



## Sensitivity and yield performance of wheat varieties as influenced by sulfosulfuron + metsulfuron application

S.S. Punia\*, Samunder Singh, Dharambir Yadav and V.S. Hooda

Department of Agronomy, CCS Haryana Agricultural University, Hisar, Haryana 125 004

Received: 5 September 2013; Revised: 26 December 2013

**Key words:** Chemical control, Sensitivity, sulfosulfuron + metsulfuron, Variety, Wheat

Wheat is an important cereal *Rabi* crop of Haryana. The crop is severely infested by both grass and broad-leaf weeds. A new herbicide, ready mixture of sulfosulfuron + metsulfuron, provides excellent control of resistant population of *Phalaris minor* and broad-leaved weeds (Malik *et al.* 2007, Punia *et al.* 2008, Chhokar *et al.* 2011). Some wheat varieties have been found to be sensitive to 2,4-D and isoproturon (Balyan 1999, Yadav and Malik 2005). Keeping it in view, the present experiment was planned to study the sensitivity of popular wheat varieties to this new herbicide.

A study was done to find the sensitivity of 9 wheat varieties to sulfosulfuron + metsulfuron (R.M.) at CCS HAU, Hisar during *Rabi* season of 2005-06 and 2006-07. Nine wheat varieties, viz. 'WH 1022', 'HD-2687', 'C-306', 'UP-2338', 'PBW-343', 'WH-542', 'WH-711', 'WH-283' and 'WH-147' were kept as main plots treatments, and two doses of herbicide, viz. sulfosulfuron + metsulfuron at 32 g/ha (x), double to recommended 64 g/ha (2x) and weedy check were kept as subplot treatments, with four replications in a plot size of 5.0 x 1.6 m. All agronomic practices except herbicide doses were same in all treatments. Observations on visual phytotoxicity to crop such as yellowing and stunting were recorded at 15 and 30 days after treatment on 0-10 scale. Crop was harvested on 11.4.2006 and data on grain yield was recorded.

Results showed that with recommended dose of herbicide 32 g/ha, leaves of all wheat varieties except 'C-306' showed slight yellowing of leaves at 15 days after treatment (DAT), which disappeared with passage of time as at 30 DAT no yellowing was visible on leaves (Table 1). At double to recommended dose (64 g/ha), even slight yellowing on leaves was also observed. Wheat plants of any variety did not show stunted growth at both application rates. Yadav *et al.* (2009) also reported that no phytotoxicity on wheat crop was observed with application of sulfosulfuron + metsulfuron (ready-mix) 32 g/ha and sulfosulfuron 25 g/ha *fb* metsulfuron 4 g/ha in wheat.

\*Corresponding author: puniasatbir@gmail.com

Grain yield of wheat did not differ significantly in x and 2x doses, and weed-free check but the yield was significantly higher than weedy check (Table 1). The yield also varied significantly among different varieties at both the herbicide doses. During 2005-06, maximum grain yield (4.52 t/ha) was recorded in 'WH-1022' but in 2006-07, the maximum grain yield (6.95 t/ha) was in 'WH-542' and minimum (2.96 and 4.25 t/ha) in 'C-306'. It may be due to inherent low yield potential of 'C-306' which is tall growing with good grain quality. Grain yield of all wheat varieties did not vary significantly among herbicide rates. During 2006-07, the grain yield of 'PBW-343', 'UP-2338', 'WH-283' and 'PBW-502' was numerically higher in double dose herbicide than weed-free. Malik *et al.* (2007) reported that sulfosulfuron + metsulfuron (15 + 4 g/ha) proved effective against all weeds and reduced the total weed dry weight to the extent of 87-96%. Sulfosulfuron + metsulfuron produced effective tillers and grain yield of wheat statistically at par with weed-free check, which was 40-42% higher than weedy check. Yadav *et al.* (2009) also observed that sulfosulfuron + metsulfuron and sulfosulfuron *fb* metsulfuron reduced the density and dry weight of *P. minor* and it was as good as weed-free check in respect of effective tillers and grain yield of wheat.

No phytotoxicity of sulfosulfuron + metsulfuron was observed on any wheat variety with x and 2x doses, and the grain yield did not vary significantly among varying herbicide rates.

### SUMMARY

An investigation to study the sensitivity of nine wheat varieties, viz. 'WH 1022', 'HD-2687', 'C-306', 'UP-2338', 'PBW-343', 'WH-542', 'WH-711', 'WH-283' and 'WH-147' to most popular used herbicide combination, i.e. sulfosulfuron + metsulfuron (R.M.) was undertaken at Hisar during *Rabi* seasons of 2005-06 and 2006-07. At 15 DAT with recommended dose of herbicide 32 g/ha, the leaves of all wheat varieties except 'C-306' showed slight yellowing of leaves which disappeared with passage of time as at 30 days after treatment no yellowing was vis-

**Table 1. Grain yield (t/ha) of different wheat varieties as affected by different doses of sulfosulfuron+metsulfuron**

Varieties	Herbicide doses (2005-06)				Herbicide doses (2006-07)			
	Recommended dose (x)	Double to recommended dose (2x)	Weed-free	Mean	Recommended dose (x)	Double to recommended dose (2x)	Weed-free	Mean
'WH 1022'	5.69	5.67	5.68	5.68	5.83	5.86	5.88	5.86
'HD-2687'	5.58	5.73	5.75	5.69	6.34	6.37	6.38	6.36
'C-306'	3.75	3.88	3.80	3.81	4.28	4.27	4.18	4.25
'UP-2338'	4.67	4.82	4.80	4.76	5.63	5.73	6.00	5.65
'PBW-343'	5.58	5.53	5.58	5.56	6.76	6.83	6.64	6.74
'WH-542'	5.62	6.00	5.60	5.61	6.98	6.92	6.96	6.95
'WH-711'	5.13	5.19	5.20	5.17	6.98	6.86	6.92	6.92
'WH-283'	5.16	5.23	5.23	5.20	6.02	5.79	5.79	5.87
'WH-147'	4.95	5.01	5.10	5.02	6.09	5.80	5.87	5.92
'WH 502'					6.61	6.49	6.35	6.48
Mean	5.12	5.18	5.17		6.15	6.09	6.06	
LSD (P=0.05) for variety		0.45				0.26		
LSD (P=0.05) for dose		NS				NS		
LSD (P=0.05) for V x H		NS				NS		

ible on leaves even at double to recommended dose (64 g/ha). In all wheat varieties, the grain yield with x and 2x doses was at par with weed-free check but higher than weedy check, indicating no detrimental effect of the herbicide on any variety tested.

## REFERENCES

- Balyan RS.1999. Efficacy of sulfosulfuron, tralkoxydim and metribuzin applied alone and tank-mix on weeds in wheat. *Indian Journal of Weed Science* **31**: 80-83.
- Chhokar RS, Sharma RK and Subhash Chander. 2011. Optimizing the surfactant dose for sulfosulfuron and ready mix combination of sulfosulfuron and carfentrazone against weeds in wheat. *Indian Journal of Weed Science* **43**: 153-162.
- Malik RS, Yadav A and Malik RK. 2007. Efficacy of tank-mix application of sulfonylurea herbicides against broadleaf weeds in

wheat and their residual effects on succeeding crop of sorghum under zero tillage. *Indian Journal of Weed Science* **39**: 185-189.

Punia SS, Yadav DB, Yadav A, Malik RS and Malik YP. 2008. Bioefficacy and phytotoxicity of herbicide UPH-206 (clodinafop propargyl 15% + metsulfuron 1%) for the control of complex weed flora in wheat and its residual effect on succeeding sorghum crop. *Indian Journal of Weed Science* **40**: 176-179.

Yadav A and Malik RK. 2005. Herbicide resistant *Phalaris minor* in wheat—a sustainability issue, p. 152 In: *Resource Book*. Department of Agronomy and Directorate of Extension Education, CCSHAU, Hisar, India.

Yadav DB, Punia SS, Yadav A and Lal Roshan. 2009. Compatibility of sulfosulfuron with carfentrazone-ethyl for the control of complex weed flora in wheat. *Indian Journal of Weed Science* **41**: 146-149.