

Preemergence applied alachlor, pendimethalin, flumioxazin, chlorimuron & sulfentrazone, and cloransulam followed by postemergence glyphosate applications in soybean, Ames, IA, 2004. Owen, Micheal D.K., James F. Lux, and Damian D. Franzenburg. The purpose of this study was to compare low rates of alachlor, pendimethalin, flumioxazin and other residual herbicides for better management of postemergence glyphosate applications. The soil was a Canisteo, Harps clay loam with a pH 7.8 and 4.7% organic matter. The experimental design was a randomized complete block with three replications and plots were 10 by 25 ft. The 2003 crop was corn. Tillage included fall chisel plowing and spring field cultivation. Crop residue on the soil surface was 30% at planting. "Asgrow variety AG 2403" soybean was planted 1.5 inches deep on April June 4, at 151,000 seeds/A in 30-inch rows. Preemergence (PRE) treatments were applied on June 5 at 20 gpa and 30 psi using flat fan nozzles. Conditions on June 5 were: air temperature 24 C, soil temperature at the 4-inch depth 21 C, 3 mph wind, 90% cloud cover, 54% relative humidity. Postemergence (POST) and sequential postemergence (SPOST) treatments were applied on July 8 and July 28, respectively, at 20 gpa and 30 psi using flat fan nozzles. Conditions on July 8 were: air temperature 23 C; soil temperature at the 4-inch depth 21 C, 3 mph wind, 50% cloud cover, 67% relative humidity. Soybean growth was V 4 and 10 inches tall. Weed species, average size, and number per ft² in the areas to be treated included: giant foxtail one to four leaves, three tillers, 1 to 8 inches tall, zero to five plants; velvetleaf cotyledon to eight leaves, 0.5 to 8 inches tall, zero to one plant; common waterhemp numerous leaves, 0.5 to 12 inches tall, zero to three plants; common lambsquarters numerous leaves, 0.5 to 8 inches tall, zero to three plants; common cocklebur numerous leaves, 8 to 12 inches tall, less than one plant. Conditions on July 28 were: air temperature 27 C; soil temperature at the 4-inch depth 24 C, 7 mph wind, 90% cloud cover, 54% relative humidity. Soybean growth was R 2 and 22 inches tall. Weed species, average size, and number per ft² in the areas to be treated included: giant foxtail one to two leaves, 1 to 4 inches tall, zero to five plants; common waterhemp four to seven leaves, 1 to 4 inches tall, less than one plant. June rainfall included: 0.01, 0.25, 0.27, 0.41, 0.33, 0.7, 0.92, 0.21, 0.05, and 0.01 inches on June 6, 10, 11, 12, 14, 16, 21, 24, 27, and 28, respectively. Total rainfall for June was 3.16 inches. July rainfall included: 1.51 inches and 0.18 inches from July 1 through 15 and 16 through 31, respectively. Total rainfall for July was 1.69 inches. Rainfall total for August was 4.54 inches.

Negligible soybean injury was observed on June 30 and July 8 from PRE treatments, twenty-five and thirty-three days after application, respectively. PRE treatments provided poor to excellent giant foxtail control when observed on July 8, prior to POST applications. Giant foxtail control was good to excellent with the low rates of PRE alachlor and pendimethalin, while flumioxazin, chlorimuron & sulfentrazone, flumioxazin plus cloransulam and cloransulam provided poor to fair control. Velvetleaf control was mostly poor to fair, except with flumioxazin plus cloransulam which provided excellent control. Good to excellent common waterhemp and common lambsquarters control was provided by all treatments, except for common waterhemp control with cloransulam. Common cocklebur control with PRE treatments was unacceptable.

Excellent crop safety was observed on July 15 and 28 following POST and SPOST glyphosate applications. Glyphosate treatments following PRE, applied POST alone, and POST followed by SPOST resulted in excellent broad spectrum weed control when observed on July 28 and September 7. (Dept. of Agronomy, Iowa State University, Ames).

Table 1. Preemergence applied alachlor, pendimethalin, flumioxazin, chlorimuron & sulfentrazone, and cloransulam followed by postemergence glyphosate applications in soybean, Ames, IA, 2004 (Owen, Lux, Franzenburg).

Treatment	Rate	Appl time	Soybean Injury		SETFA	ABUTH	AMATA	CHEAL	XANST
	(lb/A)		6/30/04	7/8/04	7/8/04	7/8/04	7/8/04	7/8/04	7/8/04
			----- (%) -----		----- (% weed control) -----				
Untreated	-	-	0	0	0	0	0	0	0
Alachlor/ glyphosate ^a	1.0/ 0.75	PRE/ POST	5	5	95	23	99	90	10
Alachlor/ glyphosate	1.25/ 0.75	PRE/ POST	5	5	95	23	99	88	20
Alachlor/ glyphosate	1.5/ 0.75	PRE/ POST	5	5	98	50	99	90	25
Pendimethalin/ glyphosate	1.0/ 0.75	PRE/ POST	5	5	85	67	93	95	32
Pendimethalin/ glyphosate	1.25/ 0.75	PRE/ POST	5	5	90	77	95	98	38
Flumioxazin/ glyphosate	0.032/ 0.75	PRE/ POST	5	3	58	82	98	96	25
Chlorimuron&sulfentrazone/ glyphosate	0.008&0.039/ 0.75	PRE/ POST	0	0	37	50	92	90	23
Flumioxazin+cloransulam/ glyphosate	0.048+0.016/ 0.75	PRE/ POST	5	5	73	96	99	98	60
Cloransulam/ glyphosate	0.016/ 0.75	PRE/ POST	0	0	43	73	50	90	23
Glyphosate	0.75	POST	0	0	0	0	0	0	0
Glyphosate/ glyphosate	0.75/ 0.75	POST/ SPOST	0	0	0	0	0	0	0
LSD (P=0.05)			0	1	10	22	5	7	12

^a Glyphosate rate in lb ae/A.

Table 2. Preemergence applied alachlor, pendimethalin, flumioxazin, chlorimuron & sulfentrazone, and cloransulam followed by postemergence glyphosate applications in soybean, Ames, IA, 2004 (Owen, Lux, Franzenburg).

followed by postemergence glyphosate applications in soybean, 7/15/04, 7/15/04, 7/28/04, 7/28/04, 7/28/04, 7/28/04, 7/28/04, 7/28/04, 7/28/04.									
Treatment	Rate	Appl time	Soybean Injury		SETFA	ABUTH	AMATA	CHEAL	XANST
	(lb/A)		7/15/04	7/28/04	7/28/04	7/28/04	7/28/04	7/28/04	7/28/04
			----- (%) -----		----- (% weed control) -----				
Untreated	-	-	0	0	0	0	0	0	0
Alachlor/ glyphosate ^a	1.0/ 0.75	PRE/ POST	0	0	99	99	99	99	99
Alachlor/ glyphosate	1.25/ 0.75	PRE/ POST	0	0	99	99	99	99	99
Alachlor/ glyphosate	1.5/ 0.75	PRE/ POST	0	0	99	96	99	99	99
Pendimethalin/ glyphosate	1.0/ 0.75	PRE/ POST	0	0	99	99	99	99	99
Pendimethalin/ glyphosate	1.25/ 0.75	PRE/ POST	0	0	99	99	99	99	99
Flumioxazin/ glyphosate	0.032/ 0.75	PRE/ POST	0	0	99	99	99	99	99
Chlorimuron&sulfentrazone/ glyphosate	0.008&0.039/ 0.75	PRE/ POST	0	0	99	99	99	99	99
Flumioxazin+cloransulam/ glyphosate	0.048+0.016/ 0.75	PRE/ POST	0	0	99	99	99	99	99
Cloransulam/ glyphosate	0.016/ 0.75	PRE/ POST	0	0	99	99	99	99	99
Glyphosate	0.75	POST	0	0	99	99	99	99	99
Glyphosate/ glyphosate	0.75/ 0.75	POST/ SPOST	0	0	99	99	99	99	99
LSD (P=0.05)			0	0	0	1	0	0	0

^a Glyphosate rate in lb ae/A.

Table 3. Preemergence applied alachlor, pendimethalin, flumioxazin, chlorimuron & sulfentrazone, and cloransulam followed by postemergence glyphosate applications in soybean, Ames, IA, 2004 (Owen, Lux, Franzenburg).

Treatment	Rate	Appl time	SETFA 9/7/04	ABUTH 9/7/04	AMATA 9/7/04	CHEAL 9/7/04	XANST 9/7/04
	(lb/A)		----- (% weed control) -----				
Untreated	-	-	0	0	0	0	0
Alachlor/ glyphosate ^a	1.0/ 0.75	PRE/ POST	99	98	99	98	99
Alachlor/ glyphosate	1.25/ 0.75	PRE/ POST	99	99	98	98	99
Alachlor/ glyphosate	1.5/ 0.75	PRE/ POST	99	96	99	99	99
Pendimethalin/ glyphosate	1.0/ 0.75	PRE/ POST	99	99	99	99	99
Pendimethalin/ glyphosate	1.25/ 0.75	PRE/ POST	99	99	99	99	99
Flumioxazin/ glyphosate	0.032/ 0.75	PRE/ POST	99	99	99	99	99
Chlorimuron&sulfentrazone/ glyphosate	0.008&0.039/ 0.75	PRE/ POST	99	99	99	99	99
Flumioxazin+cloransulam/ glyphosate	0.048+0.016/ 0.75	PRE/ POST	99	99	99	99	99
Cloransulam/ glyphosate	0.016/ 0.75	PRE/ POST	99	99	99	99	99
Glyphosate	0.75	POST	99	99	99	98	99
Glyphosate/ glyphosate	0.75/ 0.75	POST/ SPOST	99	99	99	99	99
LSD (P=0.05)			0	2	1	2	0

^a Glyphosate rate in lb ae/A.