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# Effect of Fenoxaprop and Sulfosulfuron Alone and as Tank Mixture Against Complex Flora of Weeds in Wheat

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## ABSTRACT

Post-emergence application of fenoxaprop at 120 g $ha^{-1}$ was very effective against *Avena ludoviciana* and was ineffective against *Rumex retroflex* and *Coronopus didymus* in wheat. Sulfosulfuron at 20 g $ha^{-1}$ being superior to its lower doses was effective (WCE 82%) against these weeds. In general, tank mix application of fenoxaprop and sulfosulfuron at 116.7+23.3 g $ha^{-1}$ was more effective than when used as 127.3+12.7 g $ha^{-1}$. Tank mix application of fenoxaprop with 2, 4-D Na at 120+500 g $ha^{-1}$ had poor WCE (32%).

## INTRODUCTION

Wild oat *(Avena ludoviciana* Dur.) is most common grassy weed of wheat in the areas with light textured, irrigated and well-drained soils subjected most commonly to other than rice-wheat rotations (Balyan and Malik, 1991). The acute problem of both of grassy weeds alongwith some broadleaf weeds is also not uncommon in many parts of the country, which often results in huge yield losses and makes the weed management issue more complex (Balyan, 2001; Singh and Singh, 2002). In the recent past, the problem of *Rumex retroflex* and *Coronopus didymus* alongwith grassy weed is increasing in Haryana. Fenoxaprop and sulfosulfuron have been recommended for *Phalaris minor* control in wheat. Sulfosulfuron also provides control or suppresses some of the broadleaf weeds. Hence, it was realized to evaluate the efficacy of fenoxaprop and sulfosulfuron alone and as tank mixture in wheat dominated by *Avena ludoviciana* and *Rumex retroflex.*

## MATERIALS AND METHODS

The field experiment was conducted during winter season of 1997-98 and 1998-99 at Research Farm of CCS Haryana Agricultural University, Hisar, India. The soil of the experimental field was sandy loam in texture, low in available N (187.0 kg $ha^{-1}$), medium in available $P_2O_5$ (12.4 kg $ha^{-1}$) and high in $K_2O$ (372.5 kg $ha^{-1}$) with slightly alkaline in reaction (pH 8.2). Wheat variety WH-542 at seed rate of 90 kg $ha^{-1}$ was sown under furrow irrigated raised bed system on December 4 and 11 during 1997-98 and 1998-99, respectively. The experiment consisting various doses of fenoxaprop, sulfosulfuron, tank mixture of fenoxaprop with 2, 4-D Na (80% WP) and fenoxaprop with sulfosulfuron in the ratio of 10 : 1and 5 : 1 alongwith weedy and weed-free checks was laid out in randomized block design replicated thrice (Table 1). All the herbicides were sprayed as post-emergence at 35 days after sowing (DAS) using knapsack sprayer fitted with flat fan nozzles in a spray volume of 500 l water $ha^{-1}$. The field was dominated mainly with *Avena ludoviciana* (30%), *Rumex retroflex* (32%) and *Coronopus didymus* (38%). Since the data during both the years followed the similar and close trend, it was subjected to pooled analyses.

## RESULTS AND DISCUSSION

### Effect on Weeds

In general, all the herbicidal treatments reduced the density and dry weight of weeds and their impact increased with the corresponding increase in their dose either alone or in mixture (Table 1). Fenoxaprop at 120 g $ha^{-1}$ being superior to its lower dose (100 g $ha^{-1}$) and at par with its higher dose (140 g $ha^{-1}$) in terms of weed density was very effective

Table 1. Effect of herbicides on weeds in wheat

| Treatment | Dose | Population of weeds (No. $m^{-2}$) | | | Dry weight |
|---|---|---|---|---|---|
| | (g $ha^{-1}$) | *A. ludoviciana* | *R. retroflex* | *C. didymus* | (g $ha^{-1}$) |
| Fenoxaprop | 100 | 8.2 | 39.1 | 45.1 | 245.1 |
| Fenoxaprop | 120 | 2.0 | 36.3 | 51.0 | 191.3 |
| Fenoxaprop | 140 | 0.0 | 40.2 | 48.3 | 178.6 |
| Fenoxaprop+Sulfosulfuron | 90.9+9.1 | 12.7 | 34.4 | 27.1 | 218.0 |
| F enoxaprop+Sulfosulfuron | 109.1+10.9 | 4.1 | 32.8 | 28.0 | 183.7 |
| Fenoxaprop+Sulfosulfuron | 127.3+12.7 | 1.3 | 27.3 | 21.7 | 161.2 |
| Fenoxaprop+Sulfosulfuron | 83.3+16.7 | 9.5 | 20.0 | 15.3 | 178.5 |
| Fenoxaprop+Sulfosulfuron | 100+20 | 3.1 | 12.2 | 7.0 | 127.8 |
| Fenoxaprop+Sulfosulfuron | 116.7+23.3 | 0.0 | 8.1 | 4.1 | 34.1 |
| Sulfosulfuron | 10 | 24.3 | 29.3 | 23.5 | 231.9 |
| Sulfosulfuron | 15 | 18.6 | 21.5 | 16.2 | 162.4 |
| Sulfosulfuron | 20 | 7.1 | 9.1 | 17.0 | 73.0 |
| Fenoxaprop+2, 4-D | 120+500 | 18.7 | 30.6 | 22.3 | 281.3 |
| Weedy | - | 34.5 | 37.8 | 47.1 | 412.6 |
| Weed-free | - | - | - | - | - |
| LSD (P=0.05) | - | 2.7 | 4.2 | 6.4 | 15.1 |

against *A. ludoviciana* but it turned out to be ineffective against *R. retroflex* and *C. didymus*. Sulfosulfuron at 20 g $ha^{-1}$ being superior to its lower doses was very effective (WCE 82%) against both grassy as well as broadleaf weeds. However, the weed control efficacies in case of tank mix application of fenoxaprop and sulfosulfuron only at 116.7+23.3 g $ha^{-1}$ (WCE 92%) was higher than alone application of sulfosulfuron at 20 g $ha^{-1}$ (WCE 82%). Tank mixture of fenoxaprop and 2, 4-D Na at 120+500 g $ha^{-1}$ could not provide effective weed control. Antagonistic effect of 2, 4-D Na and fenoxaprop has already been documented (Yadav *et al.*, 2002).

**Effect on Crop**

Among different herbicidal treatments, fenoxaprop+sulfosulfuron at 116.7+23.3 g $ha^{-1}$ produced number and length of spike, number of grains $spike^{-1}$, 1000-grain weight and ultimately grain yield of wheat similar to weed-free conditions (Table 2). This treatment was significantly better than all other herbicidal treatments except that it was at par with fenoxaprop+sulfosulfuron at 100+20 g $ha^{-1}$ and sulfosulfuron at 20 g $ha^{-1}$ in respect of number and length of spike and grains $spike^{-1}$.

Fenoxaprop being grassy weed killer was poor

Table 2. Effect of herbicides on yield attributes and yield of wheat

| Treatment | Dose (g $ha^{-1}$) | No. of spikes $m^{-2}$ | Spike length (cm) | Grains $spike^{-1}$ | Test weight (g) | Yield (kg $ha^{-1}$) |
|---|---|---|---|---|---|---|
| Fenoxaprop | 100 | 340 | 8.3 | 47.8 | 30.1 | 2715 |
| Fenoxaprop | 120 | 380 | 8.9 | 49.2 | 30.7 | 3339 |
| Fenoxaprop | 140 | 406 | 9.3 | 51.3 | 31.3 | 3412 |
| Fenoxaprop+Sulfosulfuron | 90.9 +9.1 | 371 | 9.1 | 51.2 | 30.8 | 3286 |
| Fenoxaprop+Sulfosulfuron | 109.1+10.9 | 415 | 9.5 | 53.8 | 31.3 | 3508 |
| Fenoxaprop+Sulfosulfuron | 127.3+12.7 | 431 | 9.6 | 56.9 | 31.8 | 3756 |
| Fenoxaprop+Sulfosulfuron | 83.3+16.7 | 419 | 9.6 | 53.7 | 31.7 | 3616 |
| Fenoxaprop+Sulfosulfuron | 100+20 | 483 | 10.7 | 58.7 | 33.1 | 4523 |
| Fenoxaprop+Sulfosulfuron | 116.7+23.3 | 505 | 10.4 | 60.3 | 34.5 | 5058 |
| Sulfosulfuron | 10 | 350 | 9.1 | 48.7 | 29.0 | 3119 |
| Sulfosulfuron | 15 | 434 | 9.7 | 52.3 | 31.6 | 4067 |
| Sulfosulfuron | 20 | 476 | 10.6 | 57.1 | 32.2 | 4615 |
| Fenoxaprop+2, 4-D | 120+500 | 317 | 8.1 | 47.0 | 29.2 | 2412 |
| Weedy | - | 281 | 7.3 | 44.8 | 27.8 | 1807 |
| Weed-free | - | 520 | 11.1 | 61.3 | 34.1 | 5107 |
| LSD (P=0.05) | - | 43 | 0.7 | 3.4 | 0.9 | 402 |

against complex weed flora, hence resulted in lower yield and yield attributes. Tank mix application of fenoxaprop+ 2,4-D Na at 120+500 g $ha^{-1}$ produced lower yield and yield attributes because of unsatisfactory weed control as explained earlier. Weeds growing throughout the crop season resulted in 65% reduction in the grain yield of wheat.

## REFERENCES


Balyan, R. S. 2001. Evaluation of new herbicides against mixed weed flora in wheat. *Haryana J. Agron.* **17** : 30-34.

Balyan, R. S. and R. K. Malik, 1991. Susceptibility of wheat cultivars to fluroxypyr. *Haryana J. Agron.* **7** : 33-38.

Singh, G. and M. Singh, 2002. Bio-efficacy of metsulfuron-methyl in combination with isoproturon for control of grassy and non-grassy weeds in wheat. *Indian J. Weed Sci.* **34** : 9-12.

Yadav, A., R. K. Malik, B. S. Chauhan and G. Gill, 2002. Present status of herbicide resistance in Haryana. In : Proc. international workshop on herbicide resistance management and zero tillage in rice-wheat cropping system, March 4-6, 2002, held at CCS Haryana Agricultural University, Hisar, India. pp. 15-22.