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Effect of Herbicides on Weeds in Late Sown Wheat

Naveen Kumar Tiwari and R. D. Vaishya
Department of Agronomy
Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad-224 229 (U. P.), India

In Uttar Pradesh, rice-wheat cropping system is widely practised by the farmers. Late transplanting of rice, use of long duration varieties and late heavy rains are the main reasons for delay in sowing of wheat after rice. Further, the fields are vacated quite late in season after the end of normal sowing period by the preceding crops like sugarcane, potato, toria, etc. Sometimes, heavy rainfall during November and December also delays the sowing of wheat in the season.

Reduction in yield of late sown wheat ranging from 15 to 50% has been reported by Gill and Brar (1975) from PAU, Ludhiana. It has also been reported by the weed scientists from Hisar and Ludhiana that *Phalaris minor,* a problematic weed of wheat, is becoming resistant to isoproturon. This situation can be avoided by adopting herbicide rotation system. A number of new herbicides have been developed as alternative of isoproturon for effective control of *P. minor* and *Avena* spp. in wheat. The efficacy of herbicides in late sown wheat under eastern Uttar Pradesh condition needs to be investigated.

The field experiment with 10 treatments and three replications was conducted in randomized block design during **rabi** season of 2001-02 at

Table 1. Effect of treatments on weeds and yield of late sown wheat

Treatment	Dose (g ha^{-1})	Weed density (No. m^{-2})		Weed dry weight (g m^{-2})		Grain yield (kg ha^{-1})
		60 DAS	Harvest	60 DAS	Harvest	
Weedy	-	13.26 (175)	7.14 (50)	7.52 (55.6)	5.99 (35.0)	2613
Weed-free	-	1.00 (0)	1.00 (0)	1.00 (0.0)	1.00 (0.0)	4260
Weeding 20 and 40 DAS	-	4.79 (22)	3.32 (10)	3.00 (8.0)	2.32 (4.4)	4200
Isoproturon	1000	10.72 (114)	7.00 (48)	6.27 (38.4)	4.88 (22.8)	3265
Sulfosulfuron	25	8.66 (74)	6.00 (35)	5.38 (27.9)	3.97 (14.8)	3749
Sulfosulfuron	30	8.42 (70)	5.74 (32)	5.15 (25.5)	3.87 (14.0)	3768
Clodinafop	60	8.89 (78)	6.10 (38)	5.53 (29.6)	4.07 (15.6)	3755
Clodinafop	80	8.18 (66)	5.57 (30)	5.00 (24.0)	3.77 (13.2)	3782
Pendimethalin	750	8.77 (76)	6.85 (46)	6.15 (36.8)	4.02 (15.2)	3237
Pendimethalin	1000	8.54 (72)	6.70 (44)	6.01 (35.1)	3.92 (14.4)	3270
LSD (P=0.05)		0.50	0.34	0.31	0.22	400

Figures in parentheses are original values.
Original data of weed density and weed dry weight were transformed to $\sqrt{X+1}$.

farmer's field in village Jorium, district Faizabad (Table 1). The soil of the experimental field was clay loam in texture, poor in available nitrogen and phosphorus and medium in available potassium with pH 7.7. The EC of the soil was 0.93 dSm^{-1}. The sowing of wheat var. HUW 234 at 125 kg ha^{-1} was done in lines 18 cm apart on December 14, 2001. In all, four irrigations (including pre-sowing irrigation) were applied to the crop as per its need. Winter showers (42.3 mm during January and February, 2002) at appropriate timings compensated the requirement of two irrigations.

Phalaris minor, Cynodon dactylon, Chenopodium album, Anagallis arvensis, Vicia hirsuta, Melilotus indica, Lathyrus aphaca and *Cyperus rotundus* were dominant weeds in the experimental field.

Weeding at 20 and 40 DAS proved superior to herbicide treatments. Among herbicides, clodinafop at 80 g ha^{-1} , sulfosulfuron at 25 to 30 g ha^{-1} and pendimethalin at 1.0 kg ha^{-1} were promising in reducing the weed density at 60 days stage. Weed dry weight was also reduced appreciably by the clodinafop at 80 g ha^{-1} at both the stages which was comparable with sulfosulfuron at 30 g ha^{-1} at 60th day stage and sulfosulfuron at 25 to 30 g ha^{-1} and pendimethalin at 1.0 kg ha^{-1} at harvest stage.

Weed-free treatment registered significantly the highest grain yield (4260 kg ha^{-1}). Among herbicide treatments, sulfosulfuron at 25 to 30 g ha^{-1} and clodinafop at 60 to 80 g ha^{-1} provided significantly better grain yield than isoproturon and pendimethalin. None of the herbicides produced grain yields at par with weed-free and two weedings done at 20 and 40 DAS.

REFERENCE

Gill, H. S. and L. S. Brar, 1975. Importance of herbicides in agriculture of Punjab and Haryana. *Pesticides* **9** : 20-24.