

## RR-COTTON RESPONSE TO WEED MANAGEMENT SYSTEMS

N. W. Buehring, R. R. Dobbs, and M.P. Harrison

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

**ABSTRACT:** A study was conducted during the 2002 growing season evaluating weed management systems for Roundup Ready cotton. The study was conducted on a Leeper silty clay loam soil where weed infestations of pitted morningglory (*Impomea lacunosa*), sicklepod (*Senna obtusifolia*), broadleaf signalgrass (*Brachiaria platyphylla*), barnyardgrass (*Echinochloa crusgalli*), and crabgrass (*Digitaria sanguinalis*) were light to moderate. The results indicated that except for the check and Prowl (pendimethalin) applied alone, all treatments of Roundup (glyphosate) alone or with a preemergence (PRE) herbicide showed excellent grass and broadleaf weed control (> 90%). Roundup applied over-top of 4 leaf cotton followed by a Roundup post-direct application at 8-12 leaf cotton showed excellent season long weed control (> 90%), and both weed control and lint yield were equivalent to 3 applications of Roundup or a PRE plus 2 Roundup applications. Lint yields ranged from 842 lb/ac for the check (no herbicide) to 1351 lb/ac for Prowl at 1.00 lb ai/ac applied PRE followed by Roundup at 0.75 lb ai/ac applied postemergence to 4 leaf cotton followed by Valor (flumoxazin) + MSMA (monosodium acid methanearsonate) 0.06 + 2 lb ai/ac applied post-directed at 8 to 12 leaf cotton. All treatments showed no difference in lint yield but were higher than the check and Prowl applied alone.

**CITATION:** Buehring, N.W., R.R. Dobbs, and M.P. Harrison. 2003. RR-cotton response to weed management systems. Annual Report 2002 of the North Mississippi Research and Extension Center. Mississippi Agricultural & Forestry Experiment Station Information Bulletin 398:143-146.

**KEYWORDS:** Weed management, cotton, RR-cotton

**MATERIALS AND METHODS:** This study was conducted on a Leeper silty clay loam soil at Verona, Mississippi in 2002. The study was conducted as a randomized complete block with 4 replications. Plot size was 4 rows (38-inch) x 50 ft long. Phosphorous (P) and K fertilizer were applied based on soil test recommendations. The P level was high and no P fertilizer was applied. Potash at 250 lb/ac was applied surface broadcast 10/04/01. Land preparation involved a fall disking, do-all (row conditioner), bed-roll followed a paratill-bed-roller system on 10/16/01. The beds were do-alled prior to planting Sure-Grow SG501BR cotton cultivar on 5/16/02. Seeding rate was 4 seed/ft of row in 38 inch rows. The soil fungicide Ridomil 11G (mefenoxam) + soil insecticide Temik 15G (aldicarb) at 0.88 + 0.5 lb ai/ac were applied in-furrow at planting.

No cultivation was used in all weed management systems. A burndown application of Glyphos (glyphosate) + Clarity (banvel) at 1.0 + 0.125 lb ai/ac was made on 3/07/02. A second burndown application of Roundup Ultra (glyphosate) at 1 lb ai/ac was applied 4/23/01. All treatments received an application of Gramoxone Max (paraquat) + surfactant at 1.0 lb ai/ac + 0.4 pt/ac on 5/16/02. Preemergence treatments were applied 5/16/02 at 15 gpa and 8002VS nozzles. The

first leaf cotton treatments were applied 6/04/02. The 4 leaf cotton treatments were made 6/11/02 and the 8 to 10 leaf cotton treatments were applied 6/25/02. Pix (mepiquat chloride) Plus (3.1 x 10 colony units of bacillus cereus fluid/oz), a growth regulator was applied at 0.0218 lb ai/ac on 7/08/02 and repeated at 0.0328 lb ai/ac on 8/18/02 and 8/26/02.

The major cotton insect pests in the 2002 growing season were tarnished 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. Orthene (acephate) at 0.27 lb ai/ac was applied 6/24/02. Bidrin (dicotophos) at 0.5 lb ai/ac was applied on 7/08/02. 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. Ammo (cypermethrin) at 0.1 lb ai/ac was applied on 8/16/02 and repeated 8/22/02.

Cotton was defoliated on 9/12/02 with Cotton Quik (ethephon) + Dropp (thidiazuron) at 0.85 + 0.05 lb ai/ac. Folex (phosphorotrithioate) at 0.75 lb ai/ac was applied 9/19/02. The center 2 rows of each 4-row plot were harvested 10/01/02 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% significance level.

**RESULTS AND DISCUSSION:** The 2002 environmental growing season was highly variable with above normal rainfall for May and July followed by no rainfall for the month of August until the 25<sup>th</sup> of August. Weed infestations of pitted morningglory, sicklepod, broadleaf signalgrass, barnyardgrass, and crabgrass were light to moderate. The study's mean lint yield was 1211 lb/ac and ranged from 842 to 1351 lb/ac (Table 1). Roundup applied over-top of 4 leaf cotton followed by a repeat post-directed application at 8 to 12 leaf cotton showed excellent season-long weed control (> 90%) and lint yield was equivalent to 3 applications of Roundup or a PRE-plus 2 Roundup applications (Tables 1 and 2). All treatments showed no difference in weed control and yield was greater than the check or Prowl applied alone. The preliminary results indicated that with light to moderate weed infestation, two applications of Roundup is all that is necessary for good weed control and yield.

**COOPERATORS:** None

**PUBLICATIONS:** None

**Table 1.** RR-cotton weed control and yield as influenced by preemergence and postemergence herbicides on a Leeper silty clay loam soil in 2002, Verona, MS.

Herbicide treatment	lb ai/ac	Herbicide application stage <sup>3</sup>	Cotton stage leaf (LF)	% control 8/27/02		Lint lb/ac
				Brl <sup>1</sup>	Gr <sup>2</sup>	
1. Prowl	1.0	PRE	-----			
Roundup	0.75	MPOT	4 LF			
Valor	0.06	LPD	8-12 LF	99	99	1351
MSMA	2.0	LPD	8-12 LF			
2. Meturon	1.0	PRE	-----			
Roundup	0.75	MPOT	4 LF			
Roundup	0.75	LPD	8-12 LF	99	99	1346
3. Prowl	1.0	PRE	-----			
Roundup	0.75	MPOT	4 LF			
Roundup	0.75	LPD	8-12 LF			
Prowl	1.0	LPD	8-12 LF	99	99	1320
4. Roundup	0.75	EPOT	1 LF			
Roundup	0.75	MPOT	4 LF			
Roundup	0.75	LPD	8-12 LF	99	99	1315
5. Prowl	1.24	PRE	-----			
Roundup	0.75	MPOT	4 LF			
Roundup	0.75	LPD	8-12 LF	99	99	1307
6. Roundup	0.75	MPOT	4 LF			
Roundup	0.75	LPD	8-12 LF	99	99	1297
7. Roundup	0.75	EPOT	1 LF			
Outlook	0.75	EPOT	1 LF			
Roundup	0.75	LPD	8-12 LF	99	99	1272
8. Outlook	0.75	PRE	-----			
Roundup	0.75	MPOT	4 LF			
Roundup	0.75	LPD	8-12 LF	99	99	1292
9. Prowl	0.83	PRE	-----			
Roundup	0.75	MPOT	4 LF			
Roundup	0.75	LPD	8-12 LF	99	99	1282
10. Dual II Magnum	1.24	PRE	-----			
Roundup	0.75	MPOT	4 LF			
Roundup	0.75	LPD	8-12 LF	99	99	1244
11. Prowl (3.3 EC)	0.83	PRE	-----	0	76	974
12. Prowl (3.8 EC)	0.83	PRE	-----	0	81	903
13. Untreated check	-----	-----	-----	0	0	842
	Mean			76	88	1211
	LSD.05			1	4	181
	% CV			1	3	10

<sup>1</sup> Brl means broadleaf weed present were: pitted morningglory and sicklepod. Infestation levels were light to moderate.

<sup>2</sup> Gr means annual grasses present were: crabgrass, broadleaf signalgrass, and barnyardgrass. Infestations levels were light to moderate.

<sup>3</sup> PRE means preemergence application; EPOT means early postemergence over-top application at 1 leaf stage; MPOT means mid-season postemergence over-top application at 4 leaf stage; and LPD means late season post-directed broadcast application at 8 to 12 leaf stage.

**Table 2.** RR-cotton weed control as influenced by preemergence and postemergence herbicides on a Leeper silty clay loam soil in 2002, Verona, MS.

Herbicide treatment	lb ai/ac	Herbicide application stage <sup>3</sup>	Cotton stage leaf (LF)	% control 6/19/02		% control 7/08/02	
				Brl <sup>1</sup>	Gr <sup>2</sup>	Brl <sup>1</sup>	Gr <sup>2</sup>
1. Prowl	1.0	PRE	-----				
Roundup	0.75	MPOT	4 LF				
Valor	0.06	LPD	8-12 LF	93	99	96	99
MSMA	2.0	LPD	8-12 LF				
2. Meturon	1.0	PRE	-----				
Roundup	0.75	MPOT	4 LF				
Roundup	0.75	LPD	8-12 LF	97	99	98	97
3. Prowl	1.0	PRE	-----				
Roundup	0.75	MPOT	4 LF				
Roundup	0.75	LPD	8-12 LF	97	98	96	99
Prowl	1.0	LPD	8-12 LF				
4. Roundup	0.75	EPOT	1 LF				
Roundup	0.75	MPOT	4 LF				
Roundup	0.75	LPD	8-12 LF	90	99	96	99
5. Prowl	1.24	PRE	-----				
Roundup	0.75	MPOT	4 LF				
Roundup	0.75	LPD	8-12 LF	94	99	96	99
6. Roundup	0.75	MPOT	4 LF				
Roundup	0.75	LPD	8-12 LF	94	99	95	97
7. Roundup	0.75	EPOT	1 LF				
Outlook	0.75	EPOT	1 LF				
Roundup	0.75	LPD	8-12 LF	94	96	95	99
8. Outlook	0.75	PRE	-----				
Roundup	0.75	MPOT	4 LF				
Roundup	0.75	LPD	8-12 LF	97	99	97	98
9. Prowl	0.83	PRE	-----				
Roundup	0.75	MPOT	4 LF				
Roundup	0.75	LPD	8-12 LF	90	99	94	99
10. Dual II Magnum	1.24	PRE	-----				
Roundup	0.75	MPOT	4 LF				
Roundup	0.75	LPD	8-12 LF	93	99	94	99
11. Prowl (3.3 EC)	0.83	PRE	-----	0	86	0	72
12. Prowl (3.8 EC)	0.83	PRE	-----	0	84	0	79
13. Untreated check	-----	-----	-----	0	0	0	0
Mean				72	89	1	87
LSD.05				7	5	1	8
% CV				6	4	1	6

<sup>1</sup> Brl means broadleaf weed present were: pitted morningglory and sicklepod. Infestation levels were light to moderate.

<sup>2</sup> Gr means annual grasses present were: crabgrass, broadleaf signalgrass, and barnyardgrass. Infestations levels were light to moderate.

<sup>3</sup> PRE means preemergence application; EPOT means early postemergence over-top application at 1 leaf stage; MPOT means mid-season postemergence over-top application at 4 leaf stage; and LPD means late season post-directed broadcast application at 8 to 12 leaf stage.