

RESIDUAL DEEP TILLAGE EFFECT ON COTTON YIELD

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ABSTRACT: A study was conducted during the 2002 growing season to evaluate the residual effect of a fall under-row deep tillage (paratill) bed-roller system on cotton yield on a Leeper fine sandy loam soil. The cotton growing season environmental conditions were very favorable through July and unfavorable for August with no rainfall until August 25. However, yields were above average. The results indicated an overall mean yield of 2577 lb/ac of seedcotton, 1005 lb/ac of lint, and a lint percent turnout of 39%. The fall 2001 bed-roller following the year 2000 fall paratill bed-roller system showed yield equal to the fall paratill bed-roller system applied in both 2000 and 2001. The preliminary results indicated annual under-the-row deep tillage may not be necessary.

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KEYWORDS: Tillage, cotton, yield

MATERIALS AND METHODS: A reduced tillage study was initiated in 2002 growing season at the Northeast Branch Station, Verona, Mississippi. The study site was a Leeper fine sandy loam soil. The study was conducted as a randomized complete block design with 4 replications. Plot size was 4 (38 inch) rows x 240 ft long. The tillage treatments were: Fall paratill-bed-roller (one-pass system) in 2000 and 2001; and Fall paratill-bed-roller in 2000 followed by Fall bed-roller in 2001. Both P and K fertilizer were applied based on soil test recommendations for 2 bale/ac yield potential. Potash (K_2O) at 250 lb/ac was applied surface broadcast on 10/04/01. Glyphos (glyphosate) + Clarity (banvel) at 1.0 + 0.125 lb ai/ac was applied as a burndown on 3/07/02. Another burndown application of Gramoxone Max (paraquat) + surfactant at 1.00 lb ai + 0.4 pt/ac was made 4/19/02 and repeated 5/16/02. All treatments were do-alled (row conditioner) prior to planting 5/16/02. All treatments were planted with Stoneville ST 4892BR cottonseed at 4 seed/ft row (38 inch rows) on 5/16/02. Ridomil 11G (mefenoxam) at 0.8 lb ai/ac was applied in-furrow at planting.

Glyphosate + pyrithiobac (Staple Plus) at 0.75 lb ai/ac of Roundup (glyphosate) + 0.5 oz ai/ac of Staple was applied 6/03/02. Roundup Ultra Max (glyphosate) at 1.0 lb ai/ac was applied postemergence on 6/13/02. Staple + surfactant at 1.28 oz ai/ac + 0.25 pt/ac was applied postemergence on 6/20/02. Roundup Ultra Max (glyphosate) + Bladex (cyanazine) at 1.0 + 1.0 lb ai/ac was applied as post directed broadcast layby application with a hooded sprayer on 7/08/02.

Tarnished plant bugs (*Lygus lineolaris*), bollworm (*Helicoverpa zea*), and budworm (*Heliothis virescens*) were the major cotton insect pests in 2002. The following insecticides were applied when insect pests reached or exceeded insect pest threshold levels with a twice weekly scouting program. Insecticide applications were made with TXVS-4 nozzles, 5 gpa carrier volume, 48 psi boom pressure and 4 mph rate of travel. Bidrin (dicotophos) at 0.2 lb ai/ac was applied on 6/13/02 and at 0.5 lb ai/ac on 7/08/02. Orthene (acephate) at 0.27 lb ai/ac was applied 6/24/02. Karate-Z (lambda cyhalothrin) at 0.033 lb ai/ac was applied 7/30/02. Provado (imidacloprid) at 0.04 lb ai/ac was applied 8/10/02. Pix (mepiquat chloride) Plus (3.1 x 10 colony units of *Bacillus cereus*/fluid oz) growth regulator at 0.022, 0.0328, and 0.0328 lb ai/ac was applied postemergence on 7/08/02, 7/18/02, and 7/26/02, respectively.

Cotton was defoliated on 9/12/02 with Boll-D (ethephon) + Dropp (thidiazuron) at 1.0 + 0.10 lb ai/ac. Folex (phosphorotriothioate) + Gramoxone Max at 0.75 + 0.09 lb ai/ac was applied 9/19/02. The 2 center rows of each plot were harvested on 10/02/02 with a 2 row spindle picker modified for plot harvest. Seedcotton plot samples were weighed and recorded; grab samples were taken for ginning purposes to determine percent lint turnout. Treatment means were separated using Fisher's Protected LSD at the 5% probability level.

RESULTS AND DISCUSSION: The environmental early growing season in 2002 was above normal rainfall for May and July with no rainfall in August until the 25th of August. However, yields were above average. The results indicated the overall mean yield for seedcotton and lint yield, and percent lint turnout was 2577 lb/ac, 1005 lb/ac, and 39%, respectively (Table 1). The fall 2001 bed-roller following 2000 fall paratill bed-roller indicated yield and lint percent were equal to the continuous fall paratill bed-roller system. The preliminary results indicated that annual under-the-row deep tillage may not be necessary.

Table 1. Cotton yield response to fall tillage system on a Leeper fine sandy loam soil in 2002, Verona, MS.

Tillage system	Seedcotton lb/ac	Lint lb/ac	% lint turnout
Fall paratill-bed-roller (2000) Fb fall bed-roll 2001	2592	1018	39.3
Fall paratill-bed-roller (2000 and 2001)	<u>2562</u>	<u>992</u>	<u>38.7</u>
Mean	2577	1005	39.0
LSD.05	NS	NS	NS
% CV	3	4	2.3

COOPERATORS: None

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