

### **Weed control in soybean with preemergence application of metribuzin and sulfentrazone.**

A trial was conducted to evaluate weed control resulting from the application of metribuzin and sulfentrazone (Spartan) in soybean. Soybean were planted on May 20, 2024 using a John Deere no-till planter at a depth of 1.5 inches and a seeding rate of 110,000 seeds/A. Plots were four rows of soybean planted in 30-inch rows. Rows 1 and 2 were planted using soybean variety “AG07XF4; Rows 3 and 4 were planted with soybean variety “AG07XF2”. Two soybean varieties were used to compare varietal tolerance to metribuzin and sulfentrazone. Plot size in this trial was 10 feet wide and 40 feet long. Four replications of treatments were randomized in a randomized complete block. Herbicide treatments were applied after soybean were planted, also on May 20. Soybean was evaluated for injury at 31 days after planting; no visual injury was observed for either soybean variety (Table 1). Soybean stand was measured from one meter in a random location within each row of each plot, no differences in soybean stand was observed. Kochia, common lambsquarters, and green foxtail were evaluated from control at 31 and 47 days after treatment (DAT). Control of all three weeds increased when metribuzin rate increased from 5.33 to 10.7 oz/A. There was no increase in weed control when the rate of sulfentrazone increased from 4 to 8 oz/A. Kochia control was increased when combinations of metribuzin and sulfentrazone were applied, with 100% kochia control at 47 DAT with the combination of metribuzin at 10.7 oz/A and sulfentrazone at 8 oz/A. Common lambsquarters control was 92 to 100% with sulfentrazone alone and was similar for the combination treatments. Green foxtail control was also best when sulfentrazone and metribuzin were tank-mixed. Weed biomass was measured at 35 and 57 DAT. All treatments reduced weed biomass compared to the untreated, but there were no statistical differences among treatments. Soybean yield was not collected in this trial due to the drought conditions that reduced yield in trial to near zero.

Table 1. Efficacy of weed control and soybean response to preemergence application of metribuzin and Spartan (sulfentrazone) applied alone and as a tank mix at Hettinger, ND, 2024.

Herbicide	Rate	Spybean		Kochia		C. lambsquarters		Green foxtail		Weed biomass	
		Injury — % —	Stand plants/A	31 DAT	47 DAT	31 DAT	47 DAT	31 DAT	47 DAT	35 DAT	57 DAT
1 Non-treated		0	111552-	0	0	0	0	0	0	102a	2195a
2 Metribuzin	5.33	0	115599-	80de	78e	88c	88b	79d	75c	10c	860b
3 Metribuzin	10.7	0	104912-	88bc	82cd	96b	90b	84cd	82b	18bc	788b
4 Spartan	4	0	110888-	83cd	78e	100a	92ab	85c	80b	53b	733b
5 Spartan	8	0	120848-	76e	79de	100a	100a	86c	83b	36bc	1003b
6 Metribuzin Spartan	5.33 4	0	111552-	82d	80de	100a	93ab	88bc	83b	14c	266b
7 Metribuzin Spartan	10.7 4	0	118255-	88b	85bc	99ab	95ab	92ab	88a	16bc	973b
8 Metribuzin Spartan	5.33 8	0	116864-	88bc	86b	100a	100a	91ab	88a	20bc	742b
9 Metribuzin Spartan	10.7 8	0	109560-	95a	100a	100a	99a	94a	91a	18bc	990b
LSD P=.05		.	6107.5	4.6	3.2	2.7	8.2	5.1	4.0	37.4	912.5
Standard Deviation		0.0	4164.8	3.1	2.1	1.9	5.6	3.5	2.7	25.5	626.6
CV		0.0	7.38	4.14	2.92	2.15	6.67	4.5	3.68	77.67	65.0
Treatment F		NaN	1.258	342.243	703.957	1245.56	129.608	285.607	429.683	5.070	3.202
Treatment Prob(F)		NaN	0.3140	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0010	0.0121

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Table 2. Application environment and equipment for preemergence application of herbicide treatments for weed control in soybean.

Application Description		Application equipment	
Date	May-20-2024	Equipment Type	Tractor mounted
Start Time	4:56 PM	Operation Pressure	42 PSI
Stop Time	5:28 PM	Nozzle Model	11002DG
Temperature Start, Stop	62.3, 61.7 F	Nozzle Spacing	20 IN
% Relative Humidity Start, Stop	37.7, 37.6	% Coverage	100
Wind Velocity+Dir. Start	3.2 MPH, E	Boom Length	100 IN
Wind Velocity+Dir. Stop	1.5 MPH, E	Boom Height	20 IN
Wind Velocity+Dir. Max	4.8 MPH, E	Ground Speed	2.8 MPH
Wet Leaves (Y/N)	N, no	Carrier	WATER
Soil Temperature	67 F	Application Amount	15 GAL/AC
Soil Moisture	DRY	Mix Size	3.0 L
% Ground Cover	100	Propellant	CO2
% Cloud Cover	100	Tank Mix (Y/N)	Y, yes