

COTTON VARIETIES RESPONSE TO CONVENTIONAL AND ROUNDUP WEED MANAGEMENT PROGRAM

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ABSTRACT: A study was conducted during the 2000 and 2001 growing season comparing selected productive Roundup Ready cotton varieties in conventional or Roundup (glyphosate) weed control management systems. Commonly grown productive conventional varieties were also included as a standard for comparison in conventional weed management. The study was conducted on a Leeper silty clay loam soil where weed infestations of pitted morningglory (*Impomea lacunosa*) and pigweed (*Amaranthus sp.*) were light to moderate. Both weed management systems were at high levels of weed control. The results indicated that Roundup Ready-BT varieties showed no yield difference between management systems with seedcotton yields ranging from 2807 to 3152 lb/ac in 2000 and 2559 to 3127 lb/ac in 2001. These results indicate that conventional weed management or Roundup weed management systems had no negative effect on Roundup/bollworm tolerant cotton varieties' yield. However, there was yield differences among varieties.

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MATERIALS AND METHODS: This study was conducted on a Leeper silty clay loam soil at Verona, Mississippi in 2000 and 2001. The study was conducted as a randomized complete block with 4 replications. Plot size was 4 rows (38-inch) x 50 ft long.

P and K fertilizer were applied based on soil test recommendations. Since P level was high, no P fertilizer was applied. Potash at 200 lb/ac was applied surface broadcast 10/30/00. Land preparation involved a fall application of a paratill-bed-roller system on 12/11/00. The beds were doaled prior to planting and all varieties were planted 5/08/01 with a John Deere 7000 planter, equipped with cone units (Table 1). Selected productive Roundup Ready varieties were planted in both weed management systems. Selected commonly grown productive conventional varieties were also planted in the conventional weed management system. Seeding rate was 4 seed/ft of row. The soil fungicide Ridomil 11G (mefenoxam) + soil insecticide Temik 15G (aldicarb) at 1.0 + 0.45 lb ai/ac were applied in-furrow at planting.

Weed control management in both Roundup weed management system and conventional weed management system were at high levels. The Roundup weed management system received appropriate applications of Roundup Ultra. Conventional herbicides were used in the conventional weed management system. No cultivation was used in either Roundup or conventional weed management system. A burndown application of Glyphos (glyphosate) at 1.20 lb ai/ac was made on 4/11/01. The Roundup weed management treatments received a second burndown application of Roundup Ultra at 1 lb ai/ac after planting on 5/08/01. The conventional weed management treatments received Gramoxone (paraquat) + Dual (metolachlor) + Meturon (fluometuron) + Staple (pyrithiobac) + surfactant at 0.75 + 1.5 + 1.0 ai/ac + 0.5 oz ai/ac + 0.5 pt/ac were applied as a preemergence application on 5/08/01.

The Roundup weed management treatments received one post over-top application of Roundup Ultra at 1.0 lb ai/ac 5/17/01. Post-directed broadcast applications of Roundup Ultra at 1.0 lb ai/ac were applied on 6/13/01 and repeated 6/27/01 and 7/16/01. The conventional weed management received a post directed broadcast application of MSMA (monosodium methanersonate) + Meturon at 2.0 + 0.8 lb ai/ac on 6/13/01. In the conventional weed management system, post direct broadcast applications of Cypro (cyanazine) +

MSMA at 1.0 + 2.0 lb ai/ac were made 6/26/01 and repeated as a layby application 7/16/01. Pix (mepiquat chloride) a growth regulator was applied at 0.022 lb ai/ac on 7/11/01 and repeated at 0.044 lb ai/ac on 8/14/01.

The major cotton insect pests in the 2001 growing season were tarnish plant bug (*Lygus lineolaris*), bollworm (*Helicoverpa Zea*) and budworm (*Heliothis virescens*). The following cotton insecticide applications were made at 5 gpa carrier volume with TXVS-4 nozzles when insect pests were at threshold or above threshold, based on twice weekly scouting reports. Bidrin (dicrotophos) at 0.5 lb ai/ac was applied on 7/09/01. Tracer (spinosad) at 0.09 lb ai/ac was applied on 7/23/01. Ammo (cypermethrin) at 0.1 lb ai/ac was applied on 8/03/01.

Cotton was defoliated on 9/20/01 with Finish (ethephon + cyclanilide) + Free Fall (thidiazuron) at 1.0 + 0.125 + 0.083 lb ai/ac. The center 2 rows of each 4-row plot were harvested 10/01/01 with a spindle picker modified for plot harvest. Seedcotton plot samples were weighed and grab samples were taken from each plot sample. The grab samples were ginned with a sample gin to determine percent lint turnout. All data was subjected to statistical analysis and means were separated using Fisher Protected LSD at the 5% probability level.

RESULTS AND DISCUSSION: The 2001 environmental growing season was highly variable with no rainfall at planting in May and during emergence period and no rainfall from July 13 through August 6, followed by excessive rainfall in mid to late August and early September. The study's mean yield was 2615 and 2975 lb/ac of seedcotton in 2001 and 2000, respectively. In 2000, with the exception of Sure-Grow 747, conventional varieties Stoneville 474, Phytogen 355 and Sure-Grow 501 yield equaled the Roundup Ready-BT varieties in both conventional and Roundup weed management systems. In 2001, with exception of Deltapine 451BG/RR, all varieties showed similar seedcotton yield in both Roundup and conventional weed management system. Deltapine 451BG/RR in both Roundup and conventional weed management systems produced higher yield than all conventional varieties and Roundup BT varieties in conventional weed management systems, and Stoneville 4892BG/RR in the Roundup weed management systems. Both years, Roundup Ready-BT varieties showed no yield difference between Roundup or conventional weed management systems. These results indicate that cost effective weed management is possible with either Roundup or conventional system and variety selection is very critical for maximizing yield potential. Roundup-BT tolerant varieties also can be grown successfully with either Roundup or conventional weed management programs.

Table 1. Selected cotton varieties response to conventional or Roundup weed management systems on a Leeper silty clay loam soil in 2000 and 2001, Verona, MS

Treatment/variety	Seedcotton lb/ac	
	2000	2001
A. Conventional weed mgmt		
1. Stoneville 474	2744	2514
2. Sure-Grow 747	2700	2451
3. Phytogen 355	3347	2617
4. Sure-Grow 501	2980	2376
5. Stoneville 4892BG/RR	2807	2637
6. Sure-Grow 501BG/RR	3152	2540
7. Deltapine 451BG/RR	3003	2972
8. Paymaster 1218BG/RR	2880	2432
B. Roundup weed mgmt		
9. Stoneville 4892BG/RR	2988	2559
10. Sure-Grow 501BG/RR	2946	2697
11. Deltapine 451BG/RR	3000	3127
12. Paymaster 1218BG/RR	3152	2669
Grand Mean	2975	2631
LSD (0.05)	427	308
% CV	10	8

¹Vigor rating on a scale of 1 (no seedling emerged) to 10 (excellent stand and healthy plants).