

## PRE AND POST HERBICIDE WEED CONTROL IN CORN

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

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

**ABSTRACT:** The purpose of this study was to evaluate formulated herbicide combinations applied alone as a preemergence (PRE) application or in combination with postemergence (POT) herbicides for conventional corn weed control. The study was conducted on a Leeper silty clay loam soil. Clearfield® hybrid, Pioneer 34B28, with atrazine applied preemergence followed by Lightning (imazethapyr + imazapyr) applied early POT was included as a standard for comparison with conventional hybrid corn weed control treatments. Growing conditions were very favorable for good herbicide weed control and high corn yield. Grass weeds present were: red sprangletop (*Leptochloa filiformis*), large crabgrass (*Digitaria sanguinalis*), and goosegrass (*Eleusine indica*). Broadleaf weeds present were: eclipta (*Eclipta prostrata*), spotted spurge (*Euphorbia maculata*), and pitted morningglory (*Ipomoea lacunosa*). Weed infestation levels were low and there was no crop injury. Guardsman Max (dimethenamid-p + atrazine) applied preemergence at 4 pt/ac provided excellent ( $\geq 96\%$ ) weed control and was equal to all PRE plus POT herbicide treatments. All herbicide treatments provided excellent ( $\geq 95\%$ ) season long grass and broadleaf weed control and were higher than the check (no herbicide). Yields ranged from 162 to 175 bu/ac for the Pioneer 3223 treatments. There were no yield differences among these herbicide treatments and the check. The Clearfield® corn (Pioneer 34B28) herbicide treatment provided excellent weed control ( $\geq 95\%$ ), but had a yield of 44 bu/ac, which was lower than all Pioneer 3223 treatments. The lower yield for Pioneer 34B28 was partially due to raccoon feeding damage.

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**KEYWORDS:** Weed control, Clearfield® Corn

**MATERIALS AND METHODS:** A field study was conducted on a Leeper silty clay loam soil near Verona, Mississippi during the 2002 growing season to evaluate formulated herbicide combinations applied alone as a PRE application or in combination with POT herbicides for conventional corn weed control. Clearfield® hybrid Pioneer 34B28 with atrazine applied PRE followed by Lightning applied early POT was included as a standard for comparison with conventional hybrid corn weed control treatments.

The study was conducted as a randomized complete block design with 4 replications. Plot size was 4 rows (30-inch) by 40 ft. Fertilizers P and K were applied based on soil test recommendations indicated high levels of P with medium levels of K. Therefore, 250 lb/ac of potash (K<sub>2</sub>O) was broadcast on the soil surface on 9/25/01. Land preparation consisted of a fall paratill (12/08/01) followed by bed-roller (12/11/01), and rebed-roller 3/05/02.

A burndown application of Roundup Ultra (glyphosate) + Clarity (banvel) at 2 pt/ac + 6 oz/ac was applied to the entire study after planting on 4/5/02. Pioneer 3223 and Clearfield® corn hybrid Pioneer 34B28 were planted on 4/5/02 with Lorsban (chlorpyrifos) 15G at 1.3 lb ai/ac applied in-furrow. Nitrogen fertilizer solution (32% N as UAN) at 175 lb N/ac was applied sidedress 6 inches from the row and 2 inches deep with a coulter-knife system on 5/14/02. A foliar application of Intrepid (methoxyfenozide) at 0.063 lb ai/ac was applied on 6/24/02 for southwestern corn borer (*Diatraea grandiosella*) control.

PRE treatments were applied after planting on 4/5/02 (Table 1). Due to wet field conditions, the early postemergence (EPOT) applications at 5 to 6 leaf corn had to be delayed and were applied as mid-season postemergence over-top of corn (MPOT) applications. MPOT treatments and mid-season post-directed (MPD) applications were made on 5/14/02 to 18 to 24 inch corn (Table 1). All PRE and MPOT treatments were applied at 15 gpa with 8002VS nozzles. MPD broadcast treatments were made at 20 gpa with a broadcast slide shield spray-rig equipped with 8002VS nozzles (directed to the base of the plant) and 8004VS nozzles (directed between the row). Plots were rated for broadleaf and grass weed control on 5/28/02, 6/11/02 and 8/26/02. A rating scale of 0 equaled no weed control up to 100% equaled complete weed control or kill was used.

The center 2 rows in each plot were harvested with a plot combine. Corn plot samples were weighed, and grain moisture and test weight were determined using a Dickey John® 2000 grain analysis computer. Plot weights were converted to bu/ac at 15% moisture. All data were subjected to analysis of variance and treatment means were separated using Fisher's Protected LSD at the 5% significance level.

**RESULTS AND DISCUSSION:** Rainfall during the 2002 growing season was above normal in May and July, which was very favorable for excellent weed control and yield. Broadleaf weeds present were: eclipta, spotted spurge and pitted morningglory. Grass weeds present were: red sprangletop, crabgrass and goosegrass. Weed infestations were low and no treatments caused crop injury.

All herbicide treatments provided excellent control (95 to 99%) of broadleaf and grass weeds on all 3 observation dates and control percentages were higher than the check (Table 1). Guardsman Max at 4 pt/ac applied PRE provided excellent ( $\geq 98\%$ ) season long broadleaf and grass weed control and was equal to all PRE plus POT herbicide treatments.

Yield ranged from 162 bu/ac to 175 bu/ac for the Pioneer 3223 treatments and there were no differences among these herbicide treatments or the check (Table 1). These results indicated weed infestation levels were insufficient to affect yield. Clearfield® corn (Pioneer 34B28) herbicide treatment which provided excellent weed control ( $\geq 95\%$ ), however, only had a 44 bu/ac yield, and this was lower than all other treatments. The lower yield for this hybrid was partially due to raccoon feeding damage.

**COOPERATORS:** None

**PUBLICATIONS:** None

**Table 1.** Preemergence and postemergence herbicide combination effect on weed control and corn yield on a Leeper silty clay loam soil in 2002, Verona, MS.

Corn hybrid/ herbicide trt.	Rate/ac	Appl time	5/28/02		6/11/02		8/26/02		Yield bu/ac
			% control Brl <sup>1</sup>	GR <sup>2</sup>	% control Brl <sup>1</sup>	GR <sup>2</sup>	% control Brl <sup>1</sup>	GR <sup>2</sup>	
1. P3223 Untreated check			0	0	0	0	0	0	175.1
2. P3223 Atrazine Basis Gold Surfactant	4.0 pt 14.0 oz 0.25% v/v	PRE MPOT MPOT	99	99	99	99	97	98	168.5
3. P3223 Bicep II Magnum	4.2 pt	PRE	99	99	98	99	96	99	163.6
4. P3223 Bicep II Magnum Accent Surfactant	4.2 pt 0.67 oz 0.25% v/v	PRE MPOT MPOT	99	99	99	99	97	99	169.3
5. P3223 Atrazine Evik Surfactant	4.0 pt 2.0 lb 0.5%v/v	PRE MPD MPD	99	99	99	99	99	99	168.4
6. P3223 Guardsman Max	4.0 pt	PRE	98	99	99	99	96	99	170.6
7. P3223 Guardsman Max Celebrity Plus Surfactant	3.2 pt 2.35 oz 0.25%v/v	PRE MPOT MPOT	99	99	99	99	99	98	174.9
8. P3223 Guardsman Max Celebrity Plus Surfactant	4.2 pt 1.0 oz 0.25%v/v	PRE MPOT MPOT	99	99	99	99	99	98	173.8
9. P3223 Bicep II Magnum Exceed Surfactant	4.2 pt 1.0 oz 0.25% v/v	PRE MPOT MPOT	99	99	99	99	98	98	162.2
10. P34B28 Atrazine Lightning Crop Oil Liquid N (32%)	4.0 pt 1.28 oz 1%v/v 3.0 pt	PRE MPOT MPOT MPOT	99	99	99	99	96	95	44.2 <sup>3</sup>
	LSD (.05)		1	1	1	1	3	2	20.3
	% CV		1	1	1	1	2	2	8.9

<sup>1</sup> Brl = Broadleaf weeds present were: eclipta, spotted spurge, and pitted morningglory. Infestation levels were low.

<sup>2</sup> Gr = Annual grasses present were: red sprangletop, large crabgrass, and goosegrass. Infestation levels were low.

<sup>3</sup> Raccoons destroyed about 20% of yield.