

**Annual weed control with Fierce, Valor, Gangster, Authority Assist, Authority First, Optill, Prowl H2O and Prefix at Rosemount, MN - 2010.** Gunsolus, Jeffrey L. and Douglas W. Miller. The objective of this experiment was to evaluate crop safety and residual weed control with preemergence applications of Fierce (flumioxazin & pyroxasulfone) and several other standard soil applied herbicides in glyphosate-resistant soybeans. The experiment was conducted at Rosemount, MN on a Waukegon silt loam soil with 5.4% organic matter, pH 6.1, and soil test P and K levels of 110 and 502 lb/A, respectively. Following oats, the experimental area was fall chisel plowed. In the spring, the field was disked once on May 17. On May 20, the area was field cultivated. Asgrow AG1506 soybeans were planted on May 20 at a rate of 160,000 seeds/acre with 30 inch row spacing. The experimental design was a randomized complete block with four replications and plot size was 10 by 30 ft. All herbicide treatments were applied preemergence on May 21 with a CO<sub>2</sub> powered backpack sprayer utilizing a 10 foot, six nozzle boom with 20 inch nozzle spacing, 11002VS flat-fan nozzles, 35 psi pressure, and a spray volume of 20 gpa. Environmental conditions and weed data are presented below. Crop Injury and weed control ratings are presented in Tables 1 and 2. Yield data were not collected.

<b>Treatment Date</b>	<b>May 21</b>
Application Time	10:15 – 11:15 am
Air Temperature (°F)	61
Relative humidity (%)	68
Soil Temperature (°F)	66
Sky	cloudy
Wind	E 5-10
Rainfall before Application	
Week 1 (inch)	0.00
Rainfall after Application	
Week 1 (inch)	0.55
Week 2 (inch)	1.26
<b>Weed Species</b>	<b>Density</b>
Giant/Yellow (Gift/Yeft) Foxtail species	182 /ft <sup>2</sup>
- 75-85% Giant Foxtail	
- 15-25% Yellow Foxtail	
Woolly Cupgrass (Wocg)	9 /ft <sup>2</sup>
Common Lambsquarters – (Colq)	18 /ft <sup>2</sup>
Pennsylvania Smartweed (Pesw)	3 /ft <sup>2</sup>
Pigweed species	8 /ft <sup>2</sup>
- primarily Powell amaranth	
Wild Buckwheat – (Wibu)	2 /ft <sup>2</sup>
Wild Mustard – (Wimu)	2 /ft <sup>2</sup>

Rainfall amounts of 0.3 and 0.35 inches were received on May 22 and May 25, respectively. Soybeans and grass species emerged on May 28. Visual ratings on June 4 showed no stand reduction or injury symptoms (soybeans were in the unifoliate leaf stage). At the June 10 rating date, significant injury symptoms were observed on the first trifoliate leaf in the Fierce and Prowl treatments. Fierce injury consisted of some leaf tissue constriction along the mid-vein while Prowl injury consisted of reduction in leaflet size and mid-vein chlorosis. These symptoms were not visible on later emerging trifoliate leaves. Injury ratings on the untreated check on June 18 and 25 were chlorosis caused by weed competition.

Grass control ranged from kill to varying levels of suppression. Fierce provided excellent kill of foxtail species with good residual control/suppression through the last rating on July 13. Other products that provided good initial control (in order of effectiveness) were Prefix, Prowl, Optill, and Gangster. Prefix and Optill maintained a fair level of residual foxtail control/suppression throughout the rating period while suppression with Prowl decreased greatly by the July 13 rating. Suppression with Gangster dropped sharply starting at the July 2 rating date. Valor, Authority Assist, and Authority First provided little control in terms of foxtail emergence. Valor provided some initial suppression but decreased rapidly with time. Authority Assist provided some foxtail kill after emergence and some early suppression which also decreased with time. Authority First provided no kill and little suppression of foxtail weeds.

Woolly cupgrass populations were variable over the experimental area resulting in greater variability in the control ratings. Overall, initial control of woolly cupgrass was less than that of foxtail species. The high rate of Fierce provided the greatest initial kill rate and the longest residual control/suppression of woolly cupgrass. The lower rate of Fierce and Prefix, Prowl, and Optill also provided fair to good kill rates and suppression however the level of suppression decreased throughout the rating period. Control/suppression of woolly cupgrass with Authority Assist, Authority First, Gangster and Valor was poor.

Overall broadleaf control was excellent. With few exceptions, there were not many late emerging broadleaf weeds after the initial flush. Prefix was the only treatment that did not provide excellent control of common lambsquarters. All treatments provided excellent control of Pennsylvania smartweed and pigweed species except that some late emerging smartweed in the Prefix treatment and pigweed in the Prowl treatment resulted in lower control ratings for those treatments at the later rating dates. In both cases however, high weed populations in only one replication may have skewed the results, especially for pigweed where the difference was not significant. Wild buckwheat populations were highly variable and concentrated in one to two replications. This resulted in control ratings being not significantly different. However, based on visual observations from the replication with the higher consistent population, Fierce and Optill provided excellent wild buckwheat control while the other treatments provided only fair to poor control. Prowl provided poor control of wild mustard and Valor provided good to fair control. All other treatments provided excellent control of wild mustard.

Annual weed control with Fierce, Valor, Gangster, Authority Assist, Authority First, Optill, Prowl H2O and Prefix at Rosemount, MN - 2010. (Gunsolus and Miller)

Table 1. Soybean Injury and grass species control ratings

Herbicide Treatment	Rate (product/A)	Soybean					Visual Control								
		Stand Reduction	Injury				Grass Species	Gift/Yeft				Wocg			
			6/4	6/4	6/10	6/18		6/25	6/10	6/18	6/25	7/2	7/13	6/18	6/25
		----- (%) -----													
Fierce <sup>1</sup>	3 oz	0	0	14	5	2	96	98	97	96	91	80	76	75	53
Fierce	3.75 oz	0	0	21	9	6	99	99	99	99	96	93	93	93	86
Valor SX <sup>2</sup>	2 oz	0	0	0	0	0	70	71	59	23	6	35	30	15	1
Gangster FR + Gangster V <sup>3</sup>	0.4 oz + 2 oz	0	0	3	0	0	80	83	73	46	19	36	34	33	19
Authority Assist <sup>4</sup>	5 fl oz	0	0	0	0	0	74	76	65	45	33	53	43	33	25
Authority First <sup>5</sup>	3.2 oz	0	0	0	0	0	19	31	19	8	3	26	15	8	3
Optill X <sup>6</sup>	2 oz	0	0	0	0	0	86	88	86	79	73	75	75	71	63
Prowl H2O <sup>7</sup>	2.5 pt	0	0	6	9	1	89	89	86	75	46	83	80	68	39
Prefix <sup>8</sup>	2 pt	0	0	0	0	0	92	95	93	88	76	89	86	83	61
Untreated		0	0	0	5	5	--	--	--	--	--	--	--	--	--
LSD (0.05)		ns	ns	4.0	2.9	2.2	12.0	9.2	12.7	18.7	19.1	23.9	21.2	22.5	23.5

<sup>1</sup> Fierce 76WDG = 33.5% flumioxazin & 42.5% pyroxasulfone.

<sup>2</sup> Valor SX 51WDG = flumioxazin.

<sup>3</sup> Gangster = multi-pack product of Gangster FR 84DF (chloransulam-methyl) and Gangster V 51DF (flumioxazin).

<sup>4</sup> Authority Assist 4SC = 3.33 lbs ai/gal sulfentrazone & 0.67 lbs ai/gal imazethapyr.

<sup>5</sup> Authority First 70DF = 62% sulfentrazone & 8% chloransulam-methyl .

<sup>6</sup> Optill X 68WG = 17.8% saflufenacil & 50.2% imazethapyr.

<sup>7</sup> Prowl H2O 3.3EC = pendamethalin.

<sup>8</sup> Prefix 5.29EC = 4.34 lbs ai/gal s-metolachlor & 0.95 lbs ai/gal fomesafen.

Annual weed control with Fierce, Valor, Gangster, Authority Assist, Authority First, Optill, Prowl H2O and Prefix at Rosemount, MN - 2010. (Gunsolus and Miller)

Table 2. Broadleaf species control ratings

Herbicide Treatment	Rate (product/A)	Visual Control																			
		Colq				Pesw				Pigweed Species				Wibu				Wimu			
		6/18	6/25	7/2	7/13	6/18	6/25	7/2	7/13	6/18	6/25	7/2	7/13	6/18	6/25	7/2	7/13	6/18	6/25	7/2	7/13
		----- (%) -----																			
Fierce <sup>1</sup>	3 oz	100	100	99	97	100	100	99	99	100	100	100	100	99	99	99	98	100	100	100	100
Fierce	3.75 oz	100	100	100	99	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Valor SX <sup>2</sup>	2 oz	99	96	96	95	100	99	96	96	98	98	98	98	80	82	82	82	90	87	85	85
Gangster FR + Gangster V <sup>3</sup>	0.4 oz + 2 oz	100	100	100	100	100	100	100	100	100	100	100	100	95	95	95	95	100	100	100	100
Authority Assist <sup>4</sup>	5 fl oz	100	99	99	98	100	100	100	100	100	100	100	100	85	85	85	85	99	100	94	94
Authority First <sup>5</sup>	3.2 oz	99	99	98	98	100	100	100	100	100	100	100	100	86	85	85	85	100	99	99	99
Optill X <sup>6</sup>	2 oz	99	99	99	99	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Prowl H2O <sup>7</sup>	2.5 pt	100	100	99	96	99	96	96	96	98	84	80	80	79	78	78	74	40	39	36	25
Prefix <sup>8</sup>	2 pt	81	81	74	56	99	97	82	82	100	100	100	100	84	79	76	75	100	100	100	100
Untreated		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
LSD (0.05)		9.7	9.8	9.2	7.7	ns	ns	10.6	10.6	ns	ns	ns	ns	ns	ns	ns	ns	10.3	12.3	13.1	13.9

<sup>1</sup> Fierce 76WDG = 33.5% flumioxazin & 42.5% pyroxasulfone.

<sup>2</sup> Valor SX 51WDG = flumioxazin.

<sup>3</sup> Gangster = multi-pack product of Gangster FR 84DF (chloransulam-methyl) and Gangster V 51DF (flumioxazin).

<sup>4</sup> Authority Assist 4SC = 3.33 lbs ai/gal sulfentrazone & 0.67 lbs ai/gal imazethapyr.

<sup>5</sup> Authority First 70DF = 62% sulfentrazone & 8% chloransulam-methyl .

<sup>6</sup> Optill X 68WG = 17.8% saflufenacil & 50.2% imazethapyr.

<sup>7</sup> Prowl H2O 3.3EC = pendamethalin.

<sup>8</sup> Prefix 5.29EC = 4.34 lbs ai/gal s-metolachlor & 0.95 lbs ai/gal fomesafen.