

Postemergence application timing in glyphosate-resistant corn. Waddington, Mark A., Bryan G. Young, Julie M. Young and Sean D. Nettleton. This study was designed to gain a better understanding of the importance of weed control at the proper timing in glyphosate-resistant corn. The study was conducted on an Ebbert silt loam with 2.7 % organic matter and pH 6.2 at the Belleville Research Center. Fertilizer applied was 150, 50, and 100 lb/A N, P<sub>2</sub>O<sub>5</sub>, and K<sub>2</sub>O, respectively, to an area that had been cropped to soybean in 2003. Dekalb 'DKC 60-17 RR' corn was planted 1.5 inch deep at 28000 seeds per acre into a reduced-till seedbed on May 11, 2004. Plots consisted of four rows with 30 inch row spacing, 30 ft long arranged in a randomized complete block design with 4 replications. The herbicides were broadcast applied with a CO<sub>2</sub> pressurized sprayer using 8003 flat fan tips at 40 PSI and 15 GPA water. Monthly rainfall in inches was 1.3, 8.7, 2.8, 6.6, and 5.2 in April, May, June, July and August, respectively. Weed populations per 0.25 M<sup>2</sup> in the nontreated plots, mid-season, were: 34 giant foxtail; 4 common cocklebur; 3 velvetleaf; 1 common ragweed; 1 morningglory species; and 8 common waterhemp. Applications were preemergence (PRE), and at weed heights 0 to 4 and 4 to 8 inches (0-4"W) and (4-8"W), respectively, postemergence following preemergence at weed height 0 to 4 inches (0-4"W-2), postemergence only applications at weed heights 8 to 12, 12 to 16, and 16 to 20 inches (8-10"W), (12-16"W), and (16-20"W), respectively, as well as sequential postemergence application at 0 to 4 inch weed regrowth (0-4"RG). Total rainfall for the 7 days following the PRE application was 2.0 inches. Application information is listed below.

Date	5-13-04	6-2-04	6-4-04	6-7-04	6-8-04	6-14-04	6-17-04	6-15-04
Treatment	PRE	0-4"W-1	4-8"W	0-4"W-2	8-12"W	12-16"W	16-20"W	0-4"RG
Air temperature (F)	69	66	76	75	81	76	80	79
Relative humidity (%)	98	60	44	86	79	98	89	92
field corn								
stage		V4	V4-V5	V5	V5-V6	V6-V7	V7-V8	V6-V7
height (inch)		8-10	8-10	10-12	10-12	26-28	34-36	28-30
giant foxtail								
leaf no.		3-4	4-6		6-8	5-6	5-8	
height (inch)		1-4	3-4		3-10	10-18	18-20	
common cocklebur								
leaf no.		4-6	4-6	4-6	6-8	5-8	6-8	
height (inch)		3-4	4-6	4-6	6-12	4-18	20-28	
velvetleaf								
leaf no.		3-4	4-5		4-6	5-8	6-8	6-8
height (inch)		1-2	2-11		6-8	10-16	16-20	10-12
common ragweed								
leaf no.		4-6	4-6		6-8	6-8	8-10	4-6
height (inch)		2-4	2-4		3-6	8-10	20-27	2-4
morningglory species								
leaf no.		5-7	5-7		6-12	6-12	10-12	
height (inch)		2-3	3-4		4-6	4-8	28-30	
common waterhemp								
leaf no.		2-4	4-6		6-9	7-10		
height (inch)		1-2	1-2		3-8	12-16		

Corn injury from herbicide applications, albeit minor, was only observed for glyphosate applied at 1.12 lb/A at the 16-20 inch weed removal timing. Corn height was reduced when weeds were allowed to compete beyond 8 inches compared with the handweed check. Control of giant foxtail, common cocklebur, velvetleaf, giant ragweed, morningglory species, and common waterhemp was 95% or greater at 56 days after planting for any treatment containing acetochlor & atrazine & MON 4660 or the sequential applications of glyphosate. Delaying the application of glyphosate beyond 8 inch weed heights reduced velvetleaf and morningglory species control. Similarly, delaying glyphosate applications beyond 8 inch weed heights reduced corn yield compared with the handweeded check. (Dept. of Plant, Soil and Agricultural Systems, Southern Illinois University, Carbondale)

Table. Postemergence application timing in glyphosate-resistant corn. (Waddington, Young, Young and Nettleton)

Treatment <sup>a</sup>	Application		Corn			Control <sup>d</sup>											
			Yield	Injury <sup>b</sup>	Height <sup>c</sup>	SETFA		XANST		ABUTH		AMBEL		IPOSS		AMATA <sup>e</sup>	
	Rate (lb/A)	Time		bu/A	3-5 DA POST %	June 23 Inch	At POST %	56 DAP %	At POST %	56 DAP %	At POST %	56 DAP %	At POST %	56 DAP %	At POST %	56 DAP %	56 DAP %
Nontreated			89	0	46	0	0	0	0	0	0	0	0	0	0	0	0
Handweed			199	0	57	99	99	99	99	99	99	99	99	99	99	99	99
Acetochlor & atrazine & MON 4660 / glyphosate	1.0 & 0.5 / 0.77	PRE / 0-4"W-2	203	0	56	98	99	76	98	99	97	99	99	99	95	99	99
Acetochlor & atra & MON 4660 / glyt	2.0 & 1.0 / 0.77	PRE / 0-4"W-2	197	0	55	99	99	91	99	99	99	99	99	99	96	99	99
Acetochlor & atra & MON 4660 + glyt	1.0 & 0.5 + 0.77	0-4"W-1	190	0	55		99		99		97		99		97		99
Acetochlor & atra & MON 4660 + glyt	2.0 & 1.0 + 0.77	0-4"W-1	200	0	57		99		99		98		99		98		99
Glyt / glyt	0.77 / 0.77	0-4"W-1 / 0-4"RG	208	0	59		99		99		99		99		97		99
Glyt	0.77	0-4"W-1	191	0	55		98		97		96		99		91		96
Glyt	0.77	4-8"W	193	0	55		99		98		94		99		91		97
Glyt	0.77	8-12"W	171	0	51		99		99		77		99		76		97
Glyt	0.77	12-16"W	159	1	51		99		99		78		99		80		99
Glyt	0.77	16-20"W	146	1	48		99		99		71		99		76		99
Glyt	1.12	16-20"W	152	3	48		99		99		76		99		79		99
LSD			28	2	6	2	1	8	1	0	5	1	1	0	3		2
P			0.01	0.1	0.01	0.01	0.01	0.01	0.01	1.0	0.01	0.01	0.01	1.0	0.01		0.01

<sup>a</sup>All glyphosate was Roundup WeatherMax

<sup>b</sup>Corn was evaluated 5 days after the PRE application with no observable injury.

<sup>c</sup>Corn height on June 23 was 6 days after the last postemergence application.

<sup>d</sup>DAP = Days after planting. Rating at 56 DAP are also at canopy closure.

<sup>e</sup>Common waterhemp emergence at the at post rating time was too sparse in some plots to rate at that time.