

## SELECTED SOYBEAN VARIETY RESPONSE TO CONVENTIONAL AND NO TILLAGE

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**ABSTRACT:** Previous research indicated soybean varieties may differ in their yield response to tillage. Therefore, a study was conducted on a Catalpa silty clay loam soil evaluating yield response of 16 highly productive varieties to tillage (no-tillage and conventional tillage). Three varieties were maturity group (MG) IV and 13 were MG V. The conventional tillage system was field cultivated twice in April followed by a doall in late April. Due to a 3-week dry period in July and August, yields were lower. The study mean yield was 23 bu/ac. The data indicated yield differences for tillage and varieties with no interaction between varieties and tillage. Conventional tillage produced 12% more yield than no tillage. Averaged over tillage, DP 4748S yield of 28.5 bu/ac was higher than all other varieties except DP 5655 and DP 3588. Bloom dates for the maturity IV varieties were 6/18/01 and 7/06/01 to 7/13/01 for maturity group V varieties. Maturity was 9/22/01 and 10/03/01 to 10/11/01 for maturity group IV and V varieties, respectively.

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**KEY WORDS:** Soybean, varieties, tillage, no-till.

**MATERIALS AND METHODS:** A soybean variety tillage study was conducted on a Catalpa silty clay loam soil in 2001, Verona, Mississippi. The experimental design was a split plot with tillage as main plot and soybean varieties as subplot. Plot size was 2 rows (30 inch) x 30 ft. The tillage treatments were no tillage and conventional tillage. The conventional tillage system was field cultivated twice in April followed by a doall in late April. Both systems were planted no till. Phosphorous and potassium fertilizer applications were based on soil test recommendations. The whole study received 200 lb/ac of potash (K<sub>2</sub>O) on 10/30/00. The conventional tillage plots were field cultivated twice on 4/22/01, followed by harrow on 4/28/01. Except for the burndown herbicide application, weed control management was applied uniformly to the whole study. The no-tillage area received a burndown herbicide application of Roundup (glyphosate) + 2,4-D at 1.0 + 0.95 lb ai/ac on 4/21/01. The study was planted on 5/08/01 with a John Deere 7000 planter equipped with cone planter units.

Gramoxone + Squadron (imazaquin + pendimethalin) + surfactant at 0.75 + 0.89 lb ai/ac + 0.5 pt/ac was applied preemergence to the whole study on 5/08/01. First Rate (chloransulam) + surfactant at 0.25 oz ai/ac + 0.2 pt/ac was applied postemergence to the entire study 6/13/01 and repeated 6/27/01. Orthene (acephate) at 0.27 lb ai/ac was applied 6/27/01 for grasshopper control.

Bloom dates, maturity dates, and plant height at maturity were recorded for all the varieties. The 2 rows of each variety were harvested with a plot combine within 5 days after maturity for grain yield. Following harvest, the grain was weighed and seed moisture was determined with a Dickey John ® GAC II grain analyzer. Treatment means were separated using Fisher Protected LSD at the 5% probability level.

**RESULTS AND DISCUSSION:** The environmental growing conditions were highly variable with normal temperatures and highly variable rainfall. No rainfall occurred from May 1 through May 26 and from July 13 through August 6. The 3 week dry period in July and early August resulted in low yield. Sixteen productive varieties (MG IV and MG V) evaluated in a no-till and conventional tillage environment had a study mean yield of 23 bu/ac. The results indicated yield differences between tillage systems and varieties with no variety by tillage interaction. Conventional tillage produced 12% more soybean than no tillage. Averaged over tillage system, DP 4748 S yield of 28.5 bu/ac was higher than all other varieties except DP 5655 and DP 3588. Bloom dates for the Maturity Group IV varieties were about 6/18/01, and 7/06/01 to 7/13/01 for the Maturity Group V varieties.

Maturity dates for maturity group IV varieties was about 9/22/01, and 10/03/01 to 10/11/01 for the Maturity Group V varieties, respectively.

**Table 1.** Selected soybean varieties response to tillage systems on a Catalpa silty clay loam soil in 2001, Verona, MS.

Variety	Bloom date	Maturity date	Conventional		Mean
			No-till	tillage	
			-----bu/ac-----		
DP 4748-S	6/18	9/22	28.4	28.5	28.5
DP 3588	7/09	10/11	23.7	30.2	27.0
DP 5655	7/09	10/03	26.6	27.5	27.0
TV 5495	7/13	10/11	25.2	24.5	24.8
Bolivar	7/06	10/11	21.0	28.3	24.7
A 5959	7/14	10/11	23.8	25.5	24.6
DP 5915RR	7/13	10/11	24.5	24.8	24.6
DP 5354	7/09	9/30	21.7	24.5	23.1
HY 574	7/09	10/10	22.7	23.5	23.1
P 9594	7/06	10/11	20.8	23.4	22.3
TV 5486RR	7/13	10/11	19.9	23.9	21.9
TV 4975	6/21	9/22	20.8	22.5	21.6
NKS 59-V6RR	7/13	10/11	19.3	23.1	21.2
DP 3478	6/18	9/20	18.9	23.0	21.0
DP 5806RR	7/09	10/11	20.6	20.3	20.5
P 95B53	7/06	10/03	<u>16.2</u>	<u>22.5</u>	19.4
Mean			22.1	24.8	
		Grand mean: 23.4			
		Variety LSD (0.05): 2.9			
		Tillage LSD (0.05): 2.5			
		Variety x Tillage LSD (0.05): NS			
		% CV: 12.4			