

Postemergence applications of pendimethalin, dimethenamid-P, dicamba, dicamba & diflufenzopyr, or dicamba & atrazine with glyphosate for weed control in corn, Ames, IA, 2003. Owen, Micheal D.K., James F. Lux, and Damian D. Franzenburg. The purpose of this study was to evaluate the corn tolerance and weed efficacy of postemergence applied pendimethalin, dimethenamid-P, dicamba, dicamba & diflufenzopyr or dicamba & atrazine with glyphosate. The soil was a Canisteo, Nicollet, Clarion, Webster clay loam with a pH 6.8 and 5.3% organic matter. The experimental design was a randomized complete block with three replications and plots were 10 by 25 ft. The 2002 crop was soybean. Tillage included a fall chisel plowing and a spring field cultivation. Fertilization included 127 lb/A actual N applied as urea. Crop residue on the soil surface was 35% at planting. "Dekalb hybrid DKC 58-24" corn was planted 1.5 inches deep on May 18, at 27,700 seeds/A in 30-inch rows. Preemergence (PRE) treatments were applied on May 20 at 20 gpa and 25 psi using flat fan nozzles. Early postemergence (EPOST) and mid-postemergence (MPOST) treatments were applied on June 13, and June 20, respectively, at 20 gpa and 25 psi using flat fan nozzles. Conditions on May 20 were: air temperature 17 C, soil temperature at the 4-inch depth 13 C, 5 mph wind, clear sky, 37% relative humidity. Conditions on June 13 were: air temperature 28 C, soil temperature at the 4-inch depth 21 C, 9 mph wind, 30% cloud cover, 25% relative humidity. Corn growth was V4 and 7 inches tall. Weed species, average size and number per ft² in the untreated control included: giant foxtail one to four leaves, 3 to 5 inches tall, thirty-five plants; velvetleaf two to four leaves, 1 to 3 inches tall, zero to one plant; common waterhemp numerous leaves, 1 to 5 inches tall, zero to five plants; common lambsquarters numerous leaves, 1 to 5 inches tall, zero to five plants; ivyleaf morningglory cotyledon to four leaves, 1 to 3 inches tall, zero to one plant. Conditions on June 20 were: air temperature 18 C, soil temperature at the 4-inch depth 24 C, 7 mph wind, 20% cloud cover, 39% relative humidity. Corn growth was V6 and 12 to 14 inches tall. Weed species, average size and number per ft² in the untreated control included: giant foxtail two to four leaves, 3 to 6 inches tall, ten plants; velvetleaf four to six leaves, 2 to 5 inches tall, zero to two plants; common waterhemp numerous leaves, 3 to 6 inches tall, zero to five plants; common lambsquarters numerous leaves, 2 to 6 inches tall, zero to five plants; ivyleaf morningglory numerous leaves, 4 to 8 inches tall, zero to one plant. May rainfall included: 1.67, 0.37, 0.99, 0.15, 0.39, and 0.18 inches on May 4, 6, 8, 10, 13, and 14, respectively. Total rainfall for May was 3.75 inches. June rainfall included: 0.36, 0.53, 0.32, 0.23, 0.10, 0.28, and 0.55 inches on June 2, 6, 7, 8, 9, 24, and 25, respectively. Total rainfall for June was 2.37 inches. July rainfall included: 2.38 inches and 1.12 inches from July 1 through 15 and 16 through 31, respectively. Total rainfall for July was 3.5 inches. Rainfall total for August was 0.86 inches.

Herbicide treatments did not significantly affect the corn stand as determined on August 12. Corn injury from several EPOST and MPOST treatments was observed on June 28, fifteen days after EPOST, and eight days after MPOST, respectively. Injury was evident as well on July 17 and August 22 with most treatments, but was not considered serious. Injury symptomology occurred as stunting, green snap, or brace root malformation. All EPOST and MPOST treatments generally provided good to excellent giant foxtail, velvetleaf, common waterhemp, common lambsquarters, and ivyleaf morningglory control when observed on June 28. On July 17, thirty-four days after application of the EPOST treatments, excellent common waterhemp and common lambsquarters control was observed, while giant foxtail and velvetleaf control was fair to good. Ivyleaf morningglory control was no longer acceptable with most EPOST treatments on July 17. Good to excellent giant foxtail, velvetleaf and common waterhemp control was achieved with all MPOST treatments on July 17, twenty-seven days after application. Common lambsquarters control was good to excellent with the MPOST treatments, except pendimethalin plus glyphosate. Most MPOST treatments did not provide acceptable ivyleaf morningglory control on July 17. (Dept. of Agronomy, Iowa State University, Ames).

Table 1. Postemergence applications of pendimethalin, dimethenamid-P, dicamba, dicamba & diflufenzopyr, or dicamba & atrazine with glyphosate for weed control in corn, Ames, IA, 2003 (Owen, Lux, and Franzenburg).

Treatment	Rate (lb/A)	Appl. time	Corn ^a stand	Corn injury		SETFA ABUTH AMATA CHEAL IPOHE				
				6/20/03	6/28/03	6/28/03	6/28/03	6/28/03	6/28/03	6/28/03
Untreated	-		26	0	0	0	0	0	0	0
Pendimethalin ^b + glyphosate (3SL) ^c + NIS ^d +ammonium sulfate	1.0+ 0.56+ 0.25+2.5	EPOST	26	0	0	99	99	99	93	93
Dimethenamid-P/ dicamba+glyphosate (3SL)+ NIS+ammonium sulfate	0.56/ 0.25+0.375+ 0.25+2.5	PRE/ EPOST	25	0	7	99	96	98	99	99
Dimethenamid-P+ dicamba+glyphosate (3SL)+ NIS+ammonium sulfate	0.56+ 0.25+0.375+ 0.25+2.5	EPOST	27	0	0	99	98	96	99	95
Dicamba+glyphosate (3SL)+ NIS+ammonium sulfate	0.25+0.375+ 0.25+2.5	EPOST	28	0	3	99	96	98	99	95
Dicamba&diflufenzopyr + glyphosate (3SL)+NIS+ ammonium sulfate	0.125&0.05+ 0.375+0.25 2.5	EPOST	28	0	0	98	98	99	98	96
Glyphosate (4.5SL) ^e + ammonium sulfate	0.77+ 2.5	EPOST	26	0	0	99	99	95	99	95
Dimethenamid-P/ dicamba+glyphosate (3SL)+ NIS+ammonium sulfate ammonium sulfate	0.56/ 0.25+0.375+ 0.25+2.5 2.5	PRE/ MPOST	26	0	0	95	95	98	90	93
Dimethenamid-P/ dicamba&diflufenzopyr+ glyphosate (3SL)+NIS+ ammonium sulfate	0.56/ 0.0675&0.25+ 0.375+0.25+ 2.5	PRE/ MPOST	25	0	0	96	95	96	90	93
Dimethenamid-P/ dicamba&diflufenzopyr+ glyphosate (3SL)+NIS+ ammonium sulfate	0.56/ 0.125&0.05+ 0.375+0.25+ 2.5	PRE/ MPOST	26	0	0	93	95	96	92	90
Dimethenamid-P/ glyphosate (4.5SL)+ ammonium sulfate	0.56/ 0.77+ 2.5	PRE/ MPOST	26	0	0	95	95	98	88	90
Pendimethalin+ glyphosate (3SL)+ NIS+ammonium sulfate	1.0+ 0.56+ 0.25+2.5	MPOST	26	0	0	85	93	92	85	87
Dimethenamid-P&atrazine/ dicamba&atrazine+ glyphosate (3SL)+NIS+ ammonium sulfate	0.53&1.03/ 0.275&0.525+ 0.375+0.25+ 2.5	PRE/ EPOST	27	0	2	99	98	99	99	99
Dicamba&atrazine+ glyphosate (3SL)+NIS+ ammonium sulfate/ glyphosate (3SL)+ ammonium sulfate	0.275&0.525+ 0.375+0.25+ 2.5/ 0.56+ 2.5	EPOST/ MPOST	26	0	8	99	99	99	99	99
LSD (P=0.05)			3	0	2	2	3	3	3	4

^a Corn stand per 17.5 row feet on August 12.

^b Pendimethalin = Prowl H2O from BASF.

^c Glyphosate (3SL) = Roundup. Rate in lb ae/A.

^d NIS = Activator 90, a non-ionic surfactant from Loveland Industries, Inc. Rate in % v/v.

^e Glyphosate (4.5SL) = Roundup WeatherMAX from Monsanto. Rate in lb ae/A.

Table 2. Postemergence applications of pendimethalin, dimethenamid-P, dicamba, dicamba & diflufenzopyr, or dicamba & atrazine with glyphosate for weed control in corn, Ames, IA, 2003 (Owen, Lux, and Franzenburg).

Treatment	Rate (lb/A)	Appl. time	Corn injury	SETFA	ABUTH	AMATA	CHEAL	IPOHE
			7/17/03 ----- (%) -----	7/17/03	7/17/03	7/17/03	7/17/03	7/17/03
			----- (% weed control) -----					
Untreated	-		0	0	0	0	0	0
Pendimethalin ^a + glyphosate (3SL) ^b + NIS ^c +ammonium sulfate	1.0+ 0.56+ 0.25+2.5	EPOST	0	88	83	93	93	80
Dimethenamid-P/ dicamba+glyphosate (3SL)+ NIS+ammonium sulfate	0.56/ 0.25+0.375+ 0.25+2.5	PRE/ EPOST	3	90	87	99	99	82
Dimethenamid-P+ dicamba+glyphosate (3SL)+ NIS+ammonium sulfate	0.56+ 0.25+0.375+ 0.25+2.5	EPOST	2	92	88	95	96	67
Dicamba+glyphosate (3SL)+ NIS+ammonium sulfate	0.25+0.375+ 0.25+2.5	EPOST	2	85	85	93	95	70
Dicamba&diflufenzopyr + glyphosate (3SL)+NIS+ ammonium sulfate	0.125&0.05+ 0.375+0.25 2.5	EPOST	0	83	85	93	95	75
Glyphosate (4.5SL) ^d + ammonium sulfate	0.77+ 2.5	EPOST	0	82	82	92	88	75
Dimethenamid-P/ dicamba+glyphosate (3SL)+ NIS+ammonium sulfate ammonium sulfate	0.56/ 0.25+0.375+ 0.25+2.5 2.5	PRE/ MPOST	8	93	95	96	96	87
Dimethenamid-P/ dicamba&diflufenzopyr+ glyphosate (3SL)+NIS+ ammonium sulfate	0.56/ 0.0675&0.25+ 0.375+0.25+ 2.5	PRE/ MPOST	5	95	85	98	96	78
Dimethenamid-P/ dicamba&diflufenzopyr+ glyphosate (3SL)+NIS+ ammonium sulfate	0.56/ 0.125&0.05+ 0.375+0.25+ 2.5	PRE/ MPOST	3	96	90	98	96	73
Dimethenamid-P/ glyphosate (4.5SL)+ ammonium sulfate	0.56/ 0.77+ 2.5	PRE/ MPOST	2	93	92	96	88	68
Pendimethalin+ glyphosate (3SL)+ NIS+ammonium sulfate	1.0+ 0.56+ 0.25+2.5	MPOST	5	93	95	95	82	65
Dimethenamid-P&atrazine/ dicamba&atrazine+ glyphosate (3SL)+NIS+ ammonium sulfate	0.53&1.03/ 0.275&0.525+ 0.375+0.25+ 2.5	PRE/ EPOST	2	93	90	99	99	87
Dicamba&atrazine+ glyphosate (3SL)+NIS+ ammonium sulfate/ glyphosate (3SL)+ ammonium sulfate	0.275&0.525+ 0.375+0.25+ 2.5/ 0.56+ 2.5	EPOST/ MPOST	3	88	90	98	99	78
LSD (P=0.05)			4	5	8	5	5	19

^a Pendimethalin = Prowl H2O from BASF.

^b Glyphosate (3SL) = Roundup. Rate in lb ae/A.

^c NIS = Activator 90, a non-ionic surfactant from Loveland Industries, Inc. Rate in % v/v.

^d Glyphosate (4.5SL) = Roundup WeatherMAX from Monsanto. Rate in lb ae/A.

Table 3. Postemergence applications of pendimethalin, dimethenamid-P, dicamba, dicamba & diflufenzopyr, or dicamba & atrazine with glyphosate for weed control in corn, Ames, IA, 2003 (Owen, Lux, and Franzenburg).

Treatment	Rate (lb/A)	Appl. Time	Corn injury	SETFA	ABUTH	AMATA	CHEAL	IPOHE
			8/22/03 ---- (%) ----	8/22/03	8/22/03	8/22/03	8/22/03	8/22/03
			----- (% weed control) -----					
Untreated	-		0	0	0	0	0	0
Pendimethalin ^a + glyphosate (3SL) ^b + NIS ^c +ammonium sulfate	1.0+ 0.56+ 0.25+2.5	EPOST	0	87	82	93	93	77
Dimethenamid-P/ dicamba+glyphosate (3SL)+ NIS+ammonium sulfate	0.56/ 0.25+0.375+ 0.25+2.5	PRE/ EPOST	3	87	83	98	98	77
Dimethenamid-P+ dicamba+glyphosate (3SL)+ NIS+ammonium sulfate	0.56+ 0.25+0.375+ 0.25+2.5	EPOST	2	87	85	93	96	67
Dicamba+glyphosate (3SL)+ NIS+ammonium sulfate	0.25+0.375+ 0.25+2.5	EPOST	2	78	82	93	95	67
Dicamba&diflufenzopyr + glyphosate (3SL)+NIS+ ammonium sulfate	0.125&0.05+ 0.375+0.25 2.5	EPOST	0	78	83	93	95	72
Glyphosate (4.5SL) ^d + ammonium sulfate	0.77+ 2.5	EPOST	0	75	82	90	88	72
Dimethenamid-P/ dicamba+glyphosate (3SL)+ NIS+ammonium sulfate ammonium sulfate	0.56/ 0.25+0.375+ 0.25+2.5 2.5	PRE/ MPOST	8	93	93	96	98	87
Dimethenamid-P/ dicamba&diflufenzopyr+ glyphosate (3SL)+NIS+ ammonium sulfate	0.56/ 0.0675&0.25+ 0.375+0.25+ 2.5	PRE/ MPOST	5	95	83	98	95	78
Dimethenamid-P/ dicamba&diflufenzopyr+ glyphosate (3SL)+NIS+ ammonium sulfate	0.56/ 0.125&0.05+ 0.375+0.25+ 2.5	PRE/ MPOST	3	93	87	98	96	67
Dimethenamid-P/ glyphosate (4.5SL)+ ammonium sulfate	0.56/ 0.77+ 2.5	PRE/ MPOST	2	92	90	96	87	60
Pendimethalin+ glyphosate (3SL)+ NIS+ammonium sulfate	1.0+ 0.56+ 0.25+2.5	MPOST	5	92	92	95	80	62
Dimethenamid-P&atrazine/ dicamba&atrazine+ glyphosate (3SL)+NIS+ ammonium sulfate	0.53&1.03/ 0.275&0.525+ 0.375+0.25+ 2.5	PRE/ EPOST	2	90	88	99	99	87
Dicamba&atrazine+ glyphosate (3SL)+NIS+ ammonium sulfate/ glyphosate (3SL)+ ammonium sulfate	0.275&0.525+ 0.375+0.25+ 2.5/ 0.56+ 2.5	EPOST/ MPOST	3	83	88	95	99	78
LSD (P=0.05)			4	6	10	5	6	19

^a Pendimethalin = Prowl H2O from BASF.

^b Glyphosate (3SL) = Roundup. Rate in lb ae/A.

^c NIS = Activator 90, a non-ionic surfactant from Loveland Industries, Inc. Rate in % v/v.

^d Glyphosate (4.5SL) = Roundup WeatherMAX from Monsanto. Rate in lb ae/A.