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# Effect of Traisulfuron (Logran 20 WG) on Non-grassy Weeds and Wheat Yield

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Long term continuous use of isoproturon and other herbicides like clodinafop-propargyl, diclofopmethyl and fenoxaprop-p-ethyl in wheat may result in shift in weed flora favouring non-grassy weeds as these herbicides are not effective on them (Punia *et al.*, 2002, Singh *et al.*, 2003). The commonly known non-grassy weeds infesting wheat fields are *Chenopodium album, Melilotus alba, Melilotus indica, Medicago denticulata, Lathyrus aphaca, Vicia savita, Vicia hirsuta, Fumaria parviflora, Anagallis arvensis* and *Coronopus didymus. Rumex* spp. is being also observed in wheat fields for the last 2-3 years. 2, 4-D is the commonly used herbicide against non-grassy weeds in wheat, which is not very effective on *L. aphaca, M denticulata, M indica, C. didymus* and *Rumex* spp. Therefore, there is necessity to find out alternative to 2, 4-D with wide control spectrum. The present study was conducted to evaluate bio-efficacy of traisulfuron in wheat against non-grassy weeds.

A field experiment was conducted during winter seasons of 2000-01 and 2001-02 at the Crop Research Centre of G. B. Pant University of Agriculture & Technology, Pantnagar to study weed control spectrum, efficacy and effect of traisulfuron on wheat grain yield. The soil of experimental field was clay loam, medium in organic carbon (0.7%), available phosphorus (18 kg P $ha^{-1}$) and potassium (266 kg K $ha^{-1}$). Traisulfuron (Logran 20 WG) at two doses was compared with isoproturon, 2,4-D and clodinafop. Experiment with seven treatments and four replications was laid out in randomized block design (Table 1). Herbicides were applied as spray at spray volume of 500 l $ha^{-1}$ using flat fan nozzle at 35 days after wheat sowing. Wheat varieties UP 2425 during 2000-01 and PBW 343 during 2001-02 were sown on November 22 and 21, respectively. A separate screening trial was also laid out where different weed species were sown in rows 20 cm apart. Herbicides were applied across the rows to ascertain efficacy and spectrum on specific weed species. Recommended package of practices other than weed control was adopted to grow the experimental crop.

Traisulfuron at 15 and 20 g $ha^{-1}$ was not effective on *Phalaris minor.* It was very effective on *C. album, M. alba, M. indica, V. sativa, V. hirsuta, C. didymus* and *R. acetosella* (Table 1). The efficacy depended on its dose. Effect on *L. aphaca* and *M. denticulata* was not satisfactory and efficiency was 40-60%. The overall weed control spectrum of traisulfuron was much wider and weed control efficiency very high in comparison to 2,4-D at 500 g $ha^{-1}$ and isoproturon at 1.0 kg $ha^{-1}$. Clodinafop could not control any of the non-grassy weeds but it was highly effective on *P. minor.*

In 2,4-D treated plots, spike malformation was observed in both the wheat varieties but there was no spike malformation in case of traisulfuron treated plots. Traisulfuron at both the doses did not cause any phytotoxicity on both the wheat varieties.

The wheat crop was infested mainly with non-grassy weeds. Population of *P. minor* was very low. There was more than 38% reduction in the grain yield of wheat in weedy plots when compared with weed-free plots (Table 1). Wheat grain yields due to traisulfuron at 15 and 20 g $ha^{-1}$ were at par with weed-free. The difference in grain yield between traisulfuron at 15 and 20 g $ha^{-1}$ was non-significant. In clodinafop treated plots, the grain yield was significantly lower than other herbicide treated plots.

Table 1. Effect of traisulfuron on weeds (Mean of two crop seasons) and wheat yield

| Treatment | Dose (g ha$^{-1}$) | Per cent weed control | | | | | | | | | Wheat grain yield (kg ha$^{-1}$) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | *P. minor* | *C. album* | *L. aphaca* | *M. alba* | *M. indica* | *M. denticulata* | *Vicia* spp. | *C. didymus* | *R. acetasella* | 2000-01 | 2001-02 | Mean |
| Traisulfuron | 15 | 0 | 83 | 45 | 85 | 83 | 43 | 83 | 93 | 83 | 4305 | 4875 | 4590 |
| Traisulfuron | 20 | 0 | 95 | 55 | 95 | 95 | 53 | 98 | 95 | 95 | 4480 | 5010 | 4745 |
| Isoproturon | 1000 | 86 | 83 | 0 | 83 | 8 | 0 | 5 | 0 | 0 | 4025 | 4280 | 4153 |
| 2, 4-D | 500 | 0 | 100 | 8 | 93 | 13 | 8 | 98 | 53 | 85 | 4320 | 4505 | 4413 |
| Clodinafop | 60 | 100 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3155 | 3280 | 3218 |
| Weed-free | 0 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 4725 | 4985 | 4855 |
| Weedy | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3085 | 2850 | 2968 |
| LSD (P=0.05) | - | - | - | - | - | - | - | - | - | - | 427 | 492 | - |

## REFERENCES

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