

## Weed control and soybean response to preemergence application of metribuzin and sulfentrazone at Hettinger, ND, 2025.

Two trials were conducted to evaluate weed control and soybean tolerance soybean following preemergence application of metribuzin and sulfentrazone (Spartan). Soybean were planted on June 3. Prior to planting the field was treated with paraquat (Gramoxone) to control weeds that were present prior to planting. In one trial, weeds were allowed to grow following herbicide application to determine levels of weed control. In order to determine yield, an application of glufosinate (Liberty) was applied following the final weed control evaluation (57 days after treatment). In the other trial, soybean were maintained weed free through postemergence application of glyphosate and glufosinate and the objectives were to determine soybean tolerance. Two soybean varieties were evaluated. Preemergence herbicide treatments were applied on June 4 (see Table 1 for herbicide treatments and Table 3 for a description of application). In the week following application there was 0.2 inches of rainfall. Weed control was evaluated 37 and 57 days after treatment (DAT). Control of kochia, wild buckwheat, common lambsquarters, and common mallow were greatest (87 to 90%, 57 DAT, with the tank mix of metribuzin at 10.7 oz/A and sulfentrazone at 8 oz/A. Metribuzin alone resulted in 72 to 82% control of these weeds at 57 DAT. Sulfentrazone alone resulted in 72 to 92% control of these weeds. Kochia control was similar (81 to 92%) for all combinations of metribuzin and sulfentrazone as well as the 8oz/A rate of sulfentrazone (83%). Kochia control with metribuzin alone (73 to 75%) and sulfentrazone at the 4 oz/A rate (75%) was less than the tank-mixes of these herbicides.

Table 1. Evaluation of fall application of metribuzin and pyroxasulfone for weed control in peas.

Treatment <sup>a</sup>	Rate oz/A	Kochia		Wild buckwheat		Common lambsquarters		Common Mallow	
		37 DAT	57 DAT	37 DAT	57 DAT	37 DAT	57 DAT	37 DAT	57 DAT
		% control							
1 Untreated		0e	0c	0e	0e	0d	0e	0f	0d
2 Metribuzin	5.3	85bc	73b	78d	70d	75c	70d	75e	67c
3 Metribuzin	10.7	75cd	75b	76d	76c	84b	82c	81cd	80b
4 Spartan	4	69d	75b	82c	82b	98a	86bc	79d	72c
5 Spartan	8	93ab	83ab	85bc	88a	96a	92a	84c	80b
6 Metribuzin Spartan	5.3 4	90ab	81ab	83bc	84b	92a	86bc	83c	77b
7 Metribuzin Spartan	10.7 4	98ab	92a	86b	84b	97a	89ab	87b	81b
8 Metribuzin Spartan	5.3 8	94ab	91a	87ab	89a	98a	94a	87b	82ab
9 Metribuzin Spartan	10.7 8	99a	92a	90a	92a	95a	92a	90a	87a
LSD P=.05		8.9	9.4	3.9	3.9	6.8	5.3	2.5	4.8
Standard Deviation		6.7	6.9	3.2	3.2	5.6	4.4	2.1	4.0
CV		9.61	10.97	4.38	4.34	6.88	5.76	2.83	5.72
Treatment F		72.121	55.169	300.992	316.772	125.942	180.136	719.954	180.457
Treatment Prob(F)		0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001

<sup>a</sup>Roundup PowerMax3, glyphosate 4.8 lbae/gal; Zidua SC, pyroxasulfone 4.17 lbai/gal; metribuzin 75%DF. All treatments included AMS at 8.5 lb/100gal.

<sup>b</sup>Abbreviations: DAT, days after treatment; lbae/gal, pounds acid equivalent per gallon; lbai/gal, pounds active ingredient per gallon.

There were no differences in stand count (19 DAT) or soybean height (51 DAT) in either soybean variety. Soybean yield in the weedy trial was greatest in treatments where weed control was highest (combinations of metribuzin and sulfentrazone). Soybean yield in the untreated control was reduced by more than 50%. In the weed free trial, soybean yield following herbicide treatments was equal to or greater than yield in the weed free control. This trial showed that soybean were tolerant to metribuzin and sulfentrazone rates that were applied. The soil at this location is a silty clay loam with greater than 3% organic matter and a pH of around 5.6. Soybean tolerance to metribuzin can be influenced by soil conditions, with higher injury potential to soybean in sandy soils, or soils with high pH and low organic matter.

Table 2. Evaluation of fall application of metribuzin and pyroxasulfone for crop response in peas.

		Soybean yield								
		Stand count		Soybean height		Weedy		Weed free		
Treatment <sup>a</sup>		Rate	AG07XF2	AG07XF4	AG07XF2	AG07XF4	AG07XF2	AG07XF4	AG07XF2	AG07XF4
		oz/A	Plants/A		IN		BU/A			
1	Weed Free		100264-	108232-	12-	11-	13.8f	12.9f	27.2-	24.8cd
2	Metribuzin	5.3	101592-	108232-	12-	11-	18.1e	17.6e	27.8-	28.6ab
3	Metribuzin	10.7	101592-	114872-	12-	11-	21.1cde	21.9cd	31.6-	27.0bc
4	Spartan	4	105576-	112216-	13-	12-	19.4de	20.5de	28.0-	27.3abc
5	Spartan	8	108896-	110224-	13-	11-	22.8c	22.0cd	27.1-	30.6a
6	Metribuzin	5.3	100928-	107568-	12-	11-	21.7cd	25.3bc	27.4-	21.6d
	Spartan	4								
7	Metribuzin	10.7	106240-	110224-	12-	12-	23.7bc	22.2cd	33.0-	24.4cd
	Spartan	4								
8	Metribuzin	5.3	95616-	103584-	12-	11-	26.5ab	30.4a	26.7-	24.7cd
	Spartan	8								
9	Metribuzin	10.7	97608-	109560-	13-	12-	27.4a	29.2ab	30.4-	24.6cd
	Spartan	8								
LSD P=.05			9978.2	9879.5	0.9	0.8	3.14	4.12	4.95	3.55
Standard Deviation			8247.9	8166.4	0.8	0.7	2.60	3.41	4.09	2.94
CV			8.08	7.46	6.17	5.69	12.0	15.2	14.22	11.32
Treatment F			1.050	0.594	1.186	0.973	10.522	10.161	1.252	3.339
Treatment Prob(F)			0.4284	0.7736	0.3479	0.4797	0.0001	0.0001	0.3132	0.0104

<sup>a</sup>Roundup PowerMax3, glyphosate 4.8 lbac/gal; Zidua SC, pyroxasulfone 4.17 lbai/gal; metribuzin 75%DF. All treatments included AMS at 8.5 lb/100gal.

<sup>b</sup>Abbreviations: DAT, days after treatment; lbac/gal, pounds acid equivalent per gallon; lbai/gal, pounds active ingredient per gallon.

Table 3. Application environment and equipment for preemergence herbicide application in soybean.

Application Description		Application equipment	
Date	Jun-4-2025	Equipment Type	Tractor mounted
Start, Stop Time	2:39, 3:05 PM	Operation Pressure	42 PSI
Air Temperature Start, Stop	71.1, 66.4 F	Nozzle Model	11002DG
% Relative Humidity Start, Stop	32.2, 40.2	Nozzle Spacing	20 IN
Wind Velocity+Dir. Start	1.7 MPH, SSW	Boom Height	22.0 IN
Wind Velocity+Dir. Max	12.7 MPH, WNW	Ground Speed	4 MPH
Soil Temperature	57 F	Carrier	WATER
% Cloud Cover	10	Application Amount	10 GAL/AC