

## Standardization of Sulfosulfuron doses in controlling weed of irrigated wheat (*Triticum aestivum*) under eastern U.P. condition.

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### Abstract

An on-farm trial was conducted during rabi season of 2005-06 and 2006-07 at the Agricultural Research Farm (Pili Kothi) of Agronomy Department, T. D. P. G. College Jaunpur to work out the optimum dose of Sulfosulfuron for controlling weeds in irrigated wheat (*Triticum aestivum* L. emend. Fiori & Paol). The most dominant weed in experimental plot were *C. dactylon*, *C. rotundus*, *A. arvensis* & *C. arvensis*. Most of the dominant weeds were reduced by the application of various doses of Sulfosulfuron at 90 days after sowing but drastic reduction in the density of various weeds were observed with Sulfosulfuron at 35, 40 & 45 g a.i./ha treated plot. Application of Sulfosulfuron at 35 g a.i./ha treated plot recorded significantly less number of total weeds per unit area and weed dry weight when compared with Sulfosulfuron at 20 and 25 g a.i./ha and weedy check at 90 days after sowing during both the year. Significantly higher crop dry weight and grain yield were recorded from weed-free plot which was at par with various doses of Sulfosulfuron during both the year. Maximum net return & benefit-cost ratio were notice from Sulfosulfuron at 35g a.i./ha treated plot.

**Keywords:** Wheat, Sulfosulfuron, Weed.

### Introduction

Wheat is the second most important staple food grain of the country but it has prime position at global level with more than 556.36 mt. production which serves the need of more than one billion people of almost 43 countries. Wheat fields are infested by grassy and broad leaf weeds, thus more than one herbicides are required to control the mixed weed flora. Tank mixed application of isoproturon and 2, 4-D has been in practice for the control of mixed weed population in wheat for the last many years (Kumawat *et. al* 1998). Keeping this in view, sulfosulfuron doses were evaluated to standardize for weed control in wheat crop.

### Materials and methods

A field experiment was conducted under irrigated condition during rabi season of 2005-06 and 2006-07 at T. D. P. G. College Research farm Jaunpur, U. P. The treatments consisted of 6 doses of Sulfosulfuron (20, 25, 30, 35, 40 & 45g a.i./ha) along with weedy and weed-free. Wheat variety U.P. 2338 was sown using seed rate 100 kg/ha on first December following all

recommended package and practices. Sulfosulfuron sprayed 33 days after sowing of the crop. Weed population and weed dry weight were recorded at 90 days after sowing using 50 cm x 50 cm quadrat.

### Results and discussion

In all there were thirteen weed species out of them three grassy weed, nine non-grassy and one sedge. The dominant weeds of experimental plots were *C. dactylon*, *C. rotundus*, *A. arvensis* and *C. arvensis*. All doses of applied Sulfosulfuron with weed-free condition resulted in significantly lower individual and total weed density, when compared with weedy check (Table 1). The dominance of broad leaf weeds over grassy and sedge might be due to fallowing of experimental plot in Kharif season of 2004 and 2005. This result is in conformity of Singh *et al.* (2008), who reported lower population of grassy and sedges in comparison of broad leaf weeds in the field remain fallow in kharif season. Application of different doses of Sulfosulfuron resulted into significantly less total weed density and weed dry weight as compared to weedy

check but none of them was able to provide complete control of dominant weed at 90 days stage of crop growth. However Sulfosulfuron at

35, 40 & 45g a.i/ha caused drastic reduction of total weeds and individual weeds at 90 days stage during both the year (Table 1 and 2).

**Table 1 Effect of treatments on individual and total weed density at 90 DAS.**

Treatment	Rate (g.i./ha)	Weed population in m <sup>2</sup>									
		<i>C. dactylon</i>		<i>C. rotundus</i>		<i>A. arvensis</i>		<i>C. arvensis</i>		Total weed	
		2006	2007	2006	2007	2006	2007	2006	2007	2006	2007
Sulfosulfuron	20	8.06 (64.0)	8.14 (65.3)	3.21 (9.3)	3.27 (9.7)	7.30 (52.3)	7.35 (53.0)	4.00 (15.0)	3.96 (14.7)	13.02 (168.7)	13.15 (172.02)
Sulfosulfuron	25	7.09 (49.3)	7.14 (50.0)	3.11 (8.7)	3.11 (8.7)	6.24 (38.0)	6.27 (38.3)	3.70 (12.7)	3.65 (12.3)	11.62 (134.0)	11.75 (137.0)
Sulfosulfuron	30	6.30 (38.7)	6.35 (39.3)	2.77 (6.7)	2.83 (7.0)	4.97 (23.7)	5.00 (24.0)	3.60 (12.0)	3.60 (12.0)	10.31 (105.3)	10.42 (107.7)
Sulfosulfuron	35	5.94 (34.3)	6.00 (35.0)	2.31 (4.3)	2.39 (4.7)	4.16 (16.3)	4.21 (16.7)	3.36 (10.3)	3.32 (10.0)	9.00 (80.0)	9.06 (81.0)
Sulfosulfuron	40	5.89 (33.7)	5.92 (34.0)	2.24 (4.0)	2.24 (4.0)	3.96 (14.7)	4.00 (15.0)	3.32 (10.0)	3.32 (10.0)	8.76 (75.7)	8.77 (76.0)
Sulfosulfuron	45	5.86 (33.3)	5.92 (34.0)	2.16 (3.7)	2.16 (3.7)	3.91 (14.32)	3.96 (14.7)	3.32 (10.0)	3.30 (9.7)	8.48 (71.0)	8.50 (71.3)
Weed-free		1.00 (0)	1.00 (0)	1.00 (0)	1.00 (0)	1.00 (0)	1.00 (0)	1.00 (0)	1.00 (0)	1.00 (0)	1.00 (0)
Weedy		9.43 (88.0)	9.54 (90.0)	4.12 (16.00)	4.21 (16.7)	8.31 (68.0)	8.41 (69.7)	4.44 (18.7)	4.36 (18.0)	15.26 (232.0)	15.39 (236)
C.D. (at 5%)		1.25	1.26	0.55	0.55	1.11	1.12	0.65	0.64	1.97	1.98

DAS (Days After Sowing) figure in parentheses are original value transformation used

**Table 2 Effect of treatments on total weed dry weight & crop dry matter, grain yield economic parameter of wheat**

Treatment	Rate (g a.i./ha)	Weed population in m <sup>2</sup>									
		Total weed dry wt. (g/m <sup>2</sup> ) at 90 DAS		Total crop dry wt. (g/m <sup>2</sup> ) at 90 DAS		Grain yield (kg/ha)		Net return (Rs./ha)		Benefit- cost ratio	
		2006	2007	2006	2007	2006	2007	2006	2007	2006	2007
Sulfosulfuron	20	7.87 (60.88)	7.86 (60.88)	770.2	771.0	3103	3105	5217.07	5320.0	1.30	1.31
Sulfosulfuron	25	7.03 (48.37)	7.02 (48.30)	823.0	824.0	3352	3354	6631.50	6655.00	1.37	1.38
Sulfosulfuron	30	6.24 (37.92)	6.24 (38.00)	856.8	857.5	3500	3503	7335.43	7370.40	1.40	1.42
Sulfosulfuron	35	5.46 (28.86)	5.47 (28.90)	895.6	896.2	3615	3618	7822.07	7856.07	1.42	1.43
Sulfosulfuron	40	5.32 (27.32)	5.33 (27.45)	905.2	906.0	3625	3629	7615.70	7662.0	1.41	1.42
Sulfosulfuron	45	5.16 (25.63)	5.17 (25.75)	900.8	901.0	3616	3620	7284.43	7312.2	1.38	1.39
Weed-free		1.00 (0)	1.00 (0)	921.4	922.0	3783	3788	5514.24	3843.0	1.25	1.27
Weedy		8.54 (71.92)	8.54 (72.00)	685.4	685.9	2500	2501	2212.74	2224.26	1.14	1.15
C.D. (at 5%)		1.23	1.23	129.34	129.4	486	487				

DAS (Days After Sowing) figure in parentheses are original value transformation used

Application of Sulfosulfuron doses and weed-free condition produced higher crop dry matter which reflected into higher grain yield (Table 2). The reason for higher grain yield in various doses of Sulfosulfuron treated plot were due to low dry weight of weeds and less density of total weeds, which inturn provide favourable environment for the growth and development of crop. Singh & Singh (2004) also reported similar results. Economic parameter *viz* net return and benefit cost ratio were calculated on the basis of cost of cultivation and price of grain and straw obtained from each treatment. Maximum net

return and benefit-cost ratio were recorded in Sulfosulfuron at 35 g a.i./ha treated plot because higher grain yield and without labour cost in weed management. Weed free condition resulted in maximum grain yield but cost of cultivation was higher due to more number of labourer were used in weed management practices. Therefore, application of Sulfosulfuron at 35 g a.i./ha (at 33 days after sowing) was sufficient to control dominant weeds of wheat crop and ultimately increase grain yield about 45% over weedy check.

### References

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