Preemergence applied prepackaged and tank-mixture herbicides in corn, Nashua, IA, 2004. Owen, Micheal D.K., James F. Lux, and Damian D. Franzenburg. The purpose of this study was to evaluate various prepackaged herbicides applied alone and with isoxaflutole for crop phytotoxicity and weed control in corn. The soil was a Floyd, Kenyon, Ostrander loam with a pH 6.7 and 3.3% organic matter. The experimental design was a randomized complete block with three replications and plots were 10 by 25 ft. The 2003 crop was soybean. Tillage included a spring field cultivation. Fertilization included 140 lb/A actual N applied as anhydrous ammonia. Crop residue on the soil surface was 20% at planting. "Dekalb hybrid DKC53-34" corn was planted 1.5 inches deep on May 7, at 33,674 seeds/A in 30-inch rows. Preemergence (PRE) treatments were applied on May 7 at 20 gpa and 30 psi using flat fan nozzles. Conditions on May 7 were: air temperature 16 C, soil temperature at the 4-inch depth 14 C, 15 mph wind, 100% cloud cover, 48% relative humidity. Postemergence (POST) treatments were applied on June 17 at 20 gpa and 30 psi using flat fan nozzles. Conditions on June 17 were: air temperature 24 C, soil temperature at the 4-inch depth 22 C, 5 mph wind, 35% cloud cover, 76% relative humidity. Corn growth was V 6 and 13 inches tall. Weed species, average size, and number per ft^2 in the untreated control included: giant foxtail, one to four leaves and three tillers, 0.5 to 5 inches tall, zero to five plants; velvetleaf, cotyledon to seven leaves, 0.5 to 5 inches tall, zero to two plants; common waterhemp, numerous leaves, 0.5 to 4 inches tall, zero to three plants; common lambsquarters, numerous leaves, 0.5 to 5 inches tall, zero to one plant; Pennsylvania smartweed, numerous leaves, 1 to 5 inches tall, zero to one plant. May rainfall included: 0.89, 0.03, 0.37, 0.74, 0.03, 0.57, 3.66, 1.70, 0.44, 0.54, 2.00, 0.25, and 0.02 inches on May 8, 10, 12, 13, 14, 17, 21, 22, 23, 24, 29, 30, and 31, respectively. Total rainfall for May was 11.24 inches. June rainfall included: 0.01, 0.05, 0.13, 0.01, 0.14, 0.17, 0.41, 0.03, 0.07, 0.99, 0.02, 0.51, 0.03, and 0.26 inches on June 1, 2, 5, 6, 9, 10, 11, 13, 14, 16, 18, 21, 23, and 24, respectively. Total rainfall for June was 2.92 inches. July rainfall included: 4.76 inches and 1.35 inches from July 1 through 15 and 16 through 31, respectively. Total rainfall for July was 6.11 inches. Rainfall total for August was 2.91 inches.

Significant differences in corn stand between treatments were noted. However, these were not attributable to the herbicides, but to variability in seeding rate. No corn injury was observed from the treatments on any of the observation dates. Giant foxtail control was 92% and higher with the treatments when observed on May 26, June 17, and July 1, nineteen, forty-one, and fifty-five days after application, respectively. Few significant differences in control between treatments were determined on these dates. On August 4, eighty-nine days after application, all treatments continued to provide acceptable giant foxtail control at 87% or more.

Velvetleaf control with the treatments on May 26 ranged from 83 to 96%. Significant differences were determined. Treatments including isoxaflutole and s-metolachlor & atrazine & mesotrione & benoxacor provided 93 and 96% control, respectively. On June 17 and July 1, velvetleaf control was 43 to 87% with the treatments, except s-metolachlor & atrazine & mesotrione & benoxacor and those treatments receiving a POST glyphosate application. These provided 93 to 99% control. Velvetleaf control with the treatments on August 4 reflected that observed on July 1.

Good to excellent common waterhemp control with the treatments was observed on May 26, June 17, and July 1. Significant differences were determined between the treatments on June 27 and July 1. On August 4, atrazine & metolachlor, atrazine & metolachlor plus isoxaflutole, and acetochlor & atrazine & MON 4660 provided less than 87% common waterhemp control, while remaining treatments gave 92% control and higher.

Common lambsquarters control was excellent with the treatments on May 26. On June 17, nearly all treatments provided 92% and higher control. Significant differences were determined between the treatments. Reduced rates of atrazine & metolachlor, and s-metolachlor & atrazine & benoxacor, both prior to receiving a sequential POST glyphosate application, provided 85 and 87% control, respectively. Following the POST application of glyphosate these treatments achieved 99 and 93% common lambsquarters control when observed on July 1, and August 4, respectively. Control with all other treatments on July 1 and August 4 was less than that observed on June 17, and was generally considered poor to good. Nearly all treatments provided good to excellent Pennsylvania smartweed control when observed on June 17, July 1 and August 4 with significant differences determined between a number of the treatments. (Dept. of Agronomy, Iowa State University, Ames).

Table 1. Preemergence applied prepackaged and tank-mixture herbicides in corn, Nashua, IA, 2004 (Owen, Lux, and Franzenburg).

Treatment	Rate	Appl time	Corn[a] stand	Injury 5/26/04	SETFA 5/26/04	ABUTH 5/26/04	AMATA 5/26/04	CHEAL 5/26/04
	(lb/A)			-- (%) --	---------- (% weed control) ----------			
Untreated	-	-	32	0	0	0	0	0
Atrazine&metolachlor	1.64&1.26	PRE	33	0	98	90	99	99
Atrazine&metolachlor+isoxaflutole	1.64&1.26+0.047	PRE	32	0	99	93	99	99
Atrazine&metolachlor/ glyphosate[b]+ammonium sulfate[c]	0.85&0.66/ 0.77+17.0	PRE/ POST	32	0	95	85	99	99
S-metolachlor&atrazine&benoxacor	1.26&1.64	PRE	31	0	99	88	99	99
S-metolachlor&atrazine&benoxacor+ isoxaflutole	1.26&1.64+ 0.047	PRE PRE	32	0	99	93	99	99
S-metolachlor&atrazine&benoxacor/ glyphosate+ammonium sulfate	0.66&0.85/ 0.77+17.0	PRE/ POST	32	0	96	83	99	99
Acetochlor&atrazine&dichlormid	2.1&1.58	PRE	30	0	99	85	99	99
Acetochlor&atrazine&MON 4660	2.03&1.61	PRE	32	0	99	85	99	99
S-metolachlor&atrazine&mesotrione& benoxacor	1.67&0.63&0.167	PRE	31	0	99	96	99	99
LSD (P=0.05)			1	0	2	7	0	0

[a] Corn stand per 17.42 row feet on May 26.
[b] Glyphosate rate in lb ae/A.
[c] Ammonium sulftate rate in lbs/100 gal.

Table 2. Preemergence applied prepackaged and tank-mixture herbicides in corn, Nashua, IA, 2004 (Owen, Lux, and Franzenburg).

Treatment	Rate	Appl time	Injury 6/17/04	SETFA 6/17/04	ABUTH 6/17/04	AMATA 6/17/04	CHEAL 6/17/04	POLPY 6/17/04
	(lb/A)		-- (%) --	---------- (% weed control) ----------				
Untreated	-	-	0	0	0	0	0	0
Atrazine&metolachlor	1.64&1.26	PRE	0	95	58	93	92	90
Atrazine&metolachlor+isoxaflutole	1.64&1.26+0.047	PRE	0	95	78	95	98	98
Atrazine&metolachlor/ glyphosate[a]+ammonium sulfate[b]	0.85&0.66/ 0.77+17.0	PRE/ POST	0	92	45	92	85	87
S-metolachlor&atrazine&benoxacor	1.26&1.64	PRE	0	95	63	95	93	91
S-metolachlor&atrazine&benoxacor+ isoxaflutole	1.26&1.64+ 0.047	PRE PRE	0	96	83	95	96	96
S-metolachlor&atrazine&benoxacor/ glyphosate+ammonium sulfate	0.66&0.85/ 0.77+17.0	PRE/ POST	0	92	43	92	87	73
Acetochlor&atrazine&dichlormid	2.1&1.58	PRE	0	93	58	96	96	88
Acetochlor&atrazine&MON 4660	2.03&1.61	PRE	0	93	60	93	92	93
S-metolachlor&atrazine&mesotrione& benoxacor	1.67&0.63&0.167	PRE	0	95	95	98	99	99
LSD (P=.05)			0	3	17	3	5	14

[a] Glyphosate rate in lb ae/A.
[b] Ammonium sulftate rate in lbs/100 gal.

Table 3. Preemergence applied prepackaged and tank-mixture herbicides in corn, Nashua, IA, 2004 (Owen, Lux, and Franzenburg).

Treatment	Rate	Appl time	SETFA 7/1/04	ABUTH 7/1/04	AMATA 7/1/04	CHEAL 7/1/04	POLPY 7/1/04
	(lb/A)		---------- (% weed control) ----------				
Untreated	-	-	0	0	0	0	0
Atrazine&metolachlor	1.64&1.26	PRE	93	58	92	83	90
Atrazine&metolachlor+isoxaflutole	1.64&1.26+0.047	PRE	93	83	93	87	95
Atrazine&metolachlor/ glyphosate[a]+ammonium sulfate[b]	0.85&0.66/ 0.77+17.0	PRE/ POST	99	99	99	99	99
S-metolachlor&atrazine&benoxacor	1.26&1.64	PRE	93	58	93	87	91
S-metolachlor&atrazine&benoxacor+ isoxaflutole	1.26&1.64+ 0.047	PRE PRE	95	87	93	90	96
S-metolachlor&atrazine&benoxacor/ glyphosate+ammonium sulfate	0.66&0.85/ 0.77+17.0	PRE/ POST	99	99	99	99	99
Acetochlor&atrazine&dichlormid	2.1&1.58	PRE	92	50	95	93	88
Acetochlor&atrazine&MON 4660	2.03&1.61	PRE	92	55	93	88	93
S-metolachlor&atrazine&mesotrione& benoxacor	1.67&0.63&0.167	PRE	92	93	98	96	99
LSD (P=.05)			4	13	4	6	11

[a] Glyphosate rate in lb ae/A.

[b] Ammonium sulftate rate in lbs/100 gal.

Table 4. Preemergence applied prepackaged and tank-mixture herbicides in corn, Nashua, IA, 2004 (Owen, Lux, and Franzenburg).

Treatment	Rate	Appl time	SETFA 8/4/04	ABUTH 8/4/04	AMATA 8/4/04	CHEAL 8/4/04	POLPY 8/4/04
	(lb/A)		---------- (% weed control) ----------				
Untreated	-	-	0	0	0	0	0
Atrazine&metolachlor	1.64&1.26	PRE	90	45	85	62	85
Atrazine&metolachlor+isoxaflutole	1.64&1.26+0.047	PRE	90	73	87	75	95
Atrazine&metolachlor/ glyphosate[a]+ammonium sulfate[b]	0.85&0.66/ 0.77+17.0	PRE/ POST	98	99	96	93	98
S-metolachlor&atrazine&benoxacor	1.26&1.64	PRE	93	52	92	77	91
S-metolachlor&atrazine&benoxacor+ isoxaflutole	1.26&1.64+ 0.047	PRE PRE	95	77	92	85	96
S-metolachlor&atrazine&benoxacor/ glyphosate+ammonium sulfate	0.66&0.85/ 0.77+17.0	PRE/ POST	99	99	98	93	98
Acetochlor&atrazine&dichlormid	2.1&1.58	PRE	87	45	93	83	88
Acetochlor&atrazine&MON 4660	2.03&1.61	PRE	88	43	87	70	93
S-metolachlor&atrazine&mesotrione& benoxacor	1.67&0.63&0.167	PRE	92	93	96	88	99
LSD (P=.05)			5	16	7	12	13

[a] Glyphosate rate in lb ae/A.

[b] Ammonium sulftate rate in lbs/100 gal.