Rimsulfuron plus glyphosate one pass and rimsulfuron-based two pass programs in corn, Ames, IA, 2005. Owen, Micheal D.K., James F. Lux, and Damian D. Franzenburg. The purpose of this study was to demonstrate the efficacy of one pass rimsulfuron plus glyphosate alone and in tank-mixture with others, and two pass rimsulfuron-based treatments in corn. The soil was a Clarion, Webster, Nicollet 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. Early preplant (EPP) treatments were applied on April 8 at 20 gpa and 30 psi using flat fan nozzles. Conditions on April 8 were: air temperature 19 C, soil temperature at the 4-inch depth 13 C, 9 mph wind, 30% cloud cover, 47% relative humidity. Weed species occurring in the untreated control on April 8 included light common lambsquarters. Fertilization included 125 lb/A actual N applied as urea. The study area received a field cultivation prior to planting. Crop residue on the soil surface was 50 to 60% 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. Preemergence (PRE) treatments were applied May 6 at 20 gpa and 30 psi using flat fan nozzles. Conditions on May 6 were: air temperature 20 C, soil temperature at the 4-inch depth 17 C, 3 mph wind, 80% cloud cover, 65% relative humidity. Postemergence (POST) treatments were applied June 7 at 20 gpa and 30 psi using flat fan nozzles. Conditions on June 7 were: air temperature 31 C, soil temperature at the 4-inch depth 22 C, 12 mph wind, 60% cloud cover, 50% relative humidity. Corn growth was 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, two tillers, 0.25 to 5 inches tall, zero to one plant; velvetleaf, cotyledon to five leaves, 0.25 to 4 inches, zero to one plant; common waterhemp and common lambsquarters, two to numerous leaves, 0.5 to 5 inches, zero to three plants; ivyleaf morningglory, cotyledon to numerous leaves, 1 to 5 inches tall, zero to 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.

There were no significant differences between treatments in corn stand. EPP and PRE treatments did not result in corn injury when observed on June 7, thirty-three days after planting. Crop injury on June 16, nine days after POST application timing, ranged from 5 to 10% with glyphosate plus rimsulfuron, glyphosate plus rimsulfuron plus thifensulfuron, glyphosate plus rimsulfuron plus dicamba, and glyphosate plus rimsulfuron plus atrazine. Injury from any other POST treatments was not greater than 5%.

EPP treatments provided excellent control of all weed species when evaluated on May 2. PRE applied acetochlor & atrazine & MON 4660 provided excellent giant foxtail control on June 7, prior to POST applied treatments. No other PRE treatments provided acceptable giant foxtail control on June 7. No PRE treatments provided acceptable velvetleaf and ivyleaf morningglory control. PRE rimsulfuron & thifensulfuron, without atrazine, demonstrated rate responsive common waterhemp and common lambsquarters control, while remaining PRE treatments provided excellent control on June 7.

Giant foxtail control ranged from 85 to 99% when observed on June 30 following sequential POST and total POST applications made on June 7. PRE applied rimsulfuron & thifensulfuron plus POST glyphosate and the lowest PRE rate (0.01&0.005 lb/A) of rimsulfuron & thifensulfuron with atrazine plus POST glyphosate, provided a range of 80 to 99% control of velvetleaf, common waterhemp and common lambsquarters. All other PRE followed by POST treatments provided at least 88% control of these three weed species on June 30. POST glyphosate plus rimsulfuron plus thifensulfuron and PRE atrazine & s-metolachlor & benoxacor plus POST nicosulfuron & rimsulfuron plus mesotrione plus atrazine provided 87 and 85% control of ivyleaf morningglory, respectively. No other treatments demonstrated acceptable ivyleaf morningglory control. Results from weed control observations on August 3 were very similar to those occurring June 30. (Dept. of Agronomy, Iowa State University, Ames).

Table 1. Rimsulfuron plus glyphosate one pass and rimsulfuron-based two pass programs in corn, Ames, IA, 2005 (Owen, Lux, Franzenburg).

Treatment	Rate	Appl. time	Corn[a] stand	SETFA 5/2/05	ABUTH 5/2/05	AMATA 5/2/05	CHEAL 5/2/05	IPOHE 5/2/05
	(lb/A)			---------- (% weed control) ----------				
Untreated	-	-	30	0	0	0	0	0
Gylphosate[b]+AMS[c]	0.77+2.0	POST	31	0	0	0	0	0
Glyphosate+rimsulfuron+AMS	0.77+0.0156+2.0	POST	30	0	0	0	0	0
Glyphosate+rimsulfuron+ thifensulfuron+AMS	0.77+0.0156+ 0.00294+2.0	POST	31	0	0	0	0	0
Glyphosate+rimsulfuron+ dicamba+AMS	0.77+0.0156+ 0.125+2.0	POST	30	0	0	0	0	0
Glyphosate+rimsulfuron+ atrazine+AMS	0.77+0.0156+ 0.5+2.0	POST	30	0	0	0	0	0
Glyphosate+acetochlor&MON 4660+ AMS	0.77+1.31+ 2.0	POST	31	0	0	0	0	0
Nicosulfuron&rimsulfuron+ mesotrione+atrazine+AMS	0.023&0.012+ 0.047+0.75+2.0	POST	30	0	0	0	0	0
Rimsulfuron&thifensulfuron+COC[d]/ glyphosate+AMS	0.01&0.005+1.0/ 0.77+2.0	PRE/ POST	30	0	0	0	0	0
Rimsulfuron&thifensulfuron+COC/ glyphosate+AMS	0.021&0.010+1.0/ 0.77+2.0	PRE/ POST	31	0	0	0	0	0
Rimsulfuron&thifensulfuron+COC/ glyphosate+AMS	0.031&0.016+1.0/ 0.77+2.0	PRE/ POST	31	0	0	0	0	0
Rimsulfuron&thifensulfuron+ atrazine+COC/ glyphosate+AMS	0.01&0.005+1.0+ 1.0+1.0/ 0.77+2.0	PRE/ POST	31	0	0	0	0	0
Rimsulfuron&thifensulfuron+ atrazine+COC/ glyphosate+AMS	0.021&0.010+1.0+ 1.0+1.0/ 0.77+2.0	PRE/ POST	30	0	0	0	0	0
Rimsulfuron&thifensulfuron+ atrazine+COC/ glyphosate+AMS	0.031&0.016+1.0+ 1.0+1.0/ 0.77+2.0	PRE/ POST	31	0	0	0	0	0
Rimsulfuron&thifensulfuron+ atrazine+COC/ glyphosate+AMS	0.01&0.005+1.0+ 1.0+1.0/ 0.77+2.0	EPP/ POST	31	99	99	99	99	99
Rimsulfuron&thifensulfuron+ atrazine+COC/ glyphosate+AMS	0.021&0.010+1.0+ 1.0+1.0/ 0.77+2.0	EPP/ POST	29	99	99	99	99	99
Rimsulfuron&thifensulfuron+ atrazine+COC/ glyphosate+AMS	0.031&0.016+1.0+ 1.0+1.0/ 0.77+2.0	EPP/ POST	30	99	99	99	99	99
Acetochlor&atrazine&MON 4660/ glyphosate+AMS	1.25&1.0/ 0.77+2.0	PRE/ POST	31	0	0	0	0	0
Atrazine&s-metolachlor&benoxacor/ nicosulfuron&rimsulfuron+ mesotrione+atrazine+ AMS+COC	1.45&0.58/ 0.023&0.012+ 0.047+0.75+ 2.0+1.0	PRE/ POST	30	0	0	0	0	0
LSD (P=0.05)			2	0	0	0	0	0

[a] Corn stand per 17.5 row feet on August 5.

[b] Glyphosate rate in lb ae/A.

[c] AMS = ammonium sulfate. Rate in lb/A.

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

Table 2. Rimsulfuron plus glyphosate one pass and rimsulfuron-based two pass programs in corn, Ames, IA, 2005 (Owen, Lux, Franzenburg).

Treatment	Rate	Appl. time	Injury 6/7/05	SETFA 6/7/05	ABUTH 6/7/05	AMATA 6/7/05	CHEAL 6/7/05	IPOHE 6/7/05
	(lb/A)		- (%) -	---------- (% weed control) ----------				
Untreated	-	-	0	0	0	0	0	0
Gylphosate[a]+AMS[b]	0.77+2.0	POST	0	0	0	0	0	0
Glyphosate+rimsulfuron+AMS	0.77+0.0156+2.0	POST	0	0	0	0	0	0
Glyphosate+rimsulfuron+ thifensulfuron+AMS	0.77+0.0156+ 0.00294+2.0	POST	0	0	0	0	0	0
Glyphosate+rimsulfuron+ dicamba+AMS	0.77+0.0156+ 0.125+2.0	POST	0	0	0	0	0	0
Glyphosate+rimsulfuron+ atrazine+AMS	0.77+0.0156+ 0.5+2.0	POST	0	0	0	0	0	0
Glyphosate+acetochlor&MON 4660+ AMS	0.77+1.31+ 2.0	POST	0	0	0	0	0	0
Nicosulfuron&rimsulfuron+ mesotrione+atrazine+AMS	0.023&0.012+ 0.047+0.75+2.0	POST	0	0	0	0	0	0
Rimsulfuron&thifensulfuron+COC[c]/ glyphosate+AMS	0.01&0.005+1.0/ 0.77+2.0	PRE/ POST	0	43	37	77	87	33
Rimsulfuron&thifensulfuron+COC/ glyphosate+AMS	0.021&0.010+1.0/ 0.77+2.0	PRE/ POST	0	52	43	85	95	37
Rimsulfuron&thifensulfuron+COC/ glyphosate+AMS	0.031&0.016+1.0/ 0.77+2.0	PRE/ POST	0	60	45	88	98	40
Rimsulfuron&thifensulfuron+ atrazine+COC/ glyphosate+AMS	0.01&0.005+1.0+ 1.0+1.0/ 0.77+2.0	PRE/ POST	0	52	40	95	99	40
Rimsulfuron&thifensulfuron+ atrazine+COC/ glyphosate+AMS	0.021&0.010+1.0+ 1.0+1.0/ 0.77+2.0	PRE/ POST	0	65	47	95	99	45
Rimsulfuron&thifensulfuron+ atrazine+COC/ glyphosate+AMS	0.031&0.016+1.0+ 1.0+1.0/ 0.77+2.0	PRE/ POST	0	75	53	95	99	48
Rimsulfuron&thifensulfuron+ atrazine+COC/ glyphosate+AMS	0.01&0.005+1.0+ 1.0+1.0/ 0.77+2.0	EPP/ POST	0	45	38	87	96	35
Rimsulfuron&thifensulfuron+ atrazine+COC/ glyphosate+AMS	0.021&0.010+1.0+ 1.0+1.0/ 0.77+2.0	EPP/ POST	0	52	52	92	98	42
Rimsulfuron&thifensulfuron+ atrazine+COC/ glyphosate+AMS	0.031&0.016+1.0+ 1.0+1.0/ 0.77+2.0	EPP/ POST	0	62	58	95	99	47
Acetochlor&atrazine&MON 4660/ glyphosate+AMS	1.25&1.0/ 0.77+2.0	PRE/ POST	0	96	40	99	99	35
Atrazine&s-metolachlor&benoxacor/ nicosulfuron&rimsulfuron+ mesotrione+atrazine+ AMS+COC	1.45&0.58/ 0.023&0.012+ 0.047+0.75+ 2.0+1.0	PRE/ POST	0	77	33	99	99	30
LSD (P=0.05)			0	10	15	7	4	5

[a] Glyphosate rate in lb ae/A.

[b] AMS = ammonium sulfate. Rate in lb/A.

[c] COC = Herbimax, and oil-surfactant adjuvant from UAP-Loveland Industries. Rate in % v/v.

Table 3. Rimsulfuron plus glyphosate one pass and rimsulfuron-based two pass programs in corn, Ames, IA, 2005 (Owen, Lux, Franzenburg).

Treatment	Rate	Appl. time	Injury 6/16/05	SETFA 6/30/05	ABUTH 6/30/05	AMATA 6/30/05	CHEAL 6/30/05	IPOHE 6/30/05
	(lb/A)		- (%) -	---------- (% weed control) ----------				
Untreated	-	-	0	0	0	0	0	0
Gylphosate[a]+AMS[b]	0.77+2.0	POST	0	92	95	92	92	57
Glyphosate+rimsulfuron+AMS	0.77+0.0156+2.0	POST	5	95	92	96	96	67
Glyphosate+rimsulfuron+ thifensulfuron+AMS	0.77+0.0156+ 0.00294+2.0	POST	10	95	98	95	93	87
Glyphosate+rimsulfuron+ dicamba+AMS	0.77+0.0156+ 0.125+2.0	POST	8	95	96	99	99	78
Glyphosate+rimsulfuron+ atrazine+AMS	0.77+0.0156+ 0.5+2.0	POST	5	95	96	99	99	68
Glyphosate+acetochlor&MON 4660+ AMS	0.77+1.31+ 2.0	POST	2	99	98	99	99	70
Nicosulfuron&rimsulfuron+ mesotrione+atrazine+AMS	0.023&0.012+ 0.047+0.75+2.0	POST	5	93	98	99	99	57
Rimsulfuron&thifensulfuron+COC[c]/ glyphosate+AMS	0.01&0.005+1.0/ 0.77+2.0	PRE/ POST	0	85	85	88	83	68
Rimsulfuron&thifensulfuron+COC/ glyphosate+AMS	0.021&0.010+1.0/ 0.77+2.0	PRE/ POST	0	88	92	93	95	60
Rimsulfuron&thifensulfuron+COC/ glyphosate+AMS	0.031&0.016+1.0/ 0.77+2.0	PRE/ POST	0	90	90	88	96	70
Rimsulfuron&thifensulfuron+ atrazine+COC/ glyphosate+AMS	0.01&0.005+1.0+ 1.0+1.0/ 0.77+2.0	PRE/ POST	0	88	80	98	99	75
Rimsulfuron&thifensulfuron+ atrazine+COC/ glyphosate+AMS	0.021&0.010+1.0+ 1.0+1.0/ 0.77+2.0	PRE/ POST	0	93	94	95	99	67
Rimsulfuron&thifensulfuron+ atrazine+COC/ glyphosate+AMS	0.031&0.016+1.0+ 1.0+1.0/ 0.77+2.0	PRE/ POST	0	92	88	98	98	80
Rimsulfuron&thifensulfuron+ atrazine+COC/ glyphosate+AMS	0.01&0.005+1.0+ 1.0+1.0/ 0.77+2.0	EPP/ POST	0	88	91	91	94	55
Rimsulfuron&thifensulfuron+ atrazine+COC/ glyphosate+AMS	0.021&0.010+1.0+ 1.0+1.0/ 0.77+2.0	EPP/ POST	0	91	93	92	95	67
Rimsulfuron&thifensulfuron+ atrazine+COC/ glyphosate+AMS	0.031&0.016+1.0+ 1.0+1.0/ 0.77+2.0	EPP/ POST	0	87	88	96	99	72
Acetochlor&atrazine&MON 4660/ glyphosate+AMS	1.25&1.0/ 0.77+2.0	PRE/ POST	0	96	92	99	99	65
Atrazine&s-metolachlor&benoxacor/ nicosulfuron&rimsulfuron+ mesotrione+atrazine+ AMS+COC	1.45&0.58/ 0.023&0.012+ 0.047+0.75+ 2.0+1.0	PRE/ POST	5	98	98	99	99	85
LSD (P=0.05)			2	7	10	7	7	22

[a] Glyphosate rate in lb ae/A.

[b] AMS = ammonium sulfate. Rate in lb/A.

[c] COC = Herbimax, and oil-surfactant adjuvant from UAP-Loveland Industries. Rate in % v/v.

Table 4. Rimsulfuron plus glyphosate one pass and rimsulfuron-based two pass programs in corn, Ames, IA, 2005 (Owen, Lux, Franzenburg).

Treatment	Rate	Appl. time	SETFA 8/3/05	ABUTH 8/3/05	AMATA 8/3/05	CHEAL 8/3/05	IPOHE 8/3/05
	(lb/A)		---------- (% weed control) ----------				
Untreated	-	-	0	0	0	0	0
Gylphosate[a]+AMS[b]	0.77+2.0	POST	92	95	93	88	57
Glyphosate+rimsulfuron+AMS	0.77+0.0156+2.0	POST	95	92	98	96	65
Glyphosate+rimsulfuron+ thifensulfuron+AMS	0.77+0.0156+ 0.00294+2.0	POST	95	95	96	93	85
Glyphosate+rimsulfuron+ dicamba+AMS	0.77+0.0156+ 0.125+2.0	POST	93	96	98	99	77
Glyphosate+rimsulfuron+ atrazine+AMS	0.77+0.0156+ 0.5+2.0	POST	95	96	99	99	68
Glyphosate+acetochlor&MON 4660+ AMS	0.77+1.31+ 2.0	POST	99	95	98	98	70
Nicosulfuron&rimsulfuron+ mesotrione+atrazine+AMS	0.023&0.012+ 0.047+0.75+2.0	POST	93	98	99	99	55
Rimsulfuron&thifensulfuron+COC[c]/ glyphosate+AMS	0.01&0.005+1.0/ 0.77+2.0	PRE/ POST	85	86	88	85	63
Rimsulfuron&thifensulfuron+COC/ glyphosate+AMS	0.021&0.010+1.0/ 0.77+2.0	PRE/ POST	88	91	96	95	60
Rimsulfuron&thifensulfuron+COC/ glyphosate+AMS	0.031&0.016+1.0/ 0.77+2.0	PRE/ POST	90	92	95	95	65
Rimsulfuron&thifensulfuron+ atrazine+COC/ glyphosate+AMS	0.01&0.005+1.0+ 1.0+1.0/ 0.77+2.0	PRE/ POST	88	78	95	99	75
Rimsulfuron&thifensulfuron+ atrazine+COC/ glyphosate+AMS	0.021&0.010+1.0+ 1.0+1.0/ 0.77+2.0	PRE/ POST	93	94	96	99	63
Rimsulfuron&thifensulfuron+ atrazine+COC/ glyphosate+AMS	0.031&0.016+1.0+ 1.0+1.0/ 0.77+2.0	PRE/ POST	92	88	99	99	78
Rimsulfuron&thifensulfuron+ atrazine+COC/ glyphosate+AMS	0.01&0.005+1.0+ 1.0+1.0/ 0.77+2.0	EPP/ POST	87	93	98	93	55
Rimsulfuron&thifensulfuron+ atrazine+COC/ glyphosate+AMS	0.021&0.010+1.0+ 1.0+1.0/ 0.77+2.0	EPP/ POST	90	93	93	93	63
Rimsulfuron&thifensulfuron+ atrazine+COC/ glyphosate+AMS	0.031&0.016+1.0+ 1.0+1.0/ 0.77+2.0	EPP/ POST	88	88	98	98	70
Acetochlor&atrazine&MON 4660/ glyphosate+AMS	1.25&1.0/ 0.77+2.0	PRE/ POST	96	92	99	99	63
Atrazine&s-metolachlor&benoxacor/ nicosulfuron&rimsulfuron+ mesotrione+atrazine+ AMS+COC	1.45&0.58/ 0.023&0.012+ 0.047+0.75+ 2.0+1.0	PRE/ POST	95	98	99	99	80
LSD (P=0.05)			5	11	6	7	21

[a] Glyphosate rate in lb ae/A.

[b] AMS = ammonium sulfate. Rate in lb/A.

[c] COC = Herbimax, and oil-surfactant adjuvant from UAP-Loveland Industries. Rate in % v/v.