Evaluation of weed control with preemergence and postemergence applied herbicide combinations including imazethapyr & imazapyr, dicamba & San 1269H, 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 various preemergence and postemergence applied herbicide combinations for crop injury and weed control in corn. The soil was a Canisteo, 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. "Garst hybrid 8464 IT" corn was planted 1.5 inches deep on May 3, at 27,700 seeds/A in 30-inch rows. Preemergence (PRE), early postemergence (EPOST) and mid-postemergence (MPOST) treatments were applied on May 4, May 31, and June 6, respectively, at 20 gpa and 30 psi using flat fan nozzles. Conditions on May 4 were: air temperature 20 C, soil temperature at the 4-inch depth 12 C, 8 mph wind, clear sky, 58% relative humidity. Conditions on May 31 were: air temperature 30 C, soil temperature at the 4-inch depth 24 C, 6 mph wind, 10% cloud cover, 45% relative humidity. Corn growth was V4 and 4 inches tall. Weed species, size and number per ft^2 in the untreated control included: giant foxtail one to four leaves, 0.25 to 4 inches tall, one-hundred plants; velvetleaf cotyledon to four leaves, 0.25 to 3 inches tall, zero to five plants; common waterhemp cotyledon to numerous leaves, 0.25 to 3 inches tall, zero to fifteen plants; common lambsquarters four to numerous leaves, 2 to 3 inches tall, zero to five plants; common cocklebur cotyledon to four leaves, 1 to 4 inches tall, zero to three plants. Conditions on June 6 were: air temperature 26 C, soil temperature at the 4-inch depth 21 C, 10 mph wind, 5% cloud cover, 50% 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 one to four leaves several tillers, 0.5 to 7 inches tall, one-hundred plants; velvetleaf cotyledon to six leaves, 0.25 to 5 inches tall, zero to three plants; common waterhemp numerous leaves, 1 to 4 inches tall, zero to three plants; common lambsquarters numerous leaves, 1 to 4 inches tall, zero to one plant; common cocklebur cotyledon to nine leaves, 1 to 9 inches tall, zero to five 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 herbicide treatments were determined on July 22. These differences, however, were attributable to factors such as variability in seeding rate and unfavorable environmental conditions following planting, and not due to herbicide treatment. No corn injury was detected from PRE applied treatments (data not shown). Significant injury, however, was observed on June 6, 14, and 19 from several EPOST or MPOST applied treatments. Generally, all PRE, PRE plus EPOST or MPOST, EPOST and MPOST applied treatments achieved good to excellent giant foxtail, velvetleaf, common waterhemp, common lambsquarters, and common cocklebur control when observed on June 19, July 19, and August 20. Exceptions included: PRE applied dimethenamid-P & atrazine(M) did not control velvetleaf and common cocklebur; PRE applied dimethenamid-P & atrazine(M) plus isoxaflutole and dimethenamid-P & atrazine(L) plus imazethapyr & imazapyr did not control common cocklebur; EPOST applied imazethapyr & imazapyr did not control common waterhemp. Significant differences in corn yield between treatments were determined. These differences were generally attributed to the crop injury caused by the treatments and to the variations in corn stand. Corn yields from all of the treatments were significantly higher than the untreated control. (Dept. of Agronomy, Iowa State University, Ames)

Table 1. Evaluation of weed control with preemergence and postemergence applied herbicide combinations including imazethapyr & imazapyr, dicamba & San 1269H, mesotrione and others, Ames, IA, 2002 (Owen, Lux, and Franzenburg).

Treatment	Rate	Appl. time	Corn[a] stand	Corn injury 6/6/02	Corn injury 6/14/02	Corn injury 6/19/02	SETFA 6/19/02	ABUTH 6/19/02	AMATA 6/19/02	CHEAL 6/19/02	XANST 6/19/02
	(lb/A)			---------- (%) ----------			---------- (% weed control) ----------				
Untreated	-	-	23	0	0	0	0	0	0	0	0
Dimethenamid-P&atrazine(M)[b]	0.85&1.65	PRE	31	0	0	0	96	47	99	99	62
Dimethenamid-P&atrazine(M)+ isoxaflutole	0.85&1.65+ 0.047	PRE	28	0	0	0	96	99	99	99	65
Dimethenamid-P&atrazine(L)[c]+ imazethapyr&imazapyr	0.85&1.03+ 0.042&0.014	PRE	27	0	0	0	99	93	99	99	48
Dimethenamid-P&atrazine(M)/ dicamba&San 1269H+ NIS[d]+ammonium sulfate	0.85&1.65/ 0.125&0.05+ 0.25+5.0lb/100gal	PRE/ MPOST	29	0	7	5	98	99	99	99	99
Dimethenamid-P&atrazine(M)/ dicamba+ammonium sulfate	0.85&1.65/ 0.5+2.5	PRE/ EPOST	29	12	5	3	98	99	99	99	99
Dimethenamid-P/ dicamba&atrazine	0.94/ 0.48&0.92	PRE/ EPOST	29	3	2	0	99	98	99	99	99
Dimethenamid-P/ dicamba&San 1269H+ NIS+ammonium sulfate	0.94/ 0.125&0.05+ 0.25+5.0lb/100gal	PRE/ MPOST	29	0	3	2	99	99	99	99	99
Dimethenamid-P/ dicamba+ammonium sulfate	0.94/ 0.5+2.5	PRE/ EPOST	28	15	5	3	99	99	99	99	99
Dimethenamid-P&atrazine(L)/ dicamba&San 1269H+ NIS+ammonium sulfate	1.13&1.37/ 0.125&0.05+ 0.25+5.0lb/100gal	PRE/ MPOST	28	0	5	3	99	99	99	99	99
Imazethapyr&imazapyr+ dicamba&San 1269H+ NIS+ammonium sulfate	0.042&0.014+ 0.125&0.05+ 0.25+12.0lb/100gal	MPOST	28	0	13	15	83	96	93	95	99
Atrazine/ imazethapyr&imazapyr+ dicamba&San 1269H+ NIS+ammonium sulfate	1.0/ 0.042&0.014+ 0.125&0.05+ 0.25+12.0lb/100gal	PRE/ EPOST	27	17	3	2	99	98	99	99	99
Dimethenamid-P&atrazine(L)/ imazethapyr&imazapyr+ dicamba&San 1269H+ NIS+ammonium sulfate	0.42&0.52/ 0.042&0.014+ 0.125&0.05+ 0.25+12.0lb/100gal	PRE/ MPOST	26	0	8	5	99	98	99	98	96
Dimethenamid-P/ imazethapyr&imazapyr+ dicamba&San 1269H+ NIS+ammonium sulfate	0.56/ 0.042&0.014+ 0.125&0.05+ 0.25+12.0lb/100gal	PRE/ EPOST	26	15	5	2	99	98	99	99	99
Imazethapyr&imazapyr+ dicamba&atrazine+ NIS+ammonium sulfate	0.042&0.014+ 0.34&0.66+ 0.25+12.0lb/100gal	EPOST	27	12	12	13	93	99	94	99	99
Imazethapyr&imazapyr+ mesotrione+atrazine+ COC[e]+ammonium sulfate	0.042&0.014+ 0.0625+0.25+ 1.0+12.0lb/100gal	EPOST	29	17	10	7	95	99	99	99	99
Imazethapyr&imazapyr+ mesotrione+atrazine+ COC+ammonium sulfate	0.042&0.014+ 0.047+0.25+ 1.0+12.0lb/100gal	EPOST	29	15	8	8	95	99	99	99	98
Imazethapyr&imazapyr+ NIS+ammonium sulfate	0.042&0.014+ 0.25+12.0lb/100gal	EPOST	28	10	10	8	96	99	53	96	99
LSD (P=.05)			3	4	5	4	3	3	10	1	13

[a] Corn stand per 17.5 row feet on July 22.

[b] Dimethenamid-P&atrazine(M) = Guardsman Max from BASF.

[c] Dimethenamid-P&atrazine(L) = G-Max Lite from BASF.

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

[e] COC = Riverside/Terra Prime oil, a petroleum base oil additive with a 17% emulsifier. Rate in % v/v.

Table 2. Evaluation of weed control with preemergence and postemergence applied herbicide combinations including imazethapyr & imazapyr, dicamba & San 1269H, mesotrione and others, Ames, IA, 2002 (Owen, Lux, and Franzenburg).

Treatment	Rate	Appl. time	Corn inj. 7/19/02	SETFA 7/19/02	ABUTH 7/19/02	AMATA 7/19/02	CHEAL 7/19/02	XANST 7/19/02
	(lb/A)		---- (%) ----	---------- (% weed control) ----------				
Untreated	-	-	0	0	0	0	0	0
Dimethenamid-P&atrazine(M)[a]	0.85&1.65	PRE	0	93	47	99	99	57
Dimethenamid-P&atrazine(M)+ isoxaflutole	0.85&1.65+ 0.047	PRE	0	93	95	99	99	65
Dimethenamid-P&atrazine(L)[b]+ imazethapyr&imazapyr	0.85&1.03+ 0.042&0.014	PRE	0	95	92	99	99	48
Dimethenamid-P&atrazine(M)/ dicamba&San 1269H+ NIS[c]+ammonium sulfate	0.85&1.65/ 0.125&0.05+ 0.25+5.0lb/100gal	PRE/ MPOST	0	95	96	99	99	98
Dimethenamid-P&atrazine(M)/ dicamba+ammonium sulfate	0.85&1.65/ 0.5+2.5	PRE/ EPOST	0	93	98	99	99	96
Dimethenamid-P/ dicamba&atrazine	0.94/ 0.48&0.92	PRE/ EPOST	0	95	96	99	99	99
Dimethenamid-P/ dicamba&San 1269H+ NIS+ammonium sulfate	0.94/ 0.125&0.05+ 0.25+5.0lb/100gal	PRE/ MPOST	0	95	99	99	99	96
Dimethenamid-P/ dicamba+ammonium sulfate	0.94/ 0.5+2.5	PRE/ EPOST	0	95	98	99	99	98
Dimethenamid-P&atrazine(L)/ dicamba&San 1269H+ NIS+ammonium sulfate	1.13&1.37/ 0.125&0.05+ 0.25+5.0lb/100gal	PRE/ MPOST	0	86	99	99	99	96
Imazethapyr&imazapyr+ dicamba&San 1269H+ NIS+ammonium sulfate	0.042&0.014+ 0.125&0.05+ 0.25+12.0lb/100gal	MPOST	7	90	98	96	96	95
Atrazine/ imazethapyr&imazapyr+ dicamba&San 1269H+ NIS+ammonium sulfate	1.0/ 0.042&0.014+ 0.125&0.05+ 0.25+12.0lb/100gal	PRE/ EPOST	0	92	98	98	99	96
Dimethenamid-P&atrazine(L)/ imazethapyr&imazapyr+ dicamba&San 1269H+ NIS+ammonium sulfate	0.42&0.52/ 0.042&0.014+ 0.125&0.05+ 0.25+12.0lb/100gal	PRE/ MPOST	0	95	99	99	99	96
Dimethenamid-P/ imazethapyr&imazapyr+ dicamba&San 1269H+ NIS+ammonium sulfate	0.56/ 0.042&0.014+ 0.125&0.05+ 0.25+12.0lb/100gal	PRE/ EPOST	0	93	96	99	99	98
Imazethapyr&imazapyr+ dicamba&atrazine+ NIS+ammonium sulfate	0.042&0.014+ 0.34&0.66+ 0.25+12.0lb/100gal	EPOST	5	92	98	88	99	96
Imazethapyr&imazapyr+ mesotrione+atrazine+ COC[d]+ammonium sulfate	0.042&0.014+ 0.0625+0.25+ 1.0+12.0lb/100gal	EPOST	3	90	98	99	99	95
Imazethapyr&imazapyr+ mesotrione+atrazine+ COC+ammonium sulfate	0.042&0.014+ 0.047+0.25+ 1.0+12.0lb/100gal	EPOST	2	90	99	99	99	90
Imazethapyr&imazapyr+ NIS+ammonium sulfate	0.042&0.014+ 0.25+12.0lb/100gal	EPOST	2	92	99	53	96	98
LSD (P=.05)			2	8	4	10	1	11

[a] Dimethenamid-P&atrazine(M) = Guardsman Max from BASF.

[b] Dimethenamid-P&atrazine(L) = G-Max Lite from BASF.

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

[d] COC = Riverside/Terra Prime oil, a petroleum base oil additive with a 17% emulsifier. Rate in % v/v.

Table 3. Evaluation of weed control with preemergence and postemergence applied herbicide combinations including imazethapyr & imazapyr, dicamba & San 1269H, mesotrione and others, Ames, IA, 2002 (Owen, Lux, and Franzenburg).

Treatment	Rate	Appl. time	Corn inj. 8/20/02	SETFA 8/20/02	ABUTH 8/20/02	AMATA 8/20/02	CHEAL 8/20/02	XANST 8/20/02	Corn yield
	(lb/A)		---- (%) ----	---------- (% weed control) ----------					(bu/A)
Untreated	-	-	0	0	0	0	0	0	25
Dimethenamid-P&atrazine(M)[a]	0.85&1.65	PRE	0	93	45	99	99	57	202
Dimethenamid-P&atrazine(M)+ isoxaflutole	0.85&1.65+ 0.047	PRE	0	93	95	99	99	65	209
Dimethenamid-P&atrazine(L)[b]+ imazethapyr&imazapyr	0.85&1.03+ 0.042&0.014	PRE	0	95	92	99	99	47	206
Dimethenamid-P&atrazine(M)/ dicamba&San 1269H+ NIS[c]+ammonium sulfate	0.85&1.65/ 0.125&0.05+ 0.25+5.0lb/100gal	PRE/ MPOST	0	93	98	99	99	96	205
Dimethenamid-P&atrazine(M)/ dicamba+ammonium sulfate	0.85&1.65/ 0.5+2.5	PRE/ EPOST	0	92	99	99	99	96	191
Dimethenamid-P/ dicamba&atrazine	0.94/ 0.48&0.92	PRE/ EPOST	0	93	96	99	99	99	212
Dimethenamid-P/ dicamba&San 1269H+ NIS+ammonium sulfate	0.94/ 0.125&0.05+ 0.25+5.0lb/100gal	PRE/ MPOST	0	92	99	99	99	95	198
Dimethenamid-P/ dicamba+ammonium sulfate	0.94/ 0.5+2.5	PRE/ EPOST	0	95	96	99	99	98	188
Dimethenamid-P&atrazine(L)/ dicamba&San 1269H+ NIS+ammonium sulfate	1.13&1.37/ 0.125&0.05+ 0.25+5.0lb/100gal	PRE/ MPOST	0	96	99	99	99	96	198
Imazethapyr&imazapyr+ dicamba&San 1269H+ NIS+ammonium sulfate	0.042&0.014+ 0.125&0.05+ 0.25+12.0lb/100gal	MPOST	0	93	99	95	99	96	157
Atrazine/ imazethapyr&imazapyr+ dicamba&San 1269H+ NIS+ammonium sulfate	1.0/ 0.042&0.014+ 0.125&0.05+ 0.25+12.0lb/100gal	PRE/ EPOST	0	90	96	98	99	95	189
Dimethenamid-P&atrazine(L)/ imazethapyr&imazapyr+ dicamba&San 1269H+ NIS+ammonium sulfate	0.42&0.52/ 0.042&0.014+ 0.125&0.05+ 0.25+12.0lb/100gal	PRE/ MPOST	0	93	99	99	99	96	191
Dimethenamid-P/ imazethapyr&imazapyr+ dicamba&San 1269H+ NIS+ammonium sulfate	0.56/ 0.042&0.014+ 0.125&0.05+ 0.25+12.0lb/100gal	PRE/ EPOST	0	92	93	99	99	98	214
Imazethapyr&imazapyr+ dicamba&atrazine+ NIS+ammonium sulfate	0.042&0.014+ 0.34&0.66+ 0.25+12.0lb/100gal	EPOST	0	90	96	82	99	96	182
Imazethapyr&imazapyr+ mesotrione+atrazine+ COC[d]+ammonium sulfate	0.042&0.014+ 0.0625+0.25+ 1.0+12.0lb/100gal	EPOST	0	90	98	99	99	93	202
Imazethapyr&imazapyr+ mesotrione+atrazine+ COC+ammonium sulfate	0.042&0.014+ 0.047+0.25+ 1.0+12.0lb/100gal	EPOST	0	90	99	99	99	88	175
Imazethapyr&imazapyr+ NIS+ammonium sulfate	0.042&0.014+ 0.25+12.0lb/100gal	EPOST	0	93	99	48	96	98	183
LSD (P=.05)			0	4	4	11	1	12	28

[a] Dimethenamid-P&atrazine(M) = Guardsman Max from BASF.

[b] Dimethenamid-P&atrazine(L) = G-Max Lite from BASF.

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

[d] COC = Riverside/Terra Prime oil, a petroleum base oil additive with a 17% emulsifier. Rate in % v/v.