Oat response to KIH-485. Kirk Howatt, Ronald Roach, and Janet Harrington. 'Beach', 'Dancer', and 'Maida' oat were seeded in bioassay strips at Fargo, ND, and preemergence treatments (Pre) were applied May 16 with 56 F, 15% RH, 60% cloud-cover, 9 mph wind at 0°, and damp soil at 52 F. Post treatments (3L) were applied to four- to five-leaf oat on June 12 with 85 F, 55% RH, 60% cloud-cover, 22 mph wind at 180°, and moist soil at 75 F. Treatments were applied with a backpack sprayer delivering 17 and 8.5 gpa at 40 and 35 psi through 11002 TT and 11001 TT nozzles, respectively, to the entire area of 20 by 20 ft plots. The experiment was a randomized complete block design with four replicates.

			6/19	6/29
Treatment	Rate	Grow	All oat cultivars	
	oz ai/A	Stg		
Mesotrione	3	Pre	0	0
Mesotrione	6	Pre	0	0
KIH-485	3	Pre	96	99
KIH-485	4	Pre	99	99
Bromoxynil&pyrasulfotol	3	3L	0	0
Mesotrione	1.5	3L	0	0
Mesotrione	3	3L	0	0
Mesotrione+bromoxynil&MCPA5	1.5+6	3L	0	0
Mesotrione/mesotrione	3/1.5	Pre/3L	0	0
Untreated	0		0	0
CV			2	0
LSD (P=0.05)			1	0

All oat cultivars responded similarly to treatments and were combined for analysis. Only KIH-485 caused injury to oat, and this injury was substantial and excessive. All plants in areas treated with KIH-485 died. There will not be an opportunity to use KIH-485 in oat for control of foxtail; however, this herbicide may introduce new potential for grass weed control in other cereal grains. Wheat has shown tolerance to KIH-485. Next season experiments will be established to evaluate preemergence control of wild oat in wheat, and tolerance of barley and durum will be investigated.

Oat response to mesotrione, location 1. Kirk Howatt, Ronald Roach, and Janet Harrington. 'Beach', 'Dancer', and 'Maida' oat were seeded in bioassay strips at Fargo, ND, and preemergence (Pre) treatments were applied May 16 with 56 F, 15% RH, 60% cloud-cover, 9 mph wind at 0°, and damp soil at 52 F. Post treatments (2L) were applied to three- to four-leaf oat June 12 with 84 F, 53% RH, 50% cloud-cover, 12 mph wind at 180°, and wet soil with dry top at 84 F. All treatments were applied with a backpack sprayer delivering 8.5 gpa at 35 psi through 11001 TT nozzles to a 7 ft wide area the length of 10 by 30 ft plots. The experiment was a randomized complete block design with four replicates.

			6/19	6/27
Treatment	Rate	Grow	All oat cultivars	
	oz ai/A	Stg	% injury	
Untreated	0	-	0	0
Mesotrione	3	Pre	0	0
Mesotrione	6	Pre	0	0
Mesotrione+PO	1.5+1%	2L	0	0
Mesotrione+PO+UAN	1.5+1%+2.5%	2L	0	0
Mesotrione+NIS	1.5+0.25%	2L	0	0
Mesotrione+NIS+UAN	1.5+0.25%+2.5%	2L	0	0
Bromoxynil+MCPA	4+4	2L	0	0
Mesotrione+Bromoxynil+MCPA	1.5+4+4	2L	0	0
MCPA	4	2L	0	0
Mesotrione+MCPA	1.5+4	2L	0	0
Mesotrione/Bromoxynil+MCPA	3/4+4	Pre/2L	0	0
Mesotrione+Bromoxynil	1.5+4	2L	0	0
A15898+Mesotrione	5+1.5	2L	0	0
CV			0	0
LSD (P=0.05)			0	0

Initial intent of obtaining weed control information was precluded by excessive rainfall than killed the initial flush of weeds. A second flush did not occur. Saturated soil eventually damaged the oat stands, but visible injury attributed to specific treatments did not occur.

Oat response to mesotrione, location 2. Kirk Howatt, Ronald Roach, and Janet Harrington. 'Beach' (B), 'Dancer' (D), and 'Maida' (M) oat were seeded May 15. Preemergence treatments (Pre) were applied May 16 with 50 F, 23% RH, 70% cloud-cover, 8 mph wind at 0°, and damp soil at 45 F. Post treatments were applied to two-leaf oat on June 12 with 82 F, 61% RH, 40% cloud-cover, 18 mph wind at 180°, and moist soil at 70 F. Treatments were applied with a backpack sprayer delivering 17 and 8.5 gpa at 40 and 35 psi through 11002 TT and 11001 TT nozzles, respectively, to the entire area of 20 by 20 ft plots. The experiment was a randomized complete block design with four replicates.

			6/05	6/22	6/22	6/22	6/29	6/29	6/29			
Treatment	Rate	Grow	All	B	D	M	B	D	M	Beach	Dancer	Maida
		Stg				%					bu/A	
Untreated	0		0	0	0	0	0	0	0	93	85	85
Mesotrione	3	Pre	0	0	0	0	0	0	0	92	81	81
Mesotrione	6	Pre	0	0	0	0	0	0	0	89	82	84
Mesotrione+PO	1.5+1%	2L	0	0	0	5	0	0	1	97	87	82
Mest+PO+UAN	1.5+1%+2.5%	2L	0	2	3	24	0	1	8	86	79	72
Mest+NIS	1.5+0.25%	2L	0	0	0	8	0	0	0	92	88	81
Mest+NIS+UAN	1.5+0.25%+2.5%	2L	0	0	0	12	1	4	9	86	72	72
Bromoxynil+MCPA	4+4	2L	0	1	1	1	0	0	0	94	87	87
Mest+Brox+MCPA	1.5+4+4	2L	0	0	0	8	0	0	1	89	78	78
MCPA	4	2L	0	0	0	0	0	0	0	96	81	77
Mest+MCPA	1.5+4	2L	0	0	0	2	0	0	0	92	78	81
Mest/Brox+MCPA	3/4+4	Pre/2L	0	0	0	0	0	0	0	88	82	82
Mest+Bromoxynil	1.5+4	2L	0	0	0	4	0	0	0	86	80	76
A15898+Mest	5+1.5	2L	0	0	0	0	0	0	0	89	79	77
CV			0	368	468	56	748	212	81	9	7	8
LSD (P=0.05)			0	1	2	4	1	1	2	11	8	9

Injury did not occur with preemergence applications of mesotrione. Injury was greatest when post emergence mesotrione treatments included UAN, but the injury essentially was limited to the Maida cultivar. The greatest injury occurred with PO and UAN as adjuvants, 24% on 6/22. Injury with this treatment dissipated over time and was 8% by 6/29. Yield of Maida when the mesotrione treatment included UAN was slightly less than the untreated, 72 bu/A compared with 85 bu/A, respectively. Yield of Dancer was slightly less than the untreated only when NIS and UAN was included with mesotrione.

Oat response to mesotrione, location 3. Kirk Howatt, Ronald Roach, and Janet Harrington. 'Beach' (B), 'Dancer' (D), and 'Maida' (M) oat were seeded in bioassay strips on May 16. Preemergence treatments (Pre) were applied May 16 with 63 F, 3% RH, 2% cloud-cover, 5 mph wind at 0°, and wet soil with damp surface at 58 F. Post treatments (2L) were applied to two- to three-leaf oat on June 20 with 82 F, 56% RH, 5% cloud cover, 2 mph wind at 360°, and damp soil at 68 F. Treatments were applied with a backpack sprayer delivering 17 and 8.5 gpa at 40 psi through 11002 TT and 11001 TT nozzles to the entire area of 20 by 20 ft plots. The experiment was a randomized complete block design with 3 replicates.

			6/28			7/09	lodging 8/02					
Treatment	Rate	Grow	B	D	M	All	B	D	M	Beach	Dancer	Maida
	oz ai/A	Stg				%					Bu/A	
Untreated	0		0	0	0	0	1	1	0	57	63	93
Mesotrione	3	Pre	0	0	0	0	3	3	2	65	69	80
Mesotrione	6	Pre	0	0	0	0	3	3	1	71	77	89
Mesotrione+PO	1.5+1%	2L	0	2	0	0	0	0	0	67	73	87
Mest+PO+UAN	1.5+1%+2.5%	2L	6	6	7	0	0	0	0	68	78	82
Mest+NIS	1.5+0.25%	2L	1	1	2	0	0	0	0	67	78	93
Mest+NIS+UAN	1.5+0.25%+2.5%	2L	5	6	8	0	2	2	0	54	76	85
Bromoxynil+MCPA	4+4	2L	0	0	0	0	1	0	0	73	80	95
Mest+brox+MCPA	1.5+4+4	2L	5	7	8	0	1	0	0	66	85	96
MCPA	4	2L	0	0	0	0	2	1	0	78	87	98
Mest+MCPA	1.5+4	2L	0	2	0	0	3	3	3	68	68	98
Mest/broxl+MCPA	3/4+4	Pre/2L	0	1	0	0	4	1	0	71	87	104
Mest+bromoxynil	1.5+4	2L	6	10	9	0	0	1	0	70	81	85
A15898+mesotrione	5+1.5	2L	0	0	0	0	0	1	0	60	58	64
CV			68	69	82	0	184	210	388	29	30	31
LSD (P=0.05)			2	3	3	0	5	4	3	33	39	46

Preemergence treatments did not cause visible injury (data not shown). Injury was apparent with selected post emergence treatments, and injury was fairly consistent across cultivars. Injury was more pronounced when post emergence application of mesotrione included UAN as part of the adjuvant system or bromoxynil as a tank-mix partner. Bromoxynil alone did not cause injury. Saturated soil resulted in variable yield and high LSD, but oat yield when treated with herbicide tended to be similar or greater than the untreated.

Barley response to MSM. Kirk Howatt, Ronald Roach, and Janet Harrington. 'Tradition', 'Stellar', 'Robust', 'Lacey', 'Conlon', and 'Rawson' barley were seeded in bioassay strips May 15 at Fargo, ND. Treatments were applied to four-leaf barley on June 12 with 84 F, 53% RH, 50% cloud-cover, 12 mph wind at 180°, and wet soil with a damp top at 84 F. Treatments were applied with a backpack sprayer delivering 8.5 gpa at 35 psi through 11001 TT nozzles to the entire area of 20 by 40 ft plots. The experiment was a randomized complete block design with four replicates.

		6/19	6/27
Treatment	Rate	All barley cultivars	
	oz ai/A	%	
MSM+NIS	0.06+0.25%	0	0
MSM+NIS	0.12+0.25%	0	0
Metsulfuron+NIS	0.06+0.25%	0	0
Metsulfuron+NIS	0.12+0.25%	0	0
Untreated	0	0	0
CV		0	0
LSD (P=0.05)		0	0

All cultivars responded similarly to treatments and were combined for analysis. MSM, a new formulation of metsulfuron, did not cause visible injury to barley. Excessive water and saturated soil resulted in poor plant growth, and the study had to be terminated before harvest. MSM granuals dispersed more readily in the spray mixture than metsulfuron.

Wheat response to MSM. Kirk Howatt, Ronald Roach, and Janet Harrington. 'Glenn', 'Briggs', 'Alsen', 'Reeder', 'Steele', 'Faller', 'Lebsock', 'Divide', and 'Mountrail' wheat were seeded in bioassay strips on May 15 at Fargo, ND. Treatments were applied on three- to four-leaf wheat on June 12 with 87 F, 50% RH, 60% cloud-cover, 15 mph wind at 180°, and wet soil that was dry on top at 84 F. Treatments were applied with a backpack sprayer delivering 8.5 gpa at 35 psi through 11001 TT nozzles to the entire area of 20 by 60 ft plots. The experiment was a randomized complete block design with four replicates.

		6/19	6/27	7/9	8/6
Treatment	Rate	All wheat cultivars			
	oz ai/A	%			
MSM+NIS	0.06+0.25%	0	0	0	0
MSM+NIS	0.12+0.25%	0	0	0	0
Metsulfuron+NIS	0.06+0.25%	0	0	0	0
Metsulfuron+NIS	0.12+0.25%	0	0	0	0
Untreated	0	0	0	0	0
CV		0	0	0	0
LSD (P=0.05)		0	0	0	0

All cultivars responded similarly to treatments and were combined for analysis. MSM, a new formulation of metsulfuron, did not cause visible injury to wheat. Excessive water and saturated soil resulted in poor plant growth, and the study had to be terminated before harvest. MSM granuals dispersed more readily in the spray mixture than metsulfuron.

HRSW and Durum Varietal Tolerance to Olympus Herbicide

Eric Eriksmoen, Hettinger, ND

Thirty spring wheat and 13 durum varieties were treated with 0.6 oz/A Olympus herbicide at the 4 ½ leaf + 2 tiller growth stage on May 24 with 60° F, 32% RH, clear sky and north wind at 6 mph. Treatments were applied with a pickup mounted sprayer delivering 10 gpa at 40 psi through 8004 EVS nozzles to one half of 10 foot by 100 foot un-replicated strips. Varieties were evaluated for crop injury on June 9 and for maturity differences, plant stunting, head abnormalities and leaf chlorosis on June 25.

Spring Wheat	June 9 % Crop Injury
Faller	0
Howard	0
Glen	0
Steele-ND	0
Reeder	0
Traverse	0
Granger	0
Kuntz	0
Kelby	0
Freyr	0
Rush	2
AP 603 CL	0
AP 604 CL	2
Trooper	0
Briggs	5
Granite	0
Knudson	0
Parshall	0
Mercury	0
Alsen	0
AC Superb	0
Ingot	0
Oxen	0
Gunner	0
Russ	0
RB07	0
AC Vita	0
Norpro	0
FBC Dylan	0
ND809	2

Durum	June 9 % Crop Injury
Mountrail	0
Ben	0
Lebsock	0
Grenora	0
Divide	0
Alkabo	0
Maier	0
Pierce	0
Dilse	0
AC Navigator	0
AC Napoleon	0
AC Commander	0
Rugby	0

Summary

Crop injury (stunting) was initially observed on 4 spring wheat varieties and on no durum varieties. There were no visual differences between treated and untreated strips on June 25 (data not shown). Although varieties were not tested for yield differences, it appears that both spring wheat and durum have very good tolerance to Olympus herbicide.

Pinoxaden/Clodinafop Premix: Crop Tolerance in Durum at Hettinger

Eric Eriksmoen

'Alzada' durum wheat was seeded on April 19. Treatments were applied on May 16 to 3 ½ leaf durum with 61° F, 38% RH, clear sky and east wind at 6 mph. Treatments were applied with a tractor mounted CO_2 propelled plot sprayer delivering 10 gpa at 30 psi through PK-01E80 nozzles to 5 foot wide by 23 foot long plots. The trial was a randomized complete block design with four replications. Plots were evaluated for crop injury on May 21 and on June 9, for heading date and for delay in maturity. The trial was harvested on July 28.

	Treatment	Application Rate	5/21 inj	6/9 inj	Heading Date	Delayed Maturity	Plant Height	Test Weight	Grain Yield
		oz/Ac	%	%	June	days*	cm	lbs/bu	bu/Ac
1	Untreated	--	0	0	20	--	74	59.7	36.5
2	A13617R	16.4	0	0	20	0	77	60.7	36.1
3	A14298E	16.4	1	0	21	0	74	61.4	37.7
4	A13617 + Widematch + MCPA	16.4 + 16 + 12	0	0	20	0	74	60.6	35.4
5	A14298 + Widematch + MCPA	16.4 + 16 + 12	0	0	20	0	76	61.4	37.1
6	A13617	32.8	0	0	21	0	75	62.4	35.9
7	A14298	32.8	0	0	20	0	76	60.2	37.9
8	A13617 + Widematch + MCPA	32.8 + 32 + 24	1	0	20	0	74	62.2	34.0
9	A14298 + Widematch + MCPA	32.8 + 32 + 24	2	0	21	2	74	59.5	34.6
	C.V. %		122	0	3.4	111	3.1	3.9	9.3
	LSD .05		1	--	NS	1	NS	NS	NS

* Delayed Maturity = days later than the untreated check. NS = no statistical difference between trts.

Summary

Crop injury was very minor and appeared as very slight leaf chlorosis. The 2x rate of A14298 + Widematch + MCPA (trt 9) caused a slight delay in maturity. None of the treatments caused significant delays in head emergence (heading date), plant height, test weight or grain yield.

WILLISTON RESEARCH EXTENSION CENTER - 2007
VARIETY QUALIFICATION TRIALS FOR CLEARFIELD SPRING WHEAT

Two sets of 10 cultivars of spring wheat were planted on May 1, each set containing the same 10 cultivars. The Clearfield treatment, Beyond, was applied to one set of the spring wheat cultivars at 8 fl oz/a product plus Activator 90 non-ionic surfactant at 0.25% v/v and 2.5% v/v UAN, on May 28 to 4-leaf wheat beginning at 8:00 am and ending at 8:10am. Air temperature was 53 degrees F, 30% clear sky, 90% RH, with 4-5 mph east(142 degrees) wind. dry topsoil at 54 F. We used a small plot sprayer with wind cones, which was mounted on a G-Allis Chalmers tractor, to apply the treatments. The sprayer delivered 10 gals/a at 40 psi through 8001 flat fan nozzles First rain received after application was 0.97 inches on May 30. The experiment was a randomized complete block design with three replications.

Table 1. Response of ten hrs wheat cultivars to an application of Beyond herbicide.

Cultivar	Heading Date	Plant Height	Plant Height	Grain Protein	Test Weight	Yield	1000 KWT
	fr plt	cm	inches	%	lbs/b	bus/a	gms
AP603 CL	56.0	81.7	32.2	16.2	60.1	50.78	25.6
AP604 CL	53.0	75.0	29.5	15.5	61.5	50.67	27.1
ND900	56.0	86.0	33.9	15.3	57.0	52.83	28.3
ND901	53.7	83.0	32.7	16.7	60.5	48.68	28.4
ND904	57.0	89.3	35.2	15.4	57.6	44.97	25.4
ND905	56.0	82.0	32.3	15.6	57.7	43.15	29.4
Glenn							
Steele-ND							
Reeder		THESE FOUR VARIETIES 100% KILLED BY THE BEYOND					
Alsen							
HIGH MEAN	57.0	89.3	35.2	16.7	61.5	52.83	29.4
LOW MEAN	53.0	75.0	29.5	15.3	57.0	43.15	25.4
EXP MEAN	55.3	82.8	32.6	15.8	59.1	48.51	27.4
C.V. %	.4	4.8	4.9		1.5	6.60	7.6
LSD 5%	.4	7.3	2.9		1.6	5.83	NS
LSD 1%	.6	NS	NS		2.2	NS	NS
# OF REPS	3	3	3	1	3	3	3
F-TRT	132.7	4.3	4.3	.0	13.8	4.09	1.8

No visible injury to the Clearfield tolerance cultivars.

Puma at 8 oz/a product plus Bronate Advanced at 12.8 oz/a product were also applied on May 28 to the other set of 10 spring wheat cultivars and to 4-leaf wheat beginning at 8:30 am and ending at 8:40am. Temperature was 54 degrees F, 25% clear sky, 90% RH, with 4-5 mph E wind (100 degrees), dry topsoil at 54 F. We used a small plot sprayer with wind cones, which was mounted on a G-Allis Chalmers tractor, to apply the treatments. The sprayer delivered 10 gals/a at 40 psi through 8001 flat fan nozzles First rain received after application was 0.97 inches on May 30. The experiment was a randomized complete block design with three replications.

Table 2. Response of ten hrs wheat cultivars to an application of Puma + Bronate Advanced herbicide.

Cultivar	Heading Date	Plant Height	Plant Height	Grain Protein	Test Weight	Yield	1000 KWT
	fr plt	cm	inches	%	lbs/b	bus/a	gms
AP603 CL	56.0	81.3	32.0	16.3	59.9	41.00	25.3
AP604 CL	53.0	75.0	29.5	14.6	62.2	47.33	28.6
ND900	56.7	83.0	32.7	15.4	56.4	37.73	26.2
ND901	54.0	83.0	32.7	15.6	59.9	40.49	27.6
ND904	57.0	89.0	35.0	15.1	57.7	38.52	25.1
ND905	55.7	80.7	31.8	15.2	58.5	37.39	29.5
Glenn	53.3	79.3	31.2	15.8	61.8	43.45	27.9
Steele-ND	54.3	75.3	29.6	15.8	59.1	41.55	29.1
Reeder	55.3	75.7	29.8	15.5	59.0	46.29	28.8
Alsen	55.3	77.3	30.4	16.2	59.7	38.19	28.4
HIGH MEAN	57.0	89.0	35.0	16.3	62.2	47.33	29.5
LOW MEAN	53.0	75.0	29.5	14.6	56.4	37.39	25.1
EXP MEAN	55.1	80.0	31.5	15.6	59.4	41.19	27.7
C.V. %	1.0	3.5	3.5		.9	6.65	5.0
LSD 5%	.9	4.8	1.9		1.0	4.69	2.4
LSD 1%	1.3	6.6	2.6		1.3	6.44	3.2
# OF REPS	3	3	3	1	3	3	3
F-TRT	19.4	7.5	7.4	.0	29.3	4.98	3.9

No visible injury noted to any cultivar due to applicaton of Puma + Bronate Advanced

BOTH EXPERIMENTS:
Location of the WREC: Latitude 48 8'; Longitude 103 44'W; Elevation 2105 ft.
Planted: May 1 on fallow.
Applied Fertilizer in lbs/a: 31N:41P2O5:0K: 0S
Soil Test to two feet in lbs/a: 64N:18P: 22S 1.6 OM pH-7.5
Soil Type: Williams-Bowbells Loam
Harvested: August 6 Harvested Area: 54 ft2
Grain protein percentages reported on a 12% moisture basis.

WILLISTON RESEARCH EXTENSION CENTER - 2006
Neil Riveland

VARIETY QUALIFICATION TRIALS FOR CLEARFIELD SPRING WHEAT

Two sets of 10 cultivars of spring wheat were planted on May 16, each set containing the same 10 cultivars.

The Clearfield treatment, Beyond, was applied to one set of the spring wheat cultivars at 8 fl oz/a product plus Activator 90 non-ionic surfactant at 0.25% v/v and 2.5% v/v UAN, on June 7 to 4-leaf wheat beginning at 10:50 am and ending at 11:00am. Air temperature was 69 degrees F, 50% clear sky, 48% RH, with 4-5 mph NE wind. dry topsoil at 66 F. We used a small plot sprayer with wind cones, which was mounted on a G-Allis Chalmers tractor, to apply the treatments. The sprayer delivered 10 gals/a at 40 psi through 8001 flat fan nozzles First rain received after application was 0.09 inches on June 8. The experiment was a randomized complete block design with three replications.

Table 1. Response of ten hrs wheat cultivars to an application of Beyond herbicide.

Cultivar	Crop Injury			Heading	Test	Grain
	6/16	6/20	6/27	Date	Weight	Yield
	%			fr plt	cm	bus/a
AP603	0.0	0.0	0.0	50.0	56.4	26.35
ND900	0.0	0.0	0.0	49.0	53.3	23.47
ND901	0.0	0.0	0.0	46.7	57.6	27.27
ND902	20.0	46.7	60.0	50.3	54.8	16.24
ND903	0.0	0.0	0.0	50.3	55.4	22.55
Glenn	46.7	91.7	99.0			0
Steele-ND	50.0	91.7	100.0			0
Reeder	46.7	85.0	100.0			0
Howard	46.7	93.3	100.0			0
Alsen	56.7	86.7	100.0			0
HIGH MEAN	56.7	93.3	100.0	50.3	57.6	27.27
LOW MEAN	0.0	0.0	0.0	46.7	53.3	16.24
EXP MEAN	26.7	49.5	55.9	49.3	55.5	23.18
C.V. %	14.4	8.4	5.7	1.0	1.7	7.54
LSD 5%	6.6	7.2	5.4	.9	1.8	3.29
LSD 1%	9.0	9.8	7.4	1.3	2.6	4.79
# OF REPS	3	3	3	3	3	3
F-TRT	125.3	343.3	738.4	31.0	9.0	18.55

Location of the WREC: Latitude 48 8'; Longitude 103 44'W; Elevation 2105 ft.
Planted: May 16 on Fallow. Applied Fertilizer in lbs/a: 21N:31P2O5:0K:
Soil Test to two feet in lbs/a: 96N:16P:290K: 2.1 OM pH-5.6
Soil Type: Williams-Bowbells Loam
Harvested: August 11 Harvested Area: 56 ft2

Puma at 8 oz/a product plus Bronate Advanced at 12.8 oz/a product were also applied on June 7 to the ther set of 10 spring wheat cultivars and to 4-leaf wheat beginning at 11:30 am and ending at 11:40am. Temperature was 71 degrees F, 50% clear sky, 38% RH, with 4-6 mph E wind. dry topsoil at 68 F. We used a small plot sprayer with wind cones, which was mounted on a G-Allis Chalmers tractor, to apply the treatments. The sprayer delivered 10 gals/a at 40 psi through 8001 flat fan nozzles First rain received after application was 0.09 inches on June 8. The experiment was a randomized complete block design with
three replications.

Table 1. Response of ten hrs wheat cultivars to an application of Puma + Bronate Advanced herbicide.

	Crop injury			Heading	Test	Grain
Cultivar	6/16	6/20	6/27	Date	Weight	Yield
		%		fr plt	cm	bu/a
AP603	0	0	0	50.7	54.7	16.75
ND900	0	0	0	50.0	52.8	19.83
ND901	0	0	0	47.7	56.2	19.61
ND902	0	0	0	49.0	54.6	19.03
ND903	0	0	0	51.7	55.6	17.17
Glenn	0	0	0	46.7	56.9	22.92
Steele-ND	0	0	0	45.7	53.4	23.61
Reeder	0	0	0	48.0	55.4	24.68
Howard	0	0	0	47.0	54.0	21.93
Alsen	0	0	0	47.7	55.2	21.75
HIGH MEAN	0	0	0	51.7	56.9	24.68
LOW MEAN	0	0	0	45.7	52.8	16.75
EXP MEAN	0	0	0	48.4	54.9	20.73
C.V. %	0	0	0	1.1	1.0	5.66
LSD 5%	0	0	0	.9	1.0	2.01
LSD 1%	0	0	0	1.3	1.3	2.76
# OF REPS	0	0	0	3	3	3
F-TRT	0	0	0	37.4	15.5	15.67

Location of the WREC: Latitude 48 8'; Longitude 103 44'W; Elevation 2105 ft.
Planted: May 16 on Fallow. Applied Fertilizer in lbs/a: 21N:31P2O5:0K:
Soil Test to two feet in lbs/a: 96N:16P:290K: 2.1 OM pH-5.6
Soil Type: Williams-Bowbells Loam
Harvested: August 11 Harvested Area: 56 ft2

Wild Oat control with triallate. Kirk Howatt, Ronald Roach, and Janet Harrington. Preplant incorporated treatments (PPI) were applied, incorporated with 2 cultivator passes, and 'Alsen' hard red spring wheat was seeded May 2 at Fargo, ND, with 61 F, 40% RH, 0% cloud-cover, 1 mph wind at 270°, and moist soil at 54 F. Post treatments (3L) were applied tc three- to four-leaf wheat and wild oat on June 5 with 54 F, 46% RH, 5% cloud-cover, 4 mph wind at 0°, and moist soil at 55 F. All treatments were applied with a backpack sprayer delivering 8.5 gpa at 35 psi through 11001 TT nozzles to a 7 ft wide area the length of 10 by 30 ft plots. The experiment was a randomized complete block design with three replicates.

			6/22	7/02
Treatment	Rate	Grow	Wioa	Wioa
	oz ai/A	Stg	% control	
Triallate	16	PPI	96	85
Triallate	12	PPI	96	80
Triallate	8	PPI	96	68
Triallate/fenoxaprop+bromoxynil&MCPA5	8/1+8	PPI/3L	99	99
Fenoxaprop+bromoxynil &MCPA5	1+8	3L	88	93
Triallate/pinoxaden+bromoxynil &MCPA5+Adigor	8/0.4+8+0.075G	PPI/3L	98	99
Pinoxaden+bromoxynil&MCPA5+Adigor	0.4+8+0.075G	3L	95	99
Triallate/flucarbazone+bromoxynil &MCPA5+Basic Blend	8/0.21+8+1%	PPI/3L	96	98
Flucarbazone+bromoxynil&MCPA5+Basic Blend	0.21+8+1%	3L	75	87
Untreated	0	3L	0	0
CV			3	3
LSD (P=0.05)			5	5

Wild oat control with triallate was 96% on 6/22 and better than control with POST only application of fenoxaprop or flucarbazone. Late-emerging wild oat resulted in a control range from 68 to 85% with 8 to 16 oz/A triallate, respectively. Control with triallate was increased to 98% or better when a POST herbicide was included. Pinoxaden alone also achieved 99% control, but control with fenoxaprop or flucarbazone was improved by a PPI application of triallate.

Veed control with preemergence application of flucarbazone in no-till system. Kirk Howatt, Ronald Roach, and anet Harrington. The study was established May 14 near Fargo, ND, on an area that had not been tilled. Preemergence eatments were applied to five- to nine-leaf Canada thistle rosettes and three-leaf wild buckwheat and wild oat on May 24 ith 64 F, 61% RH, 75% cloud-cover, 1 mph wind, and damp soil at 59 F. Post treatments (3L) were applied when wheat the area was in the three-leaf stage, Canada thistle had flower buds, and wild buckwheat was five-leaf on June 22 with 5 F, 33% RH, 0% cloud-cover, 0.5 mph wind at 135°, and damp to moist soil at 75 F. All treatments were applied with a ackpack sprayer delivering 8.5 gpa at 40 and 35 psi, respectively, through 11001 TT nozzles to a 7 ft wide area the ngth of 10 by 30 ft plots. The experiment was a randomized complete block design with three replicates.

			6/29			7/09		
reatment	Rate	Grow	Cath	Wibu	Wioa	Cath	Wibu	Wioa
	oz ai/A	Stg	% control					
lcz+glyt+NIS+AMS/brox&MCPA5	0.28+6+0.25%+16/8	Pre/3L	90	50	95	93	86	98
lcz+glyt+NIS+AMS/flcz+brox&MCPA5+BB	0.14+6+0.25%+16/0.14+8+1%	Pre/3L	90	85	95	97	91	99
lcz+glyt+AMS/flcz+brox&MCPA5+BB	0.14+6+16/0.14+8+1%	Pre/3L	92	85	98	97	97	99
lcz+glyt+NIS+AMS/flcz+brox&MCPA5+BB	0.14+6+0.25%+16/0.14+8+1%	Pre/3L	67	43	95	92	62	99
lcz+glyt+NIS+AMS/flcz+brox&MCPA5+BB	0.21+6+0.25%+16/0.14+8+1%	Pre/3L	92	82	92	95	92	98
lcz+glyt+NIS+AMS/flcz+brox&MCPA5+BB	0.28+6+0.25%+16/0.14+8+1%	Pre/3L	92	85	93	98	96	99
lyt+NIS+AMS/flcz+brox&MCPA5+BB	6+0.25%+16/0.28+8+1%	Pre/3L	88	82	90	96	92	99
lyt+NIS+AMS/fenx+brox&MCPA5	6+0.25%+16/1.32+8	Pre/3L	90	86	91	98	85	99
ntreated			0	0	0	0	0	0
V			8	12	4	3	11	1
SD (P=0.05)			11	14	5	4	14	1

pplying 0.14 oz/A flucarbazone PRE and POST gave better control of Canada thistle and wild buckwheat than applying 28 oz/A PRE and none POST. Increasing the rate of flucarbazone PRE from 0.14 to 0.21 improved broadleaf weed ontrol, but there was not an additional benefit of increasing the rate to 0.28.

Wild oat control in spring wheat with Everest applied PRE and/or POST. (Jenks, Willoughby, Mazurek). 'Glenn' spring wheat was seeded April 25 at 90 lb/A into 7.5-inch rows in a conventionally tilled field. Herbicide treatments were applied preemergence (PRE) on May 1, at 2-leaf wheat stage on May 12, or 5-leaf wheat stage on June 4. Wild oat densities averaged 5-10 plants per sq ft, but were erratic. Foxtail present was a mixture of green and yellow foxtail with 5-25 plants per sq ft. Individual plots were 10 x 30 ft and replicated three times.

We observed some crop stunting in June with all Everest treatments (17-21%), but stunting subsided to less than 10% by July. Evaluated in early July, wild oat control with Everest applied PRE provided poor wild oat control (48%). Everest applied PRE followed by a POST application at the 2-leaf stage provided only fair wild oat control (68-80%). Puma applied at 5-leaf wheat stage provided 91% wild oat control. Similar results were observed for foxtail control with Everest and Puma. Everest provided only 50-73% foxtail control, while Puma provided 90% control.

Soil activity with Everest may have been hindered by excessive rainfall. Approximately 13 inches of rain fell during May and early June, which may have leached the herbicide below the weed seed germination zone.

			Wheat		Wild oat		Foxtail		Height	Yield	TW
			% injury		----------% control----------				inches	bu/A	lb/bu
			June	July	June	July	June	July	July	Aug	Aug
Treatment[a]	Rate	Timing	2	19	2	5	19	5	9	16	16
Untreated			0	0	0	0	0	0	37.3	7.6	58.7
Everest	0.4oz	PRE	17	5	69	48	55	50	36.3	33.4	61.3
Everest / Everest	0.2oz / 0.2oz	PRE/ 2-leaf	21	9	90	68	69	62	36.3	30.9	61.5
Everest / Everest	0.3oz / 0.2oz	PRE/ 2-leaf	21	9	89	69	68	65	35.5	39.6	61.9
Everest / Everest	0.4oz / 0.2oz	PRE/ 2-leaf	22	8	92	71	73	66	34.3	31.6	59.8
Everest	0.4oz	2-leaf	18	8	93	80	74	73	35.4	35.9	61.2
Puma	0.67pt	5-leaf	0	0	0	91	90	90	36.7	32.6	61.6
LSD (0.05)			2.2	3.1	2.4	8	11.1	11.5	3.3	12	2.7
CV			9	31	2	7	10	11	2	23	2.5

[a] *Bronate Advanced (0.8 pt) was applied with all postemergence treatments; Glyphosate (0.375 lb ae) + NIS (0.25% v/v) + AMS (2.94 gal/100gal) was applied preemergence to all treatments.*

Flucarbazone control of emerging wild oat. Kirk Howatt, Ronald Roach, and Janet Harrington. 'Alsen' hard red spring wheat was seeded May 1 at Fargo, ND. Treatments were applied as follows:

Application date	May 18	May 30	June 5
Temperature (F)	61	58	61
Relative humidity (%)	50	74	38
Cloud-cover (%)	5	100	10
Wind velocity (mph)	6	4 to 5	4
Wind direction (°)	180	360	315
Soil moisture	Dry	Wet	Moist
Soil temperature	62	68	61
Wheat stage (leaf)	1	2	3 to 4
Wild oat stage (leaf)	1 to 2	2	3 to 4

All treatments were applied with a backpack sprayer delivering 40 psi (spike, and 2L) or 35 psi (4L) through 11001 TT nozzles to a 7 ft wide area the length of 10 by 30 ft plots. The experiment was a randomized complete block design with three replicates.

Treatment	Rate	Grow Stg	6/22 Wioa	7/03 Wioa	8/06 Wioa	8/07 Yield
	oz ai/A	leaf	———	% control	———	bu/A
Flucarbazone+Basic Blend	0.28+1%	1	96	99	98	40
Propoxycarbazone&mesosulfuron+Basic Blend	0.178+1%	1	98	98	98	38
Fenoxaprop	1.32	1	97	93	98	39
Flucarbazone+Basic Blend	0.28+1%	2	82	87	96	34
Propoxycarbazone&mesosulfuron +Basic Blend	0.178+1%	2	82	95	98	35
Fenoxaprop	1.32	2	97	99	99	20
Fenoxaprop	1.32	4	90	96	98	25
Untreated	0		0	0	0	11
CV			3	3	1	13
LSD (P=0.05)			4	4	2	7

A few wild oat emerged after application of the one-leaf treatments, resulting in less wild oat control with fenoxaprop than flucarbazone or propoxycarbazone and mesosulfuron on 7/03. However, these wild oat were poor competitors with the much larger wheat and were absent from the canopy by harvest. Wild oat did not emerge after application at the two-leaf stage. Notice the exceptional control with fenoxaprop at this timing throughout the season.

Wild oat control in wheat. Kirk Howatt, Ronald Roach, and Janet Harrington. 'Alsen' hard red spring wheat was seeded May 1 at Fargo, ND. Treatments were applied to three- to four-leaf wheat and wild oat on June 5 with 57 F, 39% RH, 10% cloud-cover, 5 mph wind at 315°, and moist soil at 60 F. Treatments were applied with a backpack sprayer delivering 8.5 gpa at 35 psi through 11001 TT nozzles to a 7 ft wide area the length of 10 by 30 ft plots. The experiment was a randomized complete block design with four replicates. Yield was measured August 07.

Treatment	Rate	6/22 Wioa	7/03 Wioa	8/07 Yield
	oz ai/A	% control		bu/A
Mesosulfuron+bromoxynil&MCPA5+MSO	0.036+8+1%	70	70	17
Flucarbazone+ bromoxynil &MCPA5+Basic Blend	0.32+8+1%	72	75	19
Prcz&mess+bromoxynil&MCPA5+Basic Blend	0.178+8+1%	71	75	19
Imazamethabenz+bromoxynil &MCPA5+Basic Blend	5+8+1%	45	45	17
Propoxycarbazone+bromoxynil&MCPA5+Basic Blend	0.32+8+1%	69	64	18
GF-1847+bromoxynil&MCPA5+NIS	0.21+8+0.25%	67	71	17
GF-1848+NIS	1.68+0.25%	66	67	18
Tralkoxydim-sc+brox&MCPA5+Supercharge+AMS	2.9+8+0.5%+9.5	87	87	17
Fenoxaprop+bromoxynil&MCPA5	0.8+8	70	69	22
Fenoxaprop+bromoxynil&MCPA5	1.32+8	87	84	26
Clodinafop+bromoxynil &MCPA5	0.8+8	93	97	22
Pinoxaden+bromoxynil &MCPA5+Adigor	0.86+8+0.075G	94	99	21
Difenzoquat+bromoxynil &MCPA5	16+8	66	84	15
Untreated	0	0	0	9
CV		6	9	24
LSD (P=0.05)		6	9	6

Pinoxaden and clodinafop provided the best control of wild oat. Fenoxaprop at 1.32 oz/A gave similar control to difenzoquat on 7/03 but yield was better with fenoxaprop than difenzoquat. Fenoxaprop at 0.8 oz/A only gave 69 to 70% control, but wheat yield with this treatment was similar to yield in the pinoxaden treatment which provided complete control of wild oat. Performance of ALS inhibitors was likely influenced by damp, cloudy weather. Wild oat control with ALS-inhibitors did not exceed 75%.

Wild oat control in HRSW, Langdon 2007. John Lukach. 'Glenn' hrsw was seeded May 2 at 80 lb/a. Treatments were applied June 2 on 4 leaf wheat and 1-4 leaf wild oats with 5-10/ft². Conditions at 1 to 2pm were 74°F, 53%RH, north wind at 8mph, partly cloudy and dry foliage. A tractor mounted CO2 sprayer with wind shield was used delivering 10 gpa, 40 psi, 4.5 mph, DG8001.5 tips with four 20" spaced nozzles on 25ft plots. The experiment was over-sprayed with Bronate Advanced, 0.8pt/a, on June 11. The experiment had a RCBD design with four replications.

Treatment	Rate	5-Jun	5-Jun	20-Jun	1-Aug			
	oz ai/A	Chlo	Inj	Wioa	Wioa	Yield	Twt	Ht
		0-9		%		bu/a	lb/bu	cm
Pinoxaden+Brox&MCPA5+Adigor	0.86+8+0.075G	1.5	0.8	99	99	60	63.2	96
Prcz&Mess+Brox&MCPA5+Basic Blend	0.178+8+1%	2.5	2.8	99	98	58	62.9	94
Flucarbazone+Brox&MCPA5+Basic Blend	0.32+8+1%	2.0	2.8	98	95	56	62.6	90
Vexp3+NIS	1.68+0.25%	2.0	2.5	99	97	56	62.8	92
Vexp1+Brox&MCPA5+NIS	0.21+8+0.25%	2.8	2.3	97	95	55	63.0	91
Prcz+Brox&MCPA5+Basic Blend	0.32+8+1%	2.8	3.8	87	88	54	62.6	94
Mess+Brox&MCPA5+MSO	0.036+8+1%	1.8	0.8	94	93	53	62.7	94
Difenzoquat+Brox&MCPA5	16+8	1.3	0.3	94	90	52	62.6	89
Tral-SC+Brox&MCPA5+Supercharge+AMS	2.9+8+0.5%+9.5	0.3	0.0	58	68	49	62.6	93
Fenoxaprop+Brox&MCPA5	1.32+8	1.3	0.5	84	80	49	62.4	93
Clodinafop+Brox&MCPA5	0.8+8	0.8	0.0	82	70	47	62.2	94
Immb+Brox&MCPA5+Basic Blend	5+8+1%	0.8	0.0	40	43	46	62.2	95
Fenoxaprop+Brox&MCPA5	0.8+8	0.0	0.0	33	40	39	62.0	94
Untreated	0	0.0	0.0	0	0	25	61.7	96
	C.V. %	47.9	84.1	17.0	12.5	9.0	0.8	4.3
	LSD 5%	1.0	1.4	18.4	13.4	6.4	0.7	NS

The site includes both ALS and ACC resistant wild oat.

wild oat control in durum wheat, Williston 2007. Neil Riveland.

'Divide' durum wheat was planted on recrop (land cropped to wheat in 2006) in 7 inch rows at 90 lbs/a on April 25. All treatments were applied on June 2 with 68 F., 71% RH, soil temp 60 F, 90% clear sky and wind at 1-3 mph from 132 degrees to 4-4.5 leaf wheat, 3-6 leaf wild oats (most in the 4 to 5-leaf), 2-6 leaf green foxtail. We used a small plot sprayer with wind cones, mounted on a G-Allis Chalmers tractor to apply the treatments, delivering 8.5 gals/a at 30 psi through 8001vs flat fan nozzles to a 6.67 ft wide area the length of 10 by 24 ft plots. First rain received after application was 0.11 inches on June 6. Experimental design was a randomized complete block design with four replications. Wild oat density averaged 5-9 plants/ft2 and green foxtail density was 15-20 plants/ft2. Plots were evaluated for crop injury on June 19 and August 9. Weed control ratings were taken on July 3 (wild oats and green foxtail), and August 9 (wild oats). Wheat was machine harvested for yield on August 16.

Treatment [a]	Rate	% Crop Inj.		Test Weight	Yield	Wioa Control 7/3	Wioa Control 8/9	Grft Cntrl	Plant Height
	oz/a	6/19	8/9	lbs/b	bus/a				inches
Mess+Brox&MCPA5+MSO	0.036+8+1%	0	0	57.5	24.6	36	30	79	30
Flcz+Brox&MCPA5+Basic Blend	0.32+8+1%	4	4	58.2	32.0	88	88	92	30
Prcz&Mess+Brox&MCPA5+Basic Blend	0.178+8+1%	5	5	58.6	31.2	92	93	35	27
Immb+Brox&MCPA5+Basic Blend	5+8+1%	2	1	57.9	29.8	80	77	12	29
Prcz+Brox&MCPA5+Basic Blend	0.32+8+1%	4	2	58.2	34.0	89	90	0	30
Vexp1+Brox&MCPA5+NIS	0.21+8+0.25%	2	4	57.8	32.9	91	94	75	60
Vexp3+NIS	1.68+0.25%	2	6	58.3	35.5	94	97	87	29
Tral-sc+Brox&MCPA5+Supercharge+AMS	2.9+8+0.5%+9.5	1	0	58.1	36.0	89	90	94	31
Fenoxaprop+Brox&MCPA5	0.8+8	5	4	58.3	37.6	90	91	96	30
Fenoxaprop+Brox&MCPA5	1.32+8	8	2	58.5	35.4	94	94	95	30
Clodinafop+Brox&MCPA5	0.8+8	0	0	58.0	37.1	93	96	98	28
Pinoxaden+Brox&MCPA5+Adigor	0.86+8+0.075G	6	5	58.8	37.2	95	96	95	30
Difenzoquat+Brox&MCPA5	16+8	66	70	54.9	19.7	87	72	0	26
Untreated	0	0	0	56.9	21.5	0	0	0	31
EXP MEAN		8	7	57.9	31.8	80	79	61	29
C.V. %		149	82	1.2	11.1	12	10	17	6
LSD 5%		16	9	1.0	5.0	14	11	15	3

[a] - MSO, a methylated seed oil from Loveland
Quad 7 used as the basic blend adjuvant
NIS = R-11 from Wilbur-Ellis

Summary: Difenzoquat caused severe crop injury and reduced crop yield and test weight compared to clodinafop treatment (a popular producer choice for wild oat control) Mesosulfuron alone did not adequately control wild oats. The lower rate of Fenoxaprop, Clodinafop and Pinoxaden gave very good wild oat control and the highest yields.

Wild oat Control with pinoxaden tank-mixes. Kirk Howatt, Ronald Roach, and Janet Harrington. 'Alsen' hard red spring wheat was seeded May 1 near Fargo, ND. Treatments were applied to three- to four-leaf wheat and wild oat on June 5 with 60 F, 34% RH, 10% cloud-cover, 4 mph wind at 315°, and moist soil at 60 F. Treatments were applied with a backpack sprayer delivering 8.5 gpa at 35 psi through 11001 TT nozzles to a 7 ft wide area the length of 10 by 30 ft plots. The experiment was a randomized complete block design with four replicates.

Treatment	Rate	6/22 Wioa	7/03 Wioa
	oz ai/A		
Pinoxaden+Adigor	0.64+0.075 G	96	99
Pinoxaden+2,4-D+Adigor	0.64+8+0.075 G	95	99
Pinoxaden+bromoxynil&2,4-D+Adigor	0.64+9+0.075 G	96	99
Pinoxaden+bromoxynil&MCPA5+Adigor	0.64+8+0.075 G	97	99
Pinoxaden+bromoxynil+clopyralid+MCPA+Adigor	0.64+4+1.5+4+0.075 G	96	99
Pinoxaden+clpy&MCPA+thifensulfuron-sg+tribenuron-sg+Adigor	0.64+9.5+0.24+0.06+0.075G	95	99
Pinoxaden+clpy&2,4-D+thifensulfuron-sg+tribenuron-sg+Adigor	0.64+9.5+0.24+0.06+0.075G	92	99
Pinoxaden+clopyralid&fluroxypyr+MCPA+Adigor	0.64+3+4+0.075G	95	99
Pinoxaden+clopyralid&fluroxypyr+thifensulfuron-sg+trib-sg+Adigor	0.64+3+0.24+0.06+0.075G	95	99
Pinoxaden+clpy&flox+carfentrazone+Adigor	0.64+3+0.125+0.075G	94	99
Pinoxaden+dicamba+carfentrazone+Adigor	0.64+1.5+0.125+0.075G	93	99
Pinoxaden+MCPA+carfentrazone+Adigor	0.64+4+0.125+0.075G	97	99
Pinoxaden+thifensulfuron-sg+tribenuron-sg+MCPA+Adigor	0.64+0.24+0.06+4+0.075G	97	99
Pinoxaden+thifensulfuron-sg+tribenuron-sg+2,4-D+Adigor	0.64+0.24+0.06+4+0.075 G	94	99
Pinoxaden+thifensulfuron+tribenuron+fluroxypyr&MCPA+Adigor	0.64+0.24+0.06+8+0.075 G	97	99
Pinoxaden+thifensulfuron-sg+tribenuron-sg+dicamba+Adigor	0.64+0.24+0.06+1.5+0.075G	95	99
Untreated	0	0	0
CV		1.5	0
LSD (P=0.05)		2	0

Pinoxaden control of wild oat was antagonized most by the combination of clopyralid and 2,4-D plus thifensulfuron and tribenuron. But control of wild oat was still 92% on 6/22. All herbicide combinations with pinoxaden provided complete control of wild oat by 7/03.

Pinoxaden with formulation adjuvant. Kirk Howatt, Ronald Roach, and Janet Harrington. 'Alsen' hard red spring wheat was seeded on May 1 near Fargo, ND. Treatments were applied to three- to four-leaf wheat and wild oat on June 5 with 58 F, 34% RH, 10% cloud cover, 5 mph wind at 0°, and moist soil at 58 F. Treatments were applied with a backpack sprayer delivering 8.5 gpa at 35 psi through 11001 TT nozzles to a 7 ft wide area the length of 10 by 30 ft plots. The experiment was a randomized complete block design with four replications. Three replicates were harvested on August 7.

Treatment	Rate	6/22 Wioa	6/29 Wioa	7/09 Wioa	8/06 Wioa	8/07 Yield
	oz ai/A		% control			bu/A
Untreated	0	0	0	0	0	14
Pinoxaden	0.86	91	99	99	99	21
Pinoxaden+brox&MCPA5	0.86+8	90	98	99	99	22
Pinoxaden+thif-sg+trib-sg+dicamba	0.86+0.15+0.15+1.5	92	97	99	99	22
Fenoxaprop	1.32	93	99	99	99	21
Fenoxaprop+brox&MCPA5	1.32+8	89	95	97	97	20
Fenoxaprop+thif-sg+trib-sg+dicamba	1.32+0.15+0.15+1.5	89	93	97	98	23
Flucarbazone+Basic Blend	0.35+1%	80	79	86	94	17
Flcz+bromoxynil&MCPA5+Basic Blend	0.35+8+1%	72	77	81	87	21
Flcz+thif-sg+trib-sg+dica+Basic Blend	0.35+0.15+0.15+1.5+1%	72	70	70	76	18
CV		9	4	2	2	25
LSD (P=0.05)		10	4	2	3	8

Pinoxaden provided similar control of wild oat across treatments without or with broadleaf herbicides. Slightly less activity of fenoxaprop was observed through the mid-season evaluations when broadleaf herbicides were included, although control eventually was similar to fenoxaprop or pinoxaden alone. Flucarbazone gave less wild oat control than pinoxaden or fenoxaprop. In addition, antagonism of flucarbazone progressively worsened. While control with flucarbazone alone progressively increased to a maximum of 94%, wild oat contro with flucarbazone plus thifensulfuron and tribenuron with dicamba remained stagnant during the season and ended at 76%.

Wild oat control with late-applied Axial. (Jenks, Willoughby, Mazurek). 'Glenn' spring wheat was seeded April 25 at 90 lb/A into 7.5-inch rows in a conventionally tilled field. Wet conditions delayed herbicide application past the optimal growth stage. Herbicide treatments were applied postemergence on June 11 at the 6-leaf wheat stage. Wild oat were 12-16 inches tall and densities averaged 10 plants per sq ft. Individual plots were 10 x 30 ft and replicated three times.

A broadleaf herbicide was tank mixed with all Axial treatments except "Treatment 1". In Treatment 1, Bronate was applied nine days later on June 20. This late application likely caused the crop injury observed on August 8.

Despite the late application timing to large wild oat, control was generally excellent with Axial; however, control was poor to fair with Everest and a reduced rate of Puma. At the first weed control evaluation on July 4, wild oat control with Axial alone was generally 8% higher compared to Axial tank mixed with any broadleaf partner. However, by mid-July all Axial treatments controlled wild oat similarly, except for where Tilt was added as a tank mix partner. Adding Tilt reduced wild oat control approximately 10%. Plot yields were quite variable (CV=22), making any interpretation difficult other than all herbicide treatments increased yield over the untreated check.

			Wheat			Wild oat			Yield	TW
			-------% injury-------			------% control------			bu/A	lb/bu
Treatment[a]	Rate	Timing	Jun 23	July 4	Aug 8	July 4	July 16	Aug 8	Aug 16	Aug 16
Axial / Bronate	16.4fl oz / 0.8pt	6-leaf / Boot	0	0	20	91	99	99	19.5	62.5
Axial + Orion	16.4fl oz + 17oz	6-leaf	0	0	0	83	96	97	26.3	62.8
Axial + Bronate	16.4fl oz + 0.8pt	6-leaf	0	0	0	83	94	94	28.7	63.1
Axial + Bronate + Tilt	16.4fl oz + 0.8pt + 2fl oz	6-leaf	0	0	0	79	89	86	22.2	62.9
Axial + WideMatch + MCPE	16.4fl oz + 1pt + 8fl oz	6-leaf	0	0	0	85	97	95	24.6	63.0
Axial + Affinity TM + MCPE	16.4fl oz + 0.8oz + 8fl oz	6-leaf	0	0	0	84	98	97	28.4	62.8
Axial + Affinity TM + WideMatch	16.4fl oz + 0.8oz + 1pt	6-leaf	0	0	0	84	97	95	21.6	63.5
Puma[b] + Bronate	0.4pt + 0.8pt	6-leaf	0	0	0	58	58	56	22.5	62.9
Everest + Bronate	0.6oz + 0.8pt	6-leaf	13	0	0	57	73	70	22.5	62.8
Untreated			0	0	0	0	0	0	9.5	61.7
LSD (0.05)			1.6	0	0	3.2	3	4.8	8.4	0.95
CV			68	0	0	3	2	4	22	0.88

[a] *Bronate = Bronate Advanced; Axial = Axial BIA*

[b] *Puma rate is a reduced rate.*

Antagonism of ACCase inhibitor control of wild oat. Kirk Howatt, Ronald Roach, Janet Harrington. 'Alsen' hard red spring wheat was seeded May 1 near Fargo, ND. Treatments were applied to three-leaf wheat and wild oat on June 5 with 59 F, 38% RH, 10% cloud cover, 2 mph at 315°, and moist soil at 61. Treatments were applied with a backpack sprayer delivering 8.5 gpa at 35 psi through 11001 TT nozzle to a 7 ft wide area the length of 10 by 30 ft plots. The experiment was a randomized complete block design with three replicates.

Treatment	Rate	6/22 Wioa	7/03 Wioa	8/07 Yield
	oz ai/A	% control		bu/A
Fenx	1.32	88	98	21
Fenx	1	88	98	23
Fenx+brox&2,4-D	1.32+9	80	75	23
Fenx+brox&2,4-D	1+9	75	63	19
Fenx+clpy&flox+thif-sg+trib-sg	1.32+3+0.24+0.06	88	95	23
Fenx+clpy&flox+thif-sg+trib-sg	1+3+0.24+0.06	85	89	18
Pinoxaden+Adigor	0.86+0.075G	85	98	17
Pinoxaden+Adigor	0.6+0.075G	93	99	13
Pinoxaden+brox&2,4-D+Adigor	0.86+9+0.075G	92	99	21
Pinoxaden+brox&2,4-D+Adigor	0.6+9+0.075G	93	99	18
Pxdn+clpy&flox+thif-sg+trib-sg+Adigor	0.86+3+0.24+0.06+0.075G	94	99	17
Pxdn+clpy&flox+thif-sg+trib-sg+Adigor	0.6+3+0.24+0.06+0.075G	93	99	18
CV		3	3	33
LSD (P=0.05)		5	4	11

Bromoxynil and 2,4-D antagonized fenoxaprop more severely than the four-way combination of clopyralid and fluroxypyr with thifensulfuron and tribenuron. Fenoxaprop alone at 1 oz/A provided 98% control of wild oat, but adding bromoxynil and 2,4-D resulted in only 63% control. While the full rate of fenoxaprop was not antagonized by the four-way combination, the reduced rate of fenoxaprop with the four-way broadleaf mix gave only 89% control. Pinoxaden was not antagonized by either broadleaf combination at either rate.

Grass herbicide antagonism with bromoxynil and pyrasulfotole. Kirk Howatt, Ronald Roach, and Janet Harrington. 'Alsen' hard red spring wheat was seeded May 1 near Fargo, ND. Treatments were applied to three- to four-leaf wheat and wild oat on June 5 with 50 F, 47% RH, 0% cloud cover, 8 mph wind and 0°, moist soil and 54 F. Treatments were applied with a backpack sprayer delivering 8.5 gpa at 35 psi through 11001 TT nozzles to a 7 ft wide area the length of 10 by 30 ft plots. The experiment was a randomized complete block design with three replicates.

Treatment	Rate	6/22 Wioa	7/03 Wioa
	oz ai/A	% control	
Propoxycarbazone&mesosulfuron+Basic Blend	0.133+1%	40	37
Prcz&mesosulfuron+brox+Basic Blend	0.133+3.4+1%	53	47
Prcz&mesosulfuron+brox&pyst+Basic Blend	0.133+4+1%	47	43
Flucarbazone+Basic Blend	0.23+1%	57	55
Flucarbazone+bromoxynil+Basic Blend	0.23+3.4+1%	55	57
Flucarbazone+bromoxynil&pyrasulfotole+Basic Blend	0.23+4+1%	55	60
Tralkoxydim-SC+Supercharge+AMS	2.2+0.5%+9.5	78	87
Tralkoxydim-SC+bromoxynil+Supercharge+AMS	2.2+3.4+0.5%+9.5	87	96
Tral-SC+bromoxynil&pyrasulfotole +Supercharge+AMS	2.2+4+0.5%+9.5	85	96
Fenoxaprop	1	92	99
Fenoxaprop+bromoxynil	1+3.4	75	72
Fenoxaprop+ bromoxynil&pyrasulfotole	1+4	80	78
Pinoxaden+Adigor	0.64+0.075G	93	99
Pinoxaden+bromoxynil+Adigor	0.64+3.4+0.075G	93	99
Pinoxaden+ bromoxynil&pyrasulfotole +Adigor	0.64+4+0.075G	90	99
CV		8	8
LSD (P=0.05)		10	10

Propoxycarbazone and mesosulfuron, flucarbazone, tralkoxydim, and pinoxaden control of wild oat was not reduced by the addition of bromoxynil or bromoxynil and pyrasulfotole. Fenoxaprop was antagonized by bromoxynil, resulting in 72% control compared with 99% with fenoxaprop alone. Fenoxaprop control with bromoxynil and pyrasulfotole tended to be greater than with bromoxynil alone likely because the rate of bromoxynil would be less in the combination product.

Wild oat control with the additive In-Place (770-16). Kirk Howatt, Ronald Roach, and Janet Harrington. 'Alsen' hard red spring wheat was seeded May 1 near Fargo, ND. Treatments were applied to three- to four-leaf wheat and wild oat on June 5 with 55 F, 46% RH, 10% cloud cover, 6 mph wind at 0°, and moist soil at 58 F. Treatments were applied with a backpack sprayer delivering 8.5 gpa at 35 psi through 11001 TT nozzles to a 7 ft wide area the length of 10 by 30 ft plots. The experiment was a randomized complete block design with four replicates.

Treatment	Rate	6/22 Wioa	7/03 Wioa
	oz ai/A	% control	
Propoxycarbazone&mesosulfuron+Basic Blend	0.178+1%	71	80
Propoxycarbazone&mesosulfuron +Basic Blend	0.133+1%	71	79
Propoxycarbazone&mesosulfuron +Basic Blend+InPlace	0.133+1%+0.16 FL OZ	71	72
Propoxycarbazone+Basic Blend	0.42+1%	74	85
Propoxycarbazone +Basic Blend	0.31+1%	75	82
Propoxycarbazone +Basic Blend+InPlace	0.31+1%+0.06 FL OZ	74	84
Fenoxaprop+bromoxynil&pyrasulfotole	1+2.25	82	76
Fenoxaprop+bromoxynil&pyrasulfotole+InPlace	1+2.25+5.5 FL OZ	90	85
Untreated	0	0	0
CV		4	4
LSD (P=0.05)		3	3

In Place deposition aid did not increase the control of wild oat with propoxycarbazone and mesosulfuron or propoxycarbazone. In Place did improve the activity of fenoxaprop. Because of the difference in formulation, substantially different rates were recommended for fenoxaprop compared with the other two herbicides. Additional research should address the use rate of In Place with low-volume, dry productsto determine whether the benefit of In Place for fenoxaprop can be extended to dry formulation herbicides.

Wild Oat control with propoxycarbazone and mesosulfuron. Kirk Howatt, Ronald Roach, and Janet Harrington. Alsen' hard red spring wheat was seeded May 1 at Fargo, ND. Treatments were applied to three- to four-leaf wheat and wild oat on June 5 with 48 F, 46% RH, 0% cloud-cover, 7 mph wind at 0°, and moist soil at 52 F. Treatments were applied with a backpack sprayer delivering 8.5 gpa at 35 psi through 11001 TT nozzles to a 7 ft wide area the length of 10 by 30 ft plots. The experiment was a randomized complete block design with three replicates.

Treatment	Rate	6/22 Wioa	7/03 Wioa	7/06 Wioa
	oz ai/A	% control		
Propoxycarbazone&mesosulfuron+MSO	0.178+0.19G	75	91	98
Propoxycarbazone&mesosulfuron+Basic Blend	0.178+1%	73	88	95
Prcz&mess +brox&MCPA5+MSO	0.178+8+0.19G	75	87	95
Prcz&mess +brox&MCPA5+Basic Blend	0.178+8+1%	72	80	95
Prcz&mess +brox&pyrasulfotole+MSO	0.178+3+0.19G	75	88	94
Prcz&mess +brox&pyrasulfotole+MSO+AMS	0.178+3+0.19G+8	55	47	47
Prcz&mess +broxl&pyrasulfotole+Basic Blend	0.178+3+1%	73	80	95
Prcz&mess +clopyralid&fluroxypyr+MCPA+MSO	0.178+3+4+0.19G	78	85	94
Prcz&mess +clopyralid&fluroxypyr+MCPA+Basic Blend	0.178+3+4+1%	72	78	85
Propoxycarbazone&mesosulfuron+Dyne-Amic	0.178+0.5%	60	70	81
Propoxycarbazone&mesosulfuron+NIS+Tri-Fol	0.178+0.25%+0.0156G	70	75	85
Untreated	0	0	0	0
CV		9	6	9
LSD (P=0.05)		9	7	13

Addition of AMS substantially antagonized the control of wild oat, resulting in 47% control compared with 94% for the same combination without the AMS. When comparing adjuvant within herbicide combination, MSO tended to enhance herbicide activity over basic blend. However, MSO and basic blend were both better adjuvants than Dyne-Amic or NIS plus Tri-Fol for control of wild oat with propoxycarbazone and mesosulfuron.

Rimfire for wild oat control in HRSW, Langdon 2007. John Lukach. 'Glenn' hrsw was seeded May 2 at 80 lb/a. Treatments were applied June 1 on 4 leaf wheat and 1-4 leaf wild oats with 5-10/ft². Conditions at 3pm were 72°F, 60%RH, east wind at 9 mph, cloudy and dry foliage. A misting rain right after application was not enough to run off the leaves. A quick 0.02" rain occurred at 5:30pm. A tractor mounted CO2 sprayer with wind shield was used delivering 10 gpa, 40 psi, 4.5 mph, DG8001.5 tips with four 20" spaced nozzles on 25ft plots. The experiment was over-sprayed with Starane 0.67pt on June 5 to control heavy vol. flax and Bronate Advanced, 0.8pt/a, on June 11. The experiment had a RCBD design with four replications.

Treatment	Rate	6-Jun	6-Jun	20-Jun	1-Aug	1-Aug			
	oz/a	Chlro	Inj	Wioa*	Wioa*	Wioa**	Yield	Twt	Ht
		0-9		% Control			bu/a	lb/bu	cm
Rimfire+MSO	1.75+24	1.8	2.8	99	99	98	52	63.3	91
Rimfire+Bronate Adv+MSO	1.75+12.8+24	6.3	5.8	99	95	94	51	63.3	93
Rimfire+Huskie+MSO+AMS	1.75+11+24+0.5lb	3.3	4.3	99	96	91	51	63.3	93
Rimfire+Huskie+Basic Blend	1.75+11+1%	1.3	1.0	99	93	94	50	63.4	95
Rimfire+Huskie+MSO	1.75+11+24	3.5	3.3	99	97	96	50	63.4	92
Rimfire+Bronate Adv+Basic Blend	1.75+12.8+1%	3.5	2.8	98	90	90	50	63.4	93
Rimfire+Basic Blend	1.75+1%	3.0	1.3	99	96	91	50	63.3	94
Rimfire+Widematch+MCPAe+MSO	1.75+16+8+24	5.8	6.3	99	98	96	50	63.5	92
Rimfire+Widematch+MCPAe+Basic Blend	1.75+16+8+1%	2.8	3.0	99	95	93	49	63.4	94
Untreated		0.0	0.0	0	0	0	22	62.0	90
LSD 5%		2.8	2.9	1.1	2.5	2.7	3.8	0.4	2.4
C.V. %		62.3	65.2	0.8	2.0	2.2	5.5	0.5	1.8

Wioa* - plants emerged before June 1 treatments.
Wioa** - Plants emerged after herbicide application which were short (60cm) and green on Aug 1 with a small amount of seed set, about 4/yd2.
MSO – Persist Ultra
Basic Blend – Quad 7

The wild oat at this site demonstrated ALS resistance in adjacent experiments.

Weed control in spring wheat with Rimfire tank mixes. (Jenks, Willoughby, Mazurek). 'Glenn' spring wheat was seeded April 25 at 90 lb/A into 7.5-inch rows in a conventionally tilled field. Herbicide treatments were applied postemergence on June 4 at the 5-leaf wheat stage. Wild oat was about 3-4 leaf and densities averaged 5-10 plants per sq ft. Individual plots were 10 x 30 ft and replicated three times. Rimfire was applied alone or with a broadleaf tank mix partner to evaluate wild oat and broadleaf weed control. The top two Rimfire treatments in the table below
None of the treatments caused any visible crop injury. All treatments provided good to excellent wild oat control as well as broadleaf weed control (pigweed and lambsquarters). All herbicide treatments produced similar wheat yields, which were significantly higher than the untreated check.

		Wioa[b]			Rrpw[b]		Colq[b]		Yield	TW
		----------% control----------							bu/A	lb/bu
Treatment[a]	Rate	Jun 23	Jul 4	Aug 8	Jun 23	Jul 4	Jun 23	Jul 4	Aug 9	Aug 9
Untreated		0	0	0	0	0	0	0	23.2	62.4
[c]Rimfire + MSO	1.75oz + 1.5pt	86	94	98	94	97	98	100	38.6	62.9
[c]Rimfire + Quad 7	1.75oz + 1%	85	95	99	92	95	98	100	37.8	63.2
Rimfire + Bronate + MSO	1.75oz + 0.8pt + 1.5pt	83	89	96	92	92	98	100	39.2	62.7
Rimfire + Bronate + Quad 7	1.75oz + 0.8pt + 1%	85	91	99	93	92	97	100	39.6	62.7
Rimfire + Huskie + MSO	1.75oz + 11 oz + 1.5pt	84	94	99	100	100	100	100	35.4	62.3
Rimfire + Huskie + MSO + Dry AMS	1.75oz + 11 oz + 1.5pt + 0.5lb	93	95	99	100	100	100	100	39.1	62.1
Rimfire + Huskie + Quad 7	1.75oz + 11 oz + 1%	83	91	97	100	100	100	100	37.7	63.1
Rimfire + WideMatch + MCPE + MSO	1.75oz + 1pt + 0.5pt + 1.5pt	83	90	98	88	89	92	100	40.3	63.0
Rimfire + WideMatch + MCPE + Quad 7	1.75oz + 1pt + 0.5pt + 1%	80	88	97	90	90	92	100	38.5	63.7
LSD (0.05)		5.8	5.3	4.6	2.9	4.3	4.7	0	5.7	0.6
CV		4	4	3	2	3	3	0	9	0.6

[a] *Bronate = Bronate Advanced; Treatments were applied at about 5-leaf wheat.*
[b] *Wioa = Wild oat; Rrpw = Redroot pigweed; Colq = Common lambsquarters*
[c] *Bronate was applied 7 days after the Rimfire application in these two treatments to help control broadleaf weeds. All other treatments were applied as a tank mix on June 4.*

Rimfire for wild oat control in durum wheat, Williston 2007. Neil Riveland.

'Divide' durum wheat was planted on re-crop (land cropped to durum wheat in 2006) in 7 inch rows at 90 lbs/a on April 25. All treatments were applied on May 26 with 58 F, 39% RH, 90% clear sky and wind at 2-5mph from 271 degrees to 3.5-4 leaf wheat and 2-4 leaf wild oats (Wioa); 69%5. We used a small plot in the 3-4 leaf stage and 25% in the 5 leaf stage. Soil temperature was 64 F. We used a sprayer with wind cones, mounted on a G-Allis Chalmers tractor to apply the treatments, delivering 10 gals/a at 40 psi through 8001vs flat fan nozzles to a 6.67 ft wide area the length of 10 by 30 ft plots. First rain received after application was 0.97 inches on May 30. Experimental design was a randomized complete block design with three replications. Wild oat density averaged 8-12 plant/ft2. Plots were evaluated for crop injury wild oat control on June 19, July 6 and August 9. Durum was machine harvested for yield on August 16.

Treatment[a]	Product Rate	% Crop Injury			Test Weight	Yield	— Wioa control —			Plant Height
	oz/a	June	July	Aug	lb/b	bus/A	6/19	7/6	8/9	inches
								%		
Untreated Check	0	0	0	0	60.3	27.8	0	0	0	34.5
Rimfire+MSO	1.75+24	0	15	10	60.4	52.9	80	91	95	32.7
Rimfire+Basic Blend (BB)	1.75+1%	0	8	3	59.4	51.0	90	99	99	33.7
Rimfire+Bronate Advanced+MSO	1.75+12.8+24	0	13	10	60.7	53.8	76	92	94	34.3
Rimfire+Bronate Advanced+BB	1.75+12.8+1%	0	5	7	60.8	51.1	85	97	98	34.8
Rimfire+Huskie+MSO	1.75+11+24	0	8	7	61.3	50.8	78	95	96	33.6
Rimfire+Huskie+MSO+Dry AMS	1.75+11+24+8	0	8	8	61.1	47.8	89	99	99	34.4
Rimfire+Huskie+Basic Blend	1.75+11+1%	0	10	2	60.0	47.6	73	92	91	33.2
Rimfire+WideMatch+MCPA+MSO	1.75+16+8+24	0	0	0	57.9	49.9	96	96	96	35.4
Rimfire+WideMatch+MCPA+BB	1.75+16+8+1%	0	3	5	59.9	53.3	95	99	99	34.1
HIGH MEAN			15	10	61.3	53.8	96	99	99	35.4
LOW MEAN			0	0	57.9	27.8	0	0	0	32.7
EXP MEAN			7	5	60.2	48.6	76	86	87	34.1
C.V. %			85	133	1.8	15.9	13	4	4	4.0
LSD 5%			NS	NS	NS	13.2	17	6	7	NS
LSD 1%			NS	NS	NS	NS	23	8	9	NS
# OF REPS					3	3	3	3	3	3
F-TRT			2		2.4	2.9	24	246	189	1.0

[a] - MSO is a methylated seed oil from Loveland
Quad 7 from Agsco was used as the basic pH blend adjuvant.

Summary: No early crop injury was observed or recorded for any treatment. Later crop injury ratings were based on visual plant height differences. However no plant height differences were measure at harvest when plant height measurements were taken. Very good control of wild oats was attained with all treatments by July 6. Ratings on June 19 indicate that when only MSO is used as the adjuvant in combination with Huskie and Bronate Advanced, wild oat control is delayed compared to other treatments. The Wide Match treatment with MSO had relatively low test weight.

Vild oat control with thifensulfuron and tribenuron tank-mixes. Kirk Howatt, Ronald Roach, and Janet Harrington. \lsen' hard red spring wheat was seeded May 1 at Fargo, ND. Treatments were applied to three- to four-leaf wheat and /ild oat on June 5 with 59 F, 38% RH, 5% cloud-cover, 5 mph wind at 315°, and moist soil at 60 F. Treatments were pplied with a backpack sprayer delivering 8.5 gpa at 35 psi through 11001 TT nozzles to a 7 ft wide area the length of 10 y 30 ft plots. The experiment was a randomized complete block design with four replicates. In addition to vegetative /heat injury and wild oat control, injury to wheat heads was evaluated post emergence from the sheath.

Treatment	Rate	6/22 Wioa	7/03 Wioa	7/20 Head	8/06 Wioa	8/07 Yield
	oz ai/A			%		bu/A
ropoxycarbazone&mesosulfuron+brox&MCPA5+BB	0.178+8+1%	75	84	0	90	13
rcz&mess+bromoxynil&MCPA5+Basic Blend	0.229+8+1%	76	92	0	96	13
rcz&mess+brox&MCPA5+thifensulfuron-sg+trib-sg+BB	0.178+8+0.32+0.08+1%	74	86	0	90	15
rcz&mess+brox&MCPA5+thif-sg+tribenuron-sg+BB	0.178+8+0.2+0.2+1%	77	89	0	95	18
rcz&mess+brox&MCPA5+thif-sg+trib-sg+BB	0.229+8+0.32+0.08+1%	80	93	0	95	13
rcz&mess+brox&MCPA5+thif-sg+trib-sg+BB	0.229+8+0.2+0.2+1%	79	89	0	93	13
inoxaden+Aminopyralid&fluroxypyr+Adigor	0.86+2.24+0.075G	96	99	0	99	12
xdn+Ampy&fluroxypyr+thif-sg+trib-sg+Adigor	0.86+2.24+0.32+0.08+0.075G	95	99	0	99	13
xdn+Ampy&fluroxypyr+thif-sg+trib-sg+Adigor	0.86+2.24+0.2+0.2+0.075G	94	99	0	98	11
Intreated		0	0	0	0	6
;V		5	3	0	3	32
SD (P=0.05)		5	4	0	4	6

reatments did not cause injury to wheat vegetation (data not shown) or heads. Addition of thifensulfuron and tribenuron improve broadleaf weed control and weed spectrum did not reduce wild oat control with propoxycarbazone and esosulfuron or pinoxaden in this study.

Wild oat control with Affinity TM and Affinity BS tank mixed with Rimfire or Axial. (Jenks, Willoughby, Mazurek). 'Glenn' spring wheat was seeded April 25 at 90 lb/A into 7.5-inch rows in a conventionally tilled field. Herbicide treatments were applied postemergence on June 4 at the 5-leaf wheat stage. Wild oat were in the 3- to 4-leaf stage and densities averaged 5-10 plants per sq ft. Individual plots were 10 x 30 ft and replicated three times.

No crop injury was observed with any treatment. Faster herbicidal activity was observed with Axial compared to Rimfire, which is typical of ACCase vs. ALS inhibitors. Approximately 3 weeks after treatment, wild oat control with Rimfire treatments ranged from 60-67%, while control with Axial was 94-97%. However, by mid-July wild oat control was similar for all treatments (>96%). Despite the slower activity on wild oat, wheat yields with Rimfire were similar to Axial treatments. Grass control antagonism was minimal with any broadleaf tank mix partner. Including Affinity BS as a broadleaf tank mix partner resulted in similar wild oat control to Bronate Advanced and averaged only 1-6% lower wild oat control compared to Affinity TM.

There were low densities of quackgrass in the study area. Rimfire provided good quackgrass control, whereas, Axial had no activity on quackgrass.

		Wheat		Wild oat		Yield	TW
		---% injury---		--% control--		bu/A	lb/bu
		Jun	Jul	Jun	Jul	Aug	Aug
Treatment[ab]	Rate	15	16	26	16	16	16
Untreated Check		0	0	0	0	9.1	52.1
Rimfire + Bronate	1.75oz + 0.8pt	0	0	60	96	35.9	63.3
Rimfire + Bronate	2.25oz + 0.8pt	0	0	63	98	35.5	62.6
Rimfire + Affinity TM + Bronate	1.75oz + 0.8oz + 0.8pt	0	0	65	96	36.5	63.4
Rimfire + Affinity BS + Bronate	1.75oz + 0.8oz + 0.8pt	0	0	62	97	36.1	63.1
Rimfire + Affinity TM + Bronate	2.25oz + 0.8oz + 0.8pt	0	0	67	97	37.9	62.9
Rimfire + Affinity BS + Bronate	2.25oz + 0.8oz + 0.8pt	0	0	61	98	38.7	63.3
Axial + Adigor + CleanWave	8.2fl oz + 9.6fl oz + 1.12pt	0	0	97	98	37.6	63.4
Axial + Affinity TM + CleanWave	8.2fl oz + 0.8oz + 9.6fl oz + 1.12pt	0	0	96	98	34.5	63.0
Axial + Affinity BS + CleanWave	8.2fl oz + 0.8oz + 9.6fl oz + 1.12pt	0	0	94	97	39.5	63.2
LSD (0.05)		0	0	3	2.6	7.4	9.6
CV		0	0	3	2	13	9

[a] *Bronate = Bronate Advanced; All Rimfire treatments were applied with NIS (0.25% v/v); All Axial treatments were applied with Adigor (9.6fl oz/A).*

[b] *Treatments were applied at 5-leaf wheat stage.*

Antagonism of ALS inhibitor control of wild oat. Kirk Howatt, Ronald Roach, and Janet Harrington. 'Alsen' hard red spring wheat was seeded May 1 near Fargo, ND. Treatments were applied to three-leaf wheat and wild oat on June 5 with 64 F, 32% RH, 10% cloud-cover, 2 mph wind at 315°, and moist soil at 61 F. Treatments were applied with a backpack sprayer delivering 8.5 gpa at 35 psi through 11001 TT nozzles to a 7 ft wide area the length of 10 by 30 ft plots. The experiment was a randomized complete block design with three replicates.

Treatment	Rate	6/22 Wioa	7/03 Wioa
	oz ai/A	% control	
Flucarbazone+Basic Blend	0.35+1%	77	93
Flucarbazone+Basic Blend	0.28+1%	75	91
Flucarbazone+bromoxynil&2,4-D+Basic Blend	0.35+9+1%	72	83
Flucarbazone+bromoxynil&2,4-D+Basic Blend	0.28+9+1%	72	85
Flucarbazone+clopyralid&fluroxypyr+thif-sg+trib-sg+Basic Blend	0.35+3+0.24+0.06+1%	77	91
Flucarbazone+clopyralid&fluroxypyr+thif-sg+trib-sg+Basic Blend	0.28+3+0.24+0.06+ 1%	72	88
Propoxycarbazone&Mesosulfuron+Basic Blend	0.178+1%	68	82
Propoxycarbazone&Mesosulfuron+Basic Blend	0.14+1%	70	75
Prcz&mess+bromoxynil&2,4-D+Basic Blend	0.178+9+1%	72	78
Prcz&mess +bromoxynil&2,4-D+Basic Blend	0.14+9+1%	68	68
Prcz&mess +clpy&fluroxypyr+thif-sg+trib-sg+Basic Blend	0.178+3+0.24+ 0.06+ 1%	72	73
Prcz&mess +clopyralid&flox+thif-sg+trib-sg+Basic Blend	0.14+3+ 0.24+ 0.06+ 1%	72	68
CV		4	5
LSD (P=0.05)		5	7

Bromoxynil and 2,4-D tended to antagonize control of wild oat with flucarbazone. Propoxycarbazone and mesosulfuron was antagonized by the combination of clopyralid and fluroxypyr with thifensulfuron and tribenuron on 7/03. Flucarbazone provided better wild oat control than propoxycarbazone and mesosulfuron, 93% control compared with 82% control, respectively.

Wild oat control with GF-1847 and GF-1848. Kirk Howatt, Ronald Roach, and Janet Harrington. 'Alsen' hard red spring wheat was seeded May 1 at Fargo, ND. Treatments were applied to three- to four-leaf wheat and wild oat on June 5 with 58 F, 36% RH, 10% cloud-cover, 2 mph wind at 315°, and moist soil at 58 F. Treatments were applied with a backpack sprayer delivering 8.5 gpa at 35 psi through 11001 TT nozzles to a 7 ft wide area the length of 10 by 30 ft plots. The experiment was a randomized complete block design with four replicates.

		6/22	7/03	8/06	8/07
Treatment	Rate	Wioa	Wioa	Wioa	Yield
	oz ai/a		% control		bu/A
GF-1848+NIS+AMS	1.26+0.5%+24	70	86	95	25
GF-1847+PO	0.16+0.8%	75	89	88	16
GF-1848+NIS	1.68+0.5%	70	87	89	25
GF-1848+NIS+AMS	1.68+0.5%+24	79	93	96	17
GF-1848+PO	1.68+0.8%	70	85	93	23
GF-1848+MSO	1.68+0.8%	73	94	96	19
GF-1847+NIS	0.21+0.5%	77	88	95	20
GF-1847+NIS+AMS	0.21+0.5%+24	69	89	92	21
GF-1847+PO	0.21+0.8%	75	89	96	22
GF-1674+PO	0.21+0.8%	72	80	87	16
GF-1847+MSO	0.21+0.8%	75	92	96	27
GF-1847+2,4-D	0.21+6	67	72	84	22
GF-1847+PO	0.26+0.8%	75	90	94	25
GF-1848	1.68	75	88	96	21
GF-1847	0.21	69	81	91	25
Pinoxaden+clopyralid&fluroxypyr+MCPA+Adigor	0.86+3+6+0.075G	93	99	99	22
Fenxoxaprop+bromoxynil&MCPA5	1.32+8	20	10	7	9
Clodinafopp-ng+thifensulfuron+tribenuron	0.8+0.15+0.15	94	99	99	20
Flucarbazone+2,4-D	0.28+6	66	75	79	15
Propoxycarbazone&mesosulfuron+NIS+AMS	0.178+0.25%+24	70	76	89	22
Untreated	0	0	0	0	13
CV		7	8	7	31
LSD (P=0.05)		6	9	8	10

Slight variation in control occurred among GF-1847 and GF-1848 treatments, but control essentially was similar for treatments including these herbicides. Antagonism from 2,4-D to GF-1847 became apparent 7/03. MSO was a good adjuvant for controlling wild oat with either product, resulting in similar control to pinoxaden or clodinafop by 7/03. NIS plus AMS also gave good enhancement of herbicide activity.

Wild oat control with difenzoquat and adjuvants. Kirk Howatt, Ronald Roach, and Janet Harrington. 'Alsen' hard red spring wheat was seeded May 1 near Fargo, ND. Treatments were applied to three- to four-leaf wheat and wild oat on June 5 with 58 F, 46% RH, 5% cloud-cover, 4 mph wind at 0°, and moist soil at 55 F. Treatments were applied with a backpack sprayer delivering 8.5 gpa at 35 psi through 11001 TT nozzles to a 7 ft wide area the length of 10 by 30 ft plots. The experiment was a randomized complete block design with four replicates.

Treatment	Rate	6/22 Wioa	7/03 Wioa
	oz ai/A	% control	
Difenzoquat	12	66	74
Difenzoquat+Basic Blend	12+1%	70	76
Difenzoquat+NIS	12+0.25%	62	71
Difenzoquat+NIS+UAN	12+0.25%+2.5%	66	75
Difenzoquat+PO	12+0.25G	71	82
Difenzoquat+PO+UAN	12+0.25G+2.5%	67	80
Difenzoquat+MSO	12+0.125G	64	76
Difenzoquat+MSO+UAN	12+0.125G+2.5%	74	85
Difenzoquat+Renegade	12+0.125G	69	85
Difenzoquat+Sylgard 309	12+0.25%	70	82
Difenzoquat+Syl-tac	12+0.5%	69	86
CV		6	4
LSD (P=0.05)		6	5

Difenzoquat control of wild oat on 6/22, 66%, was improved to 74% with the addition of MSO and UAN. This enhancement continued through the evaluation on 7/03. At this evaluation, Renegade, an MSO basic blend, and Syl-tac, an MSO plus organosilicone surfactant, also enhanced difenzoquat activity to 85 and 86%, respectively. However, difenzoquat with MSO only gave 76% control.

Wheat response to KIH-485 and tembotrione applied preemergence. Kirk Howatt, Ronald Roach, and Janet Harrington. 'Alsen' hard red spring wheat was seeded May 14 near Fargo, ND. Treatments were applied preemergence on May 18 with 65 F, 47% RH, 5 to 10% cloud-cover, 8 to 9 mph wind at 180°, and dry soil at 60 F. Treatments were applied with a backpack sprayer delivering 8.5 gpa at 40 psi through 11002.TT nozzles to a 7 ft wide area the length of 10 by 30 ft plots. The experiment was a randomized complete block design with four replicates.

Treatment	Rate	6/13 Wht	6/28 Wht	6/28 Yeft
	oz ai/A			
KIH-485	1	0	0	92
KIH-485	1.5	0	0	95
KIH-485	2	0	0	96
KIH-485	2.8	0	0	98
KIH-485	3.5	0	8	99
Tembotrione	2	0	0	97
Tembotrione	4	0	0	98
Flucarbazone	0.28	0	9	89
Untreated	0	0	0	0
CV		0	42	2
LSD (P=0.05)		0	1	2

Treatments did not cause injury to wheat on 6/13. On 6/28, KIH-485 at 3.5 oz/A and flucarbazone caused 8 and 9% injury to wheat, respectively. Foxtail control with all herbicide treatments was exceptional at 89% or greater. KIH-485 and tembotrione provided better control than flucarbazone. The study was terminated because of injury related to standing water and saturated soil.

Yellow foxtail control in HRS wheat with Everest, Carrington, 2007. (Greg Endres). The experiment was conducted at the NDSU Carrington Research Extension Center on a Heimdahl loam soil containing 47% sand, 36% silt, and 17% clay with 6.2 pH and 3.2% organic matter. The experimental design was a randomized complete block with three replicates. 'Glenn' HRS wheat was seeded May 10, 2007 on conventionally-tilled ground that produced soybean in 2006. Herbicide treatments were applied with a CO_2-hand-boom plot sprayer delivering 10 gal/A at 35 psi through 8001 flat fan nozzles to the center 6.7 ft of 10 by 25 ft plots. PRE treatments were applied on May 4 with 61 F, 85% RH, 100% cloudy sky, and 13 mph wind. Rainfall totaled 1.09 inches on May 5. EPOST treatments were applied on May 24 with 43 F, 87% RH, clear sky, and 4 mph wind to 2-leaf wheat and 2- to 3-leaf yellow foxtail. Average foxtail density in untreated plots on May 25 was 16 plants/ft^2. POST treatments were applied on June 8 with 58 F, 65% RH, clear sky, and 11 mph wind to 4.5-leaf wheat and 1- to 4-leaf yellow foxtail. Average wheat density in untreated plots on June 8 was 42 plants/ft^2 and average foxtail density was 21 plants/ft^2. The LPOST treatment was applied on June 13 with 65 F, 96% RH, 10% clear sky; and 8 mph wind to 5-leaf wheat and $\leq$4-leaf yellow foxtail. The trial was harvested with a plot combine on August 16.

PRE treatments did not control yellow foxtail and injury did not occur to wheat when visually evaluated on May 25 (Table). Yellow foxtail control generally was poor (15 to 70%) with POST Everest treatments. Puma provided 70 to 91% control of yellow foxtail. Wheat injury, consisting of biomass reduction, with POST Everest ranged from 16 to 40% on June 8. Crop response significantly declined later in the season. Plant height at maturity was less with PRE Everest and Everest plus basic blend compared to the untreated check. Wheat treated with herbicides tended to have higher yield compared to the untreated check.

Table.

Herbicide			Yellow foxtail control				Wheat injury				Wheat	
Treatment[1]	Application timing[2]	product/A	5/25	6/8	6/29	7/30	5/25	6/8	6/29	7/30	Plt ht	Yield
			%				%				inch	bu/A
Untreated check			0	0	0	0	0	0	0	0	92	31.1
Everest/Bronate Advanced	PRE/ EPOST	0.41 oz/12.8 fl oz	10	70	42	49	0	0	0	0	86	36.7
Everest/Everest + Bronate Advanced	PRE/ EPOST	0.20 oz/0.20 oz + 12.8 fl oz	10	67	33	50	0	16	3	0	89	34.2
Everest/Everest + Bronate Advanced	PRE/ EPOST	0.31 oz/0.20 oz + 12.8 fl oz	0	70	48	43	0	27	4	0	90	38.4
Everest/Everest + Bronate Advanced	PRE/ EPOST	0.41 oz/0.20 oz + 12.8 fl oz	15	69	38	15	0	33	5	1	88	35.8
Everest + Bronate Advanced	EPOST	0.41 oz + 12.8 fl oz	x	58	43	43	x	22	2	0	88	37.6
Puma + Bronate Advanced	POST	10.5 + 12.8 fl oz	x	x	73	70	x	x	0	0	91	40.2
Everest + Basic Blend/Bronate Advanced	EPOST/ POST	0.6 oz + 1%/12.8 fl oz	x	66	60	62	x	40	9	3	85	33.2
Rimfire + Basic Blend/Bronate Advanced	EPOST/ POST	1.75 oz + 1% v/v + 12.8 fl oz	x	47	57	48	x	5	2	0	88	37.7
Puma/Bronate Advanced	EPOST/ POST	10.5/12.8 fl oz	x	83	83	84	x	0	0	0	94	40.4
Bronate Advanced/Puma	POST/ LPOST	12.8/10.5 fl oz	x	x	93	91	x	0	1	0	88	37.4
C.V. (%)			254	12	20	32	0	36	83	126	3	10
LSD (0.05)			NS	13	17	27	NS	9	3	1	5	NS

[1]Basic Blend=Quad7.

[2]PRE=May 14; EPOST=May 24; POST=June 8; LPOST=June 13.

Foxtail control in HRS wheat, Carrington, 2007. (Kirk Howatt and Greg Endres) Experimental design was a randomized complete block with three replicates. 'Glenn' HRS wheat was seeded May 12, 2007 on conventionally-tilled ground. Herbicide treatments were applied with a CO_2-hand-boom plot sprayer delivering 10 gal/A at 35 psi through 8001 flat fan nozzles to the center 6.7 ft of 10 by 25 ft plots. POST treatments were applied on June 4 with 63 F, 71% RH, 75% clear sky, and 4 mph wind to 3-leaf wheat and 1- to 4-leaf yellow and green foxtail. Average foxtail density on June 5 was 4 plants/ft^2. The trial was harvested with a plot combine on August 16.

Foxtail control was excellent (91-94%) with Vexp3, fenoxaprop at 1.32 oz, clodinafop and pinoxaden when visually evaluated on July 17 (Table). Plant chlorosis was detected when visually evaluated 4 days after application of most herbicides, with highest scores associated with pinoxaden and difenzoquat. Wheat yield was low with difenzoquat, due to little weed control and high crop injury.

Table.

Herbicide		Foxtail control[1]		Wheat injury[2]		Wheat	
Treatment	Rate	6/21	7/17	6/8	7/17	Yield	Test weight
	oz ai/A	%		%		bu/A	lb/bu
Mess+Brox&MCPA5+MSO	0.036+8+1%	77	20	3	2	48.8	58.7
Flucarbazone+Brox&MCPA5+Basic Blend	0.32+8+1%	83	77	2	4	43.1	58.6
Prcz&Mess+Brox&MCPA5+Basic Blend	0.178+8+1%	85	47	3	1	33.2	59.5
Immb+Brox&MCPA5+Basic Blend	5+8+1%	89	43	3	7	47.5	58.4
Prcz+Brox&MCPA5+Basic Blend	0.32+8+1%	92	47	1	2	34.0	58.3
Vexp1+Brox&MCPA5+NIS	0.21+8+0.25%	96	83	2	3	44.2	60.2
Vexp3+NIS	1.68+0.25%	94	91	1	0	42.4	60.0
Tral-SC+Brox&MCPA5+Supercharge+AMS	2.9+8+0.5%+9.5	96	87	0	4	36.7	59.5
Fenoxaprop+Brox&MCPA5	0.8+8	78	82	1	0	44.4	60.2
Fenoxaprop+Brox&MCPA5	1.32+8	93	94	0	0	39.7	59.1
Clodinafop+Brox&MCPA5	0.8+8	95	91	1	0	49.6	60.6
Pinoxaden+Brox&MCPA5+Adigor	0.86+8+0.075G	97	93	4	0	41.2	59.0
Difenzoquat+Brox&MCPA5	16+8	23	7	4	35	17.8	56.5
Untreated check	0	0	0	0	0	46.7	60.4
C.V. (%)		6.3	9.7	37.7	71.7	17.4	2.7
LSD (0.05)		8	10	1	5	11.9	NS

[1]Foxtail=Yellow and green.

[2]Chlorosis on June 8= 0 (green) to 9 (yellow-brown); % biomass reduction on July 17.

Foxtail control in HRS wheat with Axial XL, Carrington, 2007. (Greg Endres) Experimental design was a randomized complete block with three replicates. 'Steele-ND' HRS wheat was seeded May 14, 2007 on conventionally-tilled ground. Herbicide treatments were applied with a CO_2-hand-boom plot sprayer delivering 10 gal/A at 35 psi through 8001 flat fan nozzles to the center 6.7 ft of 10 by 25 ft plots. POST treatments were applied on June 13 with 66 F, 94% RH, 5% clear sky, and 2 mph wind to 4- to 5-leaf wheat and 3- to 4-leaf yellow and green foxtail. Average foxtail density on June 13 was 6 plants/ft^2. The trial was harvested with a plot combine on August 16.

Foxtail control was excellent (93-99%) with Axial XL alone or with broadleaf herbicide tank mixtures (Table). Minor plant chlorosis was detected when visually evaluated 5 days after herbicide application, but no injury was noted on June 29 (data not shown). Wheat yield and test weight were similar among all treatments including the untreated check. This was likely due to a competitive wheat stand and generally low foxtail density.

Table.

Herbicide		Foxtail control[1]			Wheat injury[2]	Wheat	
Treatment[3]	product/A	6/29	7/9	7/30	6/18	Yield	Test weight
		%			%	bu/A	lb/bu
Axial XL	16.4	99	98	97	2	42.0	58.3
Axial XL + Bronate Advanced	16.4 + 12.8	97	98	98	2	39.9	58.4
Axial XL + Bronate Advanced + Tilt	16.4 + 12.8 + 2	96	98	97	2	42.8	59.4
Axial XL + WideMatch + MCPAe	16.4 + 16 + 8	96	98	97	2	37.2	59.1
Axial XL + Affinity TM + MCPAe	16.4 + 0.6 oz + 8	94	96	93	1	37.1	58.5
Everest + Bronate Advanced	0.6 oz + 12.8	67	73	75	2	38.6	58.4
Rimfire + Bronate Advanced + MSO	2.25 oz + 12.8 + 24	67	72	70	3	39.9	59.3
Untreated check		0	0	0	0	39.9	58.9
C.V. (%)		2.5	3.4	4.5	40.9	10.5	1.1
LSD (0.05)		4	5	6	1	NS	NS

[1]Foxtail=Yellow and green.

[2]Chlorosis= 0 (green) to 9 (yellow).

[3]MSO=Destiny, a methylated seed oil from WinField; POST=June 13.

Yellow foxtail control with Pinoxaden. Kirk Howatt, Ronald Roach, and Janet Harrington. 'Alsen' hard red spring wheat was seeded May 14 near Fargo, ND. Treatments were applied to three- to four-leaf wheat and 3 to 4 leaf yellow foxtail on June 22 with 90 F, 32% RH, 0% cloud-cover, 0 to 1 mph wind at 135°, and damp to moist soil at 76 F. Treatments were applied with a backpack sprayer delivering 8.5 gpa at 35 psi through 11001 TT nozzles to a 7 ft wide area the length of 10 by 30 ft plots. The experiment was a randomized complete block design with four replicates.

Treatment	Rate	6/29 Wht	7/09 Yeft	7/23 Yeft
		% inj	% control	
Pinoxaden+Adigor	0.86+0.075 G	0	92	96
Pinoxaden + bromoxynil &MCPA5+Adigor	0.86+8+0.075 G	0	84	87
Pinoxaden +thif-sg+trib-sg+MCPA+Adigor	0.86+0.24+0.06+4+0.075 G	0	89	90
Pinoxaden +clopyralid&flox+MCPA+Adigor	0.86+3+4+0.075 G	0	93	94
Pinoxaden +thifensulfuron-sg+MCPA+Adigor	0.86+0.23+4+0.075G	0	82	79
Pinoxaden +thifensulfuron-sg+flox+Adigor	0.86+0.23+1+0.075G	0	85	84
Pinoxaden +clopyralid&MCPA+Adigor	0.86+9.5+0.075G	0	89	85
Pinoxaden +tribenuron-sg+MCPA+Adigor	0.86+0.19+4+0.075G	0	86	79
Pinoxaden +2,4-D+thifensulfuron-sg+Adigor	0.86+4+0.15+0.075G	0	85	81
Pinoxaden + bromoxynil &MCPA+Adigor	0.86+8+0.075G	0	91	90
Pinoxaden + bromoxynil &2,4-D+Adigor	0.86+9+0.075G	0	89	88
Pinoxaden +carfentrazone+MCPA+Adigor	0.86+0.125+4+0.075G	0	90	85
Flucarbazone+bromoxynil &MCPA5+Basic Blend	0.42+8+1%	15	81	74
Propoxycarbazone&mess+brox&MCPA5+MSO	0.178+8+0.19G	0	45	0
Mesostrione+ bromoxynil &MCPA5+MSO	0.035+8+0.19G	0	42	0
Fenoxaprop+ bromoxynil &MCPA5	0.8+8	0	91	93
Untreated	0	0	0	0
CV		112	4	3
LSD (P=0.05)		1	5	3

Pinoxaden alone provided 92 and 96% control of yellow foxtail on 7/09 and 7/23, respectively. Foxtail control on 7/23 was not antagonized by the addition of clopyralid and fluroxypyr plus MCPA. All other broadleaf herbicide tank-mixes with pinoxaden gave less control than pinoxaden alone. The greatest antagonism of pinoxaden was caused by thifensulfuron plus MCPA or tribenuron plus MCPA, each resulting in 79% control.

Foxtail control with Flucarbazone and adjuvants. Kirk Howatt, Ronald Roach, and Janet Harrington. "Alsen" hard red spring wheat was seeded May 14, near Fargo, ND. Treatments were applied to 3 to 4 leaf wheat, flowering wild mustard, 3 to 4 leaf yellow foxtail, 6 inch wild buckwheat, and 3 to 4 leaf common lambsquarters on June 22 with 85 F, 49% RH, 0% cloud-cover, 1 to 2 mph wind at 135 , and damp to moist soil at 76 F. Treatments were applied with a backpack sprayer delivering 8.5 gpa at 35 psi through 11001 TT nozzles to a 7 ft wide area the length of 10 by 30 ft plot. The experiment was a randomized complete block design with four replicates.

Treatment	Rate	6/29 Wht	7/09 Wht	7/09 Yeft	7/25 Yeft
	oz ai/A	%	%	%	%
Flucarbazone	0.35	7	9	77	74
Flucarbazone +Destiny+N-Pak	0.35+1%+2.5%	19	29	85	89
Flucarbazone +PrimeOil+N-Pak	0.35+1%+2.5%	17	29	85	89
Flucarbazone +SuperbHC+N-Pak	0.35+1%+2.5%	20	34	84	85
Flucarbazone +Newtone	0.35+1%	14	22	84	76
Flucarbazone +AG05006+N-Pak	0.35+0.5%+2.5%	17	20	82	72
Flucarbazone +AG05006+N-Pak	0.35+1%+2.5%	13	20	85	82
Flucarbazone +AG05055	0.35+1.5%	11	16	81	72
Flucarbazone +AG05055	0.35+2.5%	9	10	84	69
Flucarbazone +AG07041	0.35+2.5%	11	17	84	71
Flcz+AG07042+N-Pak	0.35+0.5%+2.5%	12	17	84	72
CV		33	45	3	5
LSD (P=0.05)		5	10	3	4

Substantial injury to wheat with flucarbazone persisted through the season. Wheat injury was intensified by the addition of adjuvants except with AG07041 or AG07042. Adjuvants provided similar enhancement of flucarbazone activity on 7/09. The greatest enhancement of flucarbazone activity on 7/25 occurred with Destiny, PrimeOil, and SuperbHC; however, these caused the greatest increase in wheat injury also.

Yellow foxtail control with GF-1847 and GF-1848. Kirk Howatt, Ronald Roach, and Janet Harrington. 'Alsen' hard red spring wheat was seeded May 14 near Fargo, ND. Treatments were applied to three- to four-leaf wheat and two-leaf yellow foxtail at 10 plants per yd^2 on June 22 with 88 F, 35% RH, 0% cloud-cover, 4 to 5 mph wind at 135°, and moist soil at 73 F. Treatments were applied with a backpack sprayer delivering 8.5 gpa at 35 psi through 11001 TT nozzles to a 7 ft wide area the length of 10 by 30 ft plots. The experiment was a randomized complete block design with four replicates.

Treatment	Rate	6/28 Wht	7/09 Yeft	7/23 Yeft	7/13 Yield
	oz ai/A	% inj	— % control —		bu/A
GF-1848+NIS+AMS	1.26+0.5%+24	0	87	90	31
GF-1847+PO	0.16+0.8%	0	92	95	37
GF-1848+NIS	1.68+0.5%	0	82	89	33
GF-1848+NIS+AMS	1.68+0.5%+24	0	92	92	35
GF-1848+PO	1.68+0.8%	0	91	92	34
GF-1848+MSO	1.68+0.8%	0	90	91	32
GF-1847+NIS	0.21+0.5%	0	86	86	33
GF-1847+NIS+AMS	0.21+0.5%+24	0	81	89	32
GF-1847+PO	0.21+0.8%	0	86	91	36
GF-1674+PO	0.21+0.8%	0	89	91	32
GF-1847+MSO	0.21+0.8%	0	91	92	31
GF-1847+Flcz+NIS	0.21+0.07+0.5%	0	91	92	34
GF-1847+PO	0.26+0.8%	0	84	81	34
GF-1848	1.68	0	84	82	34
GF-1847	0.21	0	84	82	33
Pinoxaden+clopyralid&fluroxypyr+MCPA+Adigor	0.86+3+6+0.075G	0	92	91	36
Fenoxaprop+bromoxynil&MCPA5	0.66+8	0	89	90	38
Clodinafop-ng+thifensulfuron-sg+tribenuron-sg	0.8+0.15+0.15	0	87	87	33
Flcz+2,4-D	0.28+6	0	84	72	37
Untreated	0	0	0	0	32
CV		0	4	4	13
LSD (P=0.05)		0	5	5	7

Treatments did not cause injury to wheat. Wheat competition helped reduce the survival of yellow foxtail. On 7/23, GF-1847 and GF-1848 generally provided similar control of foxtail to ACCase-inhibiting herbicides and better control than flucarbazone.

Yellow foxtail control with GF-1847 and adjuvants. Kirk Howatt, Ronald Roach, and Janet Harrington. 'Alsen' hard red spring wheat was seeded May 14 near Fargo, ND. Treatments were applied to three- to four-leaf wheat and two- to three-leaf yellow foxtail on June 22 with 88 F, 46% RH, 0% cloud-cover, 5 mph wind at 135°, and moist soil at 70 F. Treatments were applied with a backpack sprayer delivering 8.5 gpa at 35 psi through 11001 TT nozzles to a 7 ft wide area the length of 10 by 30 ft plots. The experiment was a randomized complete block design with four replicates.

		7/29		8/23
Treatment	Rate	Wht	Yeft	Yeft
	oz ai/A	% inj	% control	
GF-1847	0.21	1	84	76
GF-1847+Destiny+N-Pak	0.21+1%+2.5%	4	90	89
GF-1847+PrimeOil+N-Pak	0.21+1%+2.5%	4	91	90
GF-1847+SuperbHC+N-Pak	0.21+0.5%+2.5%	5	91	90
GF-1847+Newtone	0.21+1%	6	90	92
GF-1847+AG05006+N-Pak	0.21+0.5%+2.5%	4	91	91
GF-1847+AG05006+N-Pak	0.21+1%+2.5%	6	90	89
GF-1847+AG05055	0.21+1.5%	2	91	89
GF-1847+AG05055	0.21+2.5%	4	91	94
GF-1847+AG07041	0.21+2.5%	0	91	91
GF-1847+AG07041+N-Pak	0.21+0.5%+2.5%	4	90	86
CV		93	3	3
LSD (P=0.05)		4	2	3

Wheat injury with GF-1847 generally increased with the addition of adjuvant, but injury did not exceed 6% and dissipated as the season progressed. Yellow foxtail control with GF-1847, 84%, was increased by each adjuvant to 90 to 91% on 7/23. The best control on 8/23 was with AG05055 at 2.5% as the adjuvant for GF-1847.

Evaluation of Everest Herbicide for Tough Grassy Weed Control in HRSW

Eric Eriksmoen, Hettinger, ND

'Reeder' HRSW was seeded on May 1. Pre-emergence (PRE) treatments were applied on May 8 to one leaf wild oats (wiot) and to one leaf Japanese brome (jabr) with 60° F, 60% RH, clear sky and west wind at 5 mph. Post emergence (POST) treatments were applied on May 24 to 3 ½ leaf wheat and to 4 leaf wild oat, 2 leaf Persian darnel (peda) and to 5 leaf Japanese brome with 58° F, 38% RH, mostly clear sky and NW wind at 9 mph. Treatments were applied with a tractor mounted CO_2 propelled plot sprayer delivering 10 gpa at 30 psi through PK-01E80 nozzles to a 5 foot wide area the length of 10 by 28 foot plots. The trial was sprayed with 16 oz/acre Buctril + 8 oz/A Starane to control broadleaf weeds on May 28. The trial was a randomized complete block design with four replications. Wild oat, Persian darnel and Japanese brome populations averaged 2, 18 and 5 plants per square foot, respectively. Plots were evaluated for crop injury on June 9 and June 25, for plant height on July 5 and for grassy weed control on June 25 and July 27. The trial was harvested on July 30.

Summary

Crop injury was not observed. All herbicide treatments except for Everest applied pre-emergence (trt 2) provided excellent season long wild oat control. Everest herbicide does have some activity on Persian darnel but control tended to be inconsistent and no trends could be discerned. Discover NG and Axial provided excellent control of Persian darnel but had no activity on Japanese brome. The split applications of Everest and Discover NG (trts 5 & 6) provided excellent control of wild oats, Persian darnel and Japanese brome even when Discover NG was applied at a half rate (trt 6). All Everest treatments provided excellent season long control of Japanese brome and significantly better control than Rimfire (trt 8). Downy brome (dobr) was spotty throughout this trial, and evaluations were taken when observed. Plant heights were not significantly different between treatments. The trial was infected with leaf rust which severely affected test weights. Everest split applications 0.3 oz/A followed by 0.3 oz/A (trt 3), 0.4 oz/A Everest followed by 0.2 oz/A (trt 4), 0.4 oz/A Everest followed by 6.4 oz/A Discover (trt 6) and the Axial + Adigor (trt 9) treatment all had grain yields significantly higher than the untreated check. Rimfire (trt 8) had a grain yield significantly lower than the untreated check.

	Treatment	Product rate	App. timing	June 9	June 25				Plant height	July 27				Test weight	Grain yield
				inj	inj.	wiot	peda	jabr		wiot	peda	jabr	dobr		
		oz/A		% control					inches	% control				lbs/bu	bu/A
1	Untreated	--		0	0	0	0	0	30	0	0	0	0	49.7	33.8
2	Everest + BB*	0.4 + 1%	PRE	0	0	96	0	96	29	55	0	99	--	50.7	34.3
3	Everest + BB /	0.3 + 1% /	PRE												
	Everest + BB	0.3 + 1%	POST	0	0	99	74	97	29	98	94	99	0	48.8	37.0
4	Everest + BB /	0.4 + 1% /	PRE												
	Everest + BB	0.2 + 1%	POST	0	0	99	20	94	29	95	0	98	99	50.5	38.2
5	Everest + BB /	0.4 + 1%	PRE												
	Discover NG	12.8	POST	0	0	99	97	95	29	99	99	99	--	49.6	32.8
6	Everest + BB	0.4 + 1%	PRE												
	Discover NG	6.4	POST	0	0	99	99	96	29	94	99	97	--	49.2	37.0
7	Everest + BB	0.6 + 1%	POST	0	0	99	12	99	29	99	0	99	0	50.8	31.1
8	Rimfire + BB	1.75 + 1%	POST	0	0	99	0	92	30	96	0	88	0	51.2	28.4
9	Axial + Adigor	8 + 9.6	POST	0	0	99	99	0	29	99	99	0	0	49.4	37.1
10	Everest + BB /	0.3 + 1% /	PRE												
	Everest + BB	0.2 + 1%	POST	0	0	99	25	91	29	93	8	98	50	50.2	32.5
11	Everest + BB /	0.25 + 1%	PRE												
	Everest + BB	0.25 + 1%	POST	0	0	99	25	96	30	97	0	99	99	48.6	34.3
	C.V. %			0	0	1.4	42.5	4.4	3.4	10.2	13.4	2.3	--	3.3	5.4
	LSD 5%			NS	NS	2	25	5	NS	12	7	3	--	NS	2.7

* Basic Blend adjuvant.
NS = no statistical difference between treatments.

Evaluation of Everest Herbicide Tankmixes with Glyphosate and Banvel in HRSW

Eric Eriksmoen, Hettinger, ND

Pre-plant (PP) treatments were applied on April 30 to tillering downy brome (dobr) and tansy mustard (tamu) which was just starting to bolt with 53° F, 66% RH, partly cloudy sky and south wind at 5 mph. 'Reeder' HRSW was seeded on May 1. Post emergence (POST) treatments were applied on May 24 to 3 ½ leaf wheat and to flowering downy brome, flowering tansy mustard, 1" kochia (kocz) and to 5" field bindweed (fibw) with 55° F, 46% RH, mostly clear sky and NW wind at 8 mph. Treatments were applied with a tractor mounted CO_2 propelled plot sprayer delivering 10 gpa at 30 psi through PK-01E80 nozzles to a 5 foot wide area the length of 10 by 28 foot plots. The trial was a randomized complete block design with four replications. Downy brome, tansy mustard, kochia and field bindweed populations averaged 16, 7, 2 and 0.5 plants per square foot, respectively. Plots were evaluated for crop injury on June 11 and June 27, for plant height on July 5 and for weed control on June 11, June 27 and July 27. The trial was harvested on July 30.

Summary

Crop injury was not observed. All herbicide treatments except for Everest applied pre-emergence (trt 2) provided excellent season long wild oat control. Everest herbicide does have some activity on Persian darnel but control tended to be inconsistent and no trends could be discerned. Discover NG and Axial provided excellent control of Persian darnel but had no activity on Japanese brome. The split applications of Everest and Discover NG (trts 5 & 6) provided excellent control of wild oats, Persian darnel and Japanese brome even when Discover NG was applied at a half rate (trt 6). All Everest treatments provided excellent season long control of Japanese brome and significantly better control than Rimfire (trt 8). Downy brome (dobr) was spotty throughout this trial, and evaluations were taken when observed. Plant heights were not significantly different between treatments. The trial was infected with leaf rust which severely affected test weights. Everest split applications 0.3 oz/A followed by 0.3 oz/A (trt 3), 0.4 oz/A Everest followed by 0.2 oz/A (trt 4), 0.4 oz/A Everest followed by 6.4 oz/A Discover (trt 6) and the Axial + Adigor (trt 9) treatment all had grain yields significantly higher than the untreated check. Rimfire (trt 8) had a grain yield significantly lower than the untreated check.

Table. Evaluation of Everest Herbicide Tankmixes with Glyphosate and Banvel in HRSW.

	Treatment	rate	timing	inj	inj.	wiot	peda	jabr	height	wiot	peda	jabr	dobr	weight	yield
1	Untreated	--		0	0	0	0	0	30	0	0	0	0	49.7	33.8
2	Glyposate + NIS + AMS /	16 + 0.25% + 1 lb /	PP	0	0	96	0	96	29	55	0	99	--	50.7	34.3
	Puma + Bro. Adv.	10.5 + 12.8	POST												
3	Everest + NIS + AMS	0.3 + 0.25% + 1 lb	PP	0	0	99	74	97	29	98	94	99	0	48.8	37.0
4	Glyph. + Banvel + NIS + AMS	16 + 4 + 0.25% + 1 lb	PP												
5	Everest + Glyph. + NIS + AMS	0.3 + 16 + 0.25% + 1 lb	PP	0	0	99	20	94	29	95	0	98	99	50.5	38.2
6	Everest+Glyph+Banvel+NIS+AMS	0.3+16+4+0.25%+1 lb	PP												
7	Everest + Glyph. + NIS + AMS /	0.3 + 16 + 0.25% + 1 lb /	PP	0	0	99	97	95	29	99	99	99	--	49.6	32.8
	Everest + Basic Blend	0.2 + 1%	POST												
8	Ever.+ Glyph+ Ban+ NIS+ AMS /	0.3+16+4+0.25%+1 lb /	PP	0	0	99	99	96	29	94	99	97	--	49.2	37.0
	Everest + Basic Blend	0.2 + 1%	POST	0	0	99	12	99	29	99	0	99	0	50.8	31.1
9	Everest + Glyph. + NIS + AMS /	0.3 + 16 + 0.25% + 1 lb /	PP	0	0	99	0	92	30	96	0	88	0	51.2	28.4
	Everest + Banvel + Basic B.	0.2 + 3 + 1%	POST	0	0	99	99	0	29	99	99	0	0	49.4	37.1
10	Ever.+ Glyph+ Ban+ NIS+ AMS /	0.3+16+4+0.25%+1 lb /	PP												
	Everest + Banvel + Basic B.	0.2 + 3 + 1%	POST	0	0	99	25	91	29	93	8	98	50	50.2	32.5
11	Everest + Banvel + Basic Blend	0.6 + 3 + 1%	POST												
	C.V. %			0	0	1.4	42.5	4.4	3.4	10.2	13.4	2.3	--	3.3	5.4
	LSD 5%			NS	NS	2	25	5	NS	12	7	3	--	NS	2.7

* Basic Blend adjuvant.
NS = no statistical difference between treatments.

Evaluation of Everest + glyphosate and Banvel for Weed Control in HRSW

Eric Eriksmoen, Hettinger, ND

Pre-plant (PP) treatments were applied on April 30 to tillering downy brome (dobr) and to bolting tansy mustard (tamu) with 53° F, 66% RH, partly cloudy sky and south wind at 5 mph. 'Reeder' HRSW was seeded on May 1. Post emergence (POST) treatments were applied on May 24 to 3 ½ leaf wheat and to flowering downy brome, tansy mustard in full bloom, 1" kochia (kocz) and to 5" field bindweed (fibw) with 55° F, 46% RH, mostly clear sky and NW wind at 8 mph. Treatments were applied with a tractor mounted CO_2 propelled plot sprayer delivering 10 gpa at 30 psi through PK-01E80 nozzles to a 5 foot wide area the length of 10 by 28 foot plots. The trial was a randomized complete block design with four replications. Downy brome, tansy mustard, kochia and field bindweed populations averaged 16, 7, 2 and 0.5 plants per square foot, respectively. Plots were evaluated for crop injury on June 11 and June 27, for plant height on July 5 and for weed control on June 11, June 27 and July 27. The trial was harvested on July 30.

Summary

Crop injury was initially observed on all herbicide treatments except for glyphosate / Puma + Bronate Advance (trt 2). All pre-plant treatments containing glyphosate (trts 2, 4–10) provided excellent downy brome control. Pre-plant Everest alone (trt 3) and post-applied Everest treatment (trt 11) provided only marginal control of downy brome. All herbicide treatments provided excellent season long control of tansy mustard. Pre-plant treatments containing Banvel did not provide adequate control of kochia. Post applied treatments containing Banvel provided excellent season long control of kochia. Pre-plant Everest + glyphosate + Banvel followed by post applied Everest + Banvel (trt 10) and post applied Everest + Banvel (trt 11) provided excellent season long control of field bindweed. All treatments except for pre-plant Everest alone (trt 3) and pre-plant Everest + glyphosate followed by post applied Everest (trt 7) had grain yields significantly higher than the untreated check. Both of these treatments also had relatively high initial crop injury ratings.

	Treatment	Product rate	App. timing	June 11 inj	June 11 dobr	June 11 tamu	June 27 inj.	June 27 dobr	June 27 tamu	June 27 kocz	June 27 fibw	Plant height	July 27 dobr	July 27 tamu	July 27 kocz	July 27 fibw	Grain yield
		oz/A		% control								inches	% control				bu/A
1	Untreated	--		0	0	0	0	0	0	0	0	24	0	0	0	0	6.5
2	glyphosate + * /	16 /	PP														
	Puma + Bro. Adv.	10.5 + 12.8	POST	0	96	100	0	95	99	99	86	26	98	99	94	82	25.4
3	Everest + *	0.3	PP	8	56	95	8	70	97	0	0	21	48	99	0	0	9.4
4	glyph + Banvel + *	16 + 4	PP	5	98	97	1	98	94	0	0	27	99	99	32	18	20.0
5	Everest + glyph + *	0.3 + 16	PP	4	99	99	10	99	99	18	0	25	99	99	8	0	18.9
6	Everest+glyph+Banv+*	0.3 + 16 + 4	PP	3	97	98	14	97	97	52	8	24	97	99	18	0	16.7
7	Everest + glyph + * /	0.3 + 16 /	PP														
	Everest + BB**	0.2 + 1%	POST	15	96	99	11	96	99	0	0	24	96	98	5	0	6.9
8	Everest+glyph+Banv+*	0.3+16+4	PP														
	Everest + BB	0.2 + 1%	POST	5	98	98	14	98	99	42	20	23	99	99	22	0	15.2
9	Everest + glyph + *	0.3 + 16	PP														
	Everest + Banv + BB	0.2 + 3 + 1%	POST	5	95	99	2	94	99	99	26	26	88	99	91	72	27.2
10	Everest+glyph+Banv+*	0.3+16+4	PP														
	Everest + Banv + BB	0.2 + 3 + 1%	POST	9	92	99	10	88	99	97	94	24	94	99	90	90	18.5
11	Everest + Banvel + BB	0.6 + 3 + 1%	POST	2	48	96	0	25	99	97	92	20	25	98	92	89	12.7
	C.V. %			102	10	2	140	12	3	22	31	9	16	1	28	36	18.4
	LSD 5%			7	12	3	NS	14	4	15	16	3	17	1	17	17	4.3

* 0.25% NIS + 1 lb/A AMS
** Basic Blend adjuvant.
NS = no statistical difference between treatments.

Herbicides split-applied for downy brome control. Kirk Howatt, Ronald Roach, and Janet Harrington. 'Alsen' hard red spring wheat was seeded and preemergence treatments applied to three- to four-leaf downy brome on May 9 with 83 F, 28% RH, 0% cloud-cover, 6 to 7 mph wind at 270°, and wet soil at 70 F. Post treatments were applied to one-leaf wheat and four- to six-leaf (tillered to late boot) downy brome on May 25 with 52 F, 36% RH, 100% cloud-cover, 3 mph wind at 90°, and damp subsurface with dry top soil at 51 F. Treatments were applied with a backpack sprayer delivering 8.5 gpa at 40 and 35 psi, respectively, through 11001 TT nozzles to a 7 ft wide area the length of 10 by 30 ft plots. The experiment was a randomized complete block design with four replicates.

			6/20
Treatment	Rate	Grow	Downey Brome
	oz ai/A	Stg	% control
Prcz&mess+Basic Blend	0.178+1%	PRE	55
Prcz&mess+BB/prcz&mess+BB	0.09+1%/0.09+1%	PRE/POST	62
Prcz+Basic Blend	0.42+1%	PRE	72
Prcz+BB/prcz+BB	0.21+1%/0.21+1%	PRE/POST	87
Flucarbazone+Basic Blend	0.42+1%	PRE	61
Flucarbazone+BB/flucarbazone+BB	0.21+1%/0.21+1%	PRE/POST	57
GF-1847+Basic Blend	0.21+1%	PRE	72
GF-1847+BB/GF-1847+BB	0.11+1%/0.11+1%	PRE/POST	86
CV			6
LSD (P=0.05)			6

The Difference in control between propoxycarbazone and propoxycarbazone with mesosulfuron likely was due to the relative rate of propoxycarbazone in each treatment. Split application of herbicides containing propoxycarbazone or GF-1847 provided better control of downy brome than a single application. Propoxycarbazone alone and GF-1847 provided similar control within application structure. Control of downy brome with flucarbazone was not improved with split application. Wheat was not able to establish in the study area allowing downy brome to show recovery at subsequent evaluation.

Evaluation of Tank Mixes with Axial Herbicide for Grassy Weed Control in HRSW

Eric Eriksmoen, Hettinger, ND

'Reeder' HRSW was seeded on May 1. Treatments were applied on May 24 to 3 ½ leaf wheat and to 2 leaf wild oat (wiot), 2 leaf Persian darnel (puda), 3 leaf Japanese brome (jabr) and 5 leaf downy brome (dobr) with 59° F, 37% RH, mostly clear sky and west wind at 9 mph. Treatments were applied with a tractor mounted CO_2 propelled plot sprayer delivering 10 gpa at 30 psi through PK-01E80 nozzles to a 5 foot wide area the length of 10 by 28 foot plots. The trial was sprayed with 16 oz/acre Buctril + 8 oz/A Starane to control broadleaf weeds on May 28. The trial was a randomized complete block design with four replications. Wild oat, Persian darnel, Japanese brome and downy brome populations averaged 2, 10, 5 and 5 plants per square foot, respectively. Plots were evaluated for crop injury on June 9 and were evaluated for grassy weed control on June 25 and July 27. The trial was harvested on July 30.

Summary

Crop injury was very minor when noted. All herbicide treatments provided excellent season long wild oat control except for Amber (trt 7). All herbicide treatments provided excellent season long Persian darnel control except for Olympus (trt 3), Maverick (trt 4), Everest (trt 6) and Amber (trt 7) which had no efficacy on this weed. All herbicide treatments provided excellent season long Japanese brome control except for Axial alone (trt 2), Amber (trt 7), Discover NG (trt 10) and Axial + Amber (trt 15). Downy brome stands were inconsistent however, Olympus alone (trt 3), Axial + Olympus Flex (trt 16) and Axial + Osprey (trt 17) provided excellent season long control. Axial + Olympus Flex (trt 16) and Axial + Osprey (trt 17) provided excellent season long control of all of the grassy weeds present in this trial. The trial was infested with leaf rust and sustained late season moisture stress causing very poor and non-significant differences in test weight and grain yield.

			June 9	------ June 25 ------			July 27				Test	Grain
	Treatment	Application Rate	Inj	wiot	puda	jabr	wiot	puda	jabr	dobr	weight	yield
		oz/A Product	---------- % Control ----------								lbs/bu	bu/A
1	Untreated	--	0	0	0	0	0	0	0	0	52.3	25.8
2	Axial + Adigor	8.2 + 9.6	0	99	99	0	99	99	0	0	52.4	28.8
3	Olympus + NIS	0.6 + 0.5%	0	97	0	20	90	0	99	99	49.7	23.9
4	Maverick + NIS	0.66 + 0.5%	0	97	30	99	94	0	99	--	53.1	25.2
5	Rimfire + MSO	1.75 + 24	0	99	90	99	98	99	99	--	52.6	27.5
6	Everest + NIS	0.5 + 0.25%	0	99	0	99	99	0	99	--	53.9	24.5
7	Amber + NIS	0.56 + 0.25%	0	0	15	0	8	0	0	0	52.3	25.4
8	Olympus Flex + MSO	3 + 24	1	99	99	99	99	99	--	--	52.6	24.5
9	Osprey + MSO	4.75 + 24	1	99	99	97	99	99	99	--	52.0	27.1
10	Discover NG	12.8	0	99	99	0	99	99	0	0	53.3	24.0
11	Axial + Adigor + Olympus	8.2 + 9.6 + 0.6	0	98	99	50	98	99	99	80	52.7	21.9
12	Axial + Adigor + Maverick	8.2 + 9.6 + 0.66	0	98	99	30	98	99	99	50	52.6	23.9
13	Axial + Adigor + Rimfire	8.2 + 9.6 + 1.75	0	99	99	0	99	99	99	0	52.0	24.8
14	Axial + Adigor + Everest	8.2 + 9.6 + 0.5	0	99	98	90	99	99	99	0	52.0	23.8
15	Axial + Adigor + Amber	8.2 + 9.6 + 0.56	0	99	99	0	99	99	0	0	52.7	25.6
16	Axial + Adigor + Olympus Flex	8.2 + 9.6 + 3	0	99	99	99	99	99	99	99	52.2	26.0
17	Axial + Adigor + Osprey	8.2 + 9.6 + 4.75	0	99	99	94	99	99	99	99	53.2	23.1
18	Discover NG + Olympus	12.8 + 0.6	0	97	99	90	96	99	99	50	51.6	22.2
19	Discover NG + Rimfire	12.8 + 1.75	0	99	97	94	96	99	97	0	52.9	24.5
	C.V. %		228	2.1	11.2	2.3	4.5	0	0	--	5.0	14.6
	LSD 5%		NS	3	12	2	6	1	1	--	NS	NS

NS = no statistical difference between treatments.

Evaluation of Tank Mixes with Axial XL Herbicide for Grassy Weed Control in HRSW

Eric Eriksmoen, Hettinger, ND

'Reeder' HRSW was seeded on May 1. Treatments were applied on May 24 to 3 ½ leaf wheat and to 2 leaf wild oat (wiot), 2 leaf Persian darnel (peda) and to 5 leaf downy brome (dobr) with 57° F, 43% RH, mostly clear sky and west wind at 9 mph. Treatments were applied with a tractor mounted CO_2 propelled plot sprayer delivering 10 gpa at 30 psi through PK-01E80 nozzles to a 5 foot wide area the length of 10 by 28 foot plots. The trial was a randomized complete block design with four replications. Wild oat, Persian darnel and downy brome populations averaged 2, 10 and 0.25 plants per square foot, respectively. Plots were evaluated for crop injury on May 27 and were evaluated for grassy weed control on June 25 and July 27. The trial was harvested on July 30.

			May 27	------ June 25 ------			July 27	Grain
	Treatment	Application Rate	Inj	wiot	peda	dobr	wiot	Yield
		product oz/A	---------- % control ----------					bu/A
1	Axial XL	16.4	0.2	99	99	0	99	25.8
2	Axial XL + Orion	16.4 + 17	0.2	99	99	0	99	29.9
3	Axial XL + Bronate Advance	16.4 + 12.8	0.0	99	99	0	99	28.3
4	Axial XL + Bronate Advance + Tilt	16.4 + 12.8 + 2.0	0.8	99	99	0	99	27.8
5	Axial XL + WideMatch + MCPA ester	16.4 + 16 + 8	0.5	99	99	0	99	31.0
6	Axial XL + Affinity TM + MCPA ester	16.4 + 0.6 + 8	0.8	99	99	0	99	26.0
7	Axial XL + Affinity TM + WideMatch	16.4 + 0.6 + 16	0.8	99	99	0	99	28.7
8	Puma + Bronate Advance	10.5 + 12.8	0.0	99	0	0	99	28.5
9	Everest + Bronate Advance	0.4 + 12.8	0.2	99	0	30	98	29.8
10	Rimfire + Bronate Advance + MSO	2.25 + 12.8 + 24	1.0	99	99	99	99	24.5
11	Untreated	--	0.0	0	0	0	0	23.6
	C.V. %		118	0	0	0	1.5	11.3
	LSD 5%		0.7	1	1	1	1	4.5

Summary

Crop injury was very minor when noted. All herbicide treatments provided excellent season long wild oat control. All herbicide treatments provided excellent season long Persian darnel control except for Puma (trt 8) and Everest (trt 9) which have no efficacy on this weed. Rimfire (trt 10) provided excellent downy brome control. Everest (trt 8) provided minimal downy brome control and the other herbicide treatments did not provide any control of downy brome. There were significant differences for grain yield between the untreated check and herbicide treatments, however, there were no significant differences for yield between Axial XL alone (trt 1) and Axial XL + broadleaf tank mixtures.

Foxtail Barley and Tame Barley control in HRSW, Langdon 2007. John Lukach. 'Glenn' hrsw, mixed with 5% by weight 'Robust' barley, was seeded May 31 at 90 lb/a. Treatments were applied June 15 on 4 leaf wheat and 1-4 leaf wild oats with 2/yd². Foxtail barley was from newly emerged to large plants in boot stage which had re-rooted after spring tillage. Conditions at 3 to 4:30pm were 73°F, 50%RH, northwest wind at 12 mph, cloudy and dry foliage and muddy saline area. A tractor mounted CO2 sprayer with wind shield was used delivering 10 gpa, 40 psi, 4.5 mph, DG8001.5 tips with four 20" spaced nozzles on 20 by 50ft plots. The experiment was over-sprayed with AffinityTM 0.6oz, NIS and Starane 0.67pt on June 16. The experiment had a RCBD design with four replications. One rep on saline ground was not harvested for yield and no foxtail barley was present in one rep. The 3 harvested reps were split for sub-sample data before fall notes and harvest.

		Foxtail Barley			Wheat				6-row Barley			
		reduced	2-Jul	6-Sep								
Treatment	Rate	heading	control	control	Inj	Yield	twt	ht	Control	Yield	seeds/lb	seeds/lb
	oz/a	%	%	%	%	bu/a	lb/bu	cm	%	bu/a	of wheat	barley
Olympus+NIS	0.2+0.25%	80.0	50.0	83.3	0.0	29.5	60.4	72.7	63.3	1.1	451	13644
Olympus+NIS	0.4+0.25%	70.0	53.3	95.0	2.0	30.9	61.1	74.8	76.7	0.6	226	14514
Olympus+NIS	0.6+0.25%	94.3	81.7	98.7	4.0	29.5	60.9	76.3	91.7	0.4	133	15635
Olympus+NIS	0.8+0.25%	93.3	86.7	98.5	11.7	28.1	60.6	72.7	90.0	0.4	235	15152
Everest+NIS	0.6+0.25%	61.7	40.0	71.7	2.7	29.5	60.5	68.5	40.0	1.1	536	15317
Olym+Ever+NIS	0.2+0.3+0.25%	94.3	53.3	68.3	2.3	31.9	60.3	71.7	53.3	0.8	357	15819
Olym+Ever+NIS	0.4+0.6+0.25%	90.0	73.3	92.5	5.0	30.7	60.5	66.0	71.7	0.6	227	14705
Untreated	----	0.0	0.0	0.0	0.0	28.9	60.6	78.0	0.0	1.6	769	13492
DiscoverNG	16	13.3	13.3	0.0	0.0	28.2	60.3	75.5	0.0	1.6	848	13842
Rimfire+MSO	2.25+24	80.0	66.7	85.8	2.7	30.8	60.3	72.5	53.3	1.1	487	14391
Silverado+MSO	2.25+24	43.3	36.7	11.7	0.0	28.8	60.3	76.7	6.7	1.6	729	13319
LSD 5%		25.4	21.5	14.5	4.6	NS	NS	5.9	29.7	0.6	377	NS
C.V. %		22.8	25.0	13.3	96.9	11.8	1.0	6.9	35.1	1.2	72	11

NIS – Activator 90
MSO – Persist Ultra

Wheat and tame barley were not injured seriously in 2007 with good foxtail barley control by Olympus and a slightly lower control by Everest at 0.6 oz/a. Seed counts for tame barley, on harvested samples, allowed reduction in barley to be shown quantitatively. Reduction in barley seed quantity and seed size is important to seed growers.

Evaluation of Weed Control Systems in Clearfield HRSW

Eric Eriksmoen, Hettinger, ND

'AP604CL' HRSW was seeded on April 30. Treatments were applied on May 24 to 3 ½ leaf wheat, to one inch tall kochia (kocz) and to 2 leaf wild oat (wiot) with 59° F, 36% RH, mostly clear sky and west wind at 8 mph. Treatments were applied with a tractor mounted CO_2 propelled plot sprayer delivering 10 gpa at 30 psi through PK-01E80 nozzles to a 5 foot wide area the length of 10 by 28 foot plots. The trial was a randomized complete block design with four replications. Kochia and wild oat populations averaged 14 and 4 plants per square foot, respectively. Plots were evaluated for crop injury and weed control on June 9, June 25 and for delayed maturity and weed control on July 20. 8 oz/A Headline fungicide was applied on June 26 to treat an outbreak of leaf rust. The trial was harvested on July 30.

			6/9	- June 25 -		------ July 20 ------			Test	Grain
	Treatment	Application Rate	kocz	kocz	wiot	mat	kocz	wiot	weight	Yield
		product oz/A	---------- % ----------			*	----- % -----		lbs/bu	bu/A
1	Beyond + NIS + UAN	4 + 0.25% + 2.5%	25	45	98	0.5	45	100	54.4	29.7
2	ClearMax + NIS + UAN	12 + 0.25% + 2.5%	50	75	99	0.2	72	100	56.8	27.3
3	ClearMax + Buctril	12 + 8	94	95	99	0.2	88	100	57.6	28.4
4	ClearMax + Starane	12 + 6	95	95	99	0.2	91	100	58.2	29.3
5	ClearMax + WideMatch	12 + 8	95	95	99	0.8	92	100	57.1	31.3
6	Untreated	0	0	0	0	0.0	0	0	56.2	23.4
	C.V. %		19.6	20.6	1.0	144	22.0	0	2.8	13.3
	LSD 5%		18	21	1	NS	22	1	NS	NS

* delay in maturity: 0=no delay, 1=slight delay (1–2 days). NS=no statistical difference between treatments.

Summary

Crop injury was not observed with any treatment (data not shown). The kochia population in this trial is known to have ALS resistant biotypes. Beyond herbicide (trt 1) provided relatively poor kochia control. ClearMax alone (trt 2) provided significantly greater kochia control than the Beyond treatment (trt 1) but significantly less initial control than the other herbicide treatments. Tank mixtures of ClearMax plus Buctril (trt 3), Starane (trt 4) and WideMatch (trt 5) all provided very good season long kochia control. Delay in maturity was observed in all herbicide treatments but tended to be relatively minor, with ClearMax + WideMatch (trt 5) showing the greatest delay. All herbicide treatments provided excellent season long wild oat control. Although there were obvious differences for grain yield between treated and untreated plots, they were not statistically different.

Weed control in Clearfield HRS wheat, Carrington, 2007. (Greg Endres). The experimental design was a randomized complete block with three replicates. 'AP604CL' HRS wheat was seeded on May 10. Herbicide treatments were applied with a CO_2-hand-boom plot sprayer delivering 10 gal/A at 35 psi through 8001 flat fan nozzles to the center 6.7 ft of 10 by 25 ft plots on June 13 with 69 F, 86% RH, 10% clear sky, and 2 mph wind to 5- to 6-leaf wheat, 5-leaf (tillering) green and yellow foxtail, 1- to 2-inch tall common lambsquarters, 0.5- to 3-inch tall prostrate and redroot pigweed, and 0.5- to 1-inch tall shepherds purse. Crop density was adequate while weed density was low. The trial was harvested with a plot combine on August 16.

Broadleaf weed control was excellent, ranging from 90 to 99% control (Table). Foxtail control ranged from 85 to 99% and volunteer wheat control ranged from 73 to 78% with all herbicide treatments. Crop response, consisting of plant height reduction, was minimal. Wheat yield and quality were similar among treatments, likely due to the competitive crop, low weed density, and minimal crop injury.

Table.

Herbicide		Weed control[1]											Wheat injury			Wheat		
		6/28						7/26										
Treatment[2]	Rate	fxtl	colq	copu	piwe	shpu	vwht	fxtl	colq	copu	piwe	shpu	6/22	6/28	7/26	Yield	TW	Protein
	fl oz product/A	%														bu/A	lb/bu	%
Beyond + NIS + UAN	4 + 0.25% + 2.5% v/v	88	94	96	96	93	78	97	99	99	99	99	0	0	0	24.4	56.6	14.1
Beyond + MCPAe + NIS + UAN	4 + 8 + 0.25% + 2.5% v/v	89	99	90	95	92	78	99	99	99	99	99	2	3	1	20.8	56.1	14.0
Beyond + MCPAe + Buctril	4 + 8 + 8	85	99	96	99	93	73	98	99	99	99	99	2	3	0	21.9	56.0	14.3
Beyond + MCPAe + Starane	4 + 8 + 6	90	98	98	99	97	73	99	99	99	99	99	2	2	0	24.8	55.8	14.4
Beyond + MCPAe + WideMatch	4 + 8 + 8	93	97	99	98	96	73	99	99	99	99	99	0	0	0	24.7	56.8	14.3
Untreated check	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22.0	55.8	14.3
C.V. (%)		0	2	6	4	3	11	2	0	0	0	0	239	204	434	27	1	1
LSD (0.05)		8	4	8	5	5	12	2	1	1	1	1	NS	NS	NS	NS	NS	NS

[1]fxtl=green and yellow foxtail; colq=common lambsquarters; copu=common purslane; piwe=redroot and prostrate pigweed; shpu=sheperdspurse; vwht=volunteer wheat.

[2]NIS=Preference (WinField); UAN=urea ammonium nitrate.

Weed control in Clearfield spring wheat. (Jenks, Willoughby, Mazurek). 'Gunner' Clearfield spring wheat was seeded May 10 at 88 lb/A into 7.5-inch rows in a conventionally tilled field. Herbicide treatments were applied postemergence on June 20 at the 5-leaf wheat stage. Wild buckwheat was 5-7 inches tall with 3-6 plants/ft^2; redroot pigweed was 4-6 inches tall with 4-8 plants/ft^2; and green foxtail was 6-8 inches tall with 10-15 plants/ft^2. Individual plots were 10 x 30 ft and replicated three times. There was no visible crop injury with any herbicide treatment. Beyond alone or with MCPE or bromoxynil provided poor to fair wild buckwheat control. Adding WideMatch with Beyond provided excellent wild buckwheat control. All Beyond treatments provided excellent redroot pigweed and green foxtail control.

		Wheat				Wibw[b]		Rrpw[b]		Grft[b]	
		% chlorosis		% control		% control		% control		% control	
		Jul	Aug	Jul	Aug	Jul	Aug	Jul	Aug	Jul	Aug
Treatment[a]	Rate	4	7	4	7	14	7	14	7	14	7
Beyond + NIS + UAN	4fl oz + 0.25% + 2.5%	0	0	0	0	55	45	83	100	85	94
Beyond + MCPE + NIS + UAN	4fl oz + 0.5pt + 0.25% + 2.5%	0	0	0	0	63	67	85	100	88	95
Beyond + MCPE + Bromonynil	4fl oz + 0.5pt + 8fl oz	0	0	0	0	70	78	87	100	83	95
Beyond + MCPE + Starane	4fl oz + 0.5pt + 6fl oz	0	0	0	0	73	93	85	100	88	94
Beyond + MCPE + WideMatch	4fl oz + 0.5pt + 8fl oz	0	0	0	0	88	97	85	100	88	97
LSD (0.05)		0	0	0	0	10.4	19.5	3.2	0	4.9	3.6
CV		0	0	0	0	8	14	2	0	3	2

[a] *Treatments were applied at 5-leaf wheat stage.*
[b] *Wibw = Wild Buckwheat; Rrpw = Redroot Pigweed; Grft = Green Foxtail.*

Preplant burndown of dandelion and other weeds. Kirk Howatt, Ronald Roach, and Janet Harrington. Preplant treatments were applied to flowering dandelion, 5 to 8 inch tall Canada thistle, four-leaf wild buckwheat, and three-leaf yellow foxtail on May 24 with 63 F, 61% RH, 75% cloud-cover, 1 mph wind, and damp soil at 59 F. Treatments were applied with a backpack sprayer delivering 8.5 gpa at 40 psi through 11001 TT nozzles to a 7 ft wide area the length of 10 by 30 ft plots. The experiment was a randomized complete block design with three replicates.

Treatment	Rate	6/29 Dali	6/29 Cath	6/29 Wibu	6/29 Yeft
	oz ai/A			%	
Glyphosate	18	73	60	70	97
Glyphosate	12	75	62	71	97
Glyphosate	6	73	60	73	97
Glyphosate+2,4-D	6+4	73	63	67	97
Glyphosate+carfentrazone+NIS	6+0.128+0.25%	77	63	72	97
Glyphosate+carf&2,4-D+NIS	6+4.1+0.25%	73	43	50	97
Carfentrazone&2,4-D+NIS	4.1+0.25%	73	27	40	0
Carfentrazone&2,4-D+NIS	5.7+0.25%	72	37	43	0
Glyphosate+dicamba	6+2	77	60	93	97
Bromoxynil&2,4-D	9	47	43	72	0
Glyphosate+tembotrione	6+1.5	73	67	68	97
Glyphosate+trib+NIS	6+0.1+0.25%	75	60	70	97
Glyphosate+brox&pyst	6+3	78	47	95	97
Untreated	0	0	0	0	0
CV		6	7	6	0
LSD (P=0.05)		7	6	6	0

Weed control did not improve with increasing glyphosate rate from 6 to 18 oz/A. Likewise, addition of another herbicide generally did not greatly affect the control of these broadleaf weeds. Tembotrione improved the control of Canada thistle, but control did not exceed 75% in ant of the plots. Wild buckwheat control with glyphosate was increased to 93% with the addition of dicamba and increased to 95% with addition of bromoxynil and pyrasulfotole. Foxtail control was not antagonized by any of the tank-mixes. Control ratings in mid-July did not improve from 6/29 (data not shown).

ET Herbicide Tank Mixtures for Preplant Burndown Applications at Hettinger, ND

Eric Eriksmoen

eatments were applied on May 24 to 3 ½ leaf wheat (hrsw), 1" kochia (kocz), 3" wild buckwheat (wibw) and 5" field bindweed (fibw) with 43° F, 68% RH, clear sky and NW wind at 12 mph. Treatments were applied th a tractor mounted CO_2 propelled plot sprayer delivering 10 gpa at 30 psi through PK-01E80 nozzles to a 5 ot wide area the length of 10 by 28 foot plots. The trial was a randomized complete block design with four plications. HRSW, kochia, wild buckwheat and field bindweed populations were 15, 8, 2 and 0.5 plants per uare foot, respectively. Plots were evaluated for control on June 9, June 21 and on July 5.

		Product	June 9				June 21				July 5			
	Treatment*	Rate	hrsw	kocz	wibw	fibw	hrsw	kocz	wibw	fibw	hrsw	kocz	wibw	fibw
		oz/A	% Control											
1	R'up Orig. Max	32	100	100	97	92	100	99	95	91	98	96	88	90
2	ET + R'up	1 + 32	100	100	97	96	100	98	94	94	99	94	91	90
3	R'up + 2,4-D	32 + 16	100	100	96	94	100	98	96	93	99	94	92	91
4	ET+R'up+2,4-D	1+32+16	100	100	97	95	100	96	96	90	98	91	92	88
5	ET + 2,4-D	1 + 16	62	96	92	92	45	97	92	94	32	94	99	98
6	Untreated	--	0	0	0	0	0	0	0	0	0	0	0	0
	C.V.%		5.1	1.2	4.0	4.1	5.5	2.8	3.3	6.5	7.3	4.3	3.3	7.4
	LSD .05		6	2	5	5	6	3	4	8	8	5	4	8

All herbicide treatments also included 0.25% NIS and 2% AMS.

Summary

l treatments containing Roundup (trts 1-4) provided excellent control of spring wheat volunteers. All rbicide treatments had comparable season long control of kochia. Roundup alone (trt 1) tended to have less ason long control of wild buckwheat than the other herbicide treatments and the ET + 2,4-D treatment (trt 5) ovided significantly higher season long control of wild buckwheat than the other herbicide treatments. eatments containing Roundup (trts 1-4) provided similar season long control of field bindweed. The ET + 4-D treatment (trt 5) provide better season long control of field bindweed than the other herbicide treatments.

Broadleaf weed control in barley. Kirk Howatt, Ronald Roach, and Janet Harrington. 'Stellar ND' barley was seeded on April 26 near Wheatland, ND. Treatments were applied to four-leaf barley, 2 to 4 inch tall kochia, four- to six-leaf sunflower, two- to six-leaf marshelder, and four-leaf to flowering wild mustard on June 11 with 78 F, 67% RH, 15% cloud-cover, 10 mph wind at 135°, and moist soil at 70 F. Treatments were applied with a backpack sprayer delivering 8.5 gpa at 35 psi through 11001 TT nozzles to a 7 ft wide area the length of 10 by 30 ft plots. The experiment was a randomized complete block design with four replicates.

Treatment	Rate	7/02 Barley	7/02 Kocz	7/02 Mael	7/02 Wimu	7/02 Sufl
	oz ai/A	%			%	
Fluroxypyr&MCPA	8	0	99	99	98	99
Clopyralid&fluroxypyr	3	0	99	98	96	98
Thif+trib+MCPA+NIS	0.24+0.06+4+0.25	0	99	99	98	99
Thif+trib+2,4-D+NIS	0.1+0.1+4+0.25%	0	99	97	93	95
Carfentrazone&2,4-D+NIS	4.06+0.25%	0	99	98	96	95
Pyraflufen+MCPA+NIS	0.013+4+0.25%	0	97	99	93	96
Bromoxynil&MCPA5	8	0	99	99	98	98
Bromoxynil&2,4-D	9	0	99	99	97	98
Bromoxynil&fluroxypyr	5	0	99	96	98	95
Bromoxynil&pyrasulfotole	3	0	99	97	99	97
Bromoxynil&pyrasulfotole+AMS	3+8	0	99	98	97	99
Florasulam&MCPA	5.07	0	99	91	97	91
MF-19+MCPA+NIS	0.22+4+0.25%	0	99	98	97	95
MF-19+clpy&flox+NIS	0.22+2+0.25%	0	99	99	99	99
Untreated	0	0	0	0	0	0
CV		0	0.5	2	2	2
LSD (P=0.05)		0	0.7	2	2	3

Vigorous barley growth enhanced weed control, resulting in greater than 90% control across the study on 7/02. Florasulam and MCPA activity on marshelder and sunflower was slower than other treatments, 91% control. Broadleaf weeds were not present at the second evaluation in plots treated with herbicide.

Broadleaf weed control in HRSW, Langdon 2007. John Lukach. 'Glenn' hrsw was seeded May 2 at 80 lb/a. Treatments were applied June 4 on 4.5 leaf wheat. Weeds included 2 leaf wild buckwheat and common mallow, dime size kochia, thick cotyledon stage redroot pigweed, 5 leaf wild mustard and canola, 1 inch lambsquarter and ladysthumb and quarter sized chickweed. Conditions at 9am were 63°F, 55%RH, north wind at 10 mph, partly cloudy and foliage dry. A tractor mounted CO2 sprayer with wind shield was used delivering 10 gpa, 40 psi, 4.5 mph, DG8001.5 tips with four 20 inch spaced nozzles on 25ft plots. The experiment was over-sprayed with Axial plus Adigor on June 11. The experiment had a RCBD design with four replications.

Treatment	Rate			TWt	Ht	% Control Aug 6					% Control June 20							
	oz/a product	Inj.	Bu/a	Lb/bu	cm	Wibu	Kocz	Rrpw	Coma	Cano	Wibu	Kocz	Rrpw	Lath	Colq	Wimu	Chick	Cano	Coma
MF-19+Sword+NIS	0.22+4+0.25	0	76	63.8	99	98	83	100	100	100	97	60	99	99	99	99	99	99	99
Bromoxynil&Fluroxypyr	5	0	76	63.5	97	100	100	99	97	100	99	99	98	99	99	98	99	98	98
Clopyralid&Fluroxypyr	3	0	75	64.0	96	100	100	99	97	0	99	99	97	99	99	96	99	50	96
Thif&Trib+Salvo+NIS	0.1+0.1+4+0.25%	0	74	63.6	97	100	92	100	100	100	97	95	99	99	99	99	99	99	95
Bromoxynil&Pyrasulfotole+AMS	3+8	0	74	63.6	97	99	100	100	100	100	98	98	99	99	99	99	99	99	98
Bromoxynil&Pyrasulfotole	3	0	74	64.1	95	99	99	100	99	100	99	98	99	99	99	99	99	99	95
Florasulam&MCPA	5.07	0	74	63.6	97	100	95	99	99	100	99	85	98	99	99	99	99	99	97
MF-19+Clpy&Flox+NIS	0.22+2+0.25%	0	73	63.8	99	100	100	100	99	100	98	98	99	99	99	98	99	95	98
Fluroxypyr&MCPA	8	0	72	63.7	98	99	100	99	99	100	98	99	98	98	99	96	99	96	84
Bromoxynil&MCPA5	8	0	72	63.5	95	96	97	98	98	100	98	99	98	99	99	99	99	98	93
Thif&Trib+Sword+NIS	0.24+0.06+4+0.25%	0	72	63.5	95	99	88	99	99	100	96	79	99	99	99	99	99	99	96
Bromoxynil&2,4-D (WecoMax)	9	0	72	63.4	96	97	98	99	95	100	97	96	98	99	99	99	99	99	96
Carfentrazone&2,4-D+NIS	4.06+0.25%	0	71	63.6	97	98	100	99	100	100	97	98	99	98	99	99	99	99	97
Pyraflufen+Sword+NIS	0.013+4+0.25%	0	68	63.8	97	86	90	98	99	100	80	87	98	98	99	98	99	97	83
Untreated	0	0	62	63.5	99	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C.V. %		0	5.0	0.5	2.4	7.0	6.1	1.0	3.4	0.0	6.4	15.1	1.2	0.8	0.0	1.8	0.4	8.9	10.8
LSD 5%		NS	5.1	NS	NS	9.2	7.8	1.3	4.5	NS	8.2	18.5	1.5	1.1	NS	2.4	0.5	11.2	13.6

Weeds rated early but not at harvest were 100% controlled by treatment and crop competition. The chickweed had also died in the check plots from competition. The kochia at harvest was small, about wheat height. The smaller size was likely due to crop competition. The widematch treatment without mcpa added controlled wild mustard but not vol. canola.

Broadleaf weed control in durum wheat, Williston 2007. Neil Riveland.

'Divide' durum wheat was planted on re-crop (land cropped to wheat in 2006) in 7 inch rows at 90 lbs/a on April 25. All treatments were applied on June 5 with 66 F., 60% RH, soil temp 63 F, 90% clear sky and wind at 3-5 mph from 146 degrees to 5-6 leaf wheat, 1-2 inch Russian thistle and 2-3 inch wild mustard. We used a small plot sprayer with wind cones, mounted on a G-Allis Chalmers tractor to apply the treatments, delivering 8.5 gals/a at 30 psi through 8001vs flat fan nozzles to a 6.67 ft wide area the length of 10 by 24 ft plots. First rain received after application was 0.11 inches on June 6. Experimental design was a randomized complete block design with four replications. Weeds densities were very light and not rated. Plots were evaluated for crop injury on June 19 and July 4. Wheat was machine harvested for yield on August 16.

Treatment[a]	Rate	Crop Injury 6-19	Crop Injury 7-4	Plant Height	Test Weight	Yield
	oz/a	%	%	inches	lbs/bu	bus/a
Fluroxypyr&MCPA	8	10	8	32.7	58.5	42.8
Clopyralid&Fluroxypyr	3	4	2	31.8	58.7	42.3
Thif+Trib+Sword+NIS	0.24+0.06+4+0.25%	1	2	31.6	59.1	45.4
Thif+Trib+Salvo+NIS	0.1+0.1+4+0.25%	6	12	32.8	58.3	45.5
Carf&2,4-D+NIS	4.06+0.25%	4	2	31.2	58.3	42.6
Pyraflufen+Sword+NIS	0.013+4+0.25%	2	5	32.7	58.2	45.3
Bromoxynil&MCPA5	8	0	2	33.4	58.1	45.9
Bromoxynil&2,4-D	9	10	10	31.3	58.1	42.4
Brom&Flox	5	0	0	32.6	58.1	46.6
Brom&Pyrasulfotole	3	10	6	31.6	58.4	43.3
Brom&Pyrasulfotole+AMS	3+8	0	0	32.4	58.4	46.3
Florsulam&MCPA	5.07	4	0	32.3	58.6	45.9
MF-19+Sword+NIS	0.22+4+0.25%	1	1	31.8	58.9	45.7
MF-19+Clopy&Floxr+NIS	0.22+2+0.25%	9	6	32.6	58.4	43.5
Untreated	0			31.6	58.6	45.4
EXP MEAN		4	4	32.2	58.4	44.6
C.V. %		130	195	4.4		7.8
LSD 5%		8	NS	NS	NS	NS

[a] - Thif = Thifensulfuron. Clopy - Clopyralid Brom = Bromoxynil
Carf = Carfentrazone Flox = Fluroxypry
NIS = R-11 from Wilbur-Ellis. AMS = Ammonium Sulfate

Summary: Early injury ratings showed significant crop injury by several treatments.

Efficacy of Starane Hi-Load Herbicide for Broadleaf Weed Control at Hettinger

Eric Eriksmoen

'Reeder' HRSW was seeded on May 1. Treatments were applied on May 21 to 3 ½ leaf wheat and to 1" kochia (kocz), 1" Russian thistle (ruth), 3" wild buckwheat (wibw) and to 4" field bindweed (fibw) with 75° F, 58% RH, clear sky and south wind at 11 mph. Treatments were applied with a tractor mounted CO_2 propelled plot sprayer delivering 10 gpa at 30 psi through PK-01E80 nozzles to a 5 foot wide area the length of 10 by 28 foot plots. The trial was sprayed with 16 oz/acre Discover NG to control grassy weeds on May 28. The trial was a randomized complete block design with four replications. Kochia, Russian thistle, wild buckwheat and field bindweed populations were 8, 6, 0.3 and 0.2 plants per square foot, respectively. Plots were evaluated for crop injury on June 9, June 26 and on July 25, were evaluated for wheat head deformity on July 25 and were evaluated for broadleaf weed control on June 26 and on July 25. The trial was harvested on July 30.

		Product	6/9	June 26				July 25		Test	Grain
	Treatment	Rate	inj.	kocz	ruth	wibw	fibw	kocz	ruth	Weight	Yield
		oz/A		% control						lbs/bu	bu/A
1	GF-1784	4	0	99	91	94	92	96	88	47.2	35.5
2	Starane	8	0	99	86	92	92	99	82	51.7	29.7
3	GF-1784+Affinity TM+NIS	4+0.6+0.25%	0	99	98	96	96	99	99	48.7	34.3
4	Starane+Affinity TM+NIS	8+0.6+0.25%	0	97	98	97	96	96	99	52.1	29.6
5	GF-1784 + Bronate Adv.	2.67 + 12.8	0	99	99	96	97	99	99	49.9	29.4
6	Starane + Bronate Adv.	5.33 + 12.8	0	99	98	96	97	99	99	46.8	31.1
7	Untreated	--	0	0	0	0	0	0	0	48.7	21.5
	C.V.%		0	1.0	2.9	3.8	2.8	4.6	1.9	2.4	4.4
	LSD .05		NS	1	4	5	3	6	2	1.8	2.0

Summary

Crop injury was not observed for any treatment (June 26, July 25 and head deformity data not shown). GF-1784 and Starane treatments provided comparable weed control. All herbicide treatments provided excellent efficacy on kochia, Russian thistle, wild buckwheat and field bindweed and provided excellent season long kochia control. GF-1784 and Starane tank mix treatments (trts 3 – 6) also provided excellent season long Russian thistle control. Test weights were very poor due to a leaf rust infestation and did not correlate with herbicide treatments or weed control. Grain yields were significantly higher for all herbicide treatments than the untreated check. GF-1784 alone (trt 1) and GF-1784 + Affinity TM (trt 3) were significantly higher yielding than the other treatments.

Kochia control with Affinity and Starane NXT. Kirk Howatt, Ronald Roach, and Janet Harrington. 'Stellar ND' barley was seeded on April 26 near Wheatland, ND. Treatments (2") were applied to three-leaf barley; 1 to 2 inch tall kochia; cotyledon to four-leaf goosefoot (lambsquarters family), sunflower, and common cocklebur; and two- to four- leaf redroot pigweed on June 1 with 65 F, 66% RH, 90% cloud-cover, 0.5 mph wind, and wet soil with 64 F. Treatments (4") were applied to four-leaf wheat, 2 to 4 inch tall kochia and four- to six-leaf redroot pigweed, goosefoot, sunflower, and common cocklebur on June 11 with 75 F, 66% RH, 40% cloud-cover, 10 mph wind at 135°, and moist soil at 72 F. All treatments were applied with a backpack sprayer delivering 8.5 gpa at 35 psi through 11001 TT nozzles to a 7 ft wide area the length of 10 by 30 ft plots. The experiment was a randomized complete block design with four replicates.

			7/02					
Treatment	Rate	Grow	Barley	Kocz	Rrpw	Goose	Vosf	Coc
	oz ai/A	Stg	% inj			% control		
Thif-sg+trib-sg+brox&flox+NIS	0.125+0.125+2.9+0.25%	2"	0	96	99	99	97	98
Thif-sg+trib-sg+brox&flox+NIS	0.125+0.125+4.4+0.25%	2"	0	98	99	99	98	98
Thif-sg+trib-sg+brox&flox+NIS	0.125+0.125+5.8+0.25%	2"	0	99	99	99	99	99
Brox&flox+NIS	2.9+0.25%	2"	0	95	94	97	97	98
Brox&flox+NIS	4.4+0.25%	2"	0	97	98	98	97	97
Brox&flox+NIS	5.8+0.25%	2"	0	98	99	99	98	98
Brox&pyrasulfotole	3	2"	0	94	99	99	99	98
Brox&pyrasulfotole+AMS	3+8	2"	0	99	99	99	99	99
Thif-sg+trib-sg+brox&flox+NIS	0.125+0.125+2.9+0.25%	4"	0	96	99	99	99	99
Thif-sg+trib-sg+brox&flox+NIS	0.125+0.125+4.4+0.25%	4"	0	99	99	99	99	99
Thif-sg+trib-sg+brox&flox+NIS	0.125+0.125+5.8+0.25%	4"	0	99	99	99	99	99
Brox&flox+NIS	2.9+0.25%	4"	0	98	89	95	98	97
Brox&flox+NIS	4.4+0.25%	4"	0	99	90	92	99	95
Brox&flox+NIS	5.8+0.25%	4"	0	98	96	99	99	99
Brox&pyst	3	4"	0	98	99	99	99	99
Brox&pyst+AMS	3+8	4"	0	99	99	99	99	99
Untreated	0	4"	0	0	0	0	0	0
CV			0	2	2	2	1	2
LSD (P=0.05)			0	2	3	2	1	2

All treatments provided excellent weed control of 94% or greater over all species when applied to weeds that were 2 inches tall. Bromoxynil and fluroxypyr gave this lowest level of control for pigweed. Bromoxynil and fluroxypyr also had difficulty controlling larger pigweed, although control was 89% or more. Broadleaf weeds were not present by the second evaluation.

Veed control with bromoxynil and pyrasulfotole. Kirk Howatt, Ronald Roach, and Janet Harrington. 'Stellar ND' arley was seeded near Wheatland, ND. Treatments were applied to two- to three-leaf barley, 2 to 4 inch tall kochia, four-) six-leaf sunflower and common cocklebur, two- to four-leaf pigweed, and two- to four-leaf goosefoot species ambsquarters family) on June 11 with 74 F, 70% RH, 60% cloud cover, 8 mph wind at 135°, and moist soil at 70 F. 'reatments were applied with a backpack sprayer delivering 8.5 gpa at 35 psi through 11001 TT nozzles to a 7 ft wide rea the length of 10 by 30 ft plots. The experiment was a randomized complete block design with four replicates.

Treatment	Rate	7/02 Barley	7/02 Kocz	7/02 Rrpw	7/02 Goosefoot	7/02 Sufl	7/02 Cocb
	oz ai/A	%			%		
3rox&MCPA5	8	0	95	98	99	98	99
3rox&2,4-D	9	0	99	98	99	99	99
3rox&pyrasulfotole	3	0	99	99	99	99	99
3rox&pyrasulfotole+AMS	3+8	0	99	99	99	99	99
3rox&pyrasulfotole+AMS(liquid)	3+8	0	99	99	99	99	99
3rox&pyrasulfotole+AMS(liquid)	3+16	0	98	99	99	99	99
TC13+AMS	27.4 fl oz+8	0	95	99	99	99	99
Clpy&fluroxypyr+MCPA	3+4	0	99	98	99	99	99
Thif+trib+fluroxypyr+NIS	0.15+0.15+1+0.25%	0	95	99	99	98	98
Jntreated	0	0	0	0	0	0	0
CV		0	1.5	1	0	1	1
_SD (P=0.05)		0	2	1	0	1	1

Treatments did not injure the barley. Weed control was excellent with all herbicide treatments, 95% or greater on 7/02. 3roadleaf weeds were not present by the second evaluation.

Huskie for broadleaf weed control in HRSW, Langdon 2007. John Lukach. 'Glenn' hrsw was seeded May 2 at 80 lb/a. Treatments were applied June 2 on 4 leaf wheat. Weeds included 2 leaf wild buckwheat and common mallow, dime size kochia, thick cotyledon stage redroot pigweed, 5 leaf wild mustard and canola, 1 inch lambsquarter and ladysthumb and quarter sized chickweed. Conditions at 2-3pm were 73°F, 53%RH, north wind at 7 mph, partly cloudy and foliage dry. A tractor mounted CO2 sprayer with wind shield was used delivering 10 gpa, 40 psi, 4.5 mph, DG8001.5 tips with four 20 inch spaced nozzles on 25ft plots. The experiment was over-sprayed with Axial plus Adigor on June 11. The experiment had a RCBD design with four replications.

Treatment	Rate	4-Jun	20-Jun									7-Aug				
	oz/a	Inj	Wibu	Kocz	Rrpw	Lath	Colq	Wimu	Chick	Ebns	Coma	Wibu	Coma	Yield	Twt	Ht
			%											Bu/a	Lb/bu	cm
Huskie+AMS liquid	11+32	0	97	99	99	99	99	99	99	99	99	98	100	73	63.2	96
Huskie+AMS dry	11+0.5lb	0	98	99	99	99	99	99	99	99	99	98	100	73	63.1	98
AffinityTM+Starane	0.6+5.3	0	99	99	99	99	99	99	99	99	99	99	100	72	63.0	95
Widematch+MCPA ester	16+8	0	99	99	99	99	99	99	99	99	99	99	100	71	62.7	98
Huskie+AMS liquid	11+16	0	97	99	99	99	99	99	99	99	99	98	100	68	63.6	96
Untreated	---	0	0	0	0	0	0	0	0	0	0	0	0	66	62.8	96
LSD 5%		NS	1.9	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.3	2.3	0.5	NS	NS	NS
C.V. %		0	1.5	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.2	1.8	0.4	5.8	0.6	2.7

Weeds rated early but not at harvest were 100% controlled by treatment and crop competition. The chickweed had also died in the check plots from competition. The kochia at harvest was small, about wheat height. The smaller size was likely due to crop competition.

Huskie for Control of False Chamomile, No Crop, Langdon 2007. John Lukach. Treatments were applied to wheat stubble with no tillage on fall emerged False chamomile from small to 3 inch diameter with 1 to 20 ft². Treatments were applied May 8. Conditions at 10am were 69°F, 45%RH, southwest wind at 9 mph but protected by a tree belt, sunny and dry foliage. A handheld CO2 boom was used delivering 10 gpa, 40 psi, XR8001 tips with three 20 inch spaced nozzles on 20ft plots. The experiment had a RCBD design with four replications.

Treatment	Rate	False Chamomile Control			
	oz/a	14-May	20-May	17-Jul	9-Aug
			%		
Untreated	---	0.0	0.0	0.0	0.0
Huskie+AMS	11+0.5lb	70.0	53.3	50.0	56.7
Huskie+AMS	13.5+0.5lb	93.0	85.0	86.7	92.0
Huskie+Buctril+AMS	11+8+0.5lb	83.3	73.3	53.3	53.3
Huskie+AffinityTM+AMS	11+0.3+0.5lb	43.3	85.0	96.0	96.0
LSD 5%		13.8	10.3	12.3	12.0
C.V. %		12.6	9.2	11.4	10.7

Buctril antagonized false chamomile control with Huskie. The high rate of Huskie gave season long control of false chamomile even without crop competition.

Broadleaf weed control in spring wheat with Huskie. (Jenks, Willoughby, Mazurek). 'Glenn' spring wheat was seeded April 25 at 90 lb/A into 7.5-inch rows into standing stubble. Herbicide treatments were applied postemergence on June 5 at the 5-leaf wheat stage. Kochia was button size to 2- inches tall. Kochia densities were erratic, but with as much as 25 plants/ft^2. Common lambsquarters were less than 2-inches tall with 2-6 plants/ft^2. Individual plots were 10 x 30 ft and replicated three times. Puma was applied over the entire study to control grassy weeds.

There was no visible injury with any treatment. Kochia and lambsquarters control was excellent with Huskie and the standard treatments of "WideMatch + MCPA" and "Affinity TM + Starane". There were no significant differences in wheat yield between treatments.

		Wheat --% injury--		Kocz[c] ----------% control----------		Colq[c]		Yield bu/A	TW lb/bu
Treatment[a]	Rate[b]	Jun 15	Jul 6	Jun 23	Aug 6	Jun 23	Aug 6	Aug 9	Aug 9
Untreated		0	0	0	0	0	0	31.0	61.5
Huskie + Dry AMS	11oz + 0.5lb/100g	0	0	96	98	100	100	34.8	62.2
Huskie + Liquid AMS	11oz + 1.47g/100g	0	0	93	97	100	100	36.8	62.2
Huskie + Liquid AMS	11oz + 2.94g/100g	0	0	95	97	100	100	36.3	62.2
Test Compound 13 + Dry AMS	27.4oz + 0.5lb/100g	0	0	95	94	100	100	37.3	61.6
WideMatch + MCPA	1pt + 0.5pt	0	0	93	93	94	100	37.1	63.4
Affinity TM + Starane + NIS	0.60oz + 0.33pt + 0.25%	0	0	92	89	96	100	43.3	61.5
LSD (0.05)		NS	NS	5.2	9.1	2.8	0	NS	NS
CV		0	0	4	6	2	0	15	1.1

[a] *Treatments were applied at 5-leaf wheat.*

[b] *g/100g = gallons/100 gallons*

[c] *Kocz=Kochia; Colq=Common lambsquarters*

Huskie on durum wheat, Williston 2007. Neil Riveland. WREC.

'Divide' durum wheat was planted on re-crop (land cropped to durum wheat in 2006) in 7 inch rows at 90 lbs/a on April 25. All treatments were applied on May 26 with 59 F, 40% RH, 90% clear sky and wind at 2-4mph from 321 degrees to 3.5-4 leaf wheat and 2-4 inch wild buckwheat (Wibw). We used a small plot sprayer with wind cones, mounted on a G-Allis Chalmers tractor to apply the treatments, delivering 10 gals/a at 40 psi through 8001vs flat fan nozzles to a 6.67 ft wide area the length of 10 by 30 ft plots. First rain received after application was 0.97 inches on May 30. Experimental design was a randomized complete block design with three replications. Wild buckwheat density averaged 4-5 plant/ft2. However by August 19 all the wild buckwheat plants were dried up from the July thru August drought. Small numbers of Russian thistle and common lambsquarters occurred in all plots and were controlled 100% by all treatments. Plots were evaluated for crop injury on June 3 and July 19. Weed control ratings were taken on June 19 and on July 7. Durum was machine harvested for yield on August 16.

Treatment[a]	Product Rate	Crop Injury	Plant Height	Test Weight	Yield	— Control — Wild buckwheat June	July
	oz/a	%	inches	lbs/b	bus/a	— % —	
Untreated	0	0	26.5	57.4	29.2	0	0
Huskie+Dry AMS	11+8	0	26.9	58.7	31.2	57	60
Huskie+Liquid AMS	11+0.5qt	0	27.4	58.8	29.8	57	70
Huskie+Liquid AMS	11+1.0qt	0	27.4	58.9	31.2	78	83
Test Compound 13+Dry AMS	27.4+8	0	26.8	58.8	30.2	67	67
Widematch+MCPA	16+8	0	28.7	58.8	30.1	95	95
Affinity TM+Starane+NIS	0.6+5.28+0.25%	0	26.2	58.8	28.6	80	87
HIGH MEAN		0	28.7	58.9	31.3	95	95
LOW MEAN			26.2	57.4	28.6		
EXP MEAN			27.1	58.6	30.1	62	66
C.V. %			4.3	1.1	5.2	20	16
LSD 5%			NS	NS	NS	22	18
LSD 1%			NS	NS	NS	31	25
# OF REPS		1	3	3	3		
F-TRT		0	1.5	2.0	1.1	17	29

[a]NIS = Activator 90 from Loveland

Summary: No crop injury was observed. Though there was significant wild buckwheat population, the dry July masked their competitive effect and no yield differences occurred when compared to the untreated check.

Weed control with pyrasulfotole. Kirk Howatt, Ronald Roach, and Janet Harrington. 'Alsen' hard red spring wheat was seeded May16 at Prosper, ND. Treatments were applied to four- to five-leaf wheat, six-leaf or less common cocklebur, 6 inch or less common lambsquarters, four- to five-leaf wild oat, and six-leaf wild mustard. Treatments were applied with a backpack sprayer delivering 8.5 gpa at 40 psi through 11001 TT nozzles to a 7 ft wide area the length of 10 by 30 ft plot. The experiment was a randomized complete block design with four replicates.

		6/27					7/09				8/06			8/13
Treatment	Rate	Wht	Wioa	Cocb	Colq	Wimu	Wioa	Cocb	Colq	Wimu	Wioa	Cocb	Colq	Yield
	oz ai/A	inj	% control											bu/A
TC 11+AMS	27.4 fl oz+8	0	80	87	84	94	90	99	99	99	99	99	99	38
TC 12+AMS	27.4 fl oz+8	0	80	86	89	93	90	99	99	99	92	99	99	36
Fenoxaprop	1.32	0	84	0	0	0	98	0	0	0	99	0	0	27
Fenx+brox&pyst+AMS	1.32+3+8	0	82	94	91	95	97	99	99	99	94	99	99	35
Fenx+clpy&flox+MCPA	1.32+3+4	0	85	82	81	82	97	99	99	99	97	99	99	34
Fenx+clpy&flox+thif+trib	1.32+2.25+0.05+0.05	0	86	82	84	80	97	99	99	99	93	99	99	36
Untreated	0	0	0	0	0	0	0	0	0	0	0	0	0	31
CV		0	2	5	3	4	2	0	0	0	2	0	0	13
LSD (P=0.05)		0	2	4	3	4	2	0	0	0	3	0	0	7

Treatments did not cause injury to wheat. Wild oat control on 6/27 was greatest, 86%, when fenoxaprop was tank-mixed with clopyralid and fluroxypyr plus thifensulfuron and tribenuron. Fenoxaprop with bromoxynil and pyrasulfotole provided 82% control, but the experimental products TC 11 and TC 12. Control with TC 11 and 12 continued to lag behind other treatments for wild oat control on 7/09. But by the end of the season, TC 11 provided control equal to fenoxaprop alone. Broadleaf weed control with bromoxynil and pyrasulfotole was more rapid than other treatments, providing 90 to 95% control of included species on 6/27 compared with 80 to 85% control with commercial competitors. By 7/09, all broadleaf weed pressure was removed from all treatments.

Bromoxynil&Pyrasulfotole rates and timings. Kirk Howatt, Ronald Roach, and Janet Harrington. 'Stellar ND' barley was seeded April 26 at Wheatland, ND. Treatments were applied as follows:

Application date	June 1	June 11	June 21
Air temperature (F)	65	72	67
Relative humidity (%)	66	64	51
Wind velocity (mph)	0.5	10	8 to 10
Wind direction (degrees)	-	135	360
Soil moisture	wet	moist	wet
Soil temperature (F)	64	75	68
Barley (leaf)	3	4	5
Kochia	1-2 inch	2-4 inch	6-8 inch
Pigweed	2-3 leaf	2 to 4 leaf	6 leaf
Common Cocklebur	-	4 – 6 leaf	8 leaf

All treatments were applied with a backpack sprayer delivering 8.5 gpa at 35 psi through 11001 TT nozzles to a 7 ft wide area the length of 10 by 30 ft plots. The experiment was a randomized complete block design with four replicates.

			7/02			
Treatment	Rate	Grow	Kocz	Rrpw	Goosefoot	Cocb
	oz ai/A	Stg			%	
Fluroxypyr&MCPA	8	2"	97	97	99	97
Bromoxynil&pyrasulfotole	3	2"	92	99	99	97
Bromoxynil&pyrasulfotole+AMS	3+8	2"	97	99	99	98
Bromoxynil&pyrasulfotole	4	2"	99	99	99	98
Bromoxynil&pyrasulfotole+AMS	4+8	2"	99	99	99	98
Fluroxypyr&MCPA	8	5"	90	99	99	96
Bromoxynil&pyrasulfotole	3	5"	99	98	99	98
Bromoxynil&pyrasulfotole+AMS	3+8	5"	99	99	99	98
Bromoxynil&pyrasulfotole	4	5"	98	99	99	98
Bromoxynil&pyrasulfotole+AMS	4+8	5"	90	98	99	97
Fluroxypyr&MCPA	8	8"	91	97	98	92
Bromoxynil&pyrasulfotole	3	8"	90	99	99	91
Bromoxynil&pyrasulfotole+AMS	3+8	8"	94	99	99	96
Bromoxynil&pyrasulfotole	4	8"	86	99	99	98
Bromoxynil&pyrasulfotole+AMS	4+8	8"	87	99	99	97
CV			4	0	1	2
LSD (P=0.05)			6	1	1	3

All treatments provided 97% or greater control of pigweed and goosefoot species on 7/02. Control of kochia and common cocklebur declined for plants that were taller than 5 inches. Control of common cocklebur with bromoxynil and pyrasulfotole increased with the higher rate or the addition of AMS, but kochia control did not. Broadleaf weeds were not present at the second evaluation.

ET Herbicide for In-Crop Applications in Wheat at Hettinger, ND

Eric Eriksmoen

'Reeder' HRSW was seeded on May 1. Treatments were applied on May 24 to 3 ½ leaf wheat and to 1" kochia (kocz), 1" Russian thistle (ruth), 3" wild buckwheat (wibw) and to 5" field bindweed (fibw) with 60° F, 36% RH, clear sky and NW wind at 8 mph. Treatments were applied with a tractor mounted CO_2 propelled plot sprayer delivering 10 gpa at 30 psi through PK-01E80 nozzles to a 5 foot wide area the length of 10 by 28 foot plots. The trial was a randomized complete block design with four replications. HRSW, kochia, Russian thistle, wild buckwheat and field bindweed populations were 8, 2, 1 and 0.5 plants per square foot, respectively. Plots were evaluated for crop injury on June 1 and June 9 and for weed control on June 9, June 25 and on July 27. The trial was harvested on July 28.

Summary

Crop injury was very minor when observed. All herbicide treatments except MCPA alone (trt 1) provided excellent season long kochia, Russian thistle and wild buckwheat control. Most of the herbicide treatments provided very good suppression of field bindweed through crop maturity, but none of the treatments controlled this weed. Test weights were very light due to a severe leaf rust infestation and did not correlate with herbicide treatments. Grain yields were significantly higher than the untreated check for all herbicide treatments except for MCPA alone (trt 1).

	Treatment*	Product Rate	June 1	June 9				June 25				July 27		Test Weight	Grain Yield
			inj	inj	kocz	ruth	wibw	fibw	kocz	ruth	wibw	fibw	kocz	fibw	
		oz/A	% Control												lbs/bu	bu/A
1	MCPA ester	16	0	0	62	74	61	48	74	74	60	34	58	12	47.9	27.2
2	ET + MCPA	0.75 + 16	0	0	98	99	96	97	99	99	99	99	98	74	44.6	28.0
3	2,4-D ester	16	0	0	96	99	79	72	99	99	93	97	96	41	46.8	31.8
4	ET + 2,4-D	0.75 + 16	0	0	97	99	96	97	99	99	93	99	96	60	47.2	30.1
5	Buctril	32	0	0	98	99	97	96	99	99	97	97	99	61	48.2	29.9
6	ET + Buctril	0.75 + 32	0	0	98	99	98	98	99	99	99	25	99	18	45.1	28.0
7	ET+2,4-D+Harm. Ext.	0.75+8+0.3	1	0	93	99	86	84	99	99	99	52	99	20	46.0	28.0
8	ET + 2,4-D + Ally Ext.	0.75+8+0.2	0	0	97	99	94	94	99	99	99	99	97	84	48.0	30.2
9	ET + 2,4-D + Ally	0.75+8+0.1	0	0	98	99	86	86	99	99	96	99	99	25	46.2	30.8
10	ET + Bronate Adv.	0.75 + 12.8	0	0	98	99	98	98	99	99	99	82	99	25	46.2	31.9
11	Untreated	--	0	0	0	0	0	0	0	0	0	0	0	0	47.0	24.4
	C.V.%		146	0	16.9	17.0	23.7	29.5	17.0	17.0	16.5	25.9	15.9	60.8	4.9	7.2
	LSD .05		1	NS	21	22	28	34	22	22	20	27	20	34	NS	3.0

* All herbicide treatments also included 0.25% NIS.

Pyraflufen equivalency to carfentrazone. Kirk Howatt, Ronald Roach, and Janet Harrington. 'Stellar ND' barley was seeded April 26 at Wheatland, ND. Treatments were applied to four-leaf barley, 2 to 4 inch tall kochia, four- to six-leaf sunflower, two- to four-leaf redroot pigweed and goosefoot species (lambsquarters family), and four-leaf to flowering wild mustard on June 11 with 72 F, 73% RH, 50% cloud-cover, 10 mph wind at 135°, and moist soil at 70 F. Treatments were applied with a backpack sprayer delivering 8.5 gpa at 35 psi through 11001 TT nozzles to a 7 ft wide area the length of 10 by 30 ft plots. The experiment was a randomized complete block design with four replicates.

		7/02				
Treatment	Rate	Kocz	Wimu	Rrpw	Goosefoot	Sufl
	oz ai/A			% control		
Carfentrazone+NIS	0.125+0.25%	95	94	99	98	90
Carfentrazone+NIS	0.25+0.25%	99	93	99	99	96
Pyraflufen+NIS	0.013+0.25%	62	60	71	71	72
Pyraflufen+NIS	0.018+0.25%	66	71	84	76	75
Pyraflufen+NIS	0.025+0.25%	72	76	94	91	86
Pyraflufen+NIS	0.032+0.25%	79	75	95	94	86
Pyraflufen+NIS	0.038+0.25%	87	84	96	98	91
Carfentrazone+MCPA+NIS	0.125+6+0.25%	90	97	99	99	96
Pyraflufen+MCPA+NIS	0.013+6+0.25%	74	96	97	97	97
Pyraflufen+MCPA+NIS	0.026+6+0.25%	95	97	98	98	98
MCPA+NIS	6+0.25%	0	93	95	97	93
CV		5	3	4	3	5
LSD (P=0.05)		6	3	5	4	6

Proposed rate of pyraflufen in cereals is 0.013 oz/A. Pyraflufen at 0.038 oz/A gave 87% control of kochia, which was less than the standard cereal rate of carfentrazone at 0.125 oz/A, 95% control. MCPA tended to antagonize kochia control with carfentrazone but improved control with pyraflufen by 12 percentage points. MCPA alone did not cause a visible effect from kochia. Pyraflufen control of wild mustard was not similar to carfentrazone unless MCPA was included. Pyraflufen at 0.032 oz/A or more provided similar control of pigweed to carfentrazone, but 0.036 oz/A pyraflufen was necessary to achieve similar control of goosefoot. Pyraflufen at 0.025 oz/A gave similar control to carfentrazone. Two to three times the field use rate of pyraflufen was necessary to provide equal weed control to carfentrazone. For each weed except kochia, MCPA made up the deficit in pyraflufen activity.

Broadleaf control with GF-1847 and GF-1848. Kirk Howatt, Ronald Roach, and Janet Harrington. 'Alsen' hard red spring wheat was seeded May 11 at Fargo, ND. Treatments were applied to three-leaf wheat, flowering wild mustard, four- to six-leaf common lambsquarters, four-leaf wild buckwheat, and two- to three-leaf yellow foxtail on June 12 with 78 F, 62% RH, 5% cloud-cover, 11 mph wind at 180°, and dry soil at 74 F. Treatments were applied with a backpack sprayer delivering 8.5 gpa at 35 psi through 11001 TT nozzles to a 7 ft wide area the length of 10 by 30 ft plots. The experiment was a randomized complete block design with four replicates.

Treatment	Rate	6/15 Wht	7/02 Wht	7/02 Wibu	7/02 Colq	7/02 Wimu	7/16 Wibu	7/16 Colq	7/16 Yeft	8/07 Wibu	8/07 Colq	8/07 Yeft	8/07 Yield
	oz ai/A												bu/A
GF-1848+NIS+AMS	1.26+0.5%+24	0	0	90	93	97	79	81	72	77	93	77	49
GF-1847+PO	0.16+0.8%	0	0	79	88	97	64	82	67	50	89	25	44
GF-1848+NIS	1.68+0.5%	0	0	85	82	95	91	85	82	87	91	84	49
GF-1848+NIS+AMS	1.68+0.5%+24	0	0	89	90	95	92	89	71	86	85	80	43
GF-1848+PO	1.68+0.8%	0	0	89	93	97	87	85	86	87	81	89	51
GF-1848+MSO	1.68+0.8%	0	0	90	85	97	93	86	80	94	84	79	50
GF-1848+2,4-D	1.68+4	0	0	81	80	97	76	77	76	89	93	74	51
GF-1847+NIS	0.21+0.5%	0	0	84	86	94	76	82	89	75	80	82	51
GF-1847+NIS+AMS	0.21+0.5%+24	0	0	81	86	94	83	85	80	84	87	82	50
GF-1847+PO	0.21+0.8%	0	0	82	85	98	82	84	81	89	89	81	48
GF-1674+PO	0.21+0.8%	0	0	81	82	95	77	82	87	77	81	84	45
GF-1847+MSO	0.21+0.8%	0	0	89	84	98	86	84	80	79	79	81	54
GF-1847+PO	0.26+0.8%	0	0	79	82	92	91	85	87	57	57	67	53
GF-1848	1.68	0	0	90	90	96	87	82	86	89	81	81	47
GF-1847	0.21	0	0	86	87	94	71	72	77	67	57	67	52
Pxdn+clpy&flox+MCPA+Adigor	0.86+3+6+.075G	0	0	95	95	95	94	94	91	99	99	93	51
Fenx+brox&MCPA5	1.32+8	0	0	85	84	94	90	93	98	99	99	99	56
Clfp-ng+thif+trib	0.8+ 0.15+0.15	0	0	82	91	94	90	92	89	90	99	91	51
Flucarbazone+2,4-D	0.28+6	0	0	85	89	96	85	88	66	85	91	65	38
Prcz&mess+NIS+AMS	0.178+0.25%+24	0	0	76	79	96	10	25	0	0	0	0	50
Untreated	0	0	0	0	0	0	0	0	0	0	0	0	42
CV		0	0	4	5	2	7	6	10	10	7	11	17
LSD (P=0.05)		0	0	5	6	2	7	7	11	10	8	11	11

Treatments did not injure wheat. Greatest control of wild buckwheat on 7/02 was achieved with clopyralid and fluroxypyr, 95%. However, bromoxynil and MCPA, thifensulfuron and tribenuron, and several treatments containing GF-1848 provided similar control to clopyralid and fluroxypyr. Clopyralid and fluroxypyr also gave 95% control of common lambsquarters on 7/02. Several other treatments gave similar control of lambsquarters on this date. As the season progressed, GF-1847 and GF-1848 did not control lambsquarters as well as the commercial standards unless 2,4-D was included. GF-1847 and GF-1848 generally gave better control of yellow foxtail than flucarbazone or propoxycarbazone and mesosulfuron, but control was not as good as with fenoxaprop or pinoxaden.

Weed control with A15898 and adjuvants. Kirk Howatt, Ronald Roach, and Janet Harrington. 'Alsen' hard red spring wheat was seeded May 15 at Fargo, ND. Treatments were applied to three-leaf wheat, four- to six-leaf common lambsquarters, and four-leaf wild buckwheat on June 12 with 77 F, 69% RH, 5% cloud-cover, 16 mph wind at 180°, and moist soil with a dry surface at 68 F. Treatments were applied with a backpack sprayer delivering 8.5 gpa at 35 psi through 11001 TT nozzles to a 7 ft wide area the length of 10 by 30 ft plots. The experiment was a randomized complete block design with four replicates.

		6/19	6/22	7/02			7/16	
Treatment	Rate	Wht	Wht	Wht	Wibu	Colq	Wibu	Colq
	oz ai/A							
A15898	4	0	0	0	66	81	90	95
A15898+Preference	4+0.25%	0	0	0	91	94	92	95
A15898+AG03019	4+0.25%	0	0	0	86	91	82	95
A15898+AG03037	4+0.25%	0	0	0	89	94	85	95
A15898+AG05045	4+0.25%	0	0	0	91	95	91	94
A15898+AG06001	4+0.25%	0	0	0	90	91	95	95
A15898+AG06011	4+5 FL/A	0	0	0	86	93	95	95
A15898+AG06099	4+0.25%	0	0	0	90	92	92	95
A15898+AG07008	4+0.25%	0	0	0	88	94	94	95
A15898+MSO	4+1%	0	0	0	82	87	96	96
CV		0	0	0	4	3	4	1
LSD (P=0.05)		0	0	0	5	3	5	2

Treatments did not injure wheat. All adjuvants improved the control of wild buckwheat with A15898 by 16 to 25 percentage points on 7/02. Control of common lambsquarters also increased by 6 to 14 percentage points. Preference, a nonionic surfactant, was a better adjuvant than MSO. On 7/16, control of common lambsquarters with A15898 was not affected by the inclusion of an adjuvant. Wild buckwheat control was improved by the addition of MSO, AG06001, or AG06011, while addition of AG03037 or AG03045 resulted in less control than A15898 alone.

Weed control with A15898. Kirk Howatt, Ronald Roach, and Janet Harrington. 'Alsen' hard red spring wheat was seeded May 15 at Fargo, ND. Treatments were applied to three-leaf wheat, flowering wild mustard, bolted Canada thistle, four- to six-leaf common lambsquarters, and four-leaf wild buckwheat on June 12 with 80 F, 62% RH, 5% cloud-cover, 11 mph wind at 180°, and dry soil at 74 F. Treatments were applied with a backpack sprayer delivering 8.5 gpa at 35 psi through 11001 TT nozzles to a 7 ft wide area the length of 10 by 30 ft plots. The experiment was a randomized complete block design with four replications except the Canada thistle with 3 replicates.

		6/19	6/22	7/02					7/16			8/07			8/7/07
Treatment	Rate	Wht	Wht	Wht	Wibu	Colq	Wimu	Cath	Wibu	Colq	Cath	Wibw	Colq	Cath	Yield
	oz ai/A														bu/A
Untreated	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40
A15898	5	0	0	0	94	96	97	90	90	92	90	99	98	97	50
A15898+fluroxypyr	5+2	0	0	0	96	97	95	87	95	95	95	99	99	99	50
A15898+brox	5+6	0	0	0	95	98	96	93	95	93	87	99	99	99	46
A15898+clopyralid	5+2	0	0	0	89	95	97	91	95	95	95	99	99	99	43
Brox&MCPA5	10	0	0	0	94	99	96	80	87	91	85	97	96	99	41
Clpy&flox+MCPA	3+5.6	0	0	0	94	97	97	95	95	95	95	99	99	99	43
Thif+trib+MCPA	0.15+0.15+5.6	0	0	0	95	95	96	90	94	95	95	98	98	99	45
Clopyralid&MCPA	9.7	0	0	0	90	97	96	97	95	95	93	99	99	98	44
Brox&pyrasulfotole	3	0	0	0	84	96	97	90	89	92	90	98	99	99	51
Brox&pyst+AMS	3+8	0	0	0	91	96	97	90	95	95	93	95	97	99	46
CV		0	0	0	4	2	2	3	3	2	2	3	2	1	18
LSD (P=0.05)		0	0	0	5	2	2	7	3	2	3	3	2	2	12

Treatments did not cause wheat injury. A15898 provided similar control of wild buckwheat, 94%, to other herbicides on 7/02, but control with A15898, 90%, was improved with the addition of another herbicide on 7/16. Common lambsquarters control was greater than 90% across herbicide treatments. Herbicide treatments provided at least 95% control of each species on 8/07.

Orion weed control in HRS wheat, Carrington, 2007. (Greg Endres). The experimental design was a randomized complete block with three replicates. 'Alsen' HRS wheat was seeded on May 4. Herbicide treatments were applied with a CO_2-hand-boom plot sprayer delivering 10 gal/A at 35 psi through 8001 flat fan nozzles to the center 6.7 ft of 10 by 25 ft plots on June 8 with 58 F, 65% RH, clear sky, and 11 mph wind to 5-leaf wheat, 1- to 4-inch tall common lambsquarters, 0.5- to 1-inch tall prostrate and redroot pigweed, and 0.5- to 3-inch tall wild buckwheat. Plots not previously receiving a graminicide were treated with Axial on June 14.

Common lambsquarters control generally was excellent (88-99%) with all treatments (Table). Pigweed control was good to excellent (83-99%) with all treatments. Kochia control generally was excellent (81-99%) with Orion plus Starane or Buctril, Bronate Advanced and WideMatch plus MCPA. Late-season (July 30) wild buckwheat control was good (83-88%) with Orion plus Buctril or Stinger, and excellent (96-99) with Orion plus Starane at 10.7 fl oz/A and WideMatch plus MCPA. Visual crop response was minimal height reduction.

Table.

Herbicide		Weed control[1]								Wheat injury	
		7/14				7/30					
Treatment	fl oz product/A	colq	piwe	KOCZ	wibw	colq	piwe	KOCZ	wibw	6/22	7/14
		%									
Orion	17	99	89	73	82	99	91	68	75	0	0
Orion + MCPAe	17 + 2.2	99	93	60	80	99	89	66	68	0	0
Orion + Starane	17 + 5.3	99	91	99	85	99	88	99	76	0	0
Orion + Starane	17 + 10.7	99	96	99	99	99	93	99	96	7	2
Orion +Buctril	17 + 16	99	95	96	89	96	90	96	83	5	2
Orion +Stinger	17 + 5.3	99	92	65	76	99	90	68	88	4	0
Orion + Axial BIA	17 + 16.4	99	83	68	89	99	84	63	76	0	0
Orion + Axial BIA + Tilt	17 + 16.4 + 2	99	91	57	83	99	91	60	71	2	0
Bronate Advanced	12.8	99	89	98	83	95	88	81	77	3	0
WideMatch + MCPAe	16 + 8	99	85	96	99	99	86	89	99	0	0
Affinity TM + MCPAe	0.6 oz + 8	88	96	57	68	99	99	58	70	0	2
Untreated check	0	0	0	0	0	0	0	0	0	0	0
C.V. (%)		6	10	24	13	2	10	21	10	181	346
LSD (0.05)		10	14	30	18	3	14	25	12	NS	NS

[1]colq=common lambsquarters; piwe=redroot and prostrate pigweed; KOCZ=kochia; wibw=wild buckwheat.

Orion for broadleaf weed control in HRSW, Langdon 2007. John Lukach. 'Glenn' hrsw was seeded May 2 at 80 lb/a. Treatments were applied June 2 on 4 leaf wheat. Weeds included 2 leaf wild buckwheat and common mallow, dime size kochia, thick cotyledon stage redroot pigweed, 5 leaf wild mustard and canola, 1 inch lambsquarter and ladysthumb and quarter sized chickweed. Conditions at 2-3pm were 73°F, 53%RH, north wind at 7 mph, partly cloudy and foliage dry. A tractor mounted CO2 sprayer with wind shield was used delivering 10 gpa, 40 psi, 4.5 mph, DG8001.5 tips with four 20 inch spaced nozzles on 25ft plots. The experiment was over-sprayed with Axial plus Adigor on June 11. The experiment had a RCBD design with four replications.

Treatment	Rate	----------Jun20----------								-------Aug1-------					
	oz/a	Inj	Wibu	Kocz	Rrpw	Lath	Colq	Wimu	Chick	Wibu	Kocz	Rrpw	Yield	Twt	Ht
		%											Bu/a	lb/bu	cm
Orion+Starane	17+10.7	0	98	99	99	99	99	99	99	98	100	100	70	63.4	96
Orion+Starane	17+5.3	0	99	99	98	99	99	99	99	99	100	99	70	63.5	97
Orion+Axial BIA+Tilt	17+16.4+2	0	97	64	96	99	99	99	99	97	91	99	69	63.3	94
Bronate Advanced	12.8	0	96	99	98	99	99	99	99	95	100	99	68	63.5	99
Orion+MCPA ester	17+2.2	0	97	72	96	99	99	99	99	98	95	99	67	63.3	97
Orion+Axial BIA	17+16.4	0	97	75	96	99	99	99	99	97	95	99	67	63.2	95
Orion+Stinger	17+5.3	0	99	98	99	99	99	99	99	100	98	99	67	63.0	99
Orion	17	0	96	61	98	99	99	99	99	98	96	98	67	63.2	96
Widematch+MCPA ester	16+8	0	99	99	97	99	99	99	99	99	100	98	66	63.6	96
Orion+Buctril	17+16	0	99	97	99	99	99	99	99	98	99	100	65	63.0	96
Affinity TM+MCPA ester	0.6+8	0	98	65	99	99	99	99	99	99	88	99	65	62.9	95
Untreated	---	0	0	0	0	0	0	0	0	0	0	0	58	63.1	97
	LSD 5%	NS	2.5	31.2	2.9	0.0	0.0	0.2	0.0	3.1	7.3	1.5	4.4	NS	NS
	C.V. %	0	2.0	28.2	2.3	0.0	0.0	0.2	0.0	2.4	5.7	1.1	4.6	0.9	2.8

Weeds rated early but not at harvest were 100% controlled by treatment and crop competition. The chickweed had also died in the check plots from competition. The kochia at harvest was small, about wheat height. The smaller size was likely due to crop competition.

Evaluation of Tank Mixes with Orion Herbicide for Broadleaf Weed Control at Hettinger

Eric Eriksmoen

'Reeder' HRSW was seeded on May 1. Treatments were applied on May 21 to 3 ½ leaf wheat and to 1" kochia (kocz), 1" Russian thistle (ruth) and to 3" wild buckwheat (wibw) with 74° F, 59% RH, clear sky and south wind at 12 mph. Treatments were applied with a tractor mounted CO_2 propelled plot sprayer delivering 10 gpa at 40 psi through PK-01E80 nozzles to a 5 foot wide area the length of 10 by 28 foot plots. The trial was sprayed with 16 oz/acre Discover NG to control grassy weeds on May 28. The trial was a randomized complete block design with four replications. Kochia, Russian thistle and wild buckwheat populations were 8, 6 and 0.3 plants per square foot, respectively. Plots were evaluated for crop injury on June 9 and were evaluated for broadleaf weed control on June 26 and July 25. The trial was harvested on July 30.

	Treatment	Application Rate		June 26			July 25		Test	Grain
			inj	kocz	ruth	wibw	kocz	ruth	wt.	yield
		oz/Ac	% Control						lbs/bu	bu/Ac
1	Orion	17	0	59	75	81	80	94	50.1	27.4
2	Orion + MCPA est.	17 + 2.2	0	60	85	91	55	96	46.1	33.4
3	Orion + Starane	17 + 5.3	0	94	88	90	95	88	47.2	35.4
4	Orion + Starane	17 + 10.6	0	99	95	96	97	91	51.9	25.4
5	Orion + Buctril	17 + 16	0.2	94	97	96	97	99	50.2	29.8
6	Orion + Stinger	17 + 5.3	0	97	92	96	76	96	47.4	27.0
7	Orion + Axial XL	17 + 16.4	0	97	98	96	75	94	50.3	24.7
8	Orion + Axial XL + Tilt	17 + 16.4 + 2	0	85	98	96	66	94	49.9	37.4
9	Bronate Advance	12.8	0	68	68	69	81	88	51.0	28.0
10	WideMatch + MCPA est.	16 + 8	0	98	90	96	96	82	48.6	31.9
11	Affinity TM + MCPA est.	0.6 + 8	0.2	94	99	85	80	99	49.0	33.9
12	Untreated	--	0	0	0	0	0	0	47.4	24.3
C.V. %			497	11.3	10.7	11.7	10.3	5.7	5.2	15.8
LSD .05			NS	13	13	14	11	7	NS	6.8

Summary

Crop injury was very minor when noted. Like all ALS inhibiting herbicides, Orion did not control ALS resistant kochia biotypes. The addition of Starane (trts 3 and 4) or Buctril (trt 5) enhanced overall kochia control. Orion alone was quite effective on Russian thistle and marginal on wild buckwheat control. Tank mixtures enhanced wild buckwheat control. The trial was infested with leaf rust and sustained late season moisture stress causing very poor test weights. Grain yields did not correlate well with weed control and may have been affected by non-uniform soil types (gravel seams).

roadleaf weed control with MF-19 or INC-101. Kirk Howatt, Ronald Roach, and Janet Harrington. 'Stellar ND' barley as seeded April 26 near Wheatland, ND. Treatments were applied to three-leaf barley, 2 to 4 inch tall kochia, four- to x-leaf sunflower, two- to four-leaf pigweed, four- to six-leaf common cocklebur, and two- to four-leaf goosefoot species ambsquarters family) on June 11 with 73 F, 69% RH, 60% cloud-cover, 10 mph wind at 135°, and moist soil at 71 F. reatments were applied with a backpack sprayer delivering 8.5 gpa at 35 psi through 11001 TT nozzles to a 7 ft wide ea the length of 10 by 30 ft plots. The experiment was a randomized complete block design with four replicates.

			7/02				
reatment	Rate	Barley	Kochia	Rrpw	Goosefoot	Sufl	Cocb
	oz ai/A	% inj			% control		
IF-19+2,4-D+NIS	0.22+4+0.25%	0	84	98	97	97	99
IF-19+bromoxynil&MCPA5+NIS	0.22+6+0.25%	0	90	99	99	99	99
IF-19+clopyralid&fluroxypyr+NIS	0.22+2.25+0.25%	0	96	99	98	99	99
IF-19+bromoxynil&pyrasulfotole+NIS	0.22+2.25+0.25%	0	99	99	98	99	99
hifensulfuron+2,4-D+NIS	0.22+4+0.25%	0	85	99	98	99	99
hifensulfuron+tribenuron+2,4-D+NIS	0.1+0.1+4+0.25%	0	69	99	99	99	99
arfentrazone&2,4-D+NIS	4.06+0.25%	0	97	99	99	99	99
arfentrazone&2,4-D+NIS	5.68+0.25%	0	96	99	99	98	99
NC-101+bromoxynil+NIS	0.15+6+0.25%	0	96	99	97	99	98
NC-101+bromoxynil+NIS	0.22+6+0.25%	0	98	99	99	98	98
NC-101+bromoxynil+NIS	0.3+6+0.25%	0	97	99	98	99	98
NC-101+bromoxynil+NIS	0.45+6+0.25%	0	98	99	99	99	99
NC-101+NIS	0.45+0.25%	0	64	99	99	96	91
romoxynil	6	0	98	98	99	99	99
ntreated	0	0	0	0	0	0	0
V		0	8	1	1	2	1
SD (P=0.05)		0	10	1	2	2	2

eatments did not cause injury to barley. All treatments provided more than 95% control of pigweed, goosefoot, and nflower on 7/02. Only INC-101 gave less than 98% control of cocklebur, but control was still 91%. Treatments that cluded bromoxynil, carfentrazone, or fluroxypyr provided excellent control of kochia, generally greater than 95%.

Weed control with sulfonylurea herbicides. Kirk Howatt, Ronald Roach, and Janet Harrington. 'Alsen' hard red spring wheat was seeded on May 14 at Fargo, ND. Treatments were applied to three-leaf wheat, flowering wild mustard, four- to six-leaf redroot pigweed, two- to six-leaf common lambsquarters, and 4- to five-leaf wild buckwheat on June 12 with 80 F, 70% RH, 5% cloud-cover, 14 mph wind at 180°, and moist soil at 68 F. Treatments were applied with a backpack sprayer delivering 8.5 gpa at 35 psi through 11001 TT nozzles to a 7 ft wide area the length of 10 by 30 ft plots. The experiment was a randomized complete block design with four replicates.

		6/21	7/02				7/16	
Treatment	Rate	Wheat	Wheat	Wimu	Wibu	Colq	Wibu	Colq
	oz ai/A	% injury				% control		
Accurate+NIS	0.06+0.25%	0	0	97	87	89	92	94
Accurate+2,4-D+NIS	0.06+4+0.25%	0	0	97	84	90	89	94
Nuance+NIS	0.25+0.25%	0	0	96	87	91	90	92
Nimble+NIS	0.45+0.25%	0	0	96	90	89	91	89
INC-101+NIS	0.45+0.25%	0	0	96	94	87	94	89
INC-102+NIS	0.25+0.25%	0	0	97	85	89	94	89
INC-103+NIS	0.3+0.25%	0	0	96	90	91	92	95
INC-104+NIS	0.29+0.25%	0	0	97	89	89	94	92
Thifensulfuron+tribenuron+NIS	0.32+0.08+0.25%	0	0	94	90	84	94	87
Thifensulfuron+tribenuron+NIS	0.2+0.2+0.25%	0	0	97	91	90	91	91
Untreated	0	0	0	0	0	0	0	0
CV		0	0	2	6	4	3	3
LSD (P=0.05)		0	0	3	6	5	4	4

Treatments did not injure wheat. INC-101 provided 94% control of wild buckwheat on 7/02. By 7/16 several treatments gave equal or similar control to INC-101. The one-to-one ratio of thifensulfuron and tribenuron gave slightly better control of common lambsquarters than the three-to-one ratio. The addition of 2,4-D did not improve control with Accurate.

Broadleaf weed control with MSM. Kirk Howatt, Ronald Roach, and Janet Harrington. 'Alsen' hard red spring wheat was seeded on May 15 at Fargo, ND. Treatments were applied to three-leaf wheat, flowering wild mustard, bolted Canada thistle, and three- to four-leaf wild buckwheat on June 12 with 78 F, 62% RH, 5% cloud-cover, 11 mph wind at 180°, and dry soil at 74 F. Treatments were applied with a backpack sprayer delivering 8.5 gpa at 35 psi through 11001 TT nozzles to a 7 ft wide area the length of 10 by 30 ft plots. The experiment was a randomized complete block design with four replicates.

		7/02				7/16			8/07	
Treatment	Rate	Wheat	Wibu	Cath	Wimu	Wibu	Cath	Wimu	Wibu	Cath
	oz ai/A	% inj				% control				
MSM+NIS	0.03+0.25%	0	77	71	93	70	79	99	79	87
MSM+NIS	0.06+0.25%	0	82	74	95	77	90	99	86	94
MSM+NIS	0.12+0.25%	0	84	79	96	90	95	99	89	95
Metsulfuron+NIS	0.03+0.25%	0	80	75	96	74	87	99	85	88
Metsulfuron+NIS	0.06+0.25%	0	86	80	96	75	87	99	89	92
Metsulfuron+NIS	0.12+0.25%	0	90	84	96	86	91	99	93	94
Untreated	0	0	0	0	0	0	0	0	0	0
CV		0	4	4	2	9	6	0	4	3
LSD (P=0.05)		0	4	4	2	9	6	0	4	3

Treatments did not cause injury to wheat. Control of wild buckwheat and Canada thistle increased with increasing rate of each herbicide, with metsulfuron giving slightly better weed control than MSM on 7/02. This relationship was not consistent during subsequent evaluations for Canada thistle, but metsulfuron tended to give better control of wild buckwheat than MSM on 8/07. MSM granuals dispersed more readily in the spray mixture than metsulfuron.

Common mallow control with herbicides applied post-harvest. (Jenks, Willoughby, Mazurek). A study was conducted in wheat stubble near Minot, ND to determine the effect of herbicides applied post-harvest for common mallow control. Herbicides were applied on September 17, 2007. Most common mallow plants were larger and hardened off by dry, hot conditions in the weeks preceding application. Most plants were nearing maturity and were 4-12 inches in diameter. Individual plots were 10 by 30 feet. Treatments were evaluated for percent control about three weeks after application.

Glyphosate alone or with Vision (dicamba) provided poor mallow control. "Bronate + Starane + Affinity + NIS" and "WideMatch + MCPA" provided some mallow suppression (59-63%). Liberty provided fair control (73%) as initial burndown was good, but plants tended to have some regrowth. The best mallow control was provided by an experimental herbicide applied alone or tank mixed with glyphosate (85% control).

			Common mallow
			% control
Treatment[a]	Rate	Timing	Oct 8
Bronate + Starane + Affinity	1 pt + 0.5 pt + 0.3 oz	Post-harvest	59
Glyphosate	0.375 lb ae	Post-harvest	30
Glyphosate + Vision	0.375 lb ae + 4 fl oz	Post-harvest	28
Glyphosate + EXP + Agridex	0.375 lb ae + 2.85 fl oz + 1% + 2%	Post-harvest	85
EXP + Agridex + AMS	5.7 fl oz + 1% + 2%	Post-harvest	85
WideMatch + MCPA	1 pt + 0.5 pt	Post-harvest	63
Liberty + AMS	28 fl oz + 2%	Post-harvest	73
Untreated			0
LSD			
CV			

[a] *All glyphosate treatments applied with 2% AMS; Affinity treatment applied with 0.25% NIS.*

False chamomile control with fall-applied herbicides. (Jenks, Willoughby, Mazurek). A study was conducted near Carpio, ND to determine the effect of fall-applied herbicides for false chamomile control. Herbicides were applied on October 6, 2006. False chamomile plants were in multiple stages at application time. Some plants were flowering, others were in the rosette stage, and many seedlings were just emerging. False chamomile density ranged from 5-20 plants/ft^2. Individual plots were 10 by 30 feet. Treatments were evaluated for percent control in April and June 2007. Corn was planted in 2007.

Several of the herbicides in this study are experimental and not labeled for use. All treatments contained glyphosate, except for Treatment #4, which contained only Valor. The goal of the study was to compare short vs. longer residual herbicides for false chamomile control. KIH-485 and Valor provided longer false chamomile control compared to other treatments. Interestingly, Valor alone provided similar control to Valor + glyphosate.

The weed we call "false chamomile" tends to grow sometimes as a winter annual, annual, and possibly a short-lived perennial. We recommend that growers with false chamomile consider spraying in late fall and treat this weed as a perennial. It is important to control emerged plants in late fall as these are plants that become more difficult to control in the spring.

			False chamomile		
			----------% control----------		
Treatment	Rate	Timing	Apr 27	Jun 1	Jun 18
Linuron + Glyphosate	0.5 lb + 0.75 lb	Fall	100	83	76
KIH-485 + Glyphosate	0.225 + 0.75 lb	Fall	100	98	96
Valor + Glyphosate	2 oz + 0.75 lb	Fall	100	100	100
Valor	3 oz	Fall	98	97	97
Affinity BS + Glyphosate	0.4 oz + 0.75 lb	Fall	100	91	90
2,4-De + dicamba + Glyphosate	0.5 pt + 4 fl oz + 0.56 lb	Fall	100	84	78
Affinity BS + dicamba + Glyphosate	0.4 oz + 3 fl oz + 0.56 lb	Fall	99	91	82
EXP + Glyphosate	2.85 fl oz + 0.56 lb	Fall	100	90	85
EXP + Glyphosate	5.7 fl oz + 0.56 lb	Fall	100	95	91
Untreated			0	0	0
LSD			1.7	10.5	17.3
CV			1	7	13