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Bio-efficacy of Triazolopyramidine Sulfonamide in Transplanted Rice

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ABSTRACT

Tirazolopyramidine was effective in reducing density of *Echinochloa colona, Ischaemum rugosum, Cyperus iria, Fimbristylis miliacea* and other weed spp. Its weed control efficacy was much less at 10 and 12.5 g ha^{-1}. Grain yield increased significantly with increase in doses of triazolopyramidine sulfonamide from 10 to 25 g ha^{-1}. None of the doses of triazolopyramidine had phystotoxic effect on transplated rice crop. Triazolopyramidine at 20 and 25 g ha^{-1} applied 15 DAS produced grain yields similar to weed-free treatments.

INTRODUCTION

Rice is major food grain crop in the tropics in general and in India particular. Weeds cause 35-55% reduction of grain yields in rice (Saikia and Purshothamam, 1996) under transplanted condition. Hence, weed control plays an important role in increasing the productivity of rice. The uses of herbicides offer selective and economic control from the beginning, giving the crop advantage of a good head start and competitive superiority. In transplanted rice, *Echinochloa colona, Echinochloa crusgalli, Ischaemum rugosum, Caesulia axillaris, Commelina* spp., *Cyperus* spp. and *Fimbristylis miliacea* have been found to be the major weeds. Butachlor, anilofos and pretilachlor are being used presently for weed control in transplanted rice. These herbicides provide effective control of annual grasses when applied as pre-emergence 3-4 days after rice transplanting (Budhar *et al.*, 1991). Effective control of annual sedges and non-grasses is not obtained by these herbicides. It has been observed that whenever there is effective control of grasses due to application of these herbicides, annual sedges and non-grasses emerge in high density competing with the crop and resulting in heavy yield losses. At present no herbicide is available which may provide effective wide spectrum control of grasses, annual sedges and non-grasses as post-emergence application. The continuous use of herbicides with similar mode of action has to be restricted to avoid undesirable weed shifts.

In view of the above facts, it would be desirable to develop alternative herbicides, which may provide wide weed control spectrum with wide application window. Therefore, the present investigation was undertaken to find out the efficacy of triazolopyramidine sulfonamide in transplanted rice.

MATERIALS AND METHODS

A field experiment was conducted during rainy seasons of 2000 and 2001 at Crop Research Centre, G. B. Pant University of Agriculture & Technology, Pantnagar, U. S. Nagar (Uttaranchal). The soil was clay loam, medium in organic carbon (0.7%), available phosphorus (19 kg P ha^{-1}) and potassium (238 kg K ha^{-1}) with pH of 7.3. Treatments consisted of five doses of triazolopyramidine sulfonamide (10.0, 12.5, 15.0, 20.0 and 25.0 g ha^{-1}) applied at 15 days after transplanting (DAT), pretilachlor at 750 g, butachlor at 2000 g, oxadiargyl at 70 g ha^{-1}, each applied at 3 DAT, weed-free and weedy (Table 1). Experiment with 11 treatments and three replications was laid out in randomized block

Table 1. Effect of triazolopyramidine sulfonamide on weed density in transplanted rice (Mean of two crop seasons)

Treatment	Dose (g ha^{-1})	Weed density (No. m^{-2}) 60 DAS				
		E. colona	*I. rugosum*	*C. iria*	*F. miliacea*	Others
Triazolopyramidine	10.0	176	10	20	14	15
Triazolopyramidine	12.5	140	11	20	14	13
Triazolopyramidine	15.0	29	8	15	11	8
Triazolopyramidine	20	6	4	8	6	7
Triazolopyramidine	25	3	5	7	3	7
Pretilachlor	750	6	10	4	2	10
Butachlor	2000	4	10	12	8	9
Anilofos	450	3	0	12	8	6
Oxadiargyl	70	9	4	4	1	5
Weed-free	-	0	0	0	0	0
Weedy	-	248	10	20	12	19

Table 2. Effect of triazolopyramidine sulfonamide on weed dry matter and grain yield of transplanted rice

Treatment	Dose (g ha^{-1})	Total weed dry weight (g m^{-2}) 60 DAT			Rice grain yield (kg ha^{-1})		
		2000	2001	Mean	2000	2001	Mean
Triazolopyramidine	10.0	186.9	178.5	182.7	2170	2250	2210
Triazolopyramidine	12.5	131.7	127.6	129.7	3015	2875	2945
Triazolopyramidine	15.0	28.3	23.8	24.6	5505	5450	5478
Triazolopyramidine	20	7.9	5.6	6.8	6179	6025	6102
Triazolopyramidine	25	4.8	6.2	5.5	6299	6150	6203
Pretilachlor	750	4.2	5.7	5.0	6110	6100	6105
Butachlor	2000	9.8	10.2	10.0	5875	5875	5875
Anilofos	450	6.7	5.9	6.3	6158	6050	6104
Oxadiargyl	70	41.3	11.2	26.3	5456	5950	5703
Weed-free	-	0.0	0.0	0.0	6238	6172	6205
Weedy	-	217.9	223.66	220.6	1875	1650	1763
LSD (P=0.05)		15.4	12.8	-	446	395	-

design. Herbicides were applied at 500 l ha^{-1} spray volume. Three weeks old seedlings of rice variety Narendra 359 at row spacing of 20 x 15 cm were transplanted on July 7, 2000 and July 14, 2001.

Recommended package of practices other than weed control was adopted to raise the experimental crop.

RESULTS AND DISCUSSION

Effect on Weeds

The weed species in the experimental field were : *E. colona* (80.2%), *I. rugosum* (3.2%), *C. iria* (6.5%), *F. miliacea* (3.9%) and others (6.2%)– *Caesulia* spp., *Panicum* spp., *Leptochloa chinensis* and *Commelina* spp. There was reduction in the density of weeds due to all the doses of triazolopyramidine in comparison to weedy check. Its weed control efficacy was much less at 10 and 12.5 g ha^{-1}. Almost all the weeds present in the experimental field were affected due to higher doses of triazolopyramidine. Pretilachlor and triazolopyramidine at 20 and 25 g ha^{-1} were comparable with respect to weed control efficiency. Similar effects were observed on the total weed dry

matter production (Table 2).

Effect on Crop

None of the doses of triazolopyramidine had phytotoxic effects on transplanted rice crop. An average yield reduction of 72.5% was recorded in weedy treatment in comparison to weed-free treatment (Table 2). There was increase in the grain yield of rice with the increasing doses of triazolopyramidine from 10-25 g ha^{-1} but the difference between 20 and 25 g ha^{-1} was non-significant. The two higher doses of triazolopyramidine were at par with weed-free, pretilachlor, anilofos and butachlor with respect to grain yield.

REFERENCES

Budhar, M. N., M. Krishnasamy and C. Ramaswamy, 1991. Evaluation of herbicides for weed control in low land rice. *Indian J. Weed. Sci.* **23** : 87-88.

Saikia, M. and S. Purshothamam, 1996. Competitive ability of weed flora in low land rice (*Oryza sativa*). *Indian J. agric. Sci.* **66** : 70-72.