

COTTON GROWTH AND YIELD RESPONSE TO TILLAGE ON A LEEPER SILTY CLAY LOAM SOIL

N. W. Buehring¹, M. P. Harrison¹, and R. R. Dobbs¹

¹Northeast Mississippi Branch Experiment Station; North Mississippi Research and Extension Center; Mississippi State University; Verona, MS 38879

ABSTRACT: A study was conducted in 2001 to evaluate cotton response to no-tillage and a fall under-the-row deep tillage (paratill-bed-roller) stale seedbed system on a Leeper silty clay loam soil. The no-tillage plots had not been tilled since the fall of 1999. Cotton growth 8 weeks after planting indicated the fall paratill-bed-roller system had a greater number of nodes and plant height than no-tillage. However, percent lint turnout and the lint yield average of 1111 lb/ac indicated no difference between no-tillage and fall paratill-bed-roller system.

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MATERIALS AND METHODS: A field study was conducted in 2001 evaluating cotton growth and yield response to no-tillage and a fall under-the-row deep tillage (paratill-bed-roller stale seedbed) system. The no-tillage plots had not received any tillage since the fall of 1999. The study was conducted as a randomized block design with eight replications. Plot size was 4 (38 inch) row by 600 ft.

Fertilizer (P and K) nutrients were applied based on soil test recommendations. Soil test results indicated a high level of P and medium K level. Potash (K₂O) at 200 lb/ac was applied broadcast to the soil surface over the entire area on 11/03/01. Liquid N (32% N) at 90 lb N/ac was applied sidedress (6 inches from the row and 2 inches deep) to cotton on 6/20/01. The fall paratill-bed-roller treatment was applied 11/22/00. The beds were rebudded 12/11/00. A doall/row conditioner (implement equipped with rolling cutter bars, drag harrow, and drag board) was applied to the paratill bed plot 5/23/01, prior to planting. After planting, all weed control was done with either postemergence or post-direct broadcast herbicide applications.

A burndown application of Roundup (glyphosate) at 1 lb ai/ac was applied to the no-tillage plots 3/27/01. Glyphos (glyphoste) at 1.2 lb ai/ac was applied to the entire study on 4/20/01. SG 501BR cotton variety at 4 seed/ft of row was planted 5/23/01. Temik (aldicarb) 15G and Ridomil (mefenoxam) 11G at 0.5 + 0.88 lb ai/ac was applied in-furrow at planting. Roundup Ultra Max (glyphosate) at 1.0 lb ai/ac was applied postemergence on 6/12/01 and repeated as a post directed broadcast application on 6/28/01 and 7/10/01.

Major cotton insect pests were tarnish plant bugs (*Lygus lineolaris*), bollworm (*Helicoverpa zea*), and budworm (*Heliothis virescens*). Insecticide applications at 5 gpa, with TX VS-4 nozzle, 40 psi, and 4 mph rate of travel were made when insect pests were at threshold or above threshold. This was determined by twice a week scouting program. Bidrin (dicotophos) at 0.5 lb ai/ac was applied 6/11/01 and repeated 6/28/01 and 7/10/01. Pix (mepiquat chloride) at 0.022 lb ai/ac was applied 7/13/01. Cotton was defoliated 9/28/01 with Finish (ethephon + cyclanilide) + Free Fall (thidiazuron) at 1.0 + 0.125 + 0.083 lb ai/ac on 9/21/01.

The center 2 rows of each plot were harvested with a 2-row spindle picker on 10/23/01. Seedcotton grab samples (0.5 lb/plot) were taken after the plot weights were recorded. These were ginned with an 8-saw sample gin to determine percent lint turnout and lint yield. Plant height and node counts were recorded 7/16/01 for 10 consecutive plants selected at random in the center 2 row of each plot. Plant population data was taken from six 3-ft of row samples in each plot on 7/16/01. All data was subjected to analysis of variance and means were separated using Fisher's Protected LSD at the 5% probability level.

RESULTS AND DISCUSSION: Temperatures during the growing season were normal. Rainfall, however, was highly variable with no rainfall for 3 weeks from mid July to early August. This was followed by excessive rainfall (8.8 inches) in late August to early September. Cotton growth data (7/16/01) indicated the fall-paratill-bed-roller

stale seedbed system had slightly better growth (more nodes and height) than no-tillage (Table 1). However, lint yield and percent lint turnout indicated no difference between no-tillage and the fall paratill-bed-roller stale seedbed system.

Table 1. Cotton growth and yield response to tillage on a Leeper silty clay loam soil in 2001, Verona, MS.

Tillage system	-----7/16/01-----			-----Lint-----		Seedcotton lb/ac
	Pl/ac x 1000	Ht (in)	Nodes/plant	%	lb/ac	
No-tillage	42.23	23	8.1	36.7	11.25	3061
Fall paratill-bed-roller	41.57	25	8.8	36.9	1098	2977
Mean	41.9	24	8.4	36.8	1111	3019
LSD (0.05)	NS	1	0.3	NS	NS	NS
% CV	6.7	4	3.4	1.0	4	4