Celebrity Plus + adjuvants. Zollinger, Richard K. and Jerry L. Ries. An experiment was conducted near Leonard, ND, to evaluate weed control in corn using Celebrity Plus with adjuvants. Golden Harvest 'H-6389Bt' was planted on May 15, 2002. POST treatments were applied June 14 at 9:15 am with 70 F air, 75 F soil surface, 42% relative humidity, 0% clouds, 0 mph wind, moist soil surface, wet subsoil, good crop vigor, and no dew present to 4 to 6 inch (3 to 4 collar) corn. Weed species present were: 2 to 3 inch (10 to 100/ft^2) yellow foxtail; and 1 to 3 inch (5 to 20/yd^2) common lambsquarters. Treatments were applied to the center 6.67 feet of the 10 by 40 foot plots with a back-pack-type plot sprayer delivering 8.5 gpa at 40 psi through 8001 flat fan nozzles. The experiment had a randomized complete block design with three replicates per treatment.

This study was designed to evaluate yellow foxtail control because of the difficulty in control. No injury was observed at any rating. All treatments controlled common lambsquarters. Celebrity plus at 4.67 oz DG/A plus oil adjuvants (Base and Premium COC) gave the greatest foxtail control. However, when Celebrity Plus rate was reduced and additional Distinct was added, weed control was less. (Dept. of Plant Sciences, North Dakota State University, Fargo).

Table. Celebrity Plus + adjuvants (Zollinger and Ries).

		June 28	July 12
Treatment[1]	Rate	Yeft	Yeft
	(product/A)	% control	% control
Celebrity Plus+Premier 90+28-0-0	4.67oz	68	73
Celebrity Plus+Linkage	4.67oz	67	67
Celebrity Plus+Base	4.67oz	78	82
Celebrity Plus+Premium COC+28-0-0	4.67oz	77	82
Celebrity Plus+Premier 90+28-0-0	3.5oz	67	70
Celebrity Plus+Linkage	3.5oz	60	62
Celebrity Plus+Base	3.5oz	68	72
Celebrity Plus+Distinct+Premier 90+28-0-0	3.5oz+1oz	70	72
Celebrity Plus+Distinct+Base	3.5oz+1oz	62	67
Celebrity Plus+Distinct+Linkage	3.5oz+1oz	75	78
LSD (0.05)		8	13

[1]Premier 90 = nonionic surfactant at 0.5% v/v; 28-0-0 = urea ammonium nitrate at 2 qt/A; Linkage = basic blend adjuvant at 1% v/v; Base = methylated seed oil basic blend adjuvant at 1% v/v; Premium COC = petroleum oil concentrate at 1% v/v.

Celebrity Plus + Distinct in corn. Zollinger, Richard K. and Jerry L. Ries. An experiment was conducted near Casselton, ND, to evaluate weed control in corn. Dekalb 'DKC39-47' was planted on May 23, 2002. EPOST treatments were applied June 5 at 9:45 am with 75 F air, 67 F soil surface, 32% relative humidity, 30% clouds, 3 to 5 mph N wind, dry soil surface, moist subsoil, excellent crop vigor, and no dew present to 2 to 3 inch (1 to 3 collar) corn. Weed species present were: 0.5 to 1 inch (1 to 10/yd^2) yellow foxtail; cotyledon (1/yd^2) common cocklebur; and cotyledon (5 to 15/yd^2) wild mustard. POST treatments were applied June 21 at 9:00 am with 66 F air, 68 F soil surface, 77% relative humidity, 100% clouds, 4 to 5 mph SW wind, dry soil surface, moist subsoil, excellent crop vigor, and dew present to 5 inch (4 to 5 collar) corn. Weed species present were: 1 to 5 inch (5 to 20/yd^2) foxtail species (25% yellow population to 75% green population); 0.5 to 2 inch (5 to 10/yd^2) redroot pigweed; 1 to 4 inch (1 to 10/yd^2) common lambsquarters; 1 to 4 inch (5 to 20/yd^2) common cocklebur; 1 to 4 inch (1 to 20/yd^2) wild buckwheat; and cotyledon to 4 inch (5 to 10/ft^2) wild mustard. Treatments were applied to the center 6.67 feet of the 10 by 40 foot plots with a bicycle-wheel-type plot sprayer delivering 8.5 gpa at 40 psi through 8001 flat fan nozzles. The experiment had a randomized complete block design with three replicates per treatment.

EPOST treatments were applied to 2 inch corn as measure to the highest area of the bent leaf and POST treatments were applied to 5 inch corn as measure to the highest area of the bent leaf. No chemical injury was expressed from any treatment. POST treatments were applied later than desired due to more than three inches rain on June 23. More than 2 inches of rain fell on July 10. All treatments controlled wild mustard and wild buckwheat. The eastern half of the study was injured by standing water which inflated weed control. The back half of the study was also damaged by water (4 to 5 foot tall corn in rep three compared to 10 to 11 foot tall in rep one). Ratings were not taken at August 16 (56 DAT) and the study was not harvested due to excess water damage. (Dept. of Plant Sciences, North Dakota State University, Fargo).

Table. Celebrity Plus + Distinct in corn (Zollinger and Ries).

Treatment[1]	Rate	July 3				July 19				July31			
		Fxtl	Rrpw	Colq	Cocb	Fxtl	Rrpw	Colq	Cocb	Fxtl	Rrpw	Colq	Cocb
	(product/A)	------% control ------				------% control ------				------% control ------			
EPOST													
Distinct+Basic Blend	4oz+1% v/v	47	57	75	50	47	60	77	53	40	57	63	43
Distinct+Basic Blend	6oz+1% v/v	65	50	50	52	60	53	53	53	43	53	53	50
Celebrity Plus+NIS+28-0-0	4.67oz+0.25% v/v+1qt	77	95	96	60	70	93	93	60	53	93	93	53
Celebrity Plus+NIS+PO+28-0-0	4.67oz+0.25% v/v+0.5% v/v+1qt	80	70	90	50	77	72	88	50	70	70	77	47
POST													
Distinct+Basic Blend	4oz+1% v/v	63	96	96	90	62	96	96	95	60	99	99	90
Distinct+Basic Blend	6oz+1%v/v	55	98	98	90	60	99	99	95	62	99	99	83
Distinct+PO	4oz+1qt	63	98	98	98	58	99	99	99	57	99	99	85
Distinct+PO	6oz+1qt	67	98	98	90	62	99	99	85	58	99	99	85
Callisto+Atrazine+PO+28-0-0	3fl oz+0.25lb ai/A+1% v/v+2.5% v/v	43	99	99	85	40	99	99	92	23	99	99	72
Steadfast+Callisto+PO+28-0-0	0.75oz+3fl oz+1% v/v+2.5% v/v	78	99	99	95	77	99	99	96	67	99	99	88
Option+Distinct+PO+28-0-0	1.75oz+4oz+1% v/v+2.5% v/v	70	99	99	96	80	99	99	98	76	99	99	80
Celebrity Plus+NIS+28-0-0	4.67oz+0.25% v/v+1qt	73	99	99	95	88	99	99	98	87	99	99	87
Celebrity Plus+NIS+PO+28-0-0	4.67oz+0.25% v/v+0.5% v/v+1qt	70	99	99	95	85	99	99	96	86	99	99	85
Celebrity Plus+NIS+28-0-0	4.67oz+0.5% v/v+1qt	70	99	99	98	83	99	99	98	87	99	99	80
Celebrity Plus+Basic Blend	4.67oz+1% v/v	90	99	99	91	96	99	99	96	95	99	99	93
Untreated		0	0	0	0	0	0	0	0	0	0	0	0
LSD (0.05)		12	6	3	8	13	7	7	13	16	11	11	20

[1]Basic Blend = Quad 7; NIS = nonionic surfactant = Activator 90; 28-0-0 = urea ammonium nitrate; PO = petroleum oil concentrate = Herbimax.

Basis in RUR corn. Zollinger, Richard K. and Jerry L. Ries. An experiment was conducted near Casselton, ND, to evaluate weed control in corn. Dekalb 'DKC39-47' was planted on May 23, 2002. PRE treatments were applied May 24 at 12:30 pm with 57 F air, 52 F soil at a 4 inch depth, 24% relative humidity, 10% clouds, 5 mph NW wind, dry soil surface, and moist subsoil. Spike treatments were applied June 5 at 9:30 am with 72 F air, 65 F soil surface, 30% relative humidity, 30% clouds, 3 to 5 mph N wind, dry soil surface, moist subsoil, excellent crop vigor, and no dew present to 2 to 3 inch (1 to 3 collar) corn. Weed species present were: 0.5 to 1 inch (1 to 10/yd^2) foxtail species (25% yellow population to 75% green population); cotyledon (1/yd^2) common cocklebur; and cotyledon (5 to 15/yd^2) wild mustard. V4 treatments were applied June 20 at 7:30 am with 59 F air, 60 F soil surface, 38% relative humidity, 0% clouds, 4 to 5 mph W wind, dry soil surface, moist subsoil, good crop vigor, and no dew present to V4 corn. Weed species present were: 1 to 4 inch (5 to 20/yd^2) foxtail species (25% yellow population to 75% green population); cotyledon to 2 inch (1/yd^2) common cocklebur; and cotyledon to 3 inch (5 to 15/yd^2) wild mustard. V7 treatments were applied July 2 at 8:30 am with 74 F air, 81 F soil surface, 55% relative humidity, 75% clouds, 2 mph SW wind, dry soil surface, moist subsoil, good crop vigor, and no dew present to V7 corn. Weed species present were: 1 to 6 inch (5 to 20/yd^2) foxtail species (25% yellow population to 75% green population); 1 to 6 inch (3 to 15/yd^2) redroot pigweed; 1 to 6 inch (3 to 15/yd^2) common lambsquarters; 3 to 6 inch (3 to 15/yd^2) common cocklebur; and 1 to 6 inch (5 to 15/yd^2) wild mustard. Treatments were applied to the center 6.67 feet of the 10 by 40 foot plots with a bicycle-wheel-type plot sprayer, with PRE treatments delivering 17 gpa at 40 psi through 11002 flat fan nozzles and Spike, V4 and V7 treatments delivering 8.5 gpa at 40 psi through 8001 flat fan nozzles. The experiment had a randomized complete block design with three replicates per treatment.

No weeds had emerged on June 5 when spike treatments were applied. All treatments controlled redroot pigweed and common lambsquarters. POST treatments were applied later than desired due more than 3 inches of rain on June 23. More than 2 inches of rain fell on July 10. No chemical injury observed at any rating. The entire study was injured twice by standing water removed many existing weeds and probably increasing weed control greater above chemical control. (Dept. of Plant Sciences, North Dakota State University, Fargo).

Table. Basis in RUR corn (Zollinger and Ries).

		June 29		July 15		July 29	
Treatment[1]	Rate	Fxtl	Cocb	Fxtl	Cocb	Fxtl	Cocb
	(product/A)	--% control --		--% control --		--% control --	
PRE/V7							
Basis+Bicep Lite II Mag./RUM+AMS	0.33oz+1.5pt/13fl oz	71	72	99	99	99	99
Basis+Bicep Lite II Mag./RUM+AMS	0.5oz+1.5pt/13fl oz	71	82	99	99	99	99
Basis+Bicep Lite II Mag./RUM+AMS	1oz+1.5pt/13fl oz	82	71	99	99	99	99
Basis+Atrazine/ RUM+AMS	0.33oz+0.5lb ai/A / 13fl oz	64	74	99	99	99	99
Spike/V7							
Basis+MSO+AMS/RUM+AMS	0.33oz / 13fl oz	62	72	99	99	99	99
Prowl+MSO+AMS/RUM+AMS	2.4pt / 13fl oz	72	22	99	99	99	99
Basis+Prowl+MSO+AMS/RUM+AMS	0.33oz+2.4pt / 13floz	84	73	99	99	99	99
V4							
Steadfast+Atrazine+MSO+AMS	0.75oz+0.375lb ai/A	73	82	98	70	99	62
Untreated		0	0	0	0	0	0
LSD (0.05)		4	3	1	0	0	2

[1]RUM = Roundup UltraMax; AMS = ammonium sulfate at 2lb/A; MSO = methylated seed oil = Scoil at 1.5pt/A.

Dicamba in 77 day RM corn. Zollinger, Richard K. and Jerry L. Ries. An experiment was conducted near Casselton, ND, to evaluate weed control in corn. Pioneer '39T71' was planted on May 23, 2002. POST treatments were applied June 29 at 11:00 am with 87 F air, 92 F soil surface, 50% relative humidity, 50% clouds, 5 to 10 mph S wind, moist soil surface, wet subsoil, good to excellent crop vigor, and no dew present to less than 14 inch (5 collar) corn. Weed species present were: 1 to 6 inch (5 to 20/yd^2) foxtail species (25% yellow population to 75% green population); 1 to 6 inch (3 to 15/yd^2) redroot pigweed; 1 to 6 inch (3 to 15/yd^2) common lambsquarters; 3 to 6 inch (3 to 15/yd^2) common cocklebur; and 1 to 6 inch (5 to 15/yd^2) wild mustard. Treatments were applied to the center 6.67 feet of the 10 by 40 foot plots with a bicycle-wheel-type plot sprayer delivering 8.5 gpa at 40 psi through 8001 flat fan nozzles. The experiment had a randomized complete block design with three replicates per treatment.

A 77 day relative maturity corn variety was planted to increase the risk of expressing injury from herbicide treatments. POST treatments were applied later than desired due to more than 3 inches of rain on June 23. No injury was observed on July 6 (7 DAT). More than 2 inches of rain fell on July 10. Injury at July 13 was stunting. All treatments controlled wild mustard. No injury was observed on July 27 (28 DAT). August 24 (56 DAT) ratings were not taken due to injury from excess rain. (Dept. of Plant Sciences, North Dakota State University, Fargo).

Table. Dicamba in 77 day RM corn (Zollinger and Ries).

		July 13					July 27			
Treatment[1]	Rate	Corn	Fxtl	Rrpw	Colq	Cocb	Fxtl	Rrpw	Colq	Cocb
	(product/A)	% injury	-------- % control --------				-------- % control --------			
Steadfast+Atrazine+PO+AMS	0.75oz+0.375lb ai/A	0	70	99	99	72	67	99	99	67
Steadfast+Atrazine+Clarity+PO+AMS	0.75oz+0.375lb ai/A+2fl oz	0	65	91	93	86	71	99	99	73
Steadfast+Atrazine+Clarity+PO+AMS	0.75oz+0.375lb ai/A+4fl oz	5	70	99	99	99	75	99	99	99
Steadfast+Atrazine+Clarity+PO+AMS	0.75oz+0.375lb ai/A+8fl oz	18	72	99	99	99	72	99	99	99
Steadfast+Atrazine+Distinct+PO+AMS	0.75oz+0.375lb ai/A+1oz	0	62	93	98	95	66	99	99	99
Steadfast+Atrazine+Distinct+PO+AMS	0.75oz+0.375lb ai/A+2oz	0	57	99	99	99	62	99	99	99
Steadfast+Atrazine+Callisto+PO+AMS	0.75oz+0.375lb ai/A+2fl oz	0	72	99	99	99	63	99	99	99
Celebrity Plus+NIS+28-0-0	4.67oz	0	57	98	99	99	62	99	99	99
Accent+MSO+AMS	0.67oz	0	50	75	75	40	61	72	72	48
Accent+Atrazine+MSO+AMS	0.67oz+0.375lb ai/A	0	60	84	86	53	62	75	73	63
Accent+Clarity+Atrazine+MSO+AMS	0.67oz+2fl oz+0.375lb ai/A	0	50	85	90	90	72	99	99	99
Accent+Clarity+Atrazine+MSO+AMS	0.67oz+4fl oz+0.375lb ai/A	0	53	91	92	90	65	99	99	95
Accent+Callisto+Atrazine+PO+AMS	0.67oz+2fl oz+0.375lb ai/A+1% v/v	0	53	92	96	90	62	99	99	98
Accent+Callisto+Atrazine+MSO+AMS	0.67oz+2fl oz+0.375lb ai/A	0	73	99	99	93	72	99	99	96
LSD (0.05)		2	5	5	3	5	3	3	2	3

[1]PO = petroleum oil concentrate = Herbimax at 1qt/A; AMS = ammonium sulfate at 2 lb/A; NIS = nonionic surfactant = Activator 90 at 0.25% v/v; 28-0-0 = urea ammonium nitrate; MSO = methylated seed oil = Scoil at 1% v/v.

Nicosulfuron + rimsulfuron mixtures in corn. Zollinger, Richard K. and Jerry L. Ries. An experiment was conducted near Leonard, ND, to evaluate weed control in corn. Golden Harvest 'H-6389Bt' was planted on May 15, 2002. POST treatments were applied June 14 at 11:00 am with 75 F air, 80 F soil surface, 42% relative humidity, 0% clouds, 0 mph wind, moist soil surface, wet subsoil, good crop vigor, and no dew present to 4 to 6 inch (3 to 4 collar) corn. Weed species present were: 1 to 4 inch (10 to 100/ft^2) yellow foxtail; and 1 to 3 inch (5 to 20/yd^2) common lambsquarters. Treatments were applied to the center 6.67 feet of the 10 by 40 foot plots with a back-pack-type plot sprayer delivering 8.5 gpa at 40 psi through 8001 flat fan nozzles. The experiment had a randomized complete block design with three replicates per treatment.

DPX 79404 = 1:1 ratio of nicosulfuron : rimsulfuron, Steadfast = 2:1 ratio of nicosulfuron : rimsulfuron, and the third treatment is a 3:1 ratio of nicosulfuron : rimsulfuron. All treatments controlled common lambsquarters. On June 21 (7 DAT), the only corn injury was from the third treatment, 5 to 8% yellow leaf striping and streaking going the direction of leaves. No stunting was observed. No injury observed at later evaluations. As the proportion of nicosulfuron increased the more the yellow foxtail control. However, Accent applied alone, or Accent with dicamba or atrazine did not give greater than 75% foxtail control. Steadfast + Callisto + Atrazine gave 94% control. (Dept. of Plant Sciences, North Dakota State University, Fargo).

Table. Nicosulfuron + rimsulfuron mixtures in corn (Zollinger and Ries).

		June 28	July 12
Treatment[1]	Rate	Yeft	Yeft
	(product/A)	% control	% control
DPX-79406+PO+AMS	0.5oz	70	82
Steadfast+PO+AMS	0.75oz	72	92
Accent+Matrix+PO+AMS	0.75oz+0.75oz	70	96
Accent+PO+AMS	0.67oz	53	63
Accent+PO+AMS	1oz	58	72
Steadfast+Clarity+PO+AMS	0.75oz+4fl oz	65	75
Steadfast+Atrazine+PO+AMS	0.75oz+0.5lb ai/A	63	75
Steadfast+Atrazine+PO+AMS	0.75oz+0.75lb ai/A	57	63
Steadfast+Callisto+Atrazine+PO+AMS	0.75oz+2fl oz+0.5lb ai/A	91	94
Untreated		0	0
LSD (0.05)		6	5

[1]PO = petroleum oil concentrate = Herbimax at 1% v/v; AMS = ammonium sulfate at 2lb/A.

Steadfast with adjuvants. Zollinger, Richard K. and Jerry L. Ries. An experiment was conducted near Leonard, ND, to evaluate weed control in corn using nicosulfuron & rimsulfuron premix with adjuvants. Golden Harvest 'H-6389Bt' was planted on May 15, 2002. POST treatments were applied June 14 at 9:30 am with 70 F air, 76 F soil surface, 42% relative humidity, 0% clouds, 0 mph wind, moist soil surface, wet subsoil, good crop vigor, and no dew present to 4 to 6 inch (3 to 4 collar) corn. Weed species present were: 2 to 3 inch (10 to 100/ft^2) yellow foxtail; and 1 to 3 inch (5 to 20/yd^2) common lambsquarters. Treatments were applied to the center 6.67 feet of the 10 by 40 foot plots with a back-type plot sprayer delivering 8.5 gpa at 40 psi through 8001 flat fan nozzles. The experiment had a randomized complete block design with three replicates per treatment.

All treatments controlled common lambsquarters. Yellow foxtail was used as the weed species in this study due to the tolerant nature of the weed to Steadfast. Generally, adjuvants containing an MSO and/or basic blend type adjuvants were necessary to control yellow foxtail. Those adjuvant which enhanced control greater than 90% were Destiny, Quad 7, and Renegade. Destiny is an MSO adjuvant, Renegade contains MSO and basic blend adjuvants, and Quad 7 is a basic blend adjuvant (nonionic surfactant + fertilizer + buffer). Adding additional fertilizer (AMS) to Quad 7 decreased control. Phase contains an MSO adjuvant + organosilicone surfactant but did not provide the same level of control as other MSO adjuvants. (Dept. of Plant Sciences, North Dakota State University, Fargo).

Table. Steadfast with adjuvants (Zollinger and Ries).

Treatment[1]	Rate	June 28 Yeft	July 12 Yeft
	(product/A)	% control	% control
Steadfast+	0.75oz+		
Liberate+AMS	0.125% v/v+2lb	62	68
LI-700+AMS	0.25% v/v+2lb	60	57
PO	1% v/v	67	78
PO+AMS	1% v/v+2lb	70	77
Destiny	1% v/v	75	90
Destiny+AMS	1% v/v+2lb	83	93
Quad 7	1% v/v	92	96
Quad 7+AMS	1% v/v+2lb	75	85
Phase	4pt/100gal	73	75
Phase+AMS	4pt/100gal+2lb	85	85
Renegade	1% v/v	88	93
Renegade+AMS	1% v/v+2lb	95	97
LSD (0.05)		5	12

[1]Liberate = surfactant; AMS = ammonium sulfate; LI-700 = surfactant; PO = petroleum oil concentrate = Herbimax; Destiny = methylated seed oil; Quad 7 = basic blend; Phase = methylated seed oil + organosilicone surfactant; Renegade = methylated seed oil basic blend.

Steadfast + adjuvants. Zollinger, Richard K. and Jerry L. Ries. An experiment was conducted near Leonard, ND, to evaluate weed control in corn. Golden Harvest 'H-6389Bt' was planted on May 15, 2002. POST treatments were applied June 14 at 10:30 am with 74 F air, 79 F soil surface, 42% relative humidity, 0% clouds, 0 mph wind, moist soil surface, wet subsoil, good crop vigor, and no dew present to 4 to 6 inch (3 to 4 collar) corn. Weed species present were: 1 to 4 inch (10 to 100/ft^2) yellow foxtail; and 1 to 3 inch (5 to 20/yd^2) common lambsquarters. Treatments were applied to the center 6.67 feet of the 10 by 40 foot plots with a back-pack-type plot sprayer delivering 8.5 gpa at 40 psi through 8001 flat fan nozzles. The experiment had a randomized complete block design with three replicates per treatment.

No injury was observed at any rating. All treatments controlled common lambsquarters. Reduced herbicide rates were used to evaluate adjuvant enhancement. Base provided greater herbicide enhancement and near complete yellow foxtail control than other adjuvants. (Dept. of Plant Sciences, North Dakota State University, Fargo).

Table. Steadfast + adjuvants (Zollinger and Ries).

		June 28	July 12
Treatment[1]	Rate	Yeft	Yeft
	(product/A)	% control	% control
Steadfast+Callisto+	0.5oz+1.5floz+		
Base	1% v/v	67	83
Soy-Stik+28-0-0	1% v/v+2qt	63	77
Premium COC+28-0-0	1% v/v+2qt	60	72
WC 015+28-0-0	3oz+2qt	60	72
WC 015+28-0-0	6oz+2qt	65	70
Steadfast+Distinct+	0.5oz+2oz+		
Base	1% v/v	90	96
Soy-Stik+28-0-0	1% v/v+2qt	72	82
LSD (0.05)		7	6

[1]Base = methylated seed oil basic blend; Soy-Stik = methylated seed oil; 28-0-0 = urea ammonium nitrate; Premium COC = petroleum oil concentrate; WC 015 = proprietary adjuvant from West Central.

Steadfast tank-mixes. Zollinger, Richard K. and Jerry L. Ries. An experiment was conducted near Leonard, ND, to evaluate weed control in corn using Steadfast with adjuvants. Golden Harvest 'H-6389Bt' was planted on May 15, 2002. POST treatments were applied June 14 at 10:00 am with 73 F air, 78 F soil surface, 42% relative humidity, 0% clouds, 0 mph wind, moist soil surface, wet subsoil, good crop vigor, and no dew present to 4 to 6 inch (3 to 4 collar) corn. Weed species present were: 1 to 4 inch (10 to 100/ft^2) yellow foxtail; and 1 to 3 inch (5 to 20/yd^2) common lambsquarters. Treatments were applied to the center 6.67 feet of the 10 by 40 foot plots with a back-pack-type plot sprayer delivering 8.5 gpa at 40 psi through 8001 flat fan nozzles. The experiment had a randomized complete block design with three replicates per treatment.

No injury was observed at any rating. All treatments controlled common lambsquarters. Labeled Steadfast rates were used with reduced Callisto rates. Atrazine enhanced yellow foxtail control. Clarity at 8 fl oz antagonized yellow foxtail control. However, atrazine + MSO type adjuvant overcame dicamba antagonism. (Dept. of Plant Sciences, North Dakota State University, Fargo).

Table. Steadfast tank-mixes (Zollinger and Ries).

		June 28	July 12
Treatment[1]	Rate	Yeft	Yeft
	(product/A)	% control	% control
Steadfast+Callisto+Base	0.75oz+2floz	68	87
Steadfast+Callisto+Soy-Stik+28-0-0	0.75oz+2floz	72	90
Steadfast+Callisto+Premium COC+28-0-0	0.75oz+2floz	68	83
Steadfast+Callisto+Atrazine+Premium COC+28-0-0	0.75oz+2floz+0.375lb ai/A	98	98
Steadfast+Callisto+Atrazine+Soy-Stik+28-0-0	0.75oz+2floz+0.375lb ai/A	99	99
Steadfast+Callisto+Clarity+Premium COC+28-0-0	0.75oz+2floz+8fl oz	68	77
Steadfast+Callisto+Clarity+Soy-Stik+28-0-0	0.75oz+2floz+8fl oz	73	88
Steadfast+Callisto+Clarity+Phase+28-0-0	0.75oz+2floz+8fl oz	62	70
Steadfast+Atrazine+Soy-Stik+28-0-0	0.75oz+0.375lb ai/A	83	95
Steadfast+Clarity+Atrazine+Soy-Stik+28-0-0	0.75oz+2floz+0.375lb ai/A	67	95
Steadfast+Clarity+Atrazine+Soy-Stik+28-0-0	0.75oz+4floz+0.375lb ai/A	65	83
LSD (0.05)		4	7

[1]Base = methylated seed oil basic blend adjuvant; Soy-Stik = methylated seed oil; 28-0-0 = urea ammonium nitrate at 2 qt/A; Premium COC = petroleum oil concentrate at 1% v/v; Phase = methylated seed oil + organosilicone surfactant at 0.25% v/v.

POST grass + Callisto tankmixes. Zollinger, Richard K. and Jerry L. Ries. An experiment was conducted near Casselton, ND, to evaluate yellow foxtail control in corn. Pioneer '39K42' was planted on May 23, 2002. POST treatments were applied June 29 at 8:30 am with 80 F air, 90 F soil surface, 50% relative humidity, 100% clouds, 5 to 10 mph S wind, moist soil surface, wet subsoil, good to excellent crop vigor, and no dew present to 10 to 14 inch (5 collar) corn. Weed species present were: 1 to 6 inch (5 to 20/yd^2) foxtail species (25% yellow population to 75% green population); 1 to 6 inch (3 to 15/yd^2) redroot pigweed; 1 to 6 inch (3 to 15/yd^2) common lambsquarters; 3 to 6 inch (3 to 15/yd^2) common cocklebur; and 1 to 6 inch (5 to 15/yd^2) wild mustard. Treatments were applied to the center 6.67 feet of the 10 by 40 foot plots with a bicycle-wheel-type plot sprayer delivering 8.5 gpa at 40 psi through 8001 flat fan nozzles. The experiment had a randomized complete block design with three replicates per treatment.

Greater than 3 inches of rain fell on June 23 and 2 inches of rain on July 10. POST application was applied later than normal due to excessively wet conditions. No corn injury occurred and all treatments controlled green foxtail, wild mustard, redroot pigweed, common cocklebur, and common lambsquarters. Only highest rates of Steadfast + Callisto or Lumax controlled yellow foxtail. Reducing rates of either component reduced control. Option in any combination did not control yellow foxtail. (Dept. of Plant Sciences, North Dakota State University, Fargo).

Table. POST grass + Callisto tankmixes (Zollinger and Ries).

		July 13	July 27
Treatment[1]	Rate	Yeft	Yeft
	(product/A)	% control	% control
Steadfast+Callisto+Atrazine+PO+28%	0.75oz+3fl oz+0.375lb A/A	85	78
Steadfast+Lumax+PO+28%	0.75oz+3pt	95	92
Steadfast+Callisto+Atrazine+PO+28%	0.5oz+3fl oz+0.375lb A/A	77	70
Steadfast+Lumax+PO+28%	0.5oz+3pt	92	80
Steadfast+Lumax+PO+28%	0.375oz+3pt	75	72
Steadfast+Lumax+PO+28%	0.5oz+2pt	80	75
Steadfast+Lumax+PO+28%	0.375oz+2pt	73	70
Steadfast+Lumax+Banvel+PO+28%	0.375oz+2pt+4fl oz	58	57
Option+Callisto+Atrazine+MSO+28%	1.5oz+3fl oz+0.375lb A/A	65	63
Option+Lumax+MSO+28%	1.5oz+3pt	60	63
Option+Callisto+Atrazine+MSO+28%	1.25oz+3fl oz+0.375 lb A/A	63	52
Option+Lumax+MSO+28%	1.25oz+3pt	60	62
Option+Lumax+MSO+28%	1oz+3pt	65	68
Option+Lumax+MSO+28%	1.25oz+2pt	65	65
Option+Lumax+MSO+28%	1oz+2pt	53	57
Option+Lumax+Banvel+MSO+28%	1oz+2pt+4fl oz	67	62
LSD (0.05)		9	11

[1]PO = petroleum oil concentrate = Herbimax at 1.5pt/A; 28-0-0 = urea ammonium nitrate at 1.5qt/A; MSO = methylated seed oil = Scoil at 1.5pt/A.

Steadfast/Option + Lumax with adjuvants. Zollinger, Richard K. and Jerry L. Ries. An experiment was conducted near Casselton, ND, to evaluate weed control in corn. Pioneer '39T71' was planted on May 23, 2002. POST treatments were applied June 29 at 10:00 am with 85 F air, 93 F soil surface, 50% relative humidity, 75% clouds, 5 to 10 mph S wind, moist soil surface, wet subsoil, good to excellent crop vigor, and no dew present to less than 14 inch (5 collar) corn. Weed species present were: 1 to 6 inch (5 to 20/yd^2) foxtail species (25% yellow population to 75% green population); 1 to 6 inch (3 to 15/yd^2) redroot pigweed; 1 to 6 inch (3 to 15/yd^2) common lambsquarters; 3 to 6 inch (3 to 15/yd^2) common cocklebur; and 1 to 6 inch (5 to 15/yd^2) wild mustard. Treatments were applied to the center 6.67 feet of the 10 by 40 foot plots with a bicycle-wheel-type plot sprayer delivering 8.5 gpa at 40 psi through 8001 flat fan nozzles. The experiment had a randomized complete block design with three replicates per treatment.

Treatments were applied later than scheduled due to a 3 inches of rain that fell June 23. No injury was observed from any herbicide treatment. All treatments controlled redroot pigweed, common lambsquarters and wild mustard. Reduced rates were used on difficult to control yellow foxtail to separate adjuvants. It was thought that Dual and emulsifiers in Lumax may provide some or all the adjuvant load for effective weed control. For Steadfast, most adjuvants did not influence weed control. MSO type adjuvant was superior to other adjuvants used. For Option, many adjuvants improved weed control. L-132, MSO, Z-64, and Base improved weed control compared to no adjuvant used. (Dept. of Plant Sciences, North Dakota State University, Fargo).

Table. Steadfast/Option + Lumax with adjuvants (Zollinger and Ries).

Treatment[1]	Rate	July 13 Fxtl	July 27 Fxtl
	(product/A)	% control	% control
Steadfast+Lumax	0.375oz+2pt	62	73
Steadfast+Lumax+	0.375oz+2pt+		
Basic Blend	1% v/v	62	70
Liberate+28-0-0	1pt/100gal+1.5qt	60	70
PO+28-0-0	1.5pt+1.5qt	73	72
L-132+28-0-0	0.75pt+1.5qt	76	70
MSO+28-0-0	1.5pt+1.5qt	84	84
Z-64+28-0-0	1% v/v+1.5qt	77	73
Base	1% v/v	52	62
Phase	0.25% v/v	48	63
Option+Lumax	1oz+2pt	27	20
Option+Lumax+	1oz+2pt+		
Basic Blend	1% v/v	45	32
Liberate+28-0-0	1pt/100gal+1.5qt	48	27
PO+28-0-0	1.5pt+1.5qt	42	27
L-132+28-0-0	0.75pt+1.5qt	62	58
MSO+28-0-0	1.5pt+1.5qt	68	60
Z-64+28-0-0	1% v/v+1.5qt	68	60
Base	1% v/v	48	63
Phase	0.25% v/v	43	37
LSD (0.05)		6	5

[1]Basic Blend = Quad 7; Liberate = surfactant; 28-0-0 = urea ammonium nitrate; PO = petroleum oil concentrate = Herbimax; L-132 = petroleum oil concentrate; MSO = methylated seed oil = Scoil; Z-64 = methylated seed oil basic blend; Base = methylated seed oil basic blend; Phase = methylated seed oil + organosilicone surfactant.

Callisto premixes in corn. Zollinger, Richard K and Jerry L Ries. An experiment was conducted near Casselton, ND, to evaluate weed control from Callisto premixes in corn. Dekalb 'DKC39-47' was planted on May 23, 2002. PRE treatments were applied May 31 at 9:30 am with 79 F air, 60 F soil at a 4 inch depth, 22% relative humidity, 0% clouds, 3 mph NW wind, dry soil surface, and moist subsoil. EPOST treatments were applied June 5 at 10:00 am with 75 F air, 67 F soil surface, 30% relative humidity, 35% clouds, 3 to 5 mph N wind, dry soil surface, moist subsoil, excellent crop vigor, and no dew present to 3 inch (1 to 3 collar) corn. Weed species present were: 0.5 to 1 inch (5 to 20/yd^2) yellow foxtail; cotyledon (1/yd^2) common cocklebur; cotyledon (1/yd^2) common lambsquarters; and cotyledon (1/yd^2) wild mustard. Treatments were applied to the center 6.67 feet of the 10 by 40 foot plots with a bicycle-wheel-type plot sprayer delivering 17 gpa at 40 psi through 8002 flat fan nozzles for PRE treatments and 8.5 gpa at 40 psi through 8001 flat fan nozzles for EPOST treatments. The experiment had a randomized complete block design with three replicates per treatment.

No corn injury observed at June 7 or 14 to PRE treatments. POST treatments were applied later than normal due to a heavy rain that delayed application. At June 19, there was no corn injury and all treatments controlled wild mustard, redroot pigweed, and common lambsquarters. At June 23, more than 3 inches of rainfall occurred resulting in standing water for a few days which stunted the corn temporarily. At July 3 (28 DAT), weeds mentioned previously were controlled and corn in some areas of the study was visibly stunted. No additional injury occurred from any herbicide treatment. An additional 2 inches of rainfall occurred on July 10. Weeds mentioned previously were controlled at July 17 and 31. No yield to be taken due to corn stunting from excess water. Lumax alone or with Accent was more efficacious than other treatments. (Dept. of Plant Sciences, North Dakota State University, Fargo).
(Dept. of Plant Sciences, North Dakota State University, Fargo).

Table. Callisto premixes in corn (Zollinger and Ries).

		June 19		July 5		July 17		July 31	
Treatment[1]	Rate	Yeft	Cocb	Yeft	Cocb	Yeft	Cocb	Yeft	Cocb
	(product/A)	--%control --		--%control --		--%control --		--%control --	
PRE									
Lumax	2.5qt	99	90	99	92	99	95	99	87
Lumax	3qt	99	88	99	96	99	94	98	80
Camix	2qt	75	70	75	68	80	67	82	65
Camix	2.4qt	72	75	80	77	78	72	73	58
Balance Pro+ Atrazine	3fl oz+ 0.5lb ai/A	85	70	90	77	92	85	92	82
Surpass+ Hornet WDG	2.5pt+ 3oz	82	68	91	78	92	67	92	55
EPOST									
Accent+Lumax	0.33oz+2.5qt	99	92	99	96	99	95	99	87
Accent+Lumax	0.33oz+3qt	99	93	99	98	99	96	99	94
Accent+Camix	0.33oz+2qt	99	72	99	75	99	73	96	60
Accent+Camix	0.33oz+2.4qt	99	78	99	78	99	77	99	73
Option+Callisto+ MSO+28%	1.25oz+3fl oz	78	75	67	58	62	47	55	33
Untreated		0	0	0	0	0	0	0	0
LSD (0.05)		2	5	7	8	10	13	10	22

[1]MSO = methylated seed oil = Scoil at 1.5pt/A; 28-0-0 = urea ammonium nitrate at 1.5qt/A.

Kochia control in corn. Zollinger, Richard K. and Jerry L. Ries. An experiment was conducted near Kindred, ND, to evaluate kochia control in corn from mesotrione-based premixes. Mycogen '4321' corn was planted on April 26, 2002. EPOST (early post emergence) treatments were applied June 3 at 8:00 pm with 64 F air, 66 F soil surface, 60% relative humidity, 80% clouds, 8 mph W wind, dry soil surface, damp subsoil, good crop vigor, and no dew present to 1 to 3 inch (1 to 2 collar) corn. Weed species present were: 1 to 2 inch (5 to 50/ft^2) common lambsquarters; and 1 to 3 inch (20 to 50/ft^2) kochia. Treatments were applied to the center 6.67 feet of the 10 by 40 foot plots with a bicycle-wheel-type plot sprayer delivering 8.5 gpa at 40 psi through 8001 flat fan nozzles. The experiment had a randomized complete block design with three replicates per treatment.

No corn injury was observed at any time. No visible injury to kochia was observed until 7 to 10 DAT. Any Camix treatment did not adequately control kochia and all Lumax treatments at either rate with or without adjuvants controlled kochia. Kochia and common lambsquarters were controlled for the remainder of the growing season (data not shown). (Dept. of Plant Sciences, North Dakota State University, Fargo).

Table. Kochia control in corn (Zollinger and Ries).

		June 17		July 1	
Treatment[1]	Rate	Koch	Colq	Koch	Colq
	(product/A)	---% control ---		---% control ---	
Camix	1.2qt	40	95	28	25
Camix	2.4qt	55	96	47	40
Camix+PO	1.2qt	55	99	50	43
Camix+PO	2.4qt	58	99	62	58
Camix+PO+28-0-0	1.2qt	58	99	52	48
Camix+PO+28-0-0	2.4qt	62	96	63	57
Camix+NIS+28-0-0	1.2qt	53	98	48	42
Camix+NIS+28-0-0	2.4qt	60	98	58	55
Lumax	1.5qt	95	99	98	99
Lumax	3qt	96	99	99	99
Lumax+PO	1.5qt	99	99	99	99
Lumax+PO	3qt	99	99	99	99
Lumax+PO+28-0-0	1.5qt	97	99	98	99
Lumax+PO+28-0-0	3qt	97	98	99	99
Lumax+NIS+28-0-0	1.5qt	95	98	97	99
Lumax+NIS+28-0-0	3qt	98	99	99	99
Bicep II Magnum	2.1qt	98	99	99	99
Untreated		0	0	0	0
LSD (0.05)		13	2	15	6

[1]PO = petroleum oil concentrate = Herbimax at 1% v/v; 28-0-0 = urea ammonium nitrate at 2.5% v/v; NIS = nonionic surfactant = Activator 90 at 0.25% v/v.

Option + adjuvants. Zollinger, Richard K .and Jerry L. Ries. An experiment was conducted near Leonard, ND, to evaluate weed control in corn using Option with adjuvants. Golden Harvest 'H-6389Bt' was planted on May 15, 2002. POST treatments were applied June 14 at 11:30 am with 77 F air, 81 F soil surface, 42% relative humidity, 0% clouds, 1 mph S wind, moist soil surface, wet subsoil, good crop vigor, and no dew present to 4 to 6 inch (3 to 4 collar) corn. Weed species present were: 2 to 3 inch (10 to 100/ft^2) yellow foxtail; and 1 to 3 inch (5 to 20/yd^2) common lambsquarters. Treatments were applied to the center 6.67 feet of the 10 by 40 foot plots with a back-pack-type plot sprayer delivering 8.5 gpa at 40 psi through 8001 flat fan nozzles. The experiment had a randomized complete block design with three replicates per treatment.

Reduced Option rates were used on difficult to control yellow foxtail to separate adjuvants. No crop injury was observed. All treatments controlled common lambsquarters. Adjuvants produced variability in yellow foxtail control. Data supports label to add an MSO type adjuvant plus 28% nitrogen. Renegade and Z-64 were the only adjuvants to enhance weed control greater than 80%. (Dept. of Plant Sciences, North Dakota State University, Fargo).

Table. Option + adjuvants (Zollinger and Ries).

Treatment[1]	Rate	June 28 Yeft	July 12 Yeft
	(product/A)	% control	% control
Option+	1.5oz+		
Soy-Stik+28-0-0	1.5pt+1.5qt	73	80
Base	2pt	70	77
Base	1.5pt	67	68
Option+	1.25oz+		
Soy-Stik+28-0-0	1.5pt+2pt	68	70
Base	1pt	67	68
Base	2pt	68	73
Destiny+28-0-0	1.5pt+1.5qt	63	75
Super Spread MSO+28-0-0	1.5pt+1.5qt	67	75
Prime Oil+28-0-0	1.5pt+1.5qt	63	72
Hi-Per-Oil+28-0-0	0.75pt+1.5qt	62	67
AG 01017+28-0-0	0.5% v/v+1.5qt	60	60
Class Act NG	2.5% v/v	50	48
AG 01034+28-0-0	0.5% v/v+1.5qt	68	75
AG 01023+28-0-0	0.5% v/v+1.5qt	63	63
AG 02020+28-0-0	0.5% v/v+1.5qt	57	60
AG 02033+28-0-0	0.5% v/v+1.5qt	57	52
Rivet+28-0-0	0.5% v/v+1.5qt	73	77
Advance ESO+28-0-0	1.5pt+1.5qt	68	72
Liberate+28-0-0	0.125% v/v+1.5qt	48	55
Renegade+28-0-0	2% v/v+1.5qt	73	81
Z-64	2% v/v	79	83
L-132	0.75pt+1.5qt	65	72
LSD (0.05)		10	11

[1]Soy-Stik = methylated seed oil; 28-0-0 = urea ammonium nitrate; Base = methylated seed oil basic blend; Destiny = methylated seed oil; Super Spread MSO = methylated seed oil; Prime Oil = petroleum oil concentrate; Hi-Per-Oil = petroleum oil concentrate; AG 01017, AG 01034; AG 01023, AG 02020 and AG 02033 = proprietary adjuvant from Agrilliance; Class Act NG = surfactant + fertilizer; Rivet = methylated seed oil + organosilicone surfactant; Advance ESO = ethylated seed oil; Liberate = surfactant; Renegade = methylated seed oil basic blend; Z-64 = methylated seed oil basic blend; L-132 = petroleum oil concentrate.

Option tank-mixes + adjuvants. Zollinger, Richard K. and Jerry L. Ries. An experiment was conducted near Leonard, ND, to evaluate weed control in corn. Golden Harvest 'H-6389Bt' was planted on May 15, 2002. POST treatments were applied June 14 at 9:00 am with 70 F air, 75 F soil surface, 42% relative humidity, 0% clouds, 0 mph wind, moist soil surface, wet subsoil, good crop vigor, and no dew present to 4 to 6 inch (3 to 4 collar) corn. Weed species present were: 2 to 3 inch (10 to 100/ft^2) yellow foxtail; and 1 to 3 inch (5 to 20/yd^2) common lambsquarters. Treatments were applied to the center 6.67 feet of the 10 by 40 foot plots with a back-pack-type plot sprayer delivering 8.5 gpa at 40 psi through 8001 flat fan nozzles. The experiment had a randomized complete block design with three replicates per treatment.

No injury was observed at any rating. All treatments controlled common lambsquarters. Option with Callisto or Distinct did not provide adequate yellow foxtail control. (Dept. of Plant Sciences, North Dakota State University, Fargo).

Table. Option tank-mixes + adjuvants (Zollinger and Ries).

		June 28	July 12
Treatment[1]	Rate	Yeft	Yeft
	(product/A)	% control	% control
Option+Callisto+Base	1.25oz+1.5fl oz	63	62
Option+Callisto+Soy-Stik+28-0-0	1.25oz+1.5fl oz	63	50
Option+Distinct+Base	1.25oz+2oz	70	63
Option+Distinct+Soy-Stik+28-0-0	1.25oz+2oz	73	68
LSD (0.05)		5	12

[1]Base = methylated seed oil basic blend at 2pt/A; Soy-Stik = methylated seed oil at 1.5pt/A; 28% = urea ammonium nitrate at 1.5qt/A.

Option tankmixtures in corn. Zollinger, Richard K. and Jerry L. Ries. An experiment was conducted near Casselton, ND, to evaluate weed control in corn. Dekalb 'DKC39-47' was planted on May 23, 2002. EPOST (early post emergence) treatments were applied June 12 at 5:30 pm with 70 F air, 72 F soil surface, 39% relative humidity, 90% clouds, 5 to 6 mph W wind, dry soil surface, moist subsoil, excellent crop vigor, and no dew present to 4 to 5 inch (3 collar) corn. Weed species present were: 1 to 2 inch (1 to 3/yd^2) foxtail species (20% green population to 80% yellow population); 1 to 3 inch (1 to 5/yd^2) common cocklebur; and 1 to 2 inch (1 to 5/yd^2) wild mustard. POST treatments were applied June 29 at 3:00 pm with 95 F air, 112 F soil surface, 50% relative humidity, 0% clouds, 8 to 15 mph S wind, moist soil surface, wet subsoil, good to excellent crop vigor, and no dew present to less than 14 inch (5 collar) corn. Weed species present were: 1 to 6 inch (1 to 3/yd^2) foxtail species (20% green population to 80% yellow population); 1 to 6 inch (3 to 15/yd^2) redroot pigweed; 1 to 6 inch (3 to 15/yd^2) common lambsquarters; 1 to 6 inch (1 to 5/yd^2) common cocklebur; and 1 to 6 inch (1 to 5/yd^2) wild mustard.

At Leonard, Golden Harvest 'H-6389Bt' was planted on May 15, 2002. EPOST treatments were applied June 5 at 11:30 am with 81 F air, 82 F soil surface, 30% relative humidity, 40% clouds, 3 to 5 mph N wind, dry soil surface, damp subsoil, good crop vigor, and no dew present to 3 to 4 inch (2 to 3 collar) corn. Weed species present were: 1 to 3 inch (25 to 75/ft^2) yellow foxtail. POST treatments were applied June 14 at 12:00 pm with 79 F air, 83 F soil surface, 42% relative humidity, 0% clouds, 1 mph S wind, moist soil surface, wet subsoil, good crop vigor, and no dew present to 4 to 6 inch (3 to 4 collar) corn. Weed species present were: 2 to 4 inch (10 to 100/ft^2) yellow foxtail; and 1 to 3 inch (5 to 20/yd^2) common lambsquarters.

Treatments were applied to the center 6.67 feet of the 10 by 40 foot plots at a rate 10 gpa at 40 psi through 8001 flat fan nozzles. Casselton treatments were applied with a bicycle-wheel-type plot sprayer, POST treatments had an attached windscreen. At Leonard, all treatments were applied using a back-pack-type sprayer. The experiment had a randomized complete block design with three replicates per treatment.

Casselton: Yellow foxtail was the target weed because of difficulty in control. All treatments controlled wild mustard, redroot pigweed, and common lambsquarters. Soil at this location contains high amount of clay with high organic matter. Corn grew in an ideal but excessively wet environment. Over three inches of rain fell on June 23 followed by 2 inches of rain on July 10. POST treatments were applied later than scheduled to large yellow foxtail because of excessive wet conditions. Corn in some parts of the study was stunted due to excess water. Define and Northstar applied with Option enhanced yellow foxtail control compared to Option applied alone. Callisto at lower rates with Option reduced yellow foxtail control. Callisto at the highest rate and Distinct did not increase yellow foxtail control.

Leonard: Yellow foxtail was the target weed because of difficulty in control. All treatments controlled common lambsquarters. Soil at this location was light with a high sand content. Conditions were dry for the first third of the season and both corn and yellow foxtail exhibited drought stress at and following application. Corn injury was primarily stunting but any treatment containing dicamba also showed yellowing. No injury occurred after June 21. Option with Define gave near complete yellow foxtail control at 14 DAT but was reduced at 28 DAT because another flush of yellow foxtail was present. As in Casselton, Northstar with Option enhanced foxtail control compared to Option applied alone. Distinct generally reduced yellow foxtail control and Callisto, generally, did not influence control. Yields were erratic. Yield variability was not due to herbicide effect or in most cases not affected by weed competition. Long strips of stunted and low vigor corn went down the length of the field, inside and outside the study border. The strips seem to match variability on soil topography and possibly inconsistency in fertility. (Dept. of Plant Sciences, North Dakota State University, Fargo).

Table 1. Option tankmixtures in corn, Casselton (Zollinger and Ries).

Treatment[1]	Rate	July 13		July 27	
		Yeft	Cocb	Yeft	Cocb
	(product/A)	---% control ---		--- % control ---	
EPOST					
Option+Define+MSO+28%	1.5oz+4oz	98	47	99	20
Option+Define+MSO+28%	1.5oz+6oz	99	57	96	43
Option+Define+MSO+28%	1.5oz+8oz	99	47	98	33
POST					
Option+MSO+28%	1.5oz	70	47	88	40
Option+Distinct+MSO+28%	1.5oz+1oz	63	63	83	93
Option+Distinct+MSO+28%	1.5oz+2oz	68	70	78	92
Option+Distinct+MSO+28%	1.5oz+4oz	70	73	85	92
Distinct+MSO+28%	4oz	47	80	60	96
Option+Callisto+MSO+28%	1.5oz+1.5fl oz	60	57	72	70
Option+Callisto+MSO+28%	1.5oz+2fl oz	63	60	77	67
Option+Callisto+MSO+28%	1.5oz+3fl oz	67	68	87	87
Callisto+MSO+28%	3fl oz	37	72	30	63
Option+Northstar+MSO+28%	1.5oz+3oz	70	70	94	93
Option+Northstar+MSO+28%	1.5oz+4oz	50	80	93	94
Option+Northstar+MSO+28%	1.5oz+5oz	65	83	93	95
Northstar+MSO+28%	5oz	47	77	47	92
Steadfast+Distinct+PO+28%	0.75oz+2oz	73	75	95	91
Untreated		0	0	0	0
LSD (0.05)		8	8	7	15

[1]MSO = methylated seed oil = Scoil at 1.5pt/A; 28% = urea ammonium nitrate at 1.5qt/A; PO = petroleum oil concentrate = Herbimax at 1qt/A.

Table 2. Option tankmixtures in corn, Leonard (Zollinger and Ries).

Treatment[1]	Rate	June 21 Corn	June 28 Yeft	July 12 Yeft	Corn Yield
	(product/A)	% injury	-----% control -----		bu/A
EPOST					
Option+Define+MSO+28%	1.5oz+4oz	12	97	72	103
Option+Define+MSO+28%	1.5oz+6oz	10	96	75	97
Option+Define+MSO+28%	1.5oz+8oz	12	97	87	124
POST					
Option+MSO+28%	1.5oz	23	65	80	98
Option+Distinct+MSO+28%	1.5oz+1oz	28	75	70	108
Option+Distinct+MSO+28%	1.5oz+2oz	25	78	73	128
Option+Distinct+MSO+28%	1.5oz+4oz	28	77	70	98
Distinct+MSO+28%	4oz	23	40	40	89
Option+Callisto+MSO+28%	1.5oz+1.5fl oz	15	63	67	96
Option+Callisto+MSO+28%	1.5oz+2fl oz	15	67	75	106
Option+Callisto+MSO+28%	1.5oz+3fl oz	15	88	78	56
Callisto+MSO+28%	3fl oz	25	37	23	69
Option+Northstar+MSO+28%	1.5oz+3oz	10	65	98	129
Option+Northstar+MSO+28%	1.5oz+4oz	15	70	98	129
Option+Northstar+MSO+28%	1.5oz+5oz	13	88	99	121
Northstar+MSO+28%	5oz	12	47	93	97
Steadfast+Distinct+PO+28%	0.75oz+2oz	10	68	96	128
Untreated		0	0	0	37
LSD (0.05)		5	7	9	54

[1]MSO = methylated seed oil = Scoil at 1.5pt/A; 28% = urea ammonium nitrate at 1.5qt/A; PO = petroleum oil concentrate = Herbimax at 1qt/A.

Aim + Atrazine in corn. Zollinger, Richard K. and Jerry L. Ries. An experiment was conducted near Casselton, ND, to evaluate weed control in corn. Dekalb 'DKC39-47' was planted on May 23, 2002. POST treatments were applied June 14 at 1:15 pm with 78 F air, 85 F soil surface, 34% relative humidity, 0% clouds, 1 to 3 mph NW wind, dry soil surface, moist subsoil, excellent crop vigor, and no dew present to 3 to 4 inch (3 collar) corn. Weed species present were: 1 to 3 inch (1 to 10/ft^2) foxtail species (50 ratio of green to yellow); 0.5 to 2 inch (1 to 5/ft^2) redroot pigweed; 0.5 to 1.5 inch (1 to 5/ft^2) common lambsquarters; cotyledon to 2 inch (1 to 10/ft^2) wild mustard; and 1 to 2 inch (3 to 5/yd^2) common cocklebur. Treatments were applied to the center 6.67 feet of the 10 by 40 foot plots with a bicycle-wheel-type plot sprayer delivering 8.5 gpa at 40 psi through 8001 flat fan nozzles. The experiment had a randomized complete block design with three replicates per treatment.

POST treatment applications were delayed due to more than 3 inches of rain on June 23. AGH 02002 did not go into solution at mixing regardless of tank-mix herbicide or adjuvant. Black specs precipitated to the bottom of the bottles. More than 2 inches of rain fell on July 10. All treatments controlled wild mustard, redroot pigweed and common lambsquarters. All treatments would probably control common cocklebur and later flushes. Poor ratings on July 12 (28 DAT) of common cocklebur resulted from a rain event after dry conditions. No crop injury observed. (Dept. of Plant Sciences, North Dakota State University, Fargo).

Table. Aim + Atrazine in corn (Zollinger and Ries).

		June 28		July 12	
Treatment[1]	Rate	Fxtl	Cocb	Fxtl	Cocb
	(product/A)	-- % control --		-- % control --	
Aim+Atrazine+Preference	0.5fl oz+0.28lb ai/A	33	52	30	42
AGH 02002+Preference	0.25lb	32	30	30	42
AGH 02002+Dicamba+Preference	0.25lb+4fl oz	32	70	32	82
AGH 02002+Dicamba+AG 01034	0.25lb+4fl oz	32	72	40	80
AGH 02002+Basic Blend	0.25lb	32	72	30	82
Option+AGH 02002+Destiny+ 28-0-0	1.5oz+0.25lb	91	52	93	53
Option+Dicamba+AHG 02002+ Destiny+28-0-0	1.5oz+4fl oz+0.25lb	91	71	94	72
Option+AGH 02002+ Hi-Per-Oil+28-0-0	1.5oz+0.25lb	82	71	83	60
Option+Dicamba+AGH 02002+ Hi-Per-Oil+28-0-0	1.5oz+4fl oz+0.25lb	80	71	83	83
Option+Aim+Atrazine+ Destiny+28-0-0	1.5oz+0.5fl oz+0.28lb ai/A	82	71	92	72
Option+Dicamba+AGH 02002+ AG 01034+28-0-0	1.5oz+4fl oz+0.25lb	83	52	90	72
Accent+AGH 02002+Basic Blend	0.67oz+0.25lb	82	52	90	50
Steadfast+Aim+PO+28-0-0	0.75oz+2fl oz	95	52	96	62
Steadfast+Aim+Hornet WDG +PO+28-0-0	0.75oz+2fl oz+3.5oz+ 1% v/v+2.5% v/v	99	99	99	91
Steadfast+Starane+Atrazine+Liberate	0.75oz+0.5oz+0.38lb ai/A	99	70	99	91
WC022+ NIS+28-0-0	1oz+ 0.25% v/v+2.5% v/v	32	50	30	91
LSD (0.05)		4	3	3	4

[1]Preference = surfactant at 0.25% v/v; AGH 02002 = Aim + atrazine premix from Agriliance; AG 01034 = proprietary adjuvant from Agrilliance at 0.25% v/v; Basic Blend = Quad 7 at 1% v/v; Destiny = methylated seed oil at 1.5pt/A; 28-0-0 = urea ammonium nitrate at 1.5qt/A; Hi-Per-Oil = petroleum oil concentrate at 0.5% v/v; PO = petroleum oil concentrate = Herbimax at 1% v/v; Liberate = surfactant; WC022 = proprietary broadleaf herbicide from West Central Inc; NIS = nonionic surfactant = Activator 90.

Liberty Link corn. Zollinger, Richard K. and Jerry L. Ries. An experiment was conducted near Casselton, ND, to evaluate weed control in corn. Pioneer '39K42' was planted on May 23, 2002. PRE treatments were applied May 24 at 1:00 pm with 59 F air, 52 F soil at a 4 inch depth, 25% relative humidity, 5% clouds, 5 mph NW wind, dry soil surface, and moist subsoil. POST treatments were applied June 29 at 9:30 am with 80 F air, 94 F soil surface, 50% relative humidity, 100% clouds, 5 to 10 mph S wind, moist soil surface, wet subsoil, good to excellent crop vigor, and no dew present to less than 14 inch (5 collar) corn. Weed species present were: 1 to 6 inch (5 to 20/yd^2) foxtail species (25% yellow population to 75% green population); 1 to 6 inch (3 to 15/yd^2) redroot pigweed; 1 to 6 inch (3 to 15/yd^2) common lambsquarters; 3 to 6 inch (3 to 15/yd^2) common cocklebur; and 1 to 6 inch (5 to 15/yd^2) wild mustard and. Treatments were applied to the center 6.67 feet of the 10 by 40 foot plots with a non-hooded bicycle-wheel-type plot sprayer for PRE treatments and hooded for POST treatments. PRE treatments delivered at 17 gpa at 40 psi through 11002 flat fan nozzles and POST treatments delivered at 10 gpa at 40 psi through 8001 flat fan nozzles. The experiment had a randomized complete block design with three replicates per treatment.

Target weed was yellow foxtail. USA 2001 treatments were not applied because they would not go into solution when mixed. When POST treatments were applied on June 29, all PRE treatments controlled redroot pigweed. No injury observed for all treatments. POST treatments were targeted at 2 to 4 inch weeds but rains delayed applications until corn was 14". Treatments were not sprayed at the proper time when weeds broke through the PRE treatments. POST treatments were applied later than desired due to more than 3 inches on June 23. Most POST treatments controlled foxtail species, redroot pigweed, common lambsquarters, and wild mustard. The study was hand harvested on Sept 26. (Dept. of Plant Sciences, North Dakota State University, Fargo).

Table. Liberty Link corn (Zollinger and Ries).

Treatment[1]	Rate	June 29			July 13			July 27			Corn
		Fxtl	Wibw	Cocb	Fxtl	Wibw	Cocb	Fxtl	Wibw	Cocb	Yield
	(product/A)	----% control ----			----% control ----			----% control ----			bu/A
PRE											
Epic	15oz	99	30	30	96	53	63	93	40	60	
Epic+Atrazine	13oz+0.5lb ai/A	99	80	70	96	96	72	95	99	48	
USA 2001	15oz	99	30	30	99	32	22	99	17	17	
USA 2001+Atrazine	15oz+0.5lb ai/A	99	90	30	99	99	72	95	99	75	
Balance Pro+Surpass+Atrazine	2.25fl oz+1pt+0.5lb ai/A	72	31	32	72	52	53	57	50	40	
PRE/POST											
USA 2001/Option+MSO+28-0-0	13oz/1.5oz	99	72	32	99	91	82	95	95	77	
USA 2001/Liberty+Atrazine+AMS	13oz/24fl oz+0.5lb ai/A	99	73	33	99	95	82	92	80	65	
Define/Liberty+Atrazine+AMS	12oz/24fl oz+0.5lb ai/A	62	0	22	96	99	97	99	99	99	163
Balance Pro/Liberty+AMS	1.88fl oz/28fl oz	62	22	32	99	99	97	96	99	95	148
Surpass/Liberty+Atrazine+AMS	1.5pt/24fl oz+0.5lb ai/A	64	0	32	98	99	97	96	99	91	180
Define/Option+Clarity+MSO+28-0-0	12oz/1.5oz+4fl oz	0	0	0	91	99	99	98	99	99	190
Surpass/Option+Clarity+MSO+28-0-0	1.5pt/1.5oz+4fl oz	64	32	30	96	96	96	96	99	95	157
Balance Pro/Option+Clarity+MSO+28-0-0	1.88fl oz/1.5oz+4fl oz	62	32	32	78	99	99	75	99	99	161
Surpass/Steadfast+Clarity+PO+28-0-0	1.5pt/0.75oz+4fl oz	72	23	32	99	98	96	93	99	97	144
POST											
Liberty+AMS	34fl oz	0	0	0	96	99	99	99	99	99	142
Option+Clarity+MSO+28-0-0	1.5oz+4fl oz	0	0	0	63	99	99	65	99	99	162
Steadfast+Clarity+PO+28-0-0	0.75oz+4fl oz	0	0	0	78	99	99	84	96	99	132
Untreated		0	0	0	0	0	0	0	0	0	124
LSD (0.05)		3	2	3	8	4	5	7	4	13	54

[1]MSO = methylated seed oil = Scoil at 1.5pt/A; 28-0-0 = urea ammonium nitrate at 1.5qt/A; AMS = ammonium sulfate at 3lb/A; PO = petroleum oil concentrate = Herbimax at 1% v/v.

Roundup Ready corn. Zollinger, Richard K. and Jerry L. Ries. An experiment was conducted near Casselton, ND, to evaluate weed control in corn. Dekalb 'DKC39-47' was planted on May 23, 2002. PRE treatments were applied May 24 at 12:00 pm with 57 F air, 52 F soil at a 4 inch depth, 24% relative humidity, 10% clouds, 5 mph NW wind, dry soil surface, and moist subsoil. EPOST treatments were applied June 5 at 9:15 am with 72 F air, 65 F soil surface, 30% relative humidity, 35% clouds, 3 to 5 mph N wind, dry soil surface, moist subsoil, excellent crop vigor, and no dew present to 2 to 3 inch (1 to 3 collar) corn. Weed species present were: 0.5 to 1 inch (1 to 10/yd^2) yellow foxtail; cotyledon (1/yd^2) common cocklebur; and cotyledon (5 to 15/yd^2) wild mustard. POST treatments were applied June 29 at 2:00 pm with 95 F air, 112 F soil surface, 50% relative humidity, 0% clouds, 8 to 15 mph S wind, moist soil surface, wet subsoil, good to excellent crop vigor, and no dew present to less than 14 inch (5 collar) corn. Weed species present were: 1 to 6 inch (1 to 10/yd^2) foxtail species (25% yellow population to 75% green population); 1 to 6 inch (3 to 15/yd^2) redroot pigweed; 1 to 6 inch (3 to 15/yd^2) common lambsquarters; 3 to 6 inch (1/yd^2) common cocklebur; and 1 to 6 inch (5 to 15/yd^2) wild mustard. Treatments were applied to the center 6.67 feet of the 10 by 40 foot plots with a bicycle-wheel-type plot sprayer delivering 17 gpa at 40 psi through 11002 flat fan nozzles for PRE treatments and 8.5 gpa at 40 psi through 8001 flat fan nozzles for EPOST and POST treatments. The experiment had a randomized complete block design with three replicates per treatment.

POST treatments were applied later than desired due to more than 3 inches of rain June 23. More than 2 inches of rain fell on July 10. PRE and EPOST treatments were rated June 29 prior to POST applications. No corn injury was observed and at July 13 (14 DAT) and July 27 (28 DAT). All treatments controlled yellow and green foxtail, wild mustard, common cocklebur, redroot pigweed, and common lambsquarters. (Dept. of Plant Sciences, North Dakota State University, Fargo).

Table. Roundup Ready corn (Zollinger and Ries).

Treatment[1]	Rate	June 29			
		Fxtl	Rrpw	Colq	Cocb
	(product/A)	% control			
PRE/POST					
Keystone LA/Roundup Original+AMS	2qt/1pt	99	99	99	50
Outlook/Roundup Original+Distinct	12fl oz/1pt+4oz	70	50	50	20
Outlook/Roundup Original+Clarity	12fl oz/1pt+8fl oz	70	50	50	20
EPOST/POST					
RUM+AMS/RUM+AMS	0.8pt/0.8pt	40	40	40	40
RU Weathermax+AMS/ RU Weathermax+AMS	11fl oz/ 11fl oz	50	50	50	50
POST					
Roundup Original+Distinct	1pt+4oz				
Roundup Original+Clarity	1pt+8fl oz				
RUM+AMS	1.6pt				
RU Weathermax+AMS	22fl oz				
Touchdown+AMS	2pt				
LSD (0.05)					

[1]AMS = ammonium sulfate at 8.5lb/100gal; RUM = Roundup UltraMax.

Volunteer RUR wheat control in RUR corn-Carrington. Oltmans and Zollinger. An experiment was conducted near Carrington, ND to evaluate Roundup Ready wheat control from POST applied herbicides. Dekalb '35-50' corn was planted May 14, 2002. 'Oxen' Roundup Ready wheat was planted at 55 lb/Acre, in 4 rows across each replicate May 14, 2002. EPOST treatments were applied June 20, 2002 at 4:45 to 5:15 pm with 82 F air, 76 F soil at a 2 to 4 inch soil depth, 30% relative humidity, 40% clouds, 2 to 4 mph W wind, dry soil surface, moist subsoil, good crop vigor, and no dew present to 3 collar corn. Weed species present were: 1 to 4 inch, (20-30 plants/ft^2) foxtail; 1 to 4 inch, (1-5 plants/ft^2) common lambsquarters; 1 to 3 inch, (1-5 plants/m^2) wild buckwheat; and 6 inch volunteer wheat. POST treatments were applied July 2, 2002 at 12:30 to 12:45 am with 82 F air, 83F soil at a 2 to 4 inch soil depth, 20% relative humidity, 10% clouds, 3 to 6 mph NW wind, dry soil surface, moist subsoil, good crop vigor, and no dew present to 6 collar corn. Weed species present were: 1 to 2 inch, (10-15 plants/ft^2) foxtail; and 8 to 10 inch volunteer wheat. Treatments were applied to the center 6.67 feet of the 10 by 40 ft plots. Treatments were applied delivering 8.5 gpa at 40 psi through 8001 flat fan nozzles using a bicycle-wheel-type plot sprayer. The experiment had a randomized complete block design with four replicates per treatment.

At 7 days after treatments (DAT), corn injury ranged from 0 to 6%. At 28 DAT, there was no visible corn injury from glyphosate applied with Accent, Basis, or Basis Gold at labeled- and reduced-rates. At 14 DAT, all treatments had 89% foxtail and common lambsquarters control, except Accent at 0.50 oz/A plus Banvel, with 85% foxtail and 80% common lambsquarters control. All treatments had 85% volunteer wheat control or less, except Roundup UltraMax applied with Accent at 0.33 or 0.50 oz/A. All treatments had 98% wild buckwheat control or greater, except Accent at 0.50 or 0.6 oz/A plus Banvel, with 19 and 28% control, respectively. At 28 DAT, all treatments had 95% common lambsqaurters control or greater. All treatments had 90% foxtail and wild buckwheat control or greater, except Roundup UltraMax plus Basis at 0.33 oz/A, and Accent at 0.50 or 0.66 oz/A plus Banvel, with 65% control or less. Volunteer wheat control ranged from 21 to 98%. All treatments had 94% volunteer wheat control or greater, except Roundup UltraMax plus atrazinel, and Roundup UltraMax plus Basis Gold at 7, 10 or 14 oz/A. On July 25, all treatments had 87% foxtail or wild buckwheat control or less, except split-applied treatments and Roundup UltraMax plus Basis Gold at 14 oz/A. All treatments had 95% volunteer wheat control or greater, except Roundup UltraMax plus atrazine at 0.47 lb/A. Higher rates of atrazine are not recommended due to carry-over problems. All treatments had 91% common lambsquarters control or greater, except Roundup UltraMax plus Basis and Accent at 0.66 oz/A plus Banvel, with 84 and 89% control, respectively. Split-applied treatments with Accent at 0.50 and 0.66 oz/A and Roundup UltraMax plus Basis Gold at 14 oz/A were effective for both volunteer wheat and weed control.

Treatment[a]	Rate[b]	Applic. Stage[c]	Corn		14 DAT				28 DAT				July 25, 2002			
			7 DAT	28 DAT	Fxtl[d]	Vwht	Colq	Wibw	Fxtl	Vwht	Colq	Wibw	Fxtl	Vwht	Colq	Wibw
	(product/Acre)		% injury		% control											
RUM+AMS+Atrazine+PO/ RUM+AMS	26floz+0.47lb+1qt/ 26floz	E/P	0	0	97	9	99	99	92	21	98	98	92	21	98	98
RUM+AMS+Accent/ RUM+AMS	26floz+0.33oz/ 26floz	E/P	1	0	97	94	99	99	94	97	98	98	94	97	98	98
RUM+AMS+Accent/ RUM+AMS	26floz+0.50oz/ 26floz	E/P	1	0	97	93	99	98	93	98	98	96	93	98	98	96
RUM+AMS+Basis	26floz+0.33oz	E	2	0	99	38	99	99	65	94	98	60	61	98	84	73
RUM+AMS+Basis Gold+MSO	26floz+14oz+1.5pt	E	6	0	99	84	99	99	94	89	99	99	91	98	98	96
RUM+AMS+Basis Gold+MSO	26floz+10oz+1.5pt	E	5	0	99	85	99	99	90	84	99	99	81	97	96	83
RUM+AMS+Basis Gold+MSO	26floz+7oz+1.5pt	E	4	0	99	84	99	99	91	85	98	94	80	95	93	87
Accent+Banvel+MSO	0.66oz+4floz+1.5pt	E	6	0	90	66	89	28	60	98	97	60	61	98	89	58
Accent+Banvel+MSO	0.50oz+4floz+1.5pt	E	3	0	85	60	80	19	58	98	95	58	55	98	91	55
Untreated			0	0	0	0	0	0	0	0	0	0	0	0	0	0
LSD (0.05)			4	0	4	9	5	5	7	6	3	5	7	3	5	11

[a]RUM = Roundup UltraMax; PO = Herbimax; MSO = Scoil
[b]AMS = ammonium sulfate at 8.5lb/100gal
[c]E = EPOST; P = POST
[d]Fxtl = Grft and Yeft; Vwht = volunteer wheat

Volunteer RUR wheat control in RUR corn-Prosper. Oltmans and Zollinger. An experiment was conducted near Prosper, ND to evaluate Roundup Ready wheat control from POST applied herbicides. Dekalb '35-50' corn was planted May 17, 2002. 'Oxen' Roundup Ready wheat was planted at 55 lb/Acre, in 4 rows across each replicate May 17, 2002. EPOST treatments were applied June 18, 2002 at 9:15 to 9:45 am with 70 F air, 65 F soil at a 2 to 4 inch soil depth, 72% relative humidity, 100% clouds, 6 to 14 mph SE wind, dry soil surface, moist subsoil, good crop vigor, and no dew present to 3 collar corn. Weed species present were: 1 to 3 inch, (10-20 plants/ft^2) foxtail; 1 to 4 inch, (5-10 plants/ft^2) common lambsquarters; 1 to 3 inch, (1-5 plants/ft^2) redroot pigweed; and 6 inch volunteer wheat. POST treatments were applied July 2, 2002 at 4:00 to 4:15 pm with 95 F air, 84 F soil at a 2 to 4 inch soil depth, 31% relative humidity, 5% clouds, 1 to 3 mph S wind, dry soil surface, moist subsoil, good crop vigor, and no dew present to 8 collar corn. Weed species present were: 1 to 2 inch, (5-15 plants/ft^2) foxtail; and 8 to 10 inch volunteer wheat. Treatments were applied to the center 6.67 feet of the 10 by 40 ft plots. Treatments were applied delivering 8.5 gpa at 40 psi through 8001 flat fan nozzles using a bicycle-wheel-type plot sprayer equipped with a wind shield. The experiment had a randomized complete block design with four replicates per treatment.

Treatment[a]	Rate[b]	Applic. Stage[c]	Corn		14 DAT		28 DAT	July 29, 2002	
			7 DAT	28 DAT	Vwht	Fxtl	Vwht	Fxtl	Vwht
	(product/Acre)		% injury		% control				
RUM+AMS+Atrazine+PO/ RUM+AMS	26floz+0.47lb+1qt/ 26floz	E/P	0	0	8	99	15	99	15
RUM+AMS+Accent/ RUM+AMS	26floz+0.33oz/ 26floz	E/P	0	0	93	99	99	99	99
RUM+AMS+Accent/ RUM+AMS	26floz+0.50oz/ 26floz	E/P	1	0	94	99	99	99	99
RUM+AMS+Basis	26floz+0.33oz	E	2	0	50	90	95	97	99
RUM+AMS+Basis Gold+MSO	26floz+14oz+1.5pt	E	2	0	88	98	98	99	99
RUM+AMS+Basis Gold+MSO	26floz+10oz+1.5pt	E	3	0	86	97	95	97	99
RUM+AMS+Basis Gold+MSO	26floz+7oz+1.5pt	E	4	0	90	98	96	96	99
Accent+Banvel+MSO	0.66oz+4floz+1.5pt	E	0	0	73	95	99	91	99
Accent+Banvel+MSO	0.50oz+4floz+1.5pt	E	1	0	68	86	96	79	99
Untreated			0	0	0	0	0	0	0
LSD (0.05)			3	0	11	6	4	6	3

[a]RUM = Roundup UltraMax; PO = Herbimax; MSO = Scoil
[b]AMS = ammonium sulfate at 8.5lb/100gal
[c]E = EPOST; P = POST
[d]Fxtl = Grft and Yeft; Vwht = volunteer wheat

At 7 days after treatment (DAT), corn injury ranged from 0 to 4%. At 28 DAT, there was no visible corn injury from glyphosate applied with Accent, Basis, and Basis Gold at labeled- and reduced-rates. At 14 DAT, all treatments had 95% foxtail, common lambsquarters, and redroot pigweed control or greater (not shown). Volunteer wheat control ranged from 8 to 94%. All treatments had 90% volunteer wheat control or less, except Roundup UltraMax applied with Accent. At 28 DAT and on July 29, all treatments had 90% foxtail control or greater, accept Accent at 0.50 oz/A plus Banvel with 86 and 79% control, respectively. All treatments 28 DAT and on July 29 had 99% common lambsquarters and redroot pigweed control (not shown). All treatments 28 DAT and on July 29 had 95 and 99% volunteer wheat control or greater, respectively, except Roundup UltraMax plus atrazine at 0.47 lb/A with 15% control. Higher rates of atrazine are not recommended due to carry-over problems. Split-applied treatments with Accent, Roundup UltraMax plus Basis and Basis Gold, and Accent at 0.66 oz/A plus Banvel were effective for volunteer wheat and weed control.

Quizalofop plantback for corn. (Howatt, Roach, and Davidson-Harrington) Treatments were applied preplant as follows at Fargo, ND:

Date	May 14 (21 DBP)	May 22 (14 DBP)	May 28, (7 DBP)	June 04, 0 DBP
Temperature, F	47	58	68	54
Relative humidity (%)	59	59	51	52
Cloudcover (%)	0	80	40	40
Wind,mph Direction	5 SE	20 S	14 S	4 E
Soil Temperature, F	54	-	55	54

All treatments were applied with a backpack sprayer delivering 8.5 gpa at 40 psi through 8001 flat fan nozzles to a 7 ft wide area the length of 10 by 30 ft plots. 'DKC 39-47RR' corn was planted June 4. The experiment was a randomized complete block design with four replicates.

Table. Quizalofop plantback for corn.

Treatment	Rate	Application timing	Jun 25 Corn
	oz ai/A	DBP	% injury
Quizalofop	0.54	21	0.8
Quizalofop	0.77	21	0.0
Quizalofop	1.54	21	2.0
Glyphosate&2,4-D	24&2.4	21	2.8
Quizalofop	0.54	14	1.3
Quizalofop	0.77	14	0.0
Quizalofop	1.54	14	0.8
Glyphosate&2,4-D	24&2.4	14	1.5
Quizalofop	0.54	7	0.8
Quizalofop	0.77	7	0.8
Quizalofop	1.54	7	0.8
Glyphosate&2,4-D	24&2.4	7	2.0
Clethodim	2	7	0.8
Quizalofop	0.54	0	2.0
Quizalofop	0.77	0	5.8
Quizalofop	1.54	0	1.3
Glyphosate&2,4-D	24&2.4	0	17.5
Untreated	0		0.0
CV			200
LSD (0.05)			6.3

Quizalofop soil residue did not injury corn more than clethodim. Quizalofop did not cause corn injury that was significant compared to the untreated. The 2,4-D component of glyphosate&2,4-D treatments only caused significant injury when applied the dat of planting. Corn injury from 2,4-D at earlier applications tended to cause injury but the amount of damage was non-significant. Excessive soil moisture influenced some of the plots and inflated the LSD value. Because of water damage, the study was terminated on July 7.

Fall applied Authority. Zollinger, Richard K. and Jerry L. Ries. An experiment was conducted near Fargo, ND, to evaluate weed control in non-cropland the spring following fall PRE application of Authority. PRE applications were made on October 23, 2001. Weather conditions at the time of PRE applications were 51 F air, 45 F soil at depth of 4 inches, 57% relative humidity, 50% clouds, 4 mph SW wind, dry soil surface, and moist soil surface. Treatments were applied to the center 6.67 feet of the 10 by 40 foot plots with a bicycle-wheel-type plot sprayer delivering 17 gpa at 40 psi through 8002 flat fan nozzles. The experiment had a randomized complete block design with three replicates per treatment.

The spring of 2002 was very dry with no weeds emerging in the untreated area. Weeds emerged in mid/late June. Authority at 4 oz/A or greater controlled redroot pigweed and common lambsquarters and suppressed yellow foxtail. The rate of 10.67 oz/A gave 91% wild buckwheat control. (Dept. of Plant Sciences, North Dakota State University, Fargo).

Table. Fall applied Authority (Zollinger and Ries).

		July 2			
Treatment	Rate	Yeft	Rrpw	Colq	Wibw
	(product/A)	---------- % control ----------			
Authority	2.67oz	27	89	90	62
Authority	4oz	43	94	98	73
Authority	5.33oz	55	99	98	82
Authority	8oz	55	99	99	73
Authority	10.67oz	68	99	99	91
Untreated		0	0	0	0
LSD(0.05)		24	14	10	18

Hairy nightshade in soybean. Zollinger, Richard K. and Jerry L. Ries. An experiment was conducted near Prosper, ND, to evaluate hairy nightshade control in soybean. PRE treatments were applied on May 17, 2002 at 12:30 pm were 53 F air, 43 F soil at a depth of 4 inches, 36% relative humidity, 90% clouds, 5 mph N wind, damp soil surface, and moist subsoil and followed by planting of Asgrow 'AG0801' soybean. POST treatments were applied June 21 at 7:30 am with 70 F air, 72 F soil surface, 64% relative humidity, 75% clouds, 5 mph W wind, dry soil surface, moist subsoil, excellent crop vigor, and no dew present to V2 to V3 soybean. Weed species present were: 1 to 6 inch (1 to 10/ft^2) yellow foxtail; 1 to 4 inch (3 to 5/yd^2) redroot pigweed; 1 to 6 inch (3 to 5/yd^2) common lambsquarters; 3 to 6 inch (1 to 3/yd^2) hairy nightshade; 2 to 5 inch diameter (1 to 5/yd^2) prostrate pigweed. LPOST treatments were applied June 28 at 10:00 am with 75 F air, 77 F soil surface, 67% relative humidity, 5% clouds, 5 mph NW wind, moist soil surface, wet subsoil, excellent crop vigor, and no dew present to V3 to V4 soybean. Weed species present were: 1 to 8 inch (1 to 10/ft^2) yellow foxtail; 1 to 6 inch (3 to 5/yd^2) redroot pigweed; 1 to 8 inch (3 to 5/yd^2) common lambsquarters; 3 to 7 inch (1 to 3/yd^2) hairy nightshade; 2 to 6 inch diameter (1 to 5/yd^2) prostrate pigweed. Treatments were applied to the center 6.67 feet of the 10 by 40 foot plots with a bicycle-wheel-type plot sprayer delivering 17 gpa at 40 psi through 11002 flat fan nozzles for PRE treatments, and 8.5 gpa at 40 psi through 8001 flat fan nozzles for POST and LPOST treatments. The experiment had a randomized complete block design with three replicates per treatment.

On July 10 (14 DAT) and July 24 (28 DAT), all treatments controlled yellow foxtail, redroot pigweed, common lambsquarters, hairy nightshade and prostrate pigweed. The injury observed was stunting. (Dept. of Plant Sciences, North Dakota State University, Fargo).

Table. Hairy nightshade in soybean (Zollinger and Ries).

		July 10		July 24	
Treatment[1]	Rate	Soybean	Hans	Soybean	Hans
	(product/A)	% injury	% control	% injury	% control
PRE/LPOST					
Spartan/RUM+AMS	3.5oz/1.6pt	0	99	0	99
Valor/RUM+AMS	2oz/1.6pt	0	99	0	99
Domain/RUM+AMS	10oz/1.6pt	0	99	0	99
Boundary/RUM+AMS	1.25pt/1.6pt	0	99	0	99
POST					
Glyphosate+Aim+AMS	1.5pt+0.25fl oz	27	99	13	99
POST/LPOST					
RUM+AMS/RUM+AMS	1.6pt/1.6pt	0	99	0	99
LSD (0.05)		2	N/S	2	N/S

[1]RUM = Roundup UltraMax; AMS = ammonium sulfate at 2lb/A; Glyphosate = Roundup Original.

PRE and POST herbicide tankmixes in soybean. Zollinger, Richard K. and Jerry L. Ries. An experiment was conducted near Fargo, ND, to evaluate tankmixes in soybean. Asgrow 'AG0801' soybean was planted on May 17, 2002. PRE treatments were applied on May 20 at 1:00 pm with 62 F air, 50 F subsoil at a depth of 4 inches, 16% relative humidity, 5% clouds, 7 mph S wind, dry soil surface, and moist subsoil. EPOST (early post emergence) treatments were applied on June 14 at 3:00 pm with 76 F, 80 F soil surface, 38% relative humidity, 100% clouds, 1 to 2 mph NW wind, moist soil surface, moist subsoil, good crop vigor and no dew present to unifoliate soybean. Weed species present were: 1 to 3 inch (20 to 100/ft^2) yellow foxtail; 1 to 3 inch (1 to 5/yd^2) common lambsquarters, and 1 to 3 inch (5 to 15/ft^2) wild buckwheat. Post treatments were applied on June 26 at 12:00 pm with 80 F air, 83 F soil surface, 54% relative humidity, 0% clouds, 6 mph NW wind, wet soil surface, wet subsoil, good crop vigor, and no dew present to V2 to V3 soybean. Weed species present were: 4 to 10 inch (20 to 50/ft^2) yellow foxtail; 6 to 10 inch (1 to 5/yd^2) common lambsquarters; and 3 to 8 inch vining (5 to 15/ft^2) wild buckwheat. Treatments were applied to the center 6.67 feet of the 10 by 40 foot plots with a bicycle-wheel-type plot sprayer delivering 17 gpa at 40 psi through 8002 flat fan nozzles for PRE treatments and 8.5 gpa at 40 psi through 8001 flat fan nozzles for EPOST and POST treatments. The experiment had a randomized complete block design with three replicates per treatment.

All PRE and EPOST treatments were evaluated prior to POST herbicide application (data not shown). There was no evidence of phytotoxicity from any PRE activity (Harmony GT, Authority, or Valor) on yellow foxtail, wild mustard, redroot pigweed, common lambsquarters, wild buckwheat, dandelion, or Canada thistle. All EPOST glyphosate treatments gave 100% control of weeds mentioned above. Pursuit applied EPOST controlled yellow foxtail and redroot pigweed and gave 70% common lambsquarters, 50% wild buckwheat, 30% dandelion, and 50% Canada thistle control. Amplify gave less than 20% control of all annual weeds listed above and dandelion but gave 70% Canada thistle control. At July 3 and 10, except for Amplify, all treatments gave 99% control of yellow foxtail, redroot pigweed, common lambsquarters, and wild mustard. Amplify gave 0% control of before mentioned weeds but 100% wild mustard control. Soybean injury (stunting) was observed only at July 31 (35 DAT). However, stunting was dramatic. Soybean height in unaffected plots was 36 inches or greater but soybean height in plots with 25-30% stunting was 20 to 25 inches. Glyphosate or other herbicides applied alone did not stunt soybean. Glyphosate applied with Harmony GT, Amplify, Pursuit, or Raptor caused soybean stunting. Stunting did appear to reduced yield. Treatments with no glyphosate or only one POST application of glyphosate had the lowest yields because of poor weed control or subsequent weed flushes after application. All glyphosate treatments controlled all annual and perennial weeds at the final evaluation (July 31). Moisture at time of cleaning and weighing was 11.4%. (Dept. of Plant Sciences, North Dakota State University, Fargo).

Table. PRE and POST herbicide tankmixes in soybean (Zollinger and Ries).

Treatment[1]	Rate	July 3				July 10				July 31				Soybean	
		Wibw	Dali	Cath	Pest	Wibw	Dali	Cath	Pest	Soybean	Wibw	Dali	Cath	Yield	
	(product/A)	---------% control --------				--------% control --------				% injury	---- % control ----			(Test wt)	(bu/A)
PRE/POST															
RUM+Harmony GT+NIS+ AMS/RUM+AMS	0.8pt+0.2oz/ 0.8pt	60	53	50	50	95	73	70	73	20	93	99	99	56.6	40.4
RUM+Harmony GT+NIS+ AMS/RUM+AMS	0.8pt+0.3oz/ 0.8pt	67	80	77	77	97	90	88	92	20	99	99	99	57.3	47.3
RUM+Harmony GT+ Authority+AMS/RUM+AMS	0.8pt+0.2oz+ 0.4oz/0.8pt	62	63	50	50	95	83	75	73	13	99	99	99	57.2	44.6
RUM+Harmony GT+Authority+ NIS+AMS/RUM+AMS	0.8pt+0.3oz+0.4oz/ 0.8pt	70	82	80	80	97	96	90	90	15	99	99	99	57.7	44.2
Valor/RUM+AMS	2oz/1.6pt	86	83	83	83	99	95	93	93	0	99	99	99	57.1	46.5
EPOST															
Pursuit+NIS+28-0-0	3fl oz	30	30	30	30	40	43	43	43	0	50	90	48	57.6	36.5
Amplify+NIS+28-0-0	0.3oz	10	10	17	17	40	40	87	73	0	40	80	30	56.7	34.2
WeatherMax+AMS	11fl oz	99	99	99	99	99	99	99	99	0	99	99	99	57.6	35.2
EPOST/POST															
RUM+AMS/RUM+AMS	1.73pt/0.8pt	99	99	99	99	99	99	99	99	0	99	99	99	57.8	39.4
RUM+AMS/RUM+AMS	0.8pt/1.6pt	99	99	99	99	99	99	99	99	0	99	99	99	57.4	40.4
RUO+AMS/RU O+AMS	1pt/1pt	99	99	99	99	99	99	99	99	0	99	99	99	57.2	38.7
POST															
RUM+Harmony GT+NIS+AMS	0.8pt+0.083oz	63	60	60	57	85	90	87	83	17	99	99	99	57.4	37.6
Touchdown+Harmony GT+AMS	2pt+0.083oz	60	63	63	63	88	93	88	88	22	99	99	99	57.4	39.6
RUM+AMS	1.6pt	70	75	80	80	83	90	95	95	0	99	99	99	56.7	41.0
Extreme+NIS+28-0-0	2.25pt	57	57	53	53	67	70	72	72	22	99	99	99	57.1	42.2
RUM+Amplify+AMS	1.6pt+0.3oz	67	70	73	73	73	78	73	73	28	70	95	95	58.0	42.7
RUO+Amplify+NIS	2pt+0.3oz	80	80	82	83	80	88	80	77	23	92	99	99	57.1	42.5
RUO+Raptor+NIS+AMS	2pt+4fl oz	75	73	68	68	93	88	87	85	23	92	99	99	57.4	42.4
RUO+AMS	2pt	63	70	70	70	73	73	90	70	4	99	99	99	56.9	44.8
WeatherMax+AMS	11fl oz	63	63	63	63	77	85	85	85	3	99	99	99	57.4	43.8
LSD (0.05)		12	14	16	16	8	7	9	10	4	6	4	8	0.9	9.1

[1]RUM = Roundup UltraMax; RUO = Roundup Original; NIS = nonionic surfactant = Activator 90 at 0.25% v/v; AMS = ammonium sulfate at 2% w/w; 28-0-0 = urea ammonium nitrate at 1 qt/A.

Raptor + Reflex with adjuvants. Zollinger, Richard K. and Jerry L. Ries. An experiment was conducted near Christine, ND, to evaluate soybean weed control from imazamox + fomesafen with adjuvants. Asgrow 'AG0801' soybean was planted on May 6, 2002. POST treatments were applied June 12 at 3:30 pm with 72 F air, 84 F soil surface, 37% relative humidity, 90% clouds, 5 to 8 mph SW wind, dry soil surface, moist subsoil, good crop vigor, and no dew present to unifoliate soybean. Weed species present were: 1 to 3 inch (5 to 50/ft^2) redroot pigweed; 1 to 4 inch (1 to 10/yd^2) common lambsquarters; 1 to 3 inch (1 to 15/yd^2) common mallow; and 1 to 4 inch (10 to 20/yd^2) marshelder. Treatments were applied to the center 6.67 feet of the 10 by 40 foot plots with a bicycle-wheel-type plot sprayer delivering 8.5 gpa at 40 psi through 8001 flat fan nozzles. The experiment had a randomized complete block design with three replicates per treatment.

At June 26 (14 DAT), injury symptoms of Reflex were slight speckling and burning. At July 10 (28 DAT), all treatments controlled marshelder. Poor redroot pigweed control was due to another flush. Raptor was used at 25% of the label rate and Reflex was used at slightly more than 50% of the labeled rate for North Dakota. Adjuvants caused a wide separation in weed control. At July 10, control of redroot pigweed was from 40 to 99%, common lambsquarters from 32 to 97%, kochia from 32 to 95%, and marshelder from 52 to 96%. All treatments that contained an MSO type adjuvant had the greatest weed control. Renegade and Z-64 gave the greatest enhancement in weed control. (Dept. of Plant Sciences, North Dakota State University, Fargo).

Table. Raptor + Reflex with adjuvants (Zollinger and Ries).

		June 26						July 10			
Treatment[1]	Rate	Soybean	Rrpw	Colq	Koch	Coma	Mael	Rrpw	Colq	Koch	Coma
	(product/A)	% injury	----------% control ----------					-------- % control --------			
Raptor+Reflex+	1fl oz+0.4pt+										
MSO	1.5pt	10	87	81	87	90	99	95	88	90	93
Prime Oil	1% v/v	0	67	53	50	70	95	60	55	58	63
Hi-Per-Oil	0.5% v/v	0	50	45	32	70	95	40	37	32	60
AG 01017	0.5% v/v	10	67	67	63	75	95	57	55	50	63
Class Act NG	2.5% v/v	5	62	53	53	75	95	43	32	40	62
AG 01034	0.25% v/v	10	70	60	57	70	95	60	50	43	60
AG 01023	0.5% v/v	0	62	48	50	65	95	47	33	40	52
AG 02020	0.5% v/v	10	52	42	43	70	95	43	37	40	62
AG 02033	0.5% v/v	10	57	53	47	70	90	43	43	37	53
Rivet	0.5% v/v	10	75	60	60	75	95	80	67	72	88
AG 02025	1.5% v/v	20	75	75	73	85	95	88	88	88	92
Basic Blend	1% v/v	5	75	73	70	75	95	78	78	77	80
Base	1% v/v	10	75	73	70	80	95	88	85	80	88
Renegade	1% v/v	15	88	82	82	90	99	99	97	95	95
Liberate	0.125% v/v	5	57	52	45	75	90	57	57	45	72
Z-64	1% v/v	25	92	88	88	95	99	99	95	95	96
L-132	0.75pt	20	77	73	73	70	95	72	70	70	75
LSD (0.05)		0	10	13	12	0	0	6	7	13	5

[1]Liberate = surfactant; AG 01017 and AG 01034 are surfactant based adjuvants from Agriliance; Class Act NG = surfactant + fertilizer; Basic Blend = Quad 7; Prime Oil, Hi-Per-Oil, L-132 = petroleum oil concentrate; AG 01023, AG 02020, and AG 02033 are petroleum oil based adjuvants from Agriliance; Scoil = methylated seed oil; Rivet = methylated seed oil + organosilicone surfactant; Base, Renegade, and Z-64 = methylated seed oil basic blend; AG 02025 = proprietary adjuvant from Agriliance.

Raptor tank-mixtures + adjuvants. Zollinger, Richard K. and Jerry L. Ries. An experiment was conducted near Wahpeton, ND, to evaluate weed control in glyphosate resistant soybean using Raptor tank-mixtures and adjuvants. Pioneer '91B33' was planted on May 7, 2002. POST treatments were applied June 18 at 10:30 am with 74 F air, 75 F soil surface, 65% relative humidity, 100% clouds, 8 to 14 mph SSE wind, dry soil surface, damp subsoil, good crop vigor, and no dew present to V2 soybean. Weed species present were: 1 to 4 inch (5 to 20/yd^2) yellow foxtail; 1 to 4 inch (1 to 20/yd^2) redroot pigweed; 1 to 4 inch (1 to 30/ft^2) common lambsquarters; 1 to 3 inch (1 to 5/yd^2) common ragweed; and 1 to 3 inch (1 to 3/yd^2) common cocklebur. Treatments were applied to the center 6.67 feet of the 10 by 40 foot plots with a hooded bicycle-wheel-type plot sprayer delivering 8.5 gpa at 40 psi through 8001 flat fan nozzles. The experiment had a randomized complete block design with three replicates per treatment.

Target weeds were common ragweed and common lambsquarters. All treatments controlled common cocklebur and common ragweed. Injury symptoms at June 25 (7 DAT) were slight speckling and burning. No injury occurred at later evaluations. Treatments containing Phoenix controlled common ragweed. Oil adjuvants enhanced weed control more than NIS based adjuvant systems. Select controlled yellow foxtail and Poast did not. Increasing rate of Basagran + Poast did not control common lambsquarters or yellow foxtail. (Dept. of Plant Sciences, North Dakota State University, Fargo).

Table. Raptor tank-mixtures + adjuvants (Zollinger and Ries).

		June 25	July 2			July 16		
Treatment[1]	Rate	Soybean	Yeft	Colq	Corw	Yeft	Colq	Corw
	(product/A)	% injury	----- % control -----			----- % control -----		
Raptor+Phoenix+Select+	2fl oz+6fl oz+6fl oz+							
Linkage	1% v/v	23	96	50	99	98	58	99
Premier 90+28%	0.5% v/v+2qt	15	95	50	99	96	62	99
Base	1% v/v	23	93	50	99	96	63	99
Renegade	1% v/v	25	95	50	99	95	61	99
Raptor+Basagran+Poast+	2floz+0.75pt+0.75pt+							
Soy-Stik+28%	1% v/v+2qt	10	60	50	52	62	55	52
Base	1% v/v	0	53	53	52	63	52	50
Renegade	1% v/v	5	57	62	53	62	52	52
Premier 90+28%	0.5% v/v+2qt	5	60	50	40	58	58	40
Linkage	1% v/v	5	43	50	40	33	50	30
Premium COC+28%	1% v/v+2qt	5	53	53	43	62	60	43
Raptor+Basagran+Poast+	2fl oz+1.5pt+1.5pt+							
Base	1% v/v	10	70	50	50	85	65	63
Soy-Stik+28%	1% v/v+2qt	15	85	70	60	92	68	60
LSD (0.05)		2	9	4	4	8	16	5

[1]Linkage = basic blend; Premier 90 = surfactant; 28% = urea ammonium nitrate; Base = methylated seed oil basic blend; Renegade = methylated seed oil basic blend; Soy-Stik = methylated seed oil; Premium COC = petroleum oil concentrate.

Soybean response to Rezult. Zollinger, Richard K. and Jerry L. Ries. An experiment was conducted near Casselton, ND, to evaluate soybean response to bentazon & sethoxydim premix with adjuvants. Asgrow 'AG0801' soybean was planted on May 30, 2002. POST treatments were applied June 28 at 1:30 pm with 87 F air, 96 F soil surface, 53% humidity, 10% clouds, 12 mph S wind, dry soil surface, moist subsoil, excellent crop vigor, and no dew present to V2 to V3 soybean. Treatments were applied to the center 6.67 feet of the 10 by 40 plots with bicycle-wheel-type plot sprayer with an attached windscreen delivering 8.5 gpa at 40 psi through 8001 flat fan nozzles. The experiment had a randomized complete block design with three replicates per treatment.

The study was initiated due to grower complaints from suspected soybean injury from a registered premix that has been assumed not to cause soybean injury. Treatments were applied to V2 to V3 soybean which may have been a little later than grower practice. Soybean injury at July 2 (4 DAT) was mostly speckling type necrosis. Injury at July 8 (10 DAT), and 29 (31 DAT) was mostly stunting and slight chlorosis. It was surprising that injury was observed even when no adjuvant was used, all treatments caused soybean stunting, and that soybeans did not recover from initial injury. Treatments containing MSO adjuvant usually caused the greater injury. (Dept. of Plant Sciences, North Dakota State University, Fargo).

Table. Soybean response to Rezult (Zollinger and Ries).

		July 2	July 8	July29
Treatment[1]	Rate	Soybean	Soybean	Soybean
	(product/A)	----------% injury ----------		
Rezult+Raptor+	1.6pt+1.6pt+2fl oz+			
PO	1% v/v	17	17	15
MSO	1% v/v	17	17	15
PO+AMS	1% v/v+2.5lb	17	13	15
MSO+AMS	1% v/v+2.5lb	22	22	18
PO+AMS	1% v/v+1lb	19	18	16
MSO+AMS	1% v/v+1lb	22	23	18
Rezult+Raptor	1.6pt+1.6pt+2fl oz	12	18	17
LSD (0.05)		5	6	4

[1]PO = petroleum oil concentrate = Herbimax; MSO = methylated seed oil = Scoil; AMS = ammonium sulfate.

Conventional herbicides and glyphosate in RUR soybean. Zollinger, Richard K. and Jerry L. Ries. An experiment was conducted near Christine, ND, to evaluate weed control in soybean applied at various weed stages. Asgrow 'AG0801' soybean was planted May 6, 2002 followed by application of PRE treatments at 10:30 am with 44 F air, 44 F subsoil at a depth of 4 inches, 76% relative humidity, 100% clouds, 4 to 6 mph N wind, damp soil surface, and wet subsoil. EPOST treatments were applied June 5 at 11:30 am with 68 F air, 78 F soil surface, 34% relative humidity, 75% clouds, 5 mph N wind, dry soil surface, moist subsoil, good crop, and no dew present to unifoliate soybean. Weeds species present were: 1 to 2 inch (1 to 20/yd^2) yellow foxtail; 1 to 2 inch (5 to 50/ft^2) redroot pigweed; 1 to 2 inch (1 to 10/ft^2) common lambsquarters; 1 to 2 inch (1 to 15/yd^2) common mallow; and 1 to 2 inch (1 to 10/yd^2) marshelder. POST treatments were applied June 12 at 11:30 am with 68 F air, 78 F soil surface, 78% relative humidity, 75% clouds, 5 mph NW wind, dry soil surface, moist subsoil, good crop vigor, and no dew present to unifoliate to first trifoliate. Weeds species present were: 1 to 3 inch (1 to 20/yd^2) yellow foxtail; 1 to 3 inch (5 to 50/ft^2) redroot pigweed; 1 to 3 inch (1 to 10/ft^2) common lambsquarters; 1 to 3 inch (1 to 15/yd^2) common mallow; and 1 to 3 inch (1 to 10/yd^2) marshelder. LPOST treatments were applied June 18 at 12:50 pm with 78 F air, 88 F soil surface, 51% relative humidity, 40% clouds, 8 to 13 mph SW wind, dry soil surface, damp subsoil, good crop vigor, and no dew present to V1 soybean. Weed species present were: 2 to 4 inch (1 to 20/yd^2) yellow foxtail; 2 to 4 inch (5 to 50/ft^2) redroot pigweed; 2 to 5 inch (1 to 10/ft^2) common lambsquarters; 1 to 3 inch (1 to 15/yd^2) common mallow; and 1 to 3 inch (1 to 10/yd^2) marshelder. Treatments were applied to the center 6.67 feet of the 10 by 30 foot plots with a bicycle-wheel-type plot sprayer delivering 17 gpa at 40 psi through 11002 flat fan nozzles for PRE treatments and 8.5 gpa at 40 psi through 8001 flat fan nozzles with an attached windscreen for EPOST, POST and LPOST treatments. The experiment had a randomized complete block design with four replicates per treatment.

At June 12, the PRE treatments were rated before POST treatments were applied. PRE ratings were very poor due to dry spring conditions and no rain after application to activate soil herbicides. Also, the soil contained 12% organic matter which tied up much of the herbicide. At June 26 (14 DAT), all treatments control foxtail species and soybean treated with Phoenix showed stunting and burning of leaves that intercepted the spray. There was soybean stand loss in plots sprayed with Aim and surviving soybeans plants were stunted and leaves were severely burned. Most glyphosate treatments controlled redroot pigweed, common lambsquarters, common mallow, and marshelder at July 2 (14 DAT POST) and July 16 (28 DAT). (Dept. of Plant Sciences, North Dakota State University, Fargo).

Table. Conventional herbicides and glyphosate in RUR soybean (Zollinger and Ries).

Treatment[1]	Rate	June 12		June 26						July 10					
		Rrpw	Colq	Soybn	Rrpw	Colq	Koch	Coma	Mael	Rrpw	Colq	Koch	Coma	Mael	Fxtl
	(product/A)	-% control -		% injury	----------% control ----------					----------% control ----------					
PRE/POST															
Valor/FirstRate+ Select+PO+AMS	2.5oz/0.3oz+ 8fl oz	5	7	0	25	25	40	37	85	23	17	42	40	80	93
Valor/Python+FirstRate+ Select+PO+AMS	1.5oz/0.67oz+0.3oz+ 8fl oz	5	5	22	70	68	85	75	92	75	62	90	73	93	96
Valor/FirstRate+Phoenix+ Select+NIS+AMS	2oz/0.3oz+8fl oz+ 8fl oz+0.25% v/v	6	5	15	53	43	40	40	92	43	33	37	37	99	96
PRE/LPOST															
Valor/RUM+AMS	2oz/1.2pt	5	7	0	99	73	99	67	99	90	90	99	73	99	96
Authority/RUM+AMS	3.5oz/1.2pt	53	60	0	99	99	99	93	99	92	99	99	93	99	93
Domain/RUM+AMS	10oz/1.2pt	5	5	0	99	77	99	68	99	75	90	99	60	99	90
Boundary/RUM+AMS	1.25pt/1.2pt	6	6	0	99	70	99	57	99	93	96	99	76	99	96
EPOST/POST															
RUM+AMS/RUM+AMS	0.8pt/0.8pt			0	99	95	99	99	99	72	93	99	99	99	94
RUM+AMS/RUM+AMS	0.6pt/0.6pt			0	99	90	99	99	99	70	90	99	99	99	88
POST															
Raptor+Phoenix+ NIS+AMS	5fl oz+8fl oz+ 0.125% v/v			23	99	77	99	99	99	96	80	99	99	99	93
RUM+AMS	1.6pt			0	99	99	99	95	99	23	95	99	99	99	93
Glyphosate+Aim+AMS	1.5pt+0.25fl oz			46	99	99	99	99	99	37	89	99	82	99	87
Extreme+Surfate	2.25pt			8	99	96	99	91	99	93	95	99	68	99	94
LSD (0.05)		9	8	4	7	10	6	9	4	7	10	7	12	12	11

[1]PO = petroleum oil concentrate = Herbimax at 1pt/A; AMS = ammonium sulfate at 2lb/A; NIS = nonionic surfactant = Activator 90; RUM = Roundup UltraMax; Glyphosate = Roundup Original; Surfate = surfactant + fertilizer at 1% v/v.

Glyphosate resistant canola control in glyphosate resistant soybean. Zollinger, Richard K. and Jerry L. Ries. An experiment was conducted near Prosper, ND, to evaluate control of volunteer glyphosate resistant canola in glyphosate resistant soybean. Asgrow 'AG0801' soybean was planted on May 17. POST treatments were applied June 26 at 8:30 am with 72 F air, 75 F soil surface, 65% relative humidity, 10% clouds, 3 mph NW wind, wet soil surface, wet subsoil, excellent crop vigor, and no dew present to V2 to V3 soybean. Weed species present were: 1 to10 inch (10 to 40/ft^2) yellow foxtail; 3 to 8 inch (1 to 3/yd^2) common lambsquarters; 2 to 8 inch (1 to 3/yd^2) redroot pigweed; 1 to 8 inch (1 to 15/yd^2) common ragweed; and 3 to 7 inch (3 to 10/yd^2) volunteer canola. Treatments were applied to the center 6.67 feet of the 10 by 40 foot plots with a backpack-type plot sprayer delivering 8.5 gpa at 40 psi through 8001 flat fan nozzles. The experiment had a randomized complete block design with three replicates per treatment.

All treatments controlled yellow foxtail, redroot pigweed, common lambsquarters, and common ragweed. At July 2 (7 DAT), 10 (14 DAT), and 24 (28 DAT), treatments containing Harmony GT mainly caused soybean stunting. Generally, by 28 DAT glyphosate combined with Amplify, Flexstar, or Raptor controlled glyphosate resistant canola. Amplify and Raptor were slower to control the canola (July 10 vs. July 24) and the lowest rate used did not provide adequate control. Harmony GT and Aim at any rate used did not control the resistant canola. (Dept. of Plant Sciences, North Dakota State University, Fargo).

Table. Glyphosate resistant canola control in glyphosate resistant soybean (Zollinger and Ries).

		June 29	June 3	July 10		July 24	
Treatment[1]	Rate	Soybean	Soybean	Soybean	V Canola[2]	Soybean	V Canola[2]
	(product/A)	% injury	% injury	% injury	% control	% injury	% control
RUM+AMS	26fl oz	0	0	0	0	0	0
RUM+Harmony GT+AMS	26fl oz+0.083oz	3	13	12	57	15	40
RUM+Harmony GT+AMS	26fl oz+0.056oz	3	17	22	73	25	73
RUM+Harmony GT+AMS	26fl oz+0.042oz	3	12	20	70	25	73
RUM+Aim+AMS	26fl oz+0.16oz	0	0	0	25	0	22
RUM+Aim+AMS	26fl oz+0.112oz	0	0	0	10	0	10
RUM+Aim+AMS	26fl oz+0.084oz	0	0	0	20	0	10
RUM+Amplify+AMS	26fl oz+0.3oz	0	0	2	75	0	96
RUM+Amplify+AMS	26fl oz+0.223oz	0	0	0	80	0	92
RUM+Amplify+AMS	26fl oz+0.2oz	0	0	0	82	0	90
RUM+Amplify+AMS	26fl oz+0.1oz	0	0	0	45	0	72
RUM+Flexstar+AMS	26fl oz+0.375pt	5	10	5	97	0	99
RUM+Flexstar+AMS	26fl oz+0.5pt	5	7	2	96	0	99
RUM+Flexstar+AMS	26fl oz+0.75pt	7	7	5	98	0	99
RUM+Raptor+AMS	26fl oz+2fl oz	0	0	5	70	0	93
RUM+Raptor+AMS	26fl oz+1.5fl oz	0	0	2	97	0	92
RUM+Raptor+AMS	26fl oz+1fl oz	0	0	0	73	0	90
Extreme+NIS+AMS	2.25pt	0	0	5	95	5	99
LSD (0.05)		2	2	3	7	0	3

[1]RUM = Roundup UltraMax; AMS = ammonium sulfate at 2% w/w; NIS = nonionic surfactant = Activator 90 at 0.125% v/v.
[2]V Canola = volunteer canola.

Volunteer RUR wheat control in RUR soybean-Carrington. Oltmans and Zollinger. An experiment was conducted near Carrington, ND to evaluate Roundup Ready wheat control from POST applied herbicides. Dekalb 'B03-51' soybean was planted May 14, 2002. 'Oxen' Roundup Ready wheat was planted at 55 lb/Acre, in 4 rows across each replicate May 14, 2001. EPOST treatments were applied June 20, 2002 at 4:15 to 4:45 pm with 82 F air, 76 F soil at a 2 to 4 inch soil depth, 30% relative humidity, 40% clouds, 2 to 4 mph SW wind, dry soil surface, moist subsoil, good crop vigor, and no dew present to second trifolate soybean. Weed species present were: 1 to 4 inch, (20-30 plants/ft^2) foxtail; 1 to 4 inch, (1-5 plants/ft^2) common lambsquarters; 1 to 3 inch, (5-10 plants/m^2) wild buckwheat; and 6 inch volunteer wheat. POST treatments were applied July 2, 2002 at 1:00 to 1:15 pm with 82 F air, 83 F soil at a 2 to 4 inch soil depth, 20% relative humidity, 10% clouds, 3 to 6 mph NW wind, dry soil surface, moist subsoil, good crop vigor, and no dew present to four to five trifoliate soybean. Weed species present were: 1 to 2 inch, (10-15 plants/ft^2) foxtail; and 8 to 10 inch volunteer wheat. Treatments were applied to the center 6.67 feet of the 10 by 40 ft plots. Treatments were applied delivering 8.5 gpa at 40 psi through 8001 flat fan nozzles using a bicycle-wheel-type plot sprayer. The experiment had a randomized complete block design with four replicates per treatment.

At 14 days after treatment (DAT), all treatments had 89% foxtail and common lambsquarters control or greater. Only split-applied treatments and Flexstar plus Fusion had 96% volunteer wheat control or greater, while the remaining had 88% control or less. All treatments had 95% wild buckwheat control or greater, except treatments with Raptor. At 28 DAT, only split-applied treatments had 94% foxtail and wild buckwheat control or greater, while the remaining treatments had 79% or less. Poor foxtail control was attributed to emergence of new seedlings following herbicide treatment. Poor wild buckwheat control was attributed to emergence of new seedlings and recovery and continued growth of injured plants. All treatments had 88% volunteer wheat control or greater. Split-applied treatments and Raptor plus Quad 7 had 94% common lambsquarters control, while the remaining treatments had 87% control or less. On July 25, only split-applied treatments had 94% foxtail and common lambsquarters control or greater, while the remaining treatments had 90% control or less. All treatments had 91% volunteer wheat control or greater, except Roundup UltraMax plus Select at 4 floz/A with 85% control. Split-applied treatments had 96% wild buckwheat control, while the remaining treatments had 90% control or less. Volunteer wheat control was adequate with Assure II at labeled- and reduced-rates and Select at the labeled-rate, but not with Select at reduced-rates.

Treatment[a]	Rate[b]	Applic. Stage[c]	14 DAT					28 DAT				July 25, 2002		
			Fxtl[d]	Vwht	Wibw	Colq	Fxtl	Vwht	Wibw	Colq	Fxtl	Vwht	Wibw	Colq
	(product/Acre)		% control											
RUM+AMS+Assure II	26floz+8floz	E	99	88	99	99	65	97	85	87	70	98	90	88
RUM+AMS+Assure II	26floz+6floz	E	99	81	99	99	65	97	83	73	65	91	90	75
RUM+AMS+Assure II/ RUM+AMS+Assure II	26floz+4floz/ 26floz+4floz	E/P	99	97	98	99	96	98	96	97	96	98	96	97
RUM+AMS+Assure II/ RUM+AMS+Assure II	26floz+3floz/ 26floz+3floz	E/P	98	99	98	99	94	99	96	97	94	99	96	97
RUM+AMS+Select	26floz+6floz	E	99	78	99	99	78	93	90	86	73	96	88	73
RUM+AMS+Select	26floz+4floz	E	99	71	99	99	74	95	84	65	75	85	88	78
Raptor+Quad 7	4floz+1%v/v	E	91	75	10	89	79	96	11	94	76	98	35	89
Raptor+Cobra+Quad 7	4floz+4floz+1%v/v	E	91	88	11	91	63	88	28	84	70	98	43	63
Flexstar+Fusion+PO	0.75pt+8floz+1qt	E	98	96	95	96	55	96	73	85	53	98	85	75
Untreated			0	0	0	0	0	0	0	0	0	0	0	0
LSD (0.05)			2	10	4	4	9	6	12	10	12	8	6	8

[a]RUM = Roundup UltraMax; PO = Herbimax
[b]AMS = ammonium sulfate at 8.5lb/100gal
[c]E = EPOST; P = POST
[d]Fxtl = Grft and Yeft; Vwht = volunteer wheat

Volunteer RUR wheat control in RUR soybean-Prosper. Oltmans and Zollinger. An experiment was conducted near Prosper, ND to evaluate Roundup Ready wheat control from POST applied herbicides. Dekalb 'B03-51' soybean was planted May 17, 2002. 'Oxen' Roundup Ready wheat was planted at 55 lb/Acre, in 4 rows across each replicate May 14, 2001. EPOST treatments were applied June 17, 2002 at 10:45 to 11:15 am with 76 F air, 63 F soil at a 2 to 4 inch soil depth, 57% relative humidity, 20% clouds, 4 to 8 mph S wind, dry soil surface, moist subsoil, good crop vigor, and no dew present to unifolate to second trifolate soybean. Weed species present were: 1 to 4 inch, (10-20 plants/ft^2) foxtail; 1 to 4 inch, (1-5 plants/ft^2) common lambsquarters; 1 to 3 inch, (1-5 plants/ft^2) redroot pigweed; and 6 inch volunteer wheat. POST treatments were applied July 2, 2002 at 4:00 to 4:15 pm with 95 F air, 84 F soil at a 2 to 4 inch soil depth, 30% relative humidity, 5% clouds, 1 to 3 mph S wind, dry soil surface, moist subsoil, good crop vigor, and no dew present to six trifoliate soybean. Weed species present were: 1 to 2 inch, (5-10 plants/ft^2) foxtail; and 8 to 10 inch volunteer wheat. Treatments were applied to the center 6.67 feet of the 10 by 40 ft plots. Treatments were applied delivering 8.5 gpa at 40 psi through 8001 flat fan nozzles using a bicycle-wheel-type plot sprayer. The experiment had a randomized complete block design with four replicates per treatment.

At 14 days after treatment (DAT), all treatments had 91% foxtail and redroot pigweed control or greater, except Raptor plus Cobra with 88% control. Volunteer wheat control ranged from 88 to 99%. All treatments had 98% volunteer wheat control or greater, except treatments with Select and Raptor. All treatments had 95% common lambsquarters control or greater, except Raptor plus Cobra and Flexstar plus Fusion, with 88 and 86% control, respectively. At 28 DAT, only three treatments, Roundup UltraMax split-applied and Roundup UltraMax plus Select at 4 floz/A had 92% foxtail control or greater, while the remaining had 87% control or less. All treatments had 98% volunteer wheat control or greater, except Roundup UltraMax plus Select at 4 and 6 floz/A. All treatments had 88% redroot pigweed and common lambsquarters control or greater. On July 29, split-applied treatments had 99% foxtail control, while the remaining treatments had 89% control or less. All treatments had 99% volunteer wheat control, except treatments with Select at 4 and 6 floz/A, with 63 and 81% control, respectively. All treatments had 90% redroot pigweed and common lambsquarters control or greater, except Roundup UltraMax plus Select at 6 floz/A and Flexstar plus Fusion. Volunteer glyphosate-resistant wheat control was adequate with Assure II at labeled- and reduced-rates, but not with Select, regardless of rate.

Treatment[a]	Rate[b]	Applic. Stage[c]	14 DAT				28 DAT				July 29, 2002			
			Fxtl[d]	Vwht	Rrpw	Colq	Fxtl	Vwht	Rrpw	Colq	Fxtl	Vwht	Rrpw	Colq
	(product/Acre)		% control											
RUM+AMS+Assure II	26floz+8floz	E	99	99	99	99	87	99	92	92	89	99	96	95
RUM+AMS+Assure II	26floz+6floz	E	99	99	99	99	86	99	90	89	89	99	94	94
RUM+AMS+Assure II/ RUM+AMS+Assure II	26floz+4floz/ 26floz+4floz	E/P	99	99	98	99	99	99	99	99	99	99	99	99
RUM+AMS+Assure II/ RUM+AMS+Assure II	26floz+3floz/ 26floz+3floz	E/P	99	99	99	99	99	99	99	99	99	99	99	99
RUM+AMS+Select	26floz+6floz	E	99	88	99	99	85	86	88	90	78	81	79	78
RUM+AMS+Select	26floz+4floz	E	99	88	99	99	92	81	92	94	88	63	90	90
Raptor+Quad 7	4floz+1%v/v	E	97	92	97	95	87	98	94	94	88	99	91	91
Raptor+Cobra+Quad 7	4floz+4floz+1%v/v	E	88	89	88	88	82	99	96	96	63	99	99	99
Flexstar+Fusion+PO	0.75pt+8floz+1qt	E	96	98	91	86	79	99	85	79	70	99	84	65
Untreated			0	0	0	0	0	0	0	0	0	0	0	0
LSD (0.05)			3	5	3	4	7	13	6	6	10	5	11	11

[a]RUM = Roundup UltraMax; PO = Herbimax
[b]AMS = ammonium sulfate at 8.5lb/100gal
[c]E = EPOST; P = POST
[d]Fxtl = Grft and Yeft; Vwht = volunteer wheat

Weed control and crop response in glyphosate-resistant soybean. (Hendrickson and Valenti) The study was conducted at the NDSU Carrington Research Extension Center on a loam soil with a 6.8 pH and 3.4% organic matter. Glyphosate-resistant soybean 'RG200RR' was seeded May 23, 2002 into 30-inch rows at 165,000 seeds/A. Individual plots were 10 ft by 25 ft and arranged in a randomized complete block design with three replications. Herbicide treatments were applied with a CO_2 pressurized hand-held plot sprayer. PRE treatments were applied at 20 gal/A and 20 psi through XR8003 flat fan nozzles. POST treatments were applied at 10 gal/A and 26 psi through XR80015 flat fan nozzles. Valor was applied PRE on May 27 with 63° F, 35% RH, 0% cloud cover, 0 mph wind, and 54° F soil temperature. EPOST herbicides were applied on June 20 with 64° F, 58% RH, 0% cloud cover, 7 mph wind, and 63° F soil temperature to V2 soybean, 2- to 4-inch green and yellow foxtail, 1- to 3-inch redroot pigweed, 2- to 3-inch common lambsquarters, and 1- to 3-inch field bindweed. POST herbicides were applied on July 3 with 79° F, 32% RH, 10% cloud cover, 6 mph wind, and 77° F soil temperature to V4 soybean, 6- to 9-inch green and yellow foxtail, 4- to 7-inch redroot pigweed, 5- to 8-inch common lambsquarters, and 4- to 8-inch field bindweed. The soybeans were harvested on September 24.

All treatments containing glyphosate gave 83 to 100% control of redroot pigweed, common lambsquarters, and green and yellow foxtail when evaluated July 29. Glyphosate applied EPOST and POST at 0.375 lb ae/A gave greater field bindweed control than 0.75 lb ae/A applied POST. With the exception of Amplify applied EPOST, soybean yield for the treatment combinations was better than the untreated control

Table. Weed control and crop response in glyphosate-resistant soybean.

Treatment[a]	Rate lb ai/A	Timing[d]	Weed control[e]												Soybean			
			Rrpw			Colq			Fibw			Fxtl			---- Injury ----			Yield
			6/20	7/12	7/29	6/20	7/12	7/29	6/20	7/12	7/29	6/20	7/12	7/29	6/20	7/12	7/29	10/24
			---------- % ----------															Bu/A
Roundup Ultramax+AMS / Roundup Ultramax+AMS	0.375 / 0.375	EP P	-	100	100	-	100	100	-	100	100	-	100	99	-	0	0	30.4
Roundup Ultramax+AMS	0.75	P	-	100	98	-	100	98	-	58	90	-	100	99	-	0	0	26.6
Roundup Ultramax+AMS / Roundup Ultramax+AMS	0.375 / 0.75	EP P	-	97	83	-	98	83	-	93	73	-	63	92	-	0	0	27.6
Extreme+NIS[b]+28%	0.61	P	-	100	100	-	100	98	-	43	77	-	100	99	-	3	0	28.0
Pursuit+NIS[b]	0.047	EP	-	80	80	-	83	72	-	50	53	-	87	80	-	0	0	28.5
Amplify+NIS[c]+28%	0.0157	EP	-	10	0	-	13	0	-	0	0	-	0	0	-	0	0	15.9
Roundup Ultramax+ Amplify+AMS	0.75+ 0.0157	P	-	100	100	-	99	100	-	43	87	-	99	96	-	0	0	30.6
Roundup Original+ Amplify+NIS[c]	0.75 0.0157	P	-	100	100	-	100	100	-	37	73	-	98	96	-	0	0	25.8
Raptor+Roundup Original+ NIS[c]+AMS	0.032+0.75	P	-	100	97	-	100	97	-	10	60	-	99	95	-	0	0	23.8
Roundup Original+AMS / Roundup Original+AMS	0.375 / 0.375	EP P	-	100	100	-	100	100	-	90	93	-	99	94	-	0	0	31.3
Roundup Original+AMS	0.75	P	-	100	100	-	100	100	-	40	67	-	99	96	-	0	0	27.8
MON 78270+AMS	0.375	EP	-	67	57	-	87	57	-	48	23	-	53	32	-	0	0	26.0
MON 78270+AMS	0.375	P	-	100	100	-	98	100	-	23	63	-	98	94	-	0	0	29.2
Valor / Roundup Ultramax+AMS	0.0625 / 0.75	PRE P	100	100	100	97	100	100	96	96	100	73	99	96	7	0	0	31.3
Untreated check	-		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11.7
LSD (0.05)			0	16	25	4	15	27	4	33	32	29	29	26	NS	2	0	7.1

[a]Rates for Roundup Ultramax, Roundup Original, and MON78270 are in lb ae/A. AMS=ammonium sulfate at 16.7 lb/100 gal, 28%=urea ammonium nitrate at 1 qt/A.

[b]NIS=Nonionic Surfactant=Activator 90 at 0.25% v/v.

[c]NIS=Nonionic Surfactant=Activator 90 at 0.125% v/v.

[d]EP=EPOST, P=POST.

Preemergence treatments in soybeans, Fargo, ND. Kegode and Ciernia. The purpose of this experiment was to evaluate the efficacy of preemergence herbicides for broadleaf weed control in wide row soybeans. Trail RR soybean was seeded June 3 in 30 in. rows. All treatments were applied June 4 with a 2 wheel bicycle sprayer equipped with 4 XR 8002 nozzles and calibrated to deliver 17 gpa at 40 psi. At that time air temperature was 70 F, RH 37%, wind NE at 2 mph, sky sunny and soil surface dry. The first significant rain event following treatment was 2.6 in. received June 6. Weed control ratings were made July 9 and Aug. 2 and the plots were harvested Sept. 27. Plots measured 10 by 25 ft. and the experiment was a randomized complete block design with 4 reps.

		July 9		Aug 2		
Treatment	Rate	Vema	Cosf	Vema	Cosf	Yield
	oz ai/A	----------% control ----------				bu/A
Axiom	2.21	8	0	60	30	30
Domain	6	60	12	78	48	25
Sencor	8	63	35	99	98	30
Dual II Magnum	32	23	32	52	0	27
Valor	1	55	82	63	75	29
Valor	1.5	77	90	78	50	29
Spartan	4	50	78	85	25	30
Python	1.06	96	93	98	95	34
Untreated	0	0	0	0	0	26
C.V. %		37	17	30	52	15
LSD 5%		31	14	36	55	NS
# OF REPS		3	3	3	2	4

No soybean injury was observed. Sencor and Python each provided excellent control of venice mallow and common sunflower by August 2. Spartan provided good control of venice mallow but performed poorly on common sunflower. Both rates of Valor provided poor to fair control of venice mallow and common sunflower.

Preemergence treatments in drilled soybeans, Fargo, ND. Kegode and Ciernia. The purpose of this experiment was to evaluate the efficacy of preemergence herbicides for broadleaf weed control in drilled soybeans. Trail RR soybean was seeded June 3 in 7 in. rows. All treatments were applied June 4 with a 2 wheel bicycle wheel sprayer equipped with 4 XR 8002 nozzles and calibrated to deliver 17 gpa at 40 psi. At that time air temperature was 70 F, RH 37%, wind NE at 2 mph, sky sunny and soil surface dry. The first significant rain event following treatment was 2.6 in. received June 6. Weed control ratings were made July 9 and August 2 and the plots were harvested Sept. 27. Plots measured 10 by 25 ft. and the experiment was a randomized complete block design with 4 reps.

		July 9				Aug 2				
Treatment	Rate	Vema	Cosf	Rrpw	Colq	Vema	Kocz	Cosf	Rrpw	Yield
	oz ai/A	----------% control----------								bu/A
Axiom	2.21	3	0	7	30	68	65	43	59	13
Domain	6	76	10	8	87	81	96	61	74	20
Sencor	8	75	90	18	78	95	99	88	97	28
Dual II Magnum	32	3	27	8	-	88	86	62	86	19
Valor	1	39	19	45	54	98	99	52	75	23
Valor	1.5	83	45	92	82	99	99	79	99	28
Spartan	4	84	57	93	-	97	99	53	99	22
Python	1.06	95	97	95	92	99	99	96	99	37
Untreated	0	0	0	0	0	0	0	0	0	23
C.V. %		21	76	30	24	19	9	51	18	27
LSD 5%		16	51	21	26	23	13	53	20	9
# OF REPS		4	3	3	3	4	3	3	4	4

No soybean injury was observed. Apart from Axiom and Domain, all treatments provided excellent control of venice mallow at the August 2 evaluation. In addition, Valor at 1.5 oz/A and Spartan provided excellent control of kochia and redroot pigweed but were weaker on common sunflower. Python and Sencor provided excellent control of all weeds.

Late timing applications in soybean, Fargo, ND. Kegode and Ciernia. This experiment was conducted to evaluate late or "rescue" postemergence treatments for broadleaf weed control in soybeans planted in wide rows. Trail RR soybeans were planted June 3 in 30 in. rows. Starting at flowering treatments were applied in 3 timings a week apart. All treatments were applied with a 2 wheel bicycle plot sprayer equipped with 4 XR8001 nozzles and delivering 8.5 gpa at 40 psi. On July 16 (timing 1) air temperature was 83 F, RH 50%, wind S at 5 mph, sky sunny and plant leaf surface dry. Redroot pigweed was 10 to 20 in. tall and flowering, venice mallow was 8 to 11 in. tall and flowering, and common sunflower was 20 to 24 in. tall. Treatments were applied July 23 (timing 2) with air temperature 73 F, RH 51%, wind NW at 1 mph, sky cloudy and plant surface dry. The July 30 treatments (timing 3) were applied with air temperature 78 F, RH 39%, wind N at 6 mph, sky sunny and plant surface dry. Soybeans had formed pods, redroot pigweed was 30 to 40 in. tall and common sunflower was 32 to 40 in. tall with flower buds. Weed control ratings were made Aug. 8 and Sept. 5 and the plots were harvested Sept. 27. Plots were 10 by 25 ft. and the experiment was a randomized complete block design with 4 reps.

			Aug 8			Sept 5		
Treatment[a]	Timing	Rate	Rrpw	Vema	Cosf	Colq	Cosf	Yield
		oz ai/A	----------% control ----------					bu/A
Glyphosate	1	6	98	100	100	67	100	30
Glyphosate	1	12	75	100	100	100	100	27
Bentazon +Scoil	1	8+1.5 pt	66	45	32	17	62	30
Bentazon +Scoil	1	16+1.5 pt	76	61	50	17	2	30
Glyphosate	2	6	98	85	97	99	100	29
Glyphosate	2	12	100	96	100	100	100	30
Bentazon +Scoil	2	8+1.5 pt	73	73	57	0	23	24
Bentazon +Scoil	2	16+1.5 pt	69	90	60	3	39	27
Glyphosate	3	6	95	60	85	100	100	25
Glyphosate	3	12	98	100	96	100	100	30
Bentazon +Scoil	3	8+1.5 pt	41	48	18	0	0	24
Bentazon +Scoil	3	16+1.5 pt	61	80	-	0	22	28
Untreated	-	0	0	0	0	0	0	23
Hand Weeded	-	0	100	100	100	100	100	32
C.V. %			37	23	19	32	16	15
LSD 5%			40	37	22	31	19	NS
# OF REPS			4	2	3	3	3	4

[a] Glyphosate = Roundup UltraMax; Scoil = methylated seed oil

No soybean injury was observed. At the Sept 5. evaluation, both rates of glyphosate provided excellent control of common sunflower. Control of common lambsquarters was equally as good except for the 6 oz rate of glyphosate that was applied at the first timing and which provided poor common lambsquarters control. Overall weed control with bentazon at either rate was poor to fair at the Aug. 8 evaluation and poor at the Sept. 5 evaluation.

Late timing applications in drilled soybean, Fargo, ND. Kegode and Ciernia. This experiment was conducted to evaluate late or "rescue" postemergence treatments for broadleaf weed control in narrow row soybeans. Trail RR soybean was planted June 3 in 7 in. rows. Starting at flowering treatments were applied in 3 timings a week apart. All treatments were applied with a 2 wheel bicycle plot sprayer equipped with 4 XR8001 nozzles and delivering 8.5 gpa at 40 psi. On July 16 (timing 1) air temperature was 83 F, RH 50%, wind S at 5 mph, sky sunny and plant leaf surface dry. Redroot pigweed was 10 to 20 in. tall and flowering, kochia 16 in. tall, common sunflower was 20 to 24 in. tall and common lambsquarters 12 to 18 in. tall. Treatments were applied July 23 (timing 2) with air temperature 73 F, RH 51%, wind NW at 1 mph, sky cloudy and plant surface dry. The July 30 treatments (timing 3) were applied with air temperature 78 F, RH 39%, wind N at 6 mph, sky sunny and plant surface dry. Soybeans had formed pods, kochia was 32 to 40 in. tall and flowering, common sunflower was 32 to 40 in. tall with flower buds and common lambsquarters was 28 to 26 in. tall with flowers. Weed control ratings were made Aug. 8 and 28 and the plots were harvested Sept. 27. Plots were 10 by 25 ft. and the experiment was a randomized complete block design with 4 reps.

		Aug 8				Aug 28			
Treatment[a]	Rate	Rrpw	Kocz	Cosf	Colq	Kocz	Cosf	Colq	Yield
	oz ai/A	% control							bu/A
Glyphosate	6	100	100	100	95	100	99	100	29
Glyphosate	12	100	100	67	95	100	99	100	24
Bentazon +Scoil	8+1.5 pt	30	68	42	38	58	39	35	16
Bentazon +Scoil	16+1.5 pt	44	48	17	15	27	0	15	17
Glyphosate	6	98	64	98	88	100	100	98	23
Glyphosate	12	98	99	93	43	99	98	69	26
Bentazon +Scoil	8+1.5 pt	18	40	27	33	25	30	35	16
Bentazon +Scoil	16+1.5 pt	20	25	48	40	30	19	25	19
Glyphosate	6	94	60	82	88	95	93	91	24
Glyphosate	12	95	63	83	93	62	94	98	24
Bentazon +Scoil	8+1.5 pt	21	30	12	8	0	3	4	18
Bentazon +Scoil	16+1.5 pt	21	27	33	25	20	5	8	14
Untreated	0	0	0	0	0	0	0	0	18
Hand Weeded	0	100	100	100	100	100	100	100	10
C.V. %		34	53	44	42	42	29	38	43
LSD 5%		29	52	42	49	41	23	30	NS
# OF REPS		4	3	3	2	3	4	4	4

[a] Glyphosate = Roundup UltraMax; Scoil = methylated seed oil

No soybean injury was observed. At the August 28 evaluation, all application timings of glyphosate provided excellent control of all weeds except common lambsquarters and kochia when glyphosate was applied at 12 oz/A. Control with bentazon was generally poor irregardless of rate or application timing.