Postemergence applications of nicosulfuron & rimsulfuron, topramezone, atrazine, mesotrione, foramsulfuron and others for weed control in corn, Ames, IA, 2005. Owen, Micheal D.K., James F. Lux, and Damian D. Franzenburg. The purpose of this study was to evaluate postemergence applications of various products including nicosulfuron & rimsulfuron, topramezone, atrazine, mesotrione, nicosulfuron, foramsulfuron, dimethenamid-P and pendimethalin for crop phytotoxicity, weed efficacy, and corn yield. The soil was a Clarion, Webster, Nicollet Canisteo clay loam with a pH 7.3 and 6.6% organic matter. The experimental design was a randomized complete block with three replications and plots were 10 by 25 ft. The 2004 crop was soybean. Fertilization included 125 lb/A actual N applied as urea. Tillage included a spring field cultivation. Crop residue on the soil surface was 20% at planting. "Dekalb hybrid DKC 53-34" corn was planted 1.5 inches deep on May 5, at 30,200 seeds/A in 30-inch rows. Early postemergence (EPOST) treatments were applied May 31 at 20 gpa and 30 psi using flat fan nozzles. Conditions on May 31 were: air temperature 19 C, soil temperature at the 4-inch depth 18 C, 2 mph wind, 100% cloud cover, 51% relative humidity. Corn growth was V 3 and 4 inches tall. Weed species, average size and number per $ft/^2$ occurring in the untreated control included: giant foxtail, one to four leaves, 0.25 to 2 inches tall, zero to three plants; velvetleaf, cotyledon to two leaves, 0.25 to 1.5 inches, less than one plant; common waterhemp and common lambsquarters, cotyledon to numerous leaves, 0.25 to 1.0 inch tall, zero to eight plants. Postemergence (POST) treatments were applied June 7 at 20 gpa and 30 psi using flat fan nozzles. Conditions on June 7 were: air temperature 30 C, soil temperature at the 4-inch depth 22 C, 10 mph wind, 30% cloud cover, 47% relative humidity. Corn growth was V 4 to V 5 and 9 inches tall. Weed species, average size and number per $ft/^2$ occurring in the untreated control included: giant foxtail, one to four leaves, one tiller, 0.25 to 5 inches tall, zero to two plants; velvetleaf, cotyledon to five leaves, 0.25 to 5 inches, less than one plant; common waterhemp and common lambsquarters, numerous leaves, 0.25 to 5 inches tall, zero to ten eight plants; ivyleaf morningglory, cotyledon to numerous leaves, 0.5 to 2 inches tall, less than one plant. April rainfall included: 1.65, 0.07, 0.1, 0.15, 0.16, and 0.2 inches on April 11, 12, 16, 20, 21, and 22, respectively. Total rainfall for April was 2.32 inches. May rainfall included: 0.66, 0.41, 0.19, 0.33, and 0.25 inches on May 12, 18, 21, 25, and 29, respectively. Total rainfall for May was 1.83 inches. June rainfall included: 0.94, 0.5, 0.33, 0.33, 0.32, 0.2, 0.29, 0.43, 0.51, 0.89, and 0.25 inches on June 4, 8, 10, 11, 12, 20, 24, 25, 26, 27, and 29, respectively. Total rainfall for June was 4.98 inches. July rainfall included: 0 inches and 3.28 inches from July 1 through 15 and 16 through 31, respectively. Total rainfall for July was 3.28 inches. Rainfall total for August was 2.86 inches.

Significant differences in corn stand were observed between treatments on June 27, but were due to variability in seeding rate and not herbicides. Five percent corn injury was observed on June 7, seven days after early postemergence (EPOST) applied treatments. No injury was observed from these treatments on subsequent observation dates. Postemergence (POST) treatments resulted in 7 to 15% corn injury when observed June 16, nine days after application. Injury continued to be observed on June 24 and July 7 with these treatments, though at negligible levels. An exception was topramezone plus nicosulfuron & rimsulfuron plus atrazine which demonstrated 10% injury.

Giant foxtail control was good to excellent with the EPOST and POST applied treatments when observed on June 16. Treatments that included topramezone provided 95 to 99% giant foxtail control on this date, while remaining treatments gave 83 to 87%. Significant differences in control between treatments were determined. Giant foxtail control was 90 to 99% with the EPOST and POST treatments when observed on June 24, July 7 and August 4. An exception was EPOST applied s-metolachlor & atrazine & mesotrione & benoxacor, which provided 80% control.

EPOST treatments afforded excellent velvetleaf, common waterhemp and common lambsquarters control when observed on June 16, 24, July 7, and August 4. Ivyleaf morningglory control was good on these dates with EPOST treatments. POST treatments that included topramezone and the mesotrione plus nicosulfuron & rimsulfuron plus atrazine treatment had achieved excellent velvetleaf, common waterhemp, common lambsquarters, and ivyleaf morningglory control on June 16, nine days after application. POST nicosulfuron & rimsulfuron and foramsulfuron plus dicamba & diflufenzopyr treatments were not as effective in control of these species on June 16. However, on the subsequent observation dates foramsulfuron plus dicamba & diflufenzopyr, as well as remaining POST treatments, afforded excellent overall broadleaf weed control. The POST nicosulfuron & rimsulfuron was unable at anytime to provide adequate common waterhemp and common lambsquarters control.

Considerable variability was observed in treatment corn yields as reflected by the large LSD. No significant differences in yield were determined between the herbicide treatments; all yields were significantly higher than the untreated control. (Dept. of Agronomy, Iowa State University, Ames).

Table 1. Postemergence applications of nicosulfuron & rimsulfuron, topramezone, atrazine, mesotrione, foramsulfuron and others for weed control in corn, Ames, IA, 2005 (Owen, Lux, and Franzenburg).

Treatment	Rate	Appl. time	Corn[a] stand	Injury 6/7/05	Injury 6/16/05	SETFA 6/16/05	ABUTH 6/16/05	AMATA 6/16/05	CHEAL 6/16/05	IPOHE 6/16/05
	(lb/A)			---------- (%) ----------		---------- (% weed control) ----------				
Untreated	-	-	31	0	0	0	0	0	0	0
Nicosulfuron&rimsulfuron+ MSO[b]+28% UAN[c]	0.023&0.012+ 1.0+2.5	POST	31	0	12	87	93	72	68	85
Topramezone[d]+ nicosulfuron&rimsulfuron+ atrazine+MSO+28% UAN	0.016+ 0.023&0.012+ 0.5+1.0+2.5	POST	34	0	15	95	98	99	99	98
Mesotrione+ nicosulfuron&rimsulfuron+ atrazine+COC[e]+28% UAN	0.094+ 0.023&0.012+ 0.25+1.0+2.5	POST	30	0	10	87	99	99	98	96
Topramezone+ nicosulfuron+atrazine+ MSO+28% UAN	0.016+ 0.031+0.5+ 1.0+2.5	POST	31	0	7	95	99	99	99	98
Topramezone+ foramsulfuron+atrazine+ MSO+28% UAN	0.016+ 0.033+0.5+ 1.0+2.5	POST	31	0	7	96	99	99	99	96
Foramsulfuron+ dicamba&diflufenzopyr+ MSO+28% UAN	0.033+ 0.125&0.05+ 1.0+2.5	POST	30	0	15	83	80	82	77	85
Dimethenamid-P+ topramezone+atrazine+ COC+28% UAN	0.75+ 0.016+1.0+ 1.0+2.5	EPOST	31	5	0	99	99	99	99	99
Pendimethalin+ topramezone+atrazine+ COC+28% UAN	0.75+ 0.016+1.0+ 1.0+2.5	EPOST	32	5	0	99	99	99	99	99
S-metolachlor&atrazine& mesotrione&benoxacor+ COC	1.67&0.63& 0.16+ 1.0	EPOST	31	5	0	85	99	99	99	98
LSD (P=0.05)			2	0	3	7	2	4	2	10

[a] Corn stand per 17.5 row feet on June 27.

[b] MSO=methylated seed oil plus surfactant from Loveland Industries, Inc. Rate in % v/v.

[c] 28% UAN = Mixtures of urea and ammonium nitrate. Rate in % v/v.

[d] Topramezone is the proposed common name for Impact.

[e] COC = Herbimax, an oil-surfactant adjuvant from Loveland Industries, Inc. Rate in % v/v.

Table 2. Postemergence applications of nicosulfuron & rimsulfuron, topramezone, atrazine, mesotrione, foramsulfuron and others for weed control in corn, Ames, IA, 2005 (Owen, Lux, and Franzenburg).

Treatment	Rate	Appl. time	Injury 6/24/05	SETFA 6/24/05	ABUTH 6/24/05	AMATA 6/24/05	CHEAL 6/24/05	IPOHE 6/24/05	Injury 7/7/05	SETFA 7/7/05	ABUTH 7/7/05	AMATA 7/7/05	CHEAL 7/7/05	IPOHE 7/7/05
	(lb/A)		-- (%) --	----------(% weed control) ----------					-- (%) --	----------(% weed control) ----------				
Untreated	-	-	0	0	0	0	0	0	0	0	0	0	0	0
Nicosulfuron&rimsulfuron+ MSO[a]+28% UAN[b]	0.023&0.012+ 1.0+2.5	POST	2	96	98	63	85	83	0	96	90	58	82	82
Topramezone[c]+ nicosulfuron&rimsulfuron+ atrazine+MSO+28% UAN	0.016+ 0.023&0.012+ 0.5+1.0+2.5	POST	10	99	99	99	99	98	10	96	96	99	99	96
Mesotrione+ nicosulfuron&rimsulfuron+ atrazine+COC[d]+28% UAN	0.094+ 0.023&0.012+ 0.25+1.0+2.5	POST	3	92	99	99	99	96	3	92	99	99	99	93
Topramezone+ nicosulfuron+atrazine+ MSO+28% UAN	0.016+ 0.031+0.5+ 1.0+2.5	POST	3	98	99	99	99	98	3	95	98	98	99	96
Topramezone+ foramsulfuron+atrazine+ MSO+28% UAN	0.016+ 0.033+0.5+ 1.0+2.5	POST	2	98	99	99	99	95	2	93	98	98	99	88
Foramsulfuron+ dicamba&diflufenzopyr+ MSO+28% UAN	0.033+ 0.125&0.05+ 1.0+2.5	POST	3	92	95	92	96	90	3	92	93	92	96	90
Dimethenamid-P+ topramezone+atrazine+ COC+28% UAN	0.75+ 0.016+1.0+ 1.0+2.5	EPOST	0	99	99	99	99	96	0	99	99	99	99	95
Pendimethalin+ topramezone+atrazine+ COC+28% UAN	0.75+ 0.016+1.0+ 1.0+2.5	EPOST	0	96	99	98	99	85	0	96	96	98	99	83
S-metolachlor&atrazine& mesotrione&benoxacor+ COC	1.67&0.63& 0.16+ 1.0	EPOST	0	80	99	99	99	98	0	80	99	98	99	93
LSD (P=0.05)			3	6	1	9	1	11	3	6	4	7	2	10

[a] MSO=methylated seed oil plus surfactant from Loveland Industries, Inc. Rate in % v/v.

[b] 28% UAN = Mixtures of urea and ammonium nitrate. Rate in % v/v.

[c] Topramezone is the proposed common name for Impact.

[d] COC = Herbimax, an oil-surfactant adjuvant from Loveland Industries, Inc. Rate in % v/v.

Table 3. Postemergence applications of nicosulfuron & rimsulfuron, topramezone, atrazine, mesotrione, foramsulfuron and others for weed control in corn, Ames, IA, 2005 (Owen, Lux, and Franzenburg).

Treatment	Rate	Appl. time	Injury 8/4/05	SETFA 8/4/05	ABUTH 8/4/05	AMATA 8/4/05	CHEAL 8/4/05	IPOHE 8/4/05	Corn Yield
	(lb/A)		----- (%) -----	----------(% weed control) ----------					--- (bu/A) ---
Untreated	-	-	0	0	0	0	0	0	150
Nicosulfuron&rimsulfuron+ MSO[a]+28% UAN[b]	0.023&0.012+ 1.0+2.5	POST	0	96	90	58	73	87	219
Topramezone[c]+ nicosulfuron&rimsulfuron+ atrazine+MSO+28% UAN	0.016+ 0.023&0.012+ 0.5+1.0+2.5	POST	0	96	96	99	99	93	218
Mesotrione+ nicosulfuron&rimsulfuron+ atrazine+COC[d]+28% UAN	0.094+ 0.023&0.012+ 0.25+1.0+2.5	POST	0	92	99	99	99	92	207
Topramezone+ nicosulfuron+atrazine+ MSO+28% UAN	0.016+ 0.031+0.5+ 1.0+2.5	POST	0	95	96	99	99	96	208
Topramezone+ foramsulfuron+atrazine+ MSO+28% UAN	0.016+ 0.033+0.5+ 1.0+2.5	POST	0	93	98	98	99	88	220
Foramsulfuron+ dicamba&diflufenzopyr+ MSO+28% UAN	0.033+ 0.125&0.05+ 1.0+2.5	POST	0	90	95	98	96	91	215
Dimethenamid-P+ topramezone+atrazine+ COC+28% UAN	0.75+ 0.016+1.0+ 1.0+2.5	EPOST	0	99	99	99	99	95	228
Pendimethalin+ topramezone+atrazine+ COC+28% UAN	0.75+ 0.016+1.0+ 1.0+2.5	EPOST	0	96	98	98	99	87	218
S-metolachlor&atrazine& mesotrione&benoxacor+ COC	1.67&0.63& 0.16+ 1.0	EPOST	0	80	99	98	99	93	226
LSD (P=0.05)			0	6	4	7	4	8	37

[a] MSO=methylated seed oil plus surfactant from Loveland Industries, Inc. Rate in % v/v.

[b] 28% UAN = Mixtures of urea and ammonium nitrate. Rate in % v/v.

[c] Topramezone is the proposed common name for Impact.

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