

Evaluation of crop phytotoxicity and weed control in corn with postemergence applied nicosulfuron & rimsulfuron, atrazine, mesotrione and others, Ames, IA, 2002. Owen, Micheal D.K., James F. Lux, and Damian D. Franzenburg. The purpose of this study was to evaluate the crop safety and weed control potential of postemergence nicosulfuron & rimsulfuron applied alone, and tank-mixed with various rates of atrazine, and mesotrione. The soil was a Canisteo, Nicollet, Clarion, Webster, Hayden-Storden clay loam with a pH 7.05 and 4.0% organic matter. The experimental design was a randomized complete block with three replications and plots were 10 by 25 ft. The 2001 crop was soybean. Tillage included a fall chisel plowing and spring field cultivation. Fertilization included 125 lb/A actual N applied as urea. Crop residue on the soil surface was 12% at planting. "Pioneer hybrid 34B23" corn was planted 1.5 inches deep on May 7, at 27,700 seeds/A in 30-inch rows. Preemergence (PRE) and mid-postemergence (MPOST) treatments were applied on May 8 and June 7, respectively, at 20 gpa and 30 psi using flat fan nozzles. Conditions on May 8 were: air temperature 28 C, soil temperature at the 4-inch depth 18 C, 11 mph wind, 90% cloud cover, 71% relative humidity. Conditions on June 7 were: air temperature 29 C, soil temperature at the 4-inch depth 23 C, 12 mph wind, clear sky, 56% relative humidity. Corn growth was V4 to V5 and 10 inches tall. Weed species, size and number per ft<sup>2</sup> in the untreated control included: giant foxtail three to four leaves, 5 to 7 inch tall, fifteen plants; velvetleaf five to seven leaves, 4 to 8 inches tall, zero to five plants; common waterhemp numerous leaves, 4 to 8 inches tall, five to ten plants; common lambsquarters numerous leaves, 3 to 6 inches tall, zero to ten plants; Pennsylvania smartweed two to six leaves, 3 to 8 inches tall, zero to one plants; and common cocklebur five to six leaves, 3 to 8 inches tall, zero to two plants. May rainfall included: 0.45, 0.01, 0.07, 2.60, 0.12, 0.19, 0.23, 0.09, 0.66 inches on May 1, 2, 5, 11, 15, 16, 23, 24, and 25, respectively. Total rainfall for May was 4.42 inches. June rainfall included: 0.54, 0.83, 1.41, 0.01, and 0.01 inches on June 2, 11, 12, 13, and 20, respectively. Total rainfall for June was 2.8 inches. July rainfall included: 4.8 inches and 0.46 inches from July 1 through 15 and 16 through 31, respectively. Total rainfall for July was 5.26 inches. Rainfall total for August was 4.89 inches.

Significant differences in corn stands between herbicide treatments were observed on July 24. These differences, however, were attributable to planter malfunction and not the herbicides. Corn injury was apparent with nearly all treatments when observed on June 15 and 22, eight and fifteen days after application, respectively. Injury ranged from 2 to 13% with the MPOST applications. S-metolachlor & atrazine & CGA-154281 applied PRE provided excellent giant foxtail, common waterhemp, common lambsquarters and Pennsylvania smartweed control when noted on June 22, but not velvetleaf and common cocklebur. The addition of mesotrione to the treatment, however, improved the control of these species to excellent. Generally, giant foxtail control was good to excellent with all of the MPOST treatments, regardless of the herbicide mixtures and rates, and ranged from 82 to 93% when evaluated July 15. Nicosulfuron & rimsulfuron applied alone did not achieve acceptable velvetleaf, common waterhemp, common lambsquarters, Pennsylvania smartweed and common cocklebur control on July 15. The addition of atrazine to the nicosulfuron & rimsulfuron treatment improved the control of several of these species to an acceptable level. The best overall broadleaf control, however, was achieved when mesotrione was included with atrazine and nicosulfuron & rimsulfuron. There were few significant differences between the various rates of mesotrione and atrazine added to the nicosulfuron & rimsulfuron treatments. Nicosulfuron & rimsulfuron plus dicamba & San 1269H provided excellent overall weed control on July 15, except for common waterhemp. When atrazine was added to this mixture, common waterhemp control improved to an acceptable level. When observed on July 15, MPOST applied AE F 130360 01 with atrazine gave acceptable control of velvetleaf, common lambsquarters, Pennsylvania smartweed and common cocklebur, but not common waterhemp. (Dept. of Agronomy, Iowa State University, Ames)

Table 1. Evaluation of crop phytotoxicity and weed control in corn with postemergence applied nicosulfuron &amp; rimsulfuron, atrazine, mesotrione and others, Ames, IA, 2002 (Owen, Lux, and Franzenburg).

Treatment	Rate	Appl. time	Corn <sup>a</sup> stand	Corn injury		SETFA	ABUTH	AMATA	CHEAL	POLPY	XANST
	(lb/A)			6/15/02	6/22/02	6/22/02	6/22/02	6/22/02	6/22/02	6/22/02	6/22/02
				----- (%) -----		----- (% weed control) -----					
Untreated	-		25	0	0	0	0	0	0	0	0
Nicosulfuron&rimsulfuron+ COC <sup>b</sup> +ammonium sulfate	0.023&0.012+ 1.0+2.0	MPOST	27	2	10	87	67	50	65	65	65
Nicosulfuron&rimsulfuron+ atrazine+ COC+ammonium sulfate	0.023&0.012+ 0.75+ 1.0+2.0	MPOST	26	2	8	93	68	77	98	90	83
Nicosulfuron&rimsulfuron+ mesotrione+ COC+ammonium sulfate	0.023&0.012+ 0.0312+ 1.0+2.0	MPOST	28	2	12	88	95	85	99	94	98
Nicosulfuron&rimsulfuron+ mesotrione+atrazine+ COC+ammonium sulfate	0.023&0.012+ 0.0312+0.25+ 1.0+2.0	MPOST	26	3	10	90	99	99	99	99	99
Nicosulfuron&rimsulfuron+ mesotrione+atrazine+ COC+ammonium sulfate	0.023&0.012+ 0.0312+0.75+ 1.0+2.0	MPOST MPOST	27	3	10	90	99	99	99	99	99
Nicosulfuron&rimsulfuron+ mesotrione+ COC+ammonium sulfate	0.023&0.012+ 0.047+ 1.0+2.0	MPOST	23	2	8	92	98	88	99	99	99
Nicosulfuron&rimsulfuron+ mesotrione+atrazine+ COC+ammonium sulfate	0.023&0.012+ 0.047+0.25+ 1.0+2.0	MPOST	26	3	13	88	99	99	99	99	99
Nicosulfuron&rimsulfuron+ mesotrione+atrazine+ COC+ammonium sulfate	0.023&0.012+ 0.047+0.75+ 1.0+2.0	MPOST	25	3	10	90	99	98	99	99	99
Nicosulfuron&rimsulfuron+ mesotrione+ COC+ammonium sulfate	0.023&0.012+ 0.0625+ 1.0+2.0	MPOST	25	5	10	85	98	91	99	98	98
Nicosulfuron&rimsulfuron+ mesotrione+atrazine+ COC+ammonium sulfate	0.023&0.012+ 0.0625+0.25+ 1.0+2.0	MPOST MPOST	26	3	8	88	99	98	99	99	99
Nicosulfuron&rimsulfuron+ mesotrione+atrazine+ COC+ammonium sulfate	0.023&0.012+ 0.0625+0.75+ 1.0+2.0	MPOST	28	5	8	87	99	99	99	99	99
Nicosulfuron&rimsulfuron+ mesotrione+ COC+ammonium sulfate	0.023&0.012+ 0.094+ 1.0+2.0	MPOST	27	3	7	83	99	87	99	69	99
Nicosulfuron&rimsulfuron+ mesotrione+atrazine+ COC+ammonium sulfate	0.023&0.012+ 0.094+0.25+ 1.0+2.0	MPOST	26	5	8	85	99	99	99	99	99
Nicosulfuron&rimsulfuron+ mesotrione+atrazine+ COC+ammonium sulfate	0.023&0.012+ 0.094+0.75+ 1.0+2.0	MPOST	28	5	12	88	99	99	99	99	99
Nicosulfuron&rimsulfuron+ dicamba&San 1269H+ COC+ammonium sulfate	0.023&0.012+ 0.0625&0.025+ 1.0+2.0	MPOST	27	5	10	88	96	85	96	96	98
Nicosulfuron&rimsulfuron+ dicamba&San 1269H+ atrazine+ COC+ammonium sulfate	0.023&0.012+ 0.0625&0.025+ 0.75+ 1.0+2.0	MPOST MPOST	27	5	10	85	99	93	99	99	99
AE F 130360 01+ atrazine+ MSO <sup>c</sup> +ammonium sulfate	0.0656+ 1.0+ 1.0+2.0	MPOST	27	5	12	86	93	73	99	99	94
S-metolachlor&atrazine& CGA-154281	2.9	PRE	26	0	0	90	75	99	99	99	75
S-metolachlor&atrazine& CGA-154281+ mesotrione	2.9+ 0.188	PRE	27	0	2	93	98	99	99	99	90
LSD (P=.05)			3	3	5	9	9	12	1	19	6

<sup>a</sup> Corn stand per 17.5 row feet on July 24.<sup>b</sup> COC = Riverside/Terra Prime oil, a petroleum base oil additive with a 17% emulsifier. Rate in % v/v.<sup>c</sup> MSO = methylated seed oil from Loveland Industries, Inc. Rate in % v/v.

Table 2. Evaluation of crop phytotoxicity and weed control in corn with postemergence applied nicosulfuron &amp; rimsulfuron, atrazine, mesotrione and others, Ames, IA, 2002 (Owen, Lux, and Franzénburg).

Treatment	Rate (lb/A)	Appl. time	Corn inj 7/15/02 -- (%) --	SETFA 7/15/02	ABUTH 7/15/02	AMATA 7/15/02	CHEAL 7/15/02	POLPY 7/15/02	XANST 7/15/02
			----- (% weed control) -----						
Untreated	-		0	0	0	0	0	0	0
Nicosulfuron&rimsulfuron+ COC <sup>a</sup> +ammonium sulfate	0.023&0.012+ 1.0+2.0	MPOST	0	88	58	47	62	63	62
Nicosulfuron&rimsulfuron+ atrazine+ COC+ammonium sulfate	0.023&0.012+ 0.75+ 1.0+2.0	MPOST	0	93	65	68	96	88	83
Nicosulfuron&rimsulfuron+ mesotrione+ COC+ammonium sulfate	0.023&0.012+ 0.0312+ 1.0+2.0	MPOST	0	90	96	83	98	93	96
Nicosulfuron&rimsulfuron+ mesotrione+atrazine+ COC+ammonium sulfate	0.023&0.012+ 0.0312+0.25+ 1.0+2.0	MPOST	0	90	98	98	99	99	98
Nicosulfuron&rimsulfuron+ mesotrione+atrazine+ COC+ammonium sulfate	0.023&0.012+ 0.0312+0.75+ 1.0+2.0	MPOST	0	88	99	99	99	99	99
Nicosulfuron&rimsulfuron+ mesotrione+ COC+ammonium sulfate	0.023&0.012+ 0.047+ 1.0+2.0	MPOST	0	93	99	86	98	96	98
Nicosulfuron&rimsulfuron+ mesotrione+atrazine+ COC+ammonium sulfate	0.023&0.012+ 0.047+0.25+ 1.0+2.0	MPOST	0	88	99	99	99	99	99
Nicosulfuron&rimsulfuron+ mesotrione+atrazine+ COC+ammonium sulfate	0.023&0.012+ 0.047+0.75+ 1.0+2.0	MPOST	0	88	99	99	99	99	99
Nicosulfuron&rimsulfuron+ mesotrione+ COC+ammonium sulfate	0.023&0.012+ 0.0625+ 1.0+2.0	MPOST	0	82	98	92	96	98	98
Nicosulfuron&rimsulfuron+ mesotrione+atrazine+ COC+ammonium sulfate	0.023&0.012+ 0.0625+0.25+ 1.0+2.0	MPOST	0	85	99	99	99	99	98
Nicosulfuron&rimsulfuron+ mesotrione+atrazine+ COC+ammonium sulfate	0.023&0.012+ 0.0625+0.75+ 1.0+2.0	MPOST	0	82	99	99	99	99	99
Nicosulfuron&rimsulfuron+ mesotrione+ COC+ammonium sulfate	0.023&0.012+ 0.094+ 1.0+2.0	MPOST	0	85	99	91	99	99	99
Nicosulfuron&rimsulfuron+ mesotrione+atrazine+ COC+ammonium sulfate	0.023&0.012+ 0.094+0.25+ 1.0+2.0	MPOST	0	83	99	99	99	99	99
Nicosulfuron&rimsulfuron+ mesotrione+atrazine+ COC+ammonium sulfate	0.023&0.012+ 0.094+0.75+ 1.0+2.0	MPOST	0	83	99	99	99	99	99
Nicosulfuron&rimsulfuron+ dicamba&San 1269H+ COC+ammonium sulfate	0.023&0.012+ 0.0625&0.025+ 1.0+2.0	MPOST	0	90	99	78	99	99	96
Nicosulfuron&rimsulfuron+ dicamba&San 1269H+ atrazine+ COC+ammonium sulfate	0.023&0.012+ 0.0625&0.025+ 0.75+ 1.0+2.0	MPOST	0	85	99	92	99	99	99
AE F 130360 01+ atrazine+ MSO <sup>b</sup> +ammonium sulfate	0.0656+ 1.0+ 1.0+2.0	MPOST	0	82	93	67	99	99	93
S-metolachlor&atrazine& CGA-154281	2.9	PRE	0	88	73	99	99	99	73
S-metolachlor&atrazine& CGA-154281+ mesotrione	2.9+ 0.188	PRE	0	91	98	98	99	99	83
LSD (P=.05)			0	8	10	12	3	5	8

<sup>a</sup> COC = Riverside/Terra Prime oil, a petroleum base oil additive with a 17% emulsifier. Rate in % v/v.<sup>b</sup> MSO = methylated seed oil from Loveland Industries, Inc. Rate in % v/v.