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Response of Soybean Varieties to Different Planting Dates in Southeastern Kansas

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Soybeans are a major crop for farmers in southeastern Kansas. Because of the longer growing season and the capability to grow doublecrop soybeans after wheat, varieties of varying maturity are planted over a wide range of planting dates. Typically, full season varieties are planted from mid-May until early June, while a considerable acreage of doublecrop soybeans are planted from late June until mid-July if adequate soil moisture is available for seed emergence. This experiment was conducted to determine the optimum planting date for selected varieties from maturity groups III, IV, and V, which are representative of the maturities commonly produced in southeastern Kansas.

Procedure

The study was conducted on a silt loam soil at the Southeast Kansas Branch Station (Columbus field) in Cherokee County over a 5-year period from 1976-1981. Five soybean varieties (Williams - Group III, DeSoto - early Group IV, Crawford - late Group IV, Essex - early Group V, and Forrest - late Group V)

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were planted on five different dates from late May until mid-July (Table 1). Varieties were planted in 30-inch rows with a seeding rate of 8 to 10 seeds per foot of row and were grown under dryland conditions. Data were collected for yield, seed characteristics, flowering and maturity dates. Yield results in 1980 were not included because of extremely dry conditions and poor yields.

Yield Results

The optimum planting period to obtain maximum yields varied according to the maturity of individual varieties. Highest average yields for all varieties, however, were obtained with a mid-June planting (Table 2).

Forrest, a later maturing variety, gave maximum yields when planted from late May to mid-June. Planting Forrest beyond late June in extreme southeastern Kansas resulted in substantially lower yields and also delayed harvest until late October or early November.

Medium to medium-late maturities, such as Crawford and Essex, could be planted over a longer period than early or late maturing varieties without reducing yields substantially. Yields for Essex and Crawford were nearly equal for most planting dates, with the exception that Essex yielded more than Crawford for the late May planting while Crawford was slightly better than Essex for the mid-July planting date.

Early maturing varieties, like Williams and DeSoto, gave highest yields when planted in mid- to late June. Shorter season varieties generally had a lower yield potential than medium and full season varieties because they were flowering and filling the seed pod during the hotter and drier period of late summer.

Seed Size, Seed Quality, and Plant Height Results

Seed size for all varieties generally decreased after the early July planting (as shown by more seeds/lb, Table 2). Highest seed quality for all varieties, except Forrest, was obtained with the mid- to late June planting. Forrest had the best seed quality when planted in late May. As planting date was delayed, plant height of all varieties decreased.

Table 1. Planting dates for soybean varieties.

Planting time	1976	1977	1978	1979	1981	Avg.
Late May - Early June	6/4	5/27	6/2	5/30	6/3	May 31
Mid-June	6/16	6/10	6/13	6/15	6/12	June 13
Late June	6/24	6/23	6/26	6/25	6/23	June 24
Early July	7/8	7/5	7/2	7/9	7/7	July 6
Mid-July	7/16	7/18	7/17	7/20	7/15	July 17

Table 2. Effects of planting dates on yield, seed quality, seed weight, and plant height of five soybean varieties, Southeast Kansas Branch Experiment Station (Columbus Field), 1976-1981.

Planting date	Williams	DeSoto	Crawford	Essex	Forrest	Avg.
Yield - bu/a						
Late May	24.1	22.2	25.2	28.0	29.7	25.8
Mid-June	27.7	26.2	28.0	28.0	30.0	28.0
Late June	25.7	25.3	27.3	28.2	27.8	26.9
Early July	23.2	23.7	25.2	25.2	23.8	24.2
Mid-July	16.7	17.9	19.3	18.0	16.7	17.7
Avg.	23.5	23.1	25.0	25.5	25.6	
Seed weight - seeds/lb						
Late May	2951	2786	3020	3655	4092	3301
Mid-June	2843	2889	3159	4022	4126	3408
Late June	2891	2889	3054	3954	4416	3441
Early July	3085	3106	3271	4205	4406	3615
Mid-July	3189	3234	3438	4309	4577	3749
Avg.	2992	2981	3188	4029	4323	
Seed quality rating ¹						
Late May	2.3	2.4	1.8	1.7	1.7	2.0
Mid-June	1.8	1.9	1.6	1.4	2.1	1.8
Late June	1.5	1.6	1.6	1.3	2.5	1.7
Early July	1.9	2.1	1.9	1.6	2.3	2.0
Mid-July	2.2	2.3	2.4	2.1	2.9	2.4
Avg.	1.9	2.1	1.9	1.6	2.3	
Plant height at maturity - inches						
Late May	29	30	31	25	33	30
Mid-June	27	28	32	25	32	29
Late June	26	28	31	26	32	29
Early July	25	26	29	24	30	27
Mid-July	21	22	25	20	26	23
Avg.	26	27	30	24	31	

Seed rating: 1 = excellent, 5 = poor

Table 3. Flowering dates, number of days from planting to flowering, maturity dates, and number of days from planting to maturity of five varieties of soybeans as affected by planting dates, Southeast Kansas Branch Experiment Station (Columbus Field), 1976-1981.

Planting date	Williams		DeSoto		Crawford		Essex		Forrest	
	Flowering date and number of days from planting to flowering.									
Late May	July 15	(45)	July 16	(46)	July 18	(48)	July 28	(58)	Aug 1	(62)
Mid-June	July 25	(42)	July 26	(43)	July 29	(46)	Aug 6	(54)	Aug 10	(58)
Late June	Aug 3	(40)	Aug 4	(41)	Aug 6	(43)	Aug 14	(51)	Aug 18	(55)
Early July	Aug 13	(38)	Aug 14	(39)	Aug 15	(40)	Aug 21	(46)	Aug 26	(51)
Mid-July	Aug 22	(36)	Aug 23	(37)	Aug 24	(38)	Aug 30	(44)	Sept 4	(49)
	Maturity date and number of days from planting to maturity.									
Late May	Sept 23	(115)	Sept 25	(117)	Sept 30	(122)	Oct 5	(127)	Oct 9	(131)
Mid-June	Sept 25	(105)	Sept 27	(107)	Oct 2	(112)	Oct 9	(119)	Oct 15	(125)
Late June	Sept 30	(98)	Oct 1	(99)	Oct 7	(105)	Oct 15	(113)	Oct 21	(119)
Early July	Oct 7	(91)	Oct 8	(92)	Oct 15	(99)	Oct 24	(108)	Oct 31	(115)
Mid-July	Oct 14	(86)	Oct 15	(87)	Oct 21	(93)	Oct 30	(102)	Nov 7	(110)

Effect of Planting Date on Flowering and Maturity

The number of days from planting to flowering, as well as from planting to maturity, declined with each successively later planting date for all varieties (Table 3). Except for the mid-July planting of Essex and the July planting of Forrest, the growing season was long enough for all varieties to mature normally before the first killing frost date (Oct. 22) in extreme southeastern Kansas.

Summary

Soybeans can be planted in southeastern Kansas over a wide range of planting dates without reducing yields substantially, provided adequate moisture is available during the reproductive stage of growth.

Varieties of late Group IV and Group V maturity generally have given the highest average yields. The optimum planting date for a given variety, however, will depend on its specific maturity range. The farmers intended cropping rotation also will affect what variety or maturity group is selected for the specific planting period. For example, where full season soybeans are planted in late May or early June, Forrest or Essex maturity normally would be expected to give highest production. Whereas, Crawford maturity would be a better selection for doublecrop soybeans planted in late June or early July. Essex would give good production in both systems. In either cropping situation, the soybeans would be mature by mid-October for the farmer who chooses to plant wheat in the fall after soybean harvest.

In summary, planting several varieties of soybeans to spread out the time of maturity is a good form of crop insurance with the unpredictable rainfall pattern experienced in southeastern Kansas.

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