

## COTTON RESPONSE TO BED RENOVATION

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**ABSTRACT:** Two studies were conducted during the 2001 growing season to evaluate cotton yield response to time of bed renovation on a Leeper silty clay loam and a Leeper fine sandy loam soil. The cotton growing season environmental conditions were unfavorable at planting (no rainfall 16 days before planting) and during the emergence period (11 days with no rainfall after planting). The dry period at planting resulted in delayed emergence and poor stands where cotton was planted no-till into a stale seedbed (fall paratill-bed-roller). The row conditioner (implement equipped with a rolling cutter bar, drag harrow, and drag board) at planting, or a bed renovation (Prepmaster®) operation applied in either April or at planting had good stands and greater plant vigor, and bloomed 7 days earlier than planted no-till into a stale seeded on both soils. The bed renovation in April, however, had higher plant vigor rating 6 weeks after planting than no-till planting, row conditioner applied at planting, and bed renovation at planting. Lint yields ranged from 872 to 1084 lb/ac across both soils with no treatment differences. Removing the dry top soil with a row conditioner or using a bed renovator at planting or prior to planting on stale seedbeds, offer an opportunity to obtain a good stand during adverse soil moisture conditions.

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**MATERIALS AND METHODS:** Two experiments were conducted during the 2001 growing season at the Northeast Branch Station, Verona, Mississippi. The study sites were a Leeper fine sandy loam soil and a Leeper silty clay loam soil. Both studies were conducted as completely randomized block designs with 4 replications. Plot size was 4 (38 inch) rows x 100 ft long. All management applications were the same for both studies.

Both P and K fertilizer were applied based on soil test recommendations for 2 bale/ac yield potential. Potash (K<sub>2</sub>O) at 200 lb/ac was applied surface broadcast on 10/30/00. Land preparation in both studies was a fall paratill-bed-roll system applied on 11/11/00 after cotton stalks had been mowed. Glyphos (glyphosate) at 1.2 lb ai/ac was applied as a burndown on 4/11/01. Another burndown application of Gramoxone (paraquat) + surfactant at 0.375 lb ai + 0.4 pt/ac was made 4/23/01. A bed renovation (Bed Renovator®, Bigham Brothers, Lubbock, Texas) one-pass operation was applied to treatment 3 on 4/23/01 and treatment 4 prior to planting on 5/09/01 (Table 1). The beds in treatment 2 received a row conditioner application on 5/09/01, prior to planting to remove dry topsoil from the bed. Treatment 1 received no bed renovation or spring tillage and cotton was planted no-till. All treatment in both studies were planted with NuCOTN 33B at 4 seed/ft row (38 inch rows) on 5/09/01. Ridomil 11G (mefenoxam) and Temik (aldicarb) at 0.88 and 0.5 lb ai/ac was applied in-furrow at planting.

Gramoxone (paraquat) + Meturon (fluometuron) + Dual (metolachlor) + Staple (pyrithiobac) + surfactant at 0.3 + 1.0 + 1.5 lb ai/ac + 0.5 oz ai/ac + 0.4 pt/ac was applied preemergence on 5/09/01. MSMA (monosodium methanearsonate) + Staple at 2.0 lb ai/ac + 1.5 oz ai/ac was applied as an early post directed broadcast application 6/12/01. MSMA + Meturon at 2.0 + 0.8 lb ai/ac was applied post-direct broadcast on 6/26/01. Cobra (lactofen) + crop oil at 0.2 lb ai/ac + 2 pt/ac was applied post-direct broadcast on 7/09/01. Select (clethodim) + crop oil at 0.125 lb ai/ac + 2 pt/ac was applied postemergence on 6/30/01.

Tarnish plant bugs (*Lygus lineolaris*), bollworm (*Helicoverpa zea*), and budworm (*Heliothis virescens*) were the major cotton insect pests in 2001. The following insecticides were applied when insect pests

reached or exceeded pest threshold levels with a twice weekly scouting program. Insecticide applications were made with TXVS-4 nozzles, 5 gpa carrier volume, 40 psi boom pressure and 4 mph rate of travel. Bidrin (dicotophos) was applied at 0.2 lb ai/ac on 5/30/01 and 0.5 lb ai/ac on 6/11/01, 6/18/01, 6/28/01 and 7/09/01. Ammo (cypermethrin) at 0.10 lb ai/ac was applied on 8/04/01. Pix (mepiquat chloride), growth regulator, at 0.022 and 0.044 lb ai/ac was applied postemergence on 7/09/01 and 8/13/01, respectively.

Cotton was defoliated on 9/20/01 with Finish (ethephon + cyclanilide) + Free Fall (thidiazuron) at 1.0 + 0.125 + 0.083 lb ai/ac. Folex (phosphorotrithioate) + Gramoxone Max at 0.75 + 0.09 lb ai/ac was applied 10/02/01. The 2 center rows of each plot were harvested on 10/11/01 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 Protected LSD at the 5% probability level.

**RESULTS AND DISCUSSION:** The environmental early growing season in 2001 was dry with no rainfall 16 days before and 11 days after planting. Dry weather also occurred for 25 days from mid-July through early August, followed by excessive rainfall in late August and early September. The dry weather before planting resulted in planting no-till into a stale seedbed (treatment 1) with deficient soil moisture in the seedling emergence zone (the upper 1.0 inch of the bed). Conversely, a row conditioner applied at planting, to remove the dry soil zone, and the bed renovation operation applied in April or at planting had good soil moisture in seedling emergence zone. Six weeks after planting, both soils indicated the row conditioner and bed renovation treatments had earlier stand emergence and greater seedling vigor than the no-till planted treatment. The bed renovation application in April, however, had more plant vigor than the no-till planted, row conditioner applied at planting, and bed renovation applied at planting. Lint yields across both studies ranged from 872 to 1084 lb/ac with no treatment differences. These results indicate that during adverse soil moisture conditions, bed renovation applied before or at planting can result in good stands with good seedling vigor.

**Table 1** Cotton growth and yield response to seedbed renovations in 2001, Verona, MS.

Spring bed renovation	Leeper silty clay loam			Leeper fine sandy loam		
	6/13/01 Vigor rating	Bloom date	Lint (lb/ac)	6/13/01 Vigor rating	Bloom date	Lint (lb/ac)
1. No-till planted	2.3	7/23	1050	2.3	7/23	956
2. Row conditioner at planting	3.3	7/16	1075	3.3	7/16	872
3. Prepmaster 4/23/01	4.5	7/16	1081	4.3	7/16	1084
4. Prepmaster at planting	<u>3.3</u>	7/17	<u>1077</u>	<u>3.3</u>	7/16	1007
Grand mean	3.4		1071	3.3		980
LSD (0.05)	0.7		NS	0.9		NS
% CV	13.6		5	17.8		17

<sup>1</sup>Rating scale ranged from 1 (no plants or late emerged) to 5 (excellent stands and healthy plants).

**Table 2** Cotton growth and yield response to seedbed renovations in 2000, Verona, MS.

Spring bed Renovation	Leeper silty clay loam			Leeper fine sandy loam		
	6/26/00 Vigor rating <sup>1</sup>	Bloom date	Seed cot lb/ac	6/26/00 Vigor rating <sup>1</sup>	Bloom date	Seed cot lb/ac
1. No-till planted	4	7/20	3117	4	7/20	3178
2. Row conditioner at planting	4	7/20	3036	5	7/20	3239
3. Prepmaster 4/1/00	2	7/20	2847	4	7/20	3440
4. Prepmaster at planting	4	7/19	3062	4	7/20	3381
Grand mean	4		3016	4		3309
LSD (0.05)	2		NS	1		NS
% CV	30		5	14		10

<sup>1</sup>Rating scale ranged from 1 (no plants or late emerged) to 5 (excellent stands and healthy plants).