

EFFECTS OF TILLAGE SYSTEMS ON YIELD OF SOYBEAN VARIETIES

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Alabama had 1.5 million acres in soybeans in 1983 and 18 percent was in conservation tillage. Much research has been done with tillage systems with one or two soybean varieties. However additional research, using a large number of soybean varieties is needed to determine if varieties respond differently among various tillage systems. In 1983, a study was conducted at the E.V. Smith Research Center to see if an interaction exists between tillage systems and varieties.

Tillage systems were conventional tillage, no-till, and no-till with in-row subsoiling. Varieties used are listed in Table 1. All plots were planted June 10 with a John Deere Flex 71¹ planter. No-till plots were planted in wheat stubble with a fluted coulter and no-till with in-row subsoiling were planted with a Brown-Harden¹ ro-till(9-inch subsoil depth). Conventional tillage plots were moldboard plowed and disked 6 weeks prior to planting, then rototilled before planting.

One year's data indicated some soybean varieties responded differently among tillage systems. Some soybean varieties had higher yields when grown with conventional tillage than either of the no-till systems, except for Ransom and Wright which yielded the same on the no-till subsoil as the conventional tillage. These varieties are listed in Table 2. With these varieties, conventionally grown soybeans had a yield range from 22.7 to 36.7 bu./acre; no-till, in-row subsoiling was next with yields from 19.2 to 35.9 bu./acre; and no-tillage was lowest with yields from 15.2 to 31.5 bu./acre. The highest yielding variety with conventional tillage was Coker 156; with no-till, in-row subsoiling was Ransom; and with no-tillage was Wright.

Some soybean varieties (Table 3) had their highest yields with no-tillage and lowest with conventional tillage. Soybean yields with no-tillage ranged from 27.2 to 36.4 bu./acre; yields with no-till plus in-row subsoiling ranged from 26.6 to 34.6 bu./acre; and yields with conventional tillage ranged from 21.4 to 30.1 bu./acre. Cobb was the highest yielding variety regardless of tillage system.

¹Mention of trademark name or proprietary product does not constitute a guarantee or warranty of the product by Auburn University and does not imply its approval to the exclusion of other products that may also be suitable.

Yields of some soybean varieties were the same for all tillage systems (Table 4). Varieties unaffected by the three tillage systems studied included Braxton, Coker 237, and Coker 488. These varieties averaged 35.6 bu./acre across tillage practices.

The data reported are only for one year, thus more testing is needed before any conclusions about variety reaction can be made. This is due to the reaction of varieties with the environment and the tillage system. However, the data do indicate varieties respond differently under various tillage practices. This test will be repeated in future years, primarily because it appears that with some varieties no-tillage without the use of expensive in-row subsoiling may be possible.

Table 1. Soybean Varieties and Maturity Groups

Maturity group	Variety
V	Bay, Bedford, Coker 355, Forrest
VI	Centennial, Coker 156, Davis, Tracy M
VII	Braxton, Coker 237, Ransom, Wright
VIII	Cobb, Coker 338, Coker 488, Hutton

Table 2. Soybean Varieties Which Yielded Higher on Conventional Tillage

Variety	Yield per acre		
	Conventional	No-till, subsoil	No-till
	<u>Bu.</u>	<u>Bu.</u>	<u>Bu.</u>
Bay	22.7	19.2	19.7
Bedford	26.8	23.3	21.6
Centennial	35.1	32.9	28.9
Coker 156	36.7	32.7	29.3
Coker 355	27.7	25.9	21.1
Davis	35.0	33.4	26.5
Forrest	31.9	25.5	15.2
Ransom	34.8	35.9	31.4
Tracy M	35.0	23.0	19.6
Wright	33.0	34.6	31.5

Table 3. Soybean Varieties Which Yielded Higher on No-till

Variety	Yield per acre		
	Conventional	No-till, subsoil	No-till
	<u>Bu .</u>	<u>Bu.</u>	<u>Bu .</u>
Cobb	30.1	34.6	36.4
Coker 388	26.9	30.5	29.4
Hutton	21.4	26.6	27.2

Table 4. Soybean Varieties For Which Yields Were Not Affected by Tillage Systems

Variety	Yield per acre		
	Conventional	No-till, subsoil	No-till
	<u>Bu .</u>	<u>Bu .</u>	<u>Bu .</u>
Braxton	35.4	35.7	36.8
Coker 237	35.5	36.4	34.4
Coker 488	34.5	36.0	35.3