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Short communication

Fenoxaprop-p-ethyl effect against weeds in late sown wheat

P.R. Singh, R.K. Singh*, A.K. Singh, R. Nayak and R.P.K. Singh
Narendra Deva University of Agriculture & Technology, Faizabad, Utter Pradesh

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Delayed sowing of wheat tends to reduce germination count and number of tillers/unit area because of sharp rise in temperature during tillering phase of the crop and ultimately decrease in yield (Soomro and Oad 2002). Hence, an attempt was made to cultivate weed free late sown wheat by use of fenoxaprop-p-ethyl at different doses in lieu of higher productivity and profitability from rice fallow areas.

Field experiment was conducted during *Rabi* season of 2010-11 at Agronomy Research Farm of N.D. University of Agriculture and Technology, Kumarganj, Faizabad (UP). Ten weed control treatments were consisted in randomized block design with three replications. Soil was slightly alkaline in reaction (7.9 pH), low in organic carbon (0.32%) and low in available nitrogen, phosphorus and medium in potassium. Wheat cultivar '*HUW 234*' was sown on 23rd December with 125 kg/ha of seed at row 20 cm apart at 4-5 cm deep by seed drill. The crop was fertilized with NPK 120- 60-40 kg/ha through urea, single super phosphate and murate of potash, respectively. Out of ten weed control treatments, fenoxaprop-p-ethyl 10 EC was applied at different doses *viz*. 75, 100, 120, 150, 200, 240 g/ha. While market sample of fenoxaprop-p-ethyl 120 g/ha and clodinofop (Topic) were used as standard check Each experiment unit of 5.4 x 5.0 m gross plot size was repeated three times. Treatments were applied as post-emergence at 35 days after sowing (DAS) with the help of knapsack sprayer fitted with flat fan nozzle using 600 liters volume of water. Data on weeds was subjected to square root transformation to normalize their distribution.

Wheat was invaded with *Phalaris minor* (40.2%), *Avena ludovaciana* (14.7%), *Cynodon dactylon* (2.3%) under grassy weeds: *Melilotus alba* (49.9%), *Cheneopodium album* (83.7%), *Anagallis arvensis* (23.8%) under broad-leaved and *Cyperus rotundus* (5.0%) in sedges group. Results revealed that weed density affected significantly due to different weed control treatments. Application of fenoxaprop-p-ethyl at higher doses of 240, 200 and 150 g/ha were equally effective between each other and recorded significantly less density of grassy weeds over rest of the herbicidal treatments. However, lowest and highest density was recorded with weed free and weedy check, respectively. Density of broad-leaved weeds (BLWs) found ineffective among all the test parameters might be due to fenoxaprop-p-ethyl as well as clodinofop were the narrow-leaf weed killer. Similarly, weed dry weight was also significantly lower under these treatments. Application of fenoxaprop at 75, 100, 120 g/ha and clodinofop 60 g/ha were found equally effective on same parameters. Selective bio-efficacy of same herbicides against narrow-leave weeds was also observed by Chhokar *et al*. (2007). Weed control efficiency (WCE) was recorded highest (95.4%) with application of fenoxaprop at higher 240 g/ha rate followed by its lower dose of 200 g/ha (65.2%). However, Whipsuper (fenoxaprop) (standard check) 120 kg/ha found to be significantly more effective in respect to nitrogen removal by weeds and weed index. The phytotoxic effect was also noticed both on crop as well as weeds at higher doses against recommendation of 120 g/ha. Similar findings have also been reported by Jain *et al.* (2007).

The tallest wheat plant (55.5 cm) with significantly increased plant dry weight (389.5 g/m^2) and maximum number of productive tillers recorded with fenoxaprop (Whipsuper) 120 g (370.0/m^2) followed by fenoxaprop 120 g (364.6/m^2), clodinofop (Topic) 60 g and fenoxaprop 100 g/ha, but it did not surpassed the spike count under weed free check (396.5 m^2). However, productive tillers were decreased at each successive increase in doses of fenoxaprop from 150 to 240 g/ha. It might be due to phytotoxic effect of higher dose of fenoxaprop on wheat crop and it has inverse relationship with weed control parameters such as crop growth, yield attributes and grain yield. These results were in conformity with the work done by Malik *et al*. (2005). Herbicides applied at lower doses measured

***Corresponding author:** rksinghagronomy02@gmail.com

Table 1. Effect of weed control treatments on weeds and nitrogen uptake in wheat crop

Treatment	Weed density (no./m^2) at 60 DAS	Weed dry weight (g/m^2) at 60 DAS	Weed control efficiency (%)	Weed index	Nitrogen removal by weeds (kg/ha)
Fenoxaprop-p-ethyl 75 g/ha	13.0 (170)	10.2 (103)	44.0	15.1	3.43
Fenoxaprop 100 g/ha	12.9 (165)	9.9 (97)	56.4	10.7	2.53
Fenoxaprop 120 g/ha	12.8 (164)	9.0 (80)	57.2	7.3	2.10
Fenoxaprop 150 g/ha	12.8 (164)	8.5 (72)	63.1	17.3	3.70
Fenoxaprop 200 g/ha	12.6 (158)	7.8 (60)	65.2	22.5	4.62
Fenoxaprop 240 g/ha	12.7 (162)	7.0 (48)	95.4	23.9	3.31
Fenoxaprop-p-ethyl (whipsuper standard check) 120 g/ha	12.9 (165)	9.2 (84)	59.5	6.5	2.01
Clodinofop (Topic) (standard check) 60 g/ha	12.7 (161)	9.6 (92)	58.7	19.3	2.12
Weedy check	15.5 (240)	11.6 (134)	0.00	33.9	6.54
Weed free	0.7 (0.00	0.7 (0.0)	100.0	0.00	0.00
LSD (P=0.05)	2.50	0.91	-	-	0.56

Data were subjected to square root transformation; values in the parentheses are original values

Table 2. Effect of weed control treatments on crop growth, yield and economics of wheat crop

Treatment	Plant height at 60 DAS	Plant dry weight at 60 DAS (g/m^2)	Productive tiller/m^2	Length of spike (cm)	Grain yield (t/ha)	B: C ratio	Nitrogen removal by crop (kg/ha)
Fenoxaprop-p-ethyl 75 g/ha	51.6	321	320	7.59	3.53	1.85	74.9
Fenoxaprop 100 g/ha	52.3	372	322	7.95	3.72	1.93	77.8
Fenoxaprop 120 g/ha	55.1	387	365	8.88	4.06	2.14	88.0
Fenoxaprop 150 g/ha	48.5	362	219	7.87	3.62	1.76	75.4
Fenoxaprop 200 g/ha	46.7	356	282	7.50	3.39	1.50	69.2
Fenoxaprop 240 g/ha	45.6	313	278	6.75	3.33	1.39	67.3
Fenoxaprop-p-ethyl (whipsuper standard check) 120 g/ha	55.5	389	370	8.91	4.09	2.17	88.4
Clodinofop (Topic) (standard check) 60 g/ha	53.8	385	359	8.81	3.76	2.13	83.7
Weedy check	43.0	277	197	6.11	2.89	1.40	58.1
Weed free	58.0	403	396	9.46	4.38	1.97	95.4
LSD (P=0.05)	6.3	54	54	1.04	0.35	--	6.64

significantly longest spike than higher doses of fenoxaprop at 200 and 240 g/ha. All weed control practices significantly influenced grain yield over the weedy check. Application of fenoxaprop (Whip-super) 120 g, new molecule of fenoxaprop at 100 and 120 g and clodinofop (standard check) 60 g/ha being at par and also recorded statistically higher grain yield over rest of herbicidal treatments. These findings were corroborated with the results obtained by Yadav *et al.* (2009).

SUMMARY

An experiment was conducted during *Rabi* season of 2010-11 at Agronomy Research Farm of NDUAT, Faizabad to assess the influence of fenoxaprop-p-ethyl at various doses with its standard check and clodinofop on weeds, plant growth, nitrogen uptake and production of late sown wheat. All weed control treatments at different doses effectively reduced nitrogen removal by weeds and its ranges in between 2.01 to 4.62 kg/ha. Post-emergence application of fenoxaprop (Whipsuper) standard check 120 g, fenoxaprop-p-ethyl at 100 and 120 g and Topic (clodinofop) 60 g/ha (standard check) produced significantly higher yield under delayed sown wheat.

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