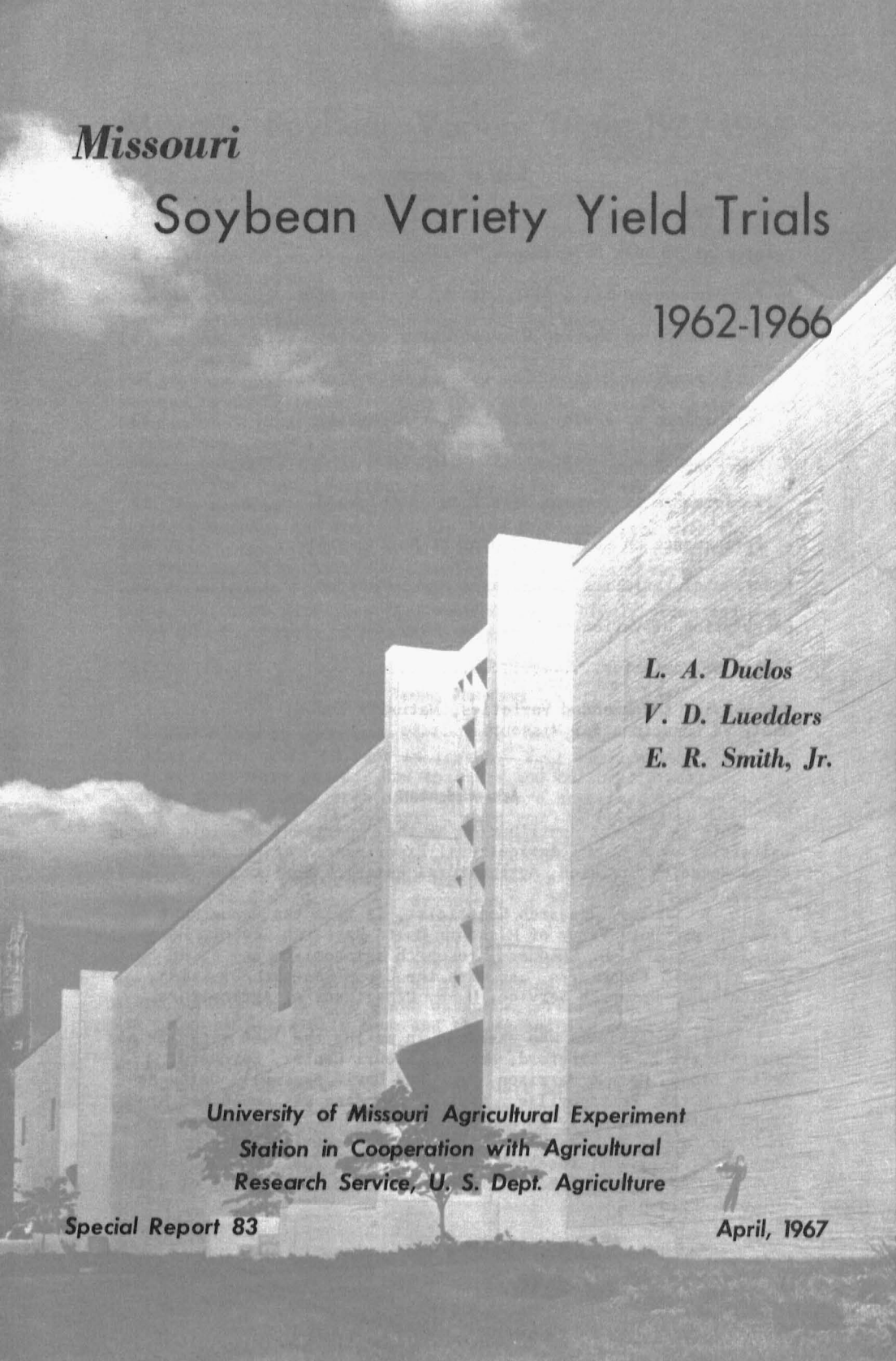

Missouri

Soybean Variety Yield Trials

1962-1966

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University of Missouri Agricultural Experiment Station in Cooperation with Agricultural Research Service, U. S. Dept. Agriculture

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Missouri Soybean Variety Trials, 1962-1966

L. A. Duclos, V. D. Luedders,
and E. A. Smith

In 1966 Missouri ranked third in soybean production in the United States with a harvest of over 85.4 million bushels. This brought Missouri farmers over 180 million dollars (U. S. Department of Agriculture) and made soybeans the number one cash crop in Missouri.

An adequate varietal testing program is essential to provide the soybean growers with a basis for selecting varieties best adapted to their areas. During 1962-1966 the Missouri Agricultural Experiment Station, in cooperation with the U. S. Department of Agriculture, tested varieties which covered maturity groups from extreme northern Missouri to extreme southern Missouri and represented four test locations and five major soil areas.

The results reported herein were obtained at Spickard, Kirksville, Columbia, and Portageville, and are summarized over the past five years. Results from Spickard, Kirksville and Columbia are from the Cooperative Uniform Tests. A separate variety test was conducted at Portageville which included all recommended varieties and other varieties that were formerly widely grown and may still be of interest to Missouri farmers.

Testing Procedures

The tests at Spickard, Kirksville, and Columbia were grown in single row plots 18 feet in length. Four replications of each variety were grown. Row spacings and cultural practices adapted to the local area of the test were practiced throughout the growing season. At maturity, each row was trimmed to 15 feet to eliminate the border effect at the end of the row and to have a uniform plot size on which to estimate yields.

A separate experiment was conducted at Portageville for estimating variety performance. Seventeen to 20 varieties have been tested each year. Three rows, 20 feet in length, of each variety were planted in each of four replications. Before harvest the middle row was trimmed to 15 feet; consequently, the border effect was removed at the sides and at the ends of the row. Two complete variety tests were grown at Portageville each year. One was grown on Salix Silt Loam and the second was grown on Sharkey Clay (gumbo). These soils represent the major portion of the soils in this area.

Planting dates at all locations were normally in early-to mid-May, depending on the local climatic conditions. Planting rates ranged from 45 pounds per acre to approximately 60 pounds per acre, depending on seed size. A stand of approximately ten plants per foot of row was desired.

Weeds were controlled by recommended herbicides as much as possible, and individual plots were cleaned of grass and weeds by hand as needed.

Test plots were checked on a regular schedule to protect against insects and other harmful pests. Disease notes were recorded on each variety as the season progressed.

In the variety test at Portageville, supplementary irrigation provided adequate moisture throughout the growing season. In addition, a starter fertilizer was applied at the Portageville station.

Prior to harvest, notes were taken on maturity, lodging, and height. After harvest, yield was determined and seed quality was rated visually.

A brief explanation of the measured variables follows:

Maturity--A variety was considered mature when approximately 90% of the pods were ripe. Harvesting usually followed the maturity date by 5 to 7 days, depending on weather conditions.

Lodging--Lodging notes were taken at maturity and recorded on a scale of 1 to 5, according to the following degrees of lodging:

1--Almost all plants are erect.
2--Either all plants are leaning slightly, or a few plants are down.
3--Either all plants are leaning moderately, or 25 to 50 per cent of the plants are down.
4--Either all plants are leaning considerably, or 50 to 80 per cent of the plants are down.
5--All the plants are down badly.

Height--Height was determined by measuring the average length from the ground to the tip of the stalks at maturity.

Yield--Yield was determined by weighing the seed and converting weight to bushels per acre. Each 15-foot row was harvested by hand or by a motor-driven mower and threshed in a small plot thresher. Each row was individually bagged and air dried to a uniform moisture before weighing.

Seed Quality--As the seed was weighed a visual seed quality rating was made. Seed coat color, uniformity of size, brightness, wrinkling, and disease prevalence were all considered in the rating. Seed quality was rated from 1 to 5 according to the following scale.

1--very good
2--good
3--fair
4--poor
5--very poor

Results of Soybean Performance Trials

The results of the tests are shown by soil types and areas in Tables 1 through 6 as follows:

Table	Soil Type	Area
1	Salix silt loam	Portageville
2*	Sharkey clay (gumbo)	Portageville
3	Mexico silt loam	Columbia
4	Shelby silt loam	Kirksville
5	Humeston silty clay loam	Spickard
6	Seymour silt loam	Spickard

*1962 and 1963 tests failed due to phytophthora rot.

The relative performances of Custer and Dyer, the two new cyst nematode-resistant varieties, on non-infested soil, are shown in Table 7.

TABLE 1 SOYBEAN YIELDS AND OTHER AGRONOMIC DATA FROM TESTS ON SALIX SILT LOAM AT PORTAGEVILLE

Variety	Yeild	Maturity	Lodging	Height	Seed Quality
		5-year average, 1962-66			
Scott	46.7	9-25	1.9	46	2.4
Kent	46.3	9-24	1.5	44	2.4
Hill	44.2	10-2	2.6	36	1.4
Bethel	41.6	10-1	1.9	50	2.0
Clark	41.6	9-14	1.6	43	2.5
S-100	41.5	10.1	2.4	56	2.5
Lee	40.9	10-24	3.6	40	1.7
Ogden	40.6	10-18	2.1	44	1.6
Hood	40.4	10-17	2.6	40	1.3
		3-year average, 1964-66			
Scott	47.5	9-26	2.3	47	2.5
Kent	45.9	9-25	1.7	44	2.4
Wayne	44.8	9-8	1.7	40	2.3
Hill	44.0	10-3	2.8	36	1.5
Clark 63	43.3	9-16	2.4	45	2.5
Bethel	42.0	10-3	2.2	49	1.8
Delmar	41.6	10-3	2.1	49	1.7
Clark	41.4	9-15	1.8	44	2.3
S-100	40.3	10-2	2.7	55	2.5
Lee	40.1	10-25	3.3	39	1.7
Hood	39.1	10-17	2.9	39	1.3
Ogden	38.4	10-19	2.4	43	1.6
Bragg	37.8	10-30	3.4	55	1.6
		2-year average, 1965-66			
Scott	46.9	9-27	2.5	46	2.7
Dare	44.6	10-14	2.5	39	1.2
Kent	44.6	9-26	1.7	43	2.6
Hill	43.4	10-6	2.8	36	1.5
Bethel	43.1	10-5	2.4	49	1.6
Wayne	43.1	9-8	1.9	38	2.2
Delmar	41.1	10-5	2.2	49	1.4

TABLE 1. (con't)

Variety	Yield	Maturity	Lodging	Height	Seed Quality
			2-year average, 1965-66		
Lee	41.0	10-27	3.3	38	1.8
Hood	40.6	10-18	3.1	40	1.3
Clark 63	40.2	9-17	3.0	43	2.6
Clark	39.6	9-16	2.1	41	2.3
Bragg	39.5	10-30	2.9	57	1.6
Ogden	37.7	10-19	2.5	43	1.6
S-100	37.4	10-4	2.9	56	2.7
			1966 only		
Scott	41.9	10-2	2.0	46	2.8
Wayne	40.9	9-17	1.5	38	3.0
Kent	40.4	10-1	1.5	43	2.5
Hill	39.4	10-6	2.0	36	1.8
Clark 63	39.0	9-24	2.8	43	3.8
Bethel	37.9	10-7	1.8	47	1.8
Dare	37.3	10-14	2.0	39	1.3
Clark	35.6	9-23	1.8	43	3.3
Bragg	34.6	10-27	3.0	62	2.0
Delmar	34.5	10-7	1.5	47	1.5
Lee	33.9	10-23	3.0	39	2.3
Davis	33.1	10-22	2.3	48	1.5
Pickett	32.8	10-22	2.8	37	2.0
Hood	31.8	10-16	3.0	40	1.5
Ogden	30.8	10-18	2.0	43	2.0
S-100	29.7	10-6	2.5	53	3.0

TABLE 2 SOYBEAN YIELDS AND OTHER AGRONOMIC DATA FROM TESTS ON SHARKEY CLAY AT PORTAGEVILLE

Variety	Yield	Maturity	Lodging	Height	Seed Quality
		3-year average, 1964-66			
Hill	37.8	10-3	2.0	34	1.7
Lee	35.1	10-26	2.1	36	1.6
Clark 63	31.4	9-19	1.3	34	2.2
Hood	30.9	10-19	1.9	36	1.6
Ogden	30.9	10-22	1.6	35	1.7
Scott	29.4	9-26	1.0	32	2.8
Bragg	29.2	11-1	2.5	48	1.6
Wayne	29.2	9-11	1.1	33	2.6
Kent	28.5	9-28	1.1	33	3.1
Clark	27.2	9-18	1.2	33	2.8
Delmar	24.3	10-2	1.1	35	2.6
Bethel	23.1	10-2	1.2	36	2.3
S-100	20.1	10-1	1.5	39	2.8
		2-year average, 1965-66			
Dare	37.9	10-18	1.8	33	1.4
Hill	35.6	10-5	2.2	33	1.6
Lee	35.0	10-28	2.1	35	1.6
Bragg	32.1	11-2	2.6	51	1.6
Ogden	29.7	10-24	1.7	35	1.6
Clark 63	27.9	9-18	1.4	33	2.1
Hood	26.8	10-20	2.2	35	1.5
Wayne	26.3	9-13	1.1	31	2.8
Scott	23.8	9-27	1.1	30	2.9
Clark	22.7	9-18	1.3	31	2.9
Kent	22.7	9-30	1.2	30	3.3
Delmar	21.4	10-3	1.2	34	2.4
Bethel	20.1	10-3	1.3	33	2.2
S-100	14.4	10-3	1.7	36	3.0

TABLE 2 (con't)

Variety	Yield	Maturity	Lodging	Height	Seed Quality
			1966 only		
Hill	38.6	10-9	2.0	32	2.0
Dare	37.9	10-21	1.8	34	1.8
Davis	36.1	10-30	2.0	43	1.3
Lee	35.4	10-26	2.0	36	2.0
Ogden	34.3	10-26	1.8	39	2.0
Bragg	31.4	11-3	3.0	52	2.0
Hood	31.4	10-24	2.0	37	1.8
Pickett	31.3	10-28	1.8	29	2.0
Clark 63	31.2	9-23	1.0	34	2.8
Delmar	27.6	10-8	1.0	36	2.0
Wayne	27.5	9-21	1.0	31	3.0
Bethel	27.1	10-8	1.0	37	1.8
Scott	26.9	10-1	1.0	33	2.8
Kent	25.1	10-6	1.0	30	3.0
Clark	24.5	9-25	1.0	30	3.3
S-100	13.1	10-8	1.0	33	3.3

TABLE 3 SOYBEAN YIELDS AND OTHER AGRONOMIC DATA FROM TESTS ON MEXICO SILT LOAM AT COLUMBIA

Variety	Yield	Maturity	Lodging	Height	Seed Quality
		5-year average, 1962-66			
Amsoy	37.7	9-8	-	35	2.4
Harosoy	34.9	9-4	-	34	2.1
Lindarin 63	32.9	9-2	-	31	1.9
Harosoy 63	32.7	9-3	-	35	2.0
Hawkeye 63 [1/]	31.9	9-6	-	35	2.2
Wayne	40.5	9-14	-	37	1.9 [2/]
Shelby	34.9	9-13	-	37	1.7 [2/]
Kent	37.6	10-3	1.6	37	1.9
Clark	37.1	9-23	1.8	38	1.7
Clark 63	36.9	9-24	1.8	38	1.8
		3-year average, 1964-66			
Amsoy	40.5	9-6	-	35	2.5
Harosoy	37.3	8-31	-	34	2.4
Lindarin 63	36.0	8-31	-	32	2.0
Hawkeye 63 [1/]	36.0	9-2	-	38	-
Harosoy 63	34.7	8-30	-	35	2.3
Wayne	43.8	9-12	-	39	2.0
Shelby	36.1	9-10	-	39	1.8
Clark 63	38.1	9-19	1.7	41	2.1
Kent	37.9	9-29	1.5	40	1.8
Clark	37.1	9-19	1.7	40	1.8

TABLE 3 (con't)

Variety	Yield	Maturity	Lodging	Height	Seed Quality
			2-year average, 1965-66		
Amsoy	42.2	9-11	2.7	34	2.8
Harosoy	37.8	9-6	1.8	33	2.4
Lindarin 63	37.4	9-6	1.9	31	2.3
Harosoy 63	36.2	9-5	2.2	34	2.3
Wayne	48.0	9-18	3.5	38	2.0
Shebly	39.4	9-16	3.5	38	2.0
Kent	41.5	10.5	1.5	40	1.8
Clark 63	41.3	9-24	1.9	41	2.1
Bellati L-263	40.9	9-24	1.8	39	1.9
Clark	38.8	9-24	1.7	39	1.8
			1966 only		
Amsoy	43.5	9-9	1.6	34	1.8
Lindarin 63	40.7	9-7	1.5	32	1.7
Harosoy	39.1	9-6	1.6	32	2.0
Harosoy 63	37.9	9-5	2.3	32	1.9
Wayne	50.4	9-16	2.9	39	1.8
Adelphia	42.0	9-16	1.4	36	1.5
Shelby	39.6	9-14	3.4	40	1.7
Bellati L-263	46.2	9-22	1.3	41	1.4
Kent	44.0	10-3	1.3	41	1.7
Clark 63	43.6	9-21	1.8	43	1.6
Clark	41.1	9-22	1.6	41	1.5
Scott	39.3	10.6	1.7	42	2.0
Delmar	39.3	10.7	1.2	42	1.8
Custer	35.0	10.5	2.1	44	2.0

TABLE 4 SOYBEAN YIELDS AND OTHER AGRONOMIC DATA FROM TESTS ON SHELBY SILT LOAM AT KIRKSVILLE IN 1965

Variety	Yield	Maturity	Lodging	Height	Seed Quality
Amsoy	38.3	10-7	2.4	39	2.3
Harosoy	34.9	10-2	2.4	38	2.2
Lindarin 63	34.7	10-1	1.8	34	2.2
Hawkeye 63	33.9	10-6	1.9	39	2.1
Harosoy 63	32.0	9-30	2.6	39	2.0
Shelby	41.3	10-9	1.9	37	1.1
Wayne	37.6	10-10	2.1	35	1.2

TABLE 5 SOYBEAN YIELDS AND OTHER AGRONOMIC DATA FROM TESTS ON HUMESTON SILTY CLAY LOAM AT SPICKARD IN 1966

Variety	Yield	Maturity[1/]	Lodging	Height	Seed Quality
Amsoy	42.9		3.7	43	1.7
Lindarin 63	39.2		3.4	36	1.7
Harosoy	35.1		3.4	40	2.0
Harosoy 63	34.3		3.3	39	1.9
Adelphia	47.8		1.8	43	2.1
Wayne	45.6		2.3	45	2.2
Shelby	43.0		2.9	46	2.5
Clark 63	36.5		3.2	49	2.5
Clark	36.3		2.9	47	2.5

[1/] Maturity Dates not Ava'' ''

TABLE 6 SOYBEAN YIELDS AND OTHER AGRONOMIC DATA FROM TESTS ON SEYMOUR SILT LOAM AT SPICKARD IN 1966

Variety	Yield	Maturity[1/]	Lodging	Height	Seed Quality
Amsoy	43.9		2.1	41	1.9
Harosoy	43.4		2.6	41	1.7
Harosoy 63	40.1		2.6	38	1.6
Lindarin 63	37.1		2.4	34	1.7
Adelphia	45.0		1.4	40	1.8
Wayne	43.7		2.2	41	1.8
Shelby	42.6		2.8	43	1.9
Clark	40.1		2.1	43	2.5
Clark 63	38.3		3.4	44	2.8

[1/] Maturity Dates not Available

TABLE 7 SOYBEAN YIELDS AND OTHER DATA COMPARING CUSTER WITH SCOTT AND CLARK 63 (1966) AND DYER WITH HILL (1965-66 AVERAGES) WHEN GROWN ON CYST NEMATODE-FREE SOILS AT PORTAGEVILLE

Variety	Yield	Maturity	Lodging	Height	Seed Quality
			Salix silt loam		
Clark 63	40.0	9-24	2.0	43	3.2
Custer	43.4	9-24	2.6	50	2.6
Scott	40.6	10-4	2.2	48	2.5
Hill	41.6	10-6	2.9	35	1.8
Dyer	44.6	10-9	2.9	35	1.5
			Sharkey clay		
Clark 63	29.9	9-27	1.7	33	2.3
Custer	30.9	10.4	2.0	41	2.8
Scott	33.0	10-7	2.0	40	3.0
Hill	34.4	10-7	2.2	33	1.3
Dyer	26.2	10-10	2.2	29	2.0

TABLE 8 REACTION OF VARIETIES TO DISEASES AND NEMATODES

Group Maturity	Bacterial Pustule	Phytophthora Rot	Pod and Stem Blight	Cyst Nematode	Root-Knot Nematode
Lindarin	S	S	S	S	S
Lindarin 63	S	R	S	S	S
Harosoy	S	S	S	S	S
Harosoy 63	S	R	S	S	S
Hawkeye	S	S	S	S	S
Hawkeye 63	S	R	S	S	S
Amsoy	S	S	S	S	S
Shelby	S	S	S	S	S
Wayne	R	R*	S	S	S
Adelphia	S	S	R	S	S
Bellati L-263	S	S	S	S	S
Clark	S	S	S	S	S
Clark 63	S	R	S	S	S
Kent	S	S	S	S	S
Scott	R	S	S	S	S
Custer	R	R	S	R	S

TABLE 8 (con't)

Group Maturity	Bacterial Pustule	Phytophthora Rot	Pod and Stem Blight	Cyst Nematode	Root-Knot Nematode
Dyer	R	S	S	R	R
S-100	S	S	S	S	S
Delmar	S	S	S	S	R
Bethel	S	S	R	S	R
Hill	R	R*	S	S	R
Dare	R	R*	S	S	S
Hood	R	S	S	S	S
Ogden	S	S	S	S	S
Pickett	R	S	S	R	S
Davis	R	R*	S	S	S
Lee	R	R*	S	S	S
Bragg	R	R*	S	S	R

S - Susceptible
R - Resistant
R* - Field Tolerant

Description of Varieties

Lindarin has gray pubescence, purple flowers, brown pods, and yellow seeds with buff seed scars. It is normally about four inches shorter than Harosoy. Maturity date is usually during the first week in September.

Harosoy has gray pubescence, purple flowers, brown pods, and yellow seeds and seed scars. Its average height is about 35 inches. Maturity date is usually during the first week of September.

Hawkeye has gray pubescence, purple flowers, brown pods, and yellow seeds with brownish-black seed scars. Growth type and plant appearance are similar to Harosoy. Maturity date is approximately three days later than Harosoy.

Lindarin 63, Harosoy 63 and Hawkeye 63: These varieties are similar to the above with the exception that they are phytophthora rot resistant. Appearance, maturity, height, and lodging are similar to their counterparts.

Amsoy has gray pubescence, purple flowers, tan pods, and yellow seeds and seed scars. It has shown a high yielding ability in yield trials. Maturity date is between the first and second week of September.

Shelby has tawny pubescence, purple flowers, brown pods, and yellow seeds with black seed scars. It is an older variety; however, it has maintained a high yield average over this period of testing. Maturity date is during the middle of September.

Wayne has tawny pubescence, white flowers, brown pods, and yellow seeds with black seed scars. It has shown good agronomic characteristics and yield performance. Maturity date ranges from the second week in September in southern Missouri to the third week in northern Missouri.

Adelphia has gray pubescence, white flowers, tan pods, and yellow seeds with buff seed scars. Maturity date is normally mid-September.

Bellati L-263 was selected from a field of Bavender Special by Mr. Louis Bellati, Mt. Pulaski, Ill. It is similar to Clark in appearance, maturity, standability, and yield.

Clark has tawny pubescence, purple flowers, brown pods, and yellow seeds with black seed scars. Maturity date ranges from Mid-September to the third week of the month.

Clark 63 is similar to Clark with the exception of its being resistant to phytophthora rot and bacterial pustule.

Kent has a tawny pubescence, purple flowers, brown pods and yellow seeds with black seed scars. It normally matures during the third week of September.

Scott has gray pubescence, purple flowers, brown pods, and yellow seeds with imperfect black seed scars. It normally matures during the last week of September.

Custer was released in 1967. It is similar to Scott in appearance, although slightly earlier and taller. Custer is resistant to phytophthora rot and to soybean cyst nematodes.

Dyer was released in 1967. It has tawny pubescence, purple flowers, tan pods, and yellow seeds with black seed scars. It is resistant to both the root-knot and cyst nematodes and has yielded 45 per cent more than Hill on cyst nematode-infested land. It is slightly later and somewhat more susceptible to phytophthora rot than Hill.

S-100 is an old variety that originated from a farmer's selection. It has gray pubescence, white flowers, and yellow seeds with light brown seed scars. It normally matures during the first week of October.

Delmar has gray pubescence, white flowers, brown pods, and yellow seeds and seed scars. It is resistant to root-knot nematodes. Maturity date is usually during the first week of October.

Bethel has gray pubescence, white flowers, and yellow seeds and seed scars. It normally matures during the first week of October.

Hill has tawny pubescence, white flowers, brown pods, and yellow seeds with brown seed scars. It normally matures during the first week of October.

Dare has gray pubescence, white flowers, tan pods, and yellow seeds with buff seed scars. This variety is relatively new and has shown good agronomic characteristics and yielding ability. It normally matures during mid-October.

Hood has gray pubescence, purple flowers, and yellow seeds with buff seed scars. The maturity date is normally during mid-October.

Ogden has gray pubescence, purple flowers, brown pods, and green seeds with imperfect black seed scars. Maturity normally occurs during the third week of October.

Pickett is similar to Lee except for gray pubescence and resistance to cyst nematodes. It is somewhat more susceptible to phytophthora so it should be grown only on the lighter soils infested with cyst nematodes.

Davis has gray pubescence, white flowers, tan pods, and yellow seeds with buff seed scars. This variety is well suited for production on clay soils. Maturity normally occurs during the last week of October.

Lee has tawny pubescence, purple flowers, tan pods, and yellow seeds with black seed scars. This variety is well liked for its shatter resistance. Maturity normally occurs during the last week of October.

Bragg has tawny pubescence, white flowers, brown pods, and yellow seeds with black seed scars. This variety is the latest maturing variety in the Missouri yield testing program. Maturity normally occurs during the last week of October or the first week of November.

Choice of Varieties

The primary purpose of the Missouri soybean variety trials is to provide data on the relative performance of soybean varieties being grown in Missouri. The data should aid farmers in making a choice of varieties for their soybean crop.

The farmer should first choose a variety of suitable maturity for his area. Figure 1 shows the maturity zones of the varieties adapted in Missouri. Only the varieties recommended by the College of Agriculture, University of Missouri, are included. Soybeans are extremely sensitive to day length. As the daylight hours begin to shorten, certain chemical changes take place within the plant which cause the initiation of flowering. Early-maturing varieties begin flowering and mature at longer day lengths than late-maturing varieties. Therefore, if a variety adapted to north Missouri is grown in south Missouri, it will likely mature too early to have time for sufficient seed set, thus lowering yield considerably. However, in some cases an early variety will outyield later varieties. If planting is delayed, late maturing varieties should be planted.

Other factors farmers must consider are yielding ability within a maturity zone, resistance to diseases, nematodes most common in the area, and resistance to lodging and shattering. They should also attempt to select a variety which is most suitable for the soil types of their farms. Many farmers may find that certain varieties perform well for themselves, but not others, due to differences in cultural practices such as tillage, weed control, irrigation, and crop rotation.

Finally, the price of seed should be considered in its proper perspective: For every five dollars per bushel increase in seed cost, an increase in yield of at least two bushels is needed to cover the cost.

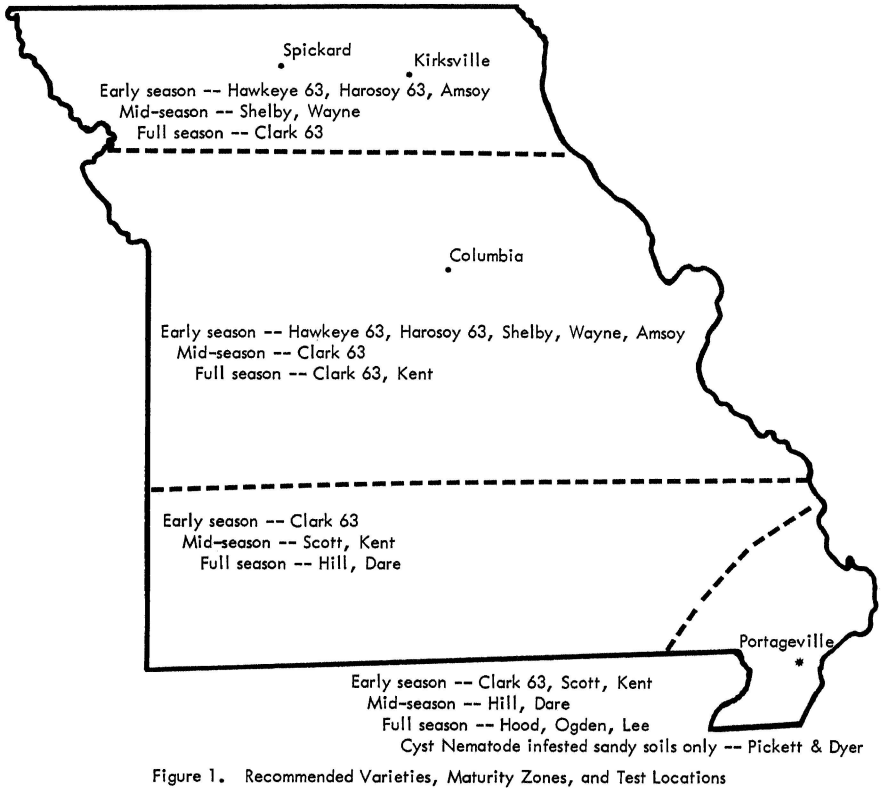

Figure 1. Recommended Varieties, Maturity Zones, and Test Locations