

## Mesotrione for Postemergence Weed Control in Grain Sorghum (S0952)

Competition from weeds both early season and at grain fill can reduce the yield potential in sorghum. There are a limited number of herbicide choices available for weed control in grain sorghum. A field study was initiated near Clay Center, Nebraska to investigate weed control efficacy, crop safety, and yield aspects of various herbicides applied on grain sorghum. The experimental design was a randomized complete block with four replications. Plots were 10 feet wide and 30 feet long and were located on a silt loam soil with an organic matter content of 2.5% and pH of 6.5. Sorghum, 'NC+ 7R-83' was planted at 113,700 seeds/A on May 19 and emerged on May 26. Herbicide treatments were made at three different timings, PRE, 6-inch sorghum and 12-inch sorghum following planting. Trial area was disked and field cultivated prior to the PRE application. A tractor-mounted sprayer calibrated to deliver 15 gallons of water per acre at 30 PSI with AIXR 110015 flat spray nozzles was used to apply broadcast treatments (Appl. Codes A & B). A backpack sprayer calibrated to deliver 15 gallons of water per acre at 30 PSI with XRC 11004 flat spray nozzles was used to apply the post-directed treatments (Appl. codes C & D). The environmental conditions at the time of spraying are given in Table 1. Rainfall in the amount of 0.62 inch was received 11 days after PRE application. Rainfall received 10 days before and 10 days after herbicide applications is listed in Table 2. Plots received 12.7 inches of rain and 8.25 inches of irrigation water applied by lateral-move overhead sprinklers during growing season.

Weed pressure in the experiment was high. The most common species was the common waterhemp/Palmer amaranth complex (40/ft<sup>2</sup>), followed by the foxtail species (9/ft<sup>2</sup>). Velvetleaf (3/ft<sup>2</sup>) and common lambsquarters (2/ft<sup>2</sup>) were present, but at much lower densities.

The difference in injury between Lumax and Callisto+Atrazine was striking. The addition of Peak to Callisto+Atrazine resulted in less bleaching/necrosis and less stunting. (Table 3).

Crop response with our drop nozzle system was not different than the broadcast system. With the drops we did not spray into the whorl, but many of the lower leaves were covered because of the height we had to hold the boom to get adequate coverage of the weeds.

The degree of injury from POST applications of Callisto+Atrazine will not be commercially acceptable. Head size was noticeably smaller for both rates of Callisto at the 12" timing, and for the 6 oz rate at the 6" timing. The degree of injury from Lumax at the 1.5 qt rate was acceptable.

Weed control with Lumax was less complete than weed control with Callisto+Atrazine. The early application of Dual made an enormous difference in grass control.

Overall average sorghum yield was 109.2 Bu/Acre. Untreated average sorghum yield was 28.9 Bu/Acre.

Crop response, weed control evaluations and crop yields are shown in Table 3.

Table 1. Environmental conditions at the Time of Herbicide Application.

Appl. Date	Air Temperature (F)	Humidity (%)	Wind Speed & direction (mph)	Time of day	Application Timing	Weed and Crop Heights (inches)				
						SETVI	ABUTH	AMATA	CHEAL	SORVU
May 21	65	55	5 SE	8:45 am	PRE	NA	NA	NA	NA	NA
June 15	84	62	8 E	6:00 pm	6-inch sorghum	3.0	3.0	2.0	3.0	6.5
June 22	91	58	4 NW	6:30 pm	12-inch sorghum	13.0	13.5	13.5	12.5	11.5

Table 2. Rainfall received 10 days before and after herbicide application.

Date (May 21)	Amount (in)		Date (June 15)	Amount (in)		Date (June 22)	Amount (in)
May 13	0.03		June 5	0.16		June 12	0.30
May 15	0.03		June 6	0.52		June 14	0.11
May 23	0.17		June 9	0.16		June 15	2.41
May 26	0.17		June 10	0.06		June 19	0.14
			June 12	0.30		June 20	0.07
			June 14	0.11		June 24	0.23
			June 15	2.41		June 26	0.10
			June 19	0.14			
			June 20	0.07			
			June 24	0.23			

SETVI = Green foxtail    ABUTH = Velvetleaf    AMATA = Common waterhemp    CHEAL = Common Lambsquarters  
 SORVU = Grain Sorghum



Table 3. (cont) Crop response, weed control, and crop yields.

						SORVU	SORVU	SETVI	ABUTH	AMATA	SETVI	ABUTH	AMATA	SORVU	
Rating Type						PHYBLE	PHYBLE	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	YIELD
Rating Unit						0-100	0-100	%	%	%	%	%	%	%	bu/A
Trt-Eval Interval						7 DAT	30 DAT	4-5 WAT	4-5 WAT	4-5 WAT	9-10 WAT	9-10 WAT	9-10 WAT		
Trt	Treatment	Rate	Rate	Growth	Appl										
No.	Name		Unit	Stage	Code										
8	Dual II Magnum	1	PT/A	PREPRE	A	80	0	93	100	100	98	100	100	122.5	
8	Ammonium Sulfate	9.4	LB AI/100 GAL	12-INCH	D										
8	Callisto 4 SC	3	FL OZ/A	12-INCH	D										
8	AATREX 90 DF	8.9	OZ/A	12-INCH	D										
8	Induce	0.5	% V/V	12-INCH	D										
9	Dual II Magnum	1	PT/A	PREPRE	A	80	0	96	100	100	96	100	100	108.3	
9	Ammonium Sulfate	18.7	LB AI/100 GAL	12-INCH	D										
9	Callisto 4 SC	6	FL OZ/A	12-INCH	D										
9	AATREX 90 DF	16	OZ AI/A	12-INCH	D										
9	Induce	0.5	% V/V	12-INCH	D										
10	Ammonium Sulfate	9.4	LB AI/100 GAL	6-INCH	B	4	0	23	100	75	28	100	83	71.8	
10	Peak 57 WG	0.75	OZ/A	6-INCH	B										
10	AATREX 90 DF	16	OZ AI/A	6-INCH	B										
10	AGRIDEX	1	% V/V	6-INCH	B										
11	Peak 57 WG	0.5	OZ/A	6-INCH	B	6	0	28	100	99	30	100	99	95.1	
11	Callisto 4 SC	3	FL OZ/A	6-INCH	B										
11	AATREX 90 DF	8.9	OZ/A	6-INCH	B										
11	Induce	0.25	% V/V	6-INCH	B										
12	Lumax	1.5	QT/A	6-INCH	B	6	0	54	100	96	38	100	96	107.4	
12	Paramount	5.3	OZ/A	6-INCH	B										
12	Induce	0.25	% V/V	6-INCH	B										
13	Dual II Magnum	1	PT/A	PREPRE	A	0	0	90	99.5	98	94	100	99	132.5	
13	Huskie	13	OZ/A	12-INCH	D										
13	AATREX 90 DF	0.5	LB AI/A	12-INCH	D										
13	AMS	9.4	LB AI/100 GAL	12-INCH	D										
LSD (P=.05)						7.8	0	53.66	0.41	7.02	33.7	0.4	4.7	15.51	