Evaluation of postemergence applications of carfentrazone, mesotrione, atrazine & 2,4-D, and CGA-248757 for crop phytotoxicity and weed control in corn, 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 applications of carfentrazone or CGA-248757 in combination with other herbicides. The soil was a Canisteo, Nicollet, Clarion, Harps clay loam with a pH 7.8 and 4.65% 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. "Garst hybrid 8550" corn was planted 1.5 inches deep on May 21, at 27,700 seeds/A in 30-inch rows. Preemergence (PRE) and postemergence (POST) treatments were applied on May 21 and June 14, respectively, at 20 gpa and 30 psi using flat fan nozzles. Conditions on May 21 were: air temperature 17 C, soil temperature at the 4-inch depth 13 C, 10 mph wind, clear sky, 46% relative humidity. Conditions on June 14 were: air temperature 24 C, soil temperature at the 4-inch depth 19 C, 13 mph wind, 60% cloud cover, 48% relative humidity. Corn growth was V5 and 10 inches tall. Weed species, size and number per ft^2 in the untreated control included: giant foxtail two to four leaves, 0.25 to 1 inch tall, zero to ten plants; velvetleaf two to six leaves, 0.5 to 5 inches tall, zero to three plants; common waterhemp and common lambsquarters with numerous leaves, 0.5 to 5 inches tall, zero to three 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 stand between treatments were noted on July 18. This was likely a result of variable seeding rate and not the herbicides. Most treatments caused significant corn injury when noted on June 21, seven days after application. When observed on July 3, little to no injury was apparent. Overall, s-metolachlor & CGA-154281 applied preemergence provided 75 to 82% giant foxtail control when observed on July 3. Giant foxtail control was 90 to 95% where postemergence applied nicosulfuron & rimsulfuron & clopyralid & flumetsulam followed s-metolachlor & CGA-154281. Postemergence applications of carfentrazone, carfentrazone with atrazine, clopyralid & flumetsulam, mesotrione or nicosulfuron & rimsulfuron & clopyralid & flumetsulam provided excellent velvetleaf, common waterhemp, and common lambsquarters control on July 3 and 19. Postemergence atrazine without carfentrazone in the tank-mixture provided excellent control of common waterhemp and common lambsquarters on July 3 and 19, but not velvetleaf. Postemergence applications of atrazine & 2, 4-D, atrazine & 2, 4-D plus CGA-248757, atrazine plus CGA-248757, atrazine plus nicosulfuron & rimsulfuron & clopyralid & flumetsulam plus CGA-248757 and nicosulfuron & rimsulfuron & clopyralid & flumetsulam plus CGA-248757 achieved excellent control of all broadleaf weed species when observed on July 3 and 19. (Dept. of Agronomy, Iowa State University, Ames)

Table 1. Evaluation of postemergence applications of carfentrazone, mesotrione, atrazine & 2,4-D, and CGA-248757 for crop phytotoxicity and weed control in corn, Ames, IA, 2002 (Owen, Lux, and Franzenburg).

Treatment	Rate	Appl. time	Corn[a] stand	Corn injury 6/21/02	Corn injury 7/3/02	SETFA 7/3/02	ABUTH 7/3/02	AMATA 7/3/02	CHEAL 7/3/02
	(lb/A)			(%)		(% weed control)			
Untreated	-		26	0	0	0	0	0	0
S-metolachlor&CGA-154281/ carfentrazone(EW)+atrazine+NIS[b]	1.6/ 0.0078+0.5+0.25	PRE/ POST	27	10	5	80	99	99	99
S-metolachlor&CGA-154281/ carfentrazone(DF)+atrazine+NIS	1.6/ 0.0083+0.5+0.25	PRE/ POST	27	10	5	80	98	98	99
S-metolachlor&CGA-154281/ carfentrazone(EW)+NIS	1.6/ 0.0078+0.25	PRE/ POST	29	13	5	77	98	93	98
S-metolachlor&CGA-154281/ atrazine+COC[c]	1.6/ 0.5+1.0QT	PRE/ POST	27	2	0	77	77	98	99
S-metolachlor&CGA-154281/ carfentrazone(EW)+ flumetsulam&clopyralid+NIS	1.6/ 0.0078+ 0.035&0.93+0.25	PRE/ POST	27	17	5	78	99	99	99
S-metolachlor&CGA-154281/ atrazine+ flumetsulam&clopyralid+NIS	1.6/ 0.5+ 0.035&0.93+0.25	PRE/ POST	27	17	0	80	99	99	99
S-metolachlor&CGA-154281/ carfentrazone(EW)+ mesotrione+COC+NIS	1.6/ 0.0078+ 0.094+1.0%+0.25	PRE/ POST	26	17	5	80	99	99	99
S-metolachlor&CGA-154281/ atrazine+mesotrione+ COC+NIS	1.6/ 0.5+0.094+ 1.0%+0.25	PRE/ POST	28	3	2	82	99	99	99
S-metolachlor&CGA-154281/ carfentrazone(EW)+ nicosulfuron&rimsulfuron& clopyralid&flumetsulam+ COC+ammonium sulfate	1.6/ 0.0078+ 0.012&0.012& 0.094&0.035+ 1.0%+2.0	PRE/ POST	27	20	5	92	99	98	98
S-metolachlor&CGA-154281/ atrazine+ nicosulfuron&rimsulfuron& clopyralid&flumetsulam+ COC+ammonium sulfate	1.6/ 0.5+ 0.012&0.012& 0.094&0.035+ 1.0%+2.0	PRE/ POST	27	17	0	92	99	98	99
S-metolachlor&CGA-154281/ atrazine&2,4-D+LI 700[d]	1.6/ 0.56&0.25+0.25	PRE/ POST	28	3	0	82	99	99	99
S-metolachlor&CGA-154281/ atrazine&2,4-D+ CGA-248757+LI 700	1.6/ 0.56&0.25+ 0.0036+0.25	PRE/ POST	25	3	5	80	99	99	99
S-metolachlor&CGA-154281/ atrazine+CGA-248757+LI 700	1.6/ 1.0+0.0036+0.25	PRE/ POST	28	5	0	75	98	99	99
S-metolachlor&CGA-154281/ atrazine+ nicosulfuron&rimsulfuron& clopyralid&flumetsulam+ CGA-248757+LI 700	1.6/ 1.0+ 0.012&0.012& 0.094&0.035+ 0.0036+0.25	PRE/ POST	28	20	0	95	99	99	99
S-metolachlor&CGA-154281/ nicosulfuron&rimsulfuron& clopyralid&flumetsulam+ CGA-248757+LI 700	1.6/ 0.012&0.012& 0.094&0.035+ 0.0036+0.25	PRE/ POST	28	20	0	90	98	96	93
LSD (0.05)			2	4	4	4	5	3	2

[a] Corn stand per 17.5 row feet on July 18.
[b] NIS = Activator 90, a non-ionic surfactant from Loveland Industries, Inc. Rate in % v/v.
[c] COC = Riverside/Terra Prime oil, a petroleum base oil additive with a 17% emulsifier.
[d] LI 700 = Non-ionic low foaming penetrant from Loveland Industries, Inc. Rate in % v/v.

Table 2. Evaluation of postemergence applications of carfentrazone, mesotrione, atrazine & 2,4-D, and CGA-248757 for crop phytotoxicity and weed control in corn, Ames, IA, 2002 (Owen, Lux, and Franzenburg).

Treatment	Rate	Appl. time	SETFA 7/19/02	ABUTH 7/19/02	AMATA 7/19/02	CHEAL 7/19/02
	(lb/A)		---------- (% weed control) ----------			
Untreated	-		0	0	0	0
S-metolachlor&CGA-154281/ carfentrazone(EW)+atrazine+NIS[a]	1.6/ 0.0078+0.5+0.25	PRE/ POST	77	98	99	99
S-metolachlor&CGA-154281/ carfentrazone(DF)+atrazine+NIS	1.6/ 0.0083+0.5+0.25	PRE/ POST	78	98	98	99
S-metolachlor&CGA-154281/ carfentrazone(EW)+NIS	1.6/ 0.0078+0.25	PRE/ POST	73	98	93	96
S-metolachlor&CGA-154281/ atrazine+COC[b]	1.6/ 0.5+1.0QT	PRE/ POST	75	78	98	99
S-metolachlor&CGA-154281/ carfentrazone(EW)+ flumetsulam&clopyralid+NIS	1.6/ 0.0078+ 0.035&0.93+0.25	PRE/ POST	77	99	99	99
S-metolachlor&CGA-154281/ atrazine+ flumetsulam&clopyralid+NIS	1.6/ 0.5+ 0.035&0.93+0.25	PRE/ POST	80	99	99	99
S-metolachlor&CGA-154281/ carfentrazone(EW)+ mesotrione+COC+NIS	1.6/ 0.0078+ 0.094+1.0%+0.25	PRE/ POST	75	99	98	99
S-metolachlor&CGA-154281/ atrazine+mesotrione+ COC+NIS	1.6/ 0.5+0.094+ 1.0%+0.25	PRE/ POST	80	99	99	98
S-metolachlor&CGA-154281/ carfentrazone(EW)+ nicosulfuron&rimsulfuron& clopyralid&flumetsulam+ COC+ammonium sulfate	1.6/ 0.0078+ 0.012&0.012& 0.094&0.035+ 1.0%+2.0	PRE/ POST	87	99	98	98
S-metolachlor&CGA-154281/ atrazine+ nicosulfuron&rimsulfuron& clopyralid&flumetsulam+ COC+ammonium sulfate	1.6/ 0.5+ 0.012&0.012& 0.094&0.035+ 1.0%+2.0	PRE/ POST	85	99	98	99
S-metolachlor&CGA-154281/ atrazine&2,4-D+LI 700[c]	1.6/ 0.56&0.25+0.25	PRE/ POST	82	99	99	99
S-metolachlor&CGA-154281/ atrazine&2,4-D+ CGA-248757+LI 700	1.6/ 0.56&0.25+ 0.0036+0.25	PRE/ POST	77	99	99	99
S-metolachlor&CGA-154281/ atrazine+CGA-248757+LI 700	1.6/ 1.0+0.0036+0.25	PRE/ POST	72	98	99	99
S-metolachlor&CGA-154281/ atrazine+ nicosulfuron&rimsulfuron& clopyralid&flumetsulam+ CGA-248757+LI 700	1.6/ 1.0+ 0.012&0.012& 0.094&0.035+ 0.0036+0.25	PRE/ POST	93	99	99	99
S-metolachlor&CGA-154281/ nicosulfuron&rimsulfuron& clopyralid&flumetsulam+ CGA-248757+LI 700	1.6/ 0.012&0.012& 0.094&0.035+ 0.0036+0.25	PRE/ POST	87	98	95	93
LSD (0.05)			7	7	3	2

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

[b] COC = Riverside/Terra Prime oil, a petroleum base oil additive with a 17% emulsifier.

[c] LI 700 = Non-ionic low foaming penetrant from Loveland Industries, Inc. Rate in % v/v.