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Bioefficacy of Oxadiargyl in Transplanted Rice Under Rainfed Conditions

D. J. Rajkhowa, I. C. Barua, N. C. Deka and D. Borah
Department of Agronomy
Assam Agricultural University, Jorhat-785 013 (Assam), India

Weeds are the major biotic constraints in rice and result in reduced quantity and quality of the produce. The weed flora in rainfed lowland rice is very much complex and consists of grasses, broad-leaved weeds and sedges. The unchecked weed growth causes rice grain yield reduction of 25 to 55% (Gautam and Mishra, 1995). Butachlor, anilofos and pretilachlor are the commonly used herbicides in rice. Continuous use of the same herbicide or herbicides having the same mode of action may result in shift in weed flora, development of resistance in weeds (Moss and Rubin, 1993) as well as build-up of residue in soil. It is, therefore, imperative to evaluate new herbicides with lower dose and higher efficacy for controlling weeds in rice.

The field experiment was conducted at the Research Farm of Assam Agricultural University, Jorhat during **kharif** season of 2003. The soil of the experimental area was acidic (pH 5.2) and had organic carbon 0.62% and 287, 8.2 and 98 kg ha^{-1} of N, P and K, respectively. Treatments (Table 1) were arranged in randomized block design with three replications. Twenty-two days old rice seedlings of variety 'Ranjit' were transplanted at spacing of 20 x 15 cm. The herbicides as per treatments were applied at three days after transplanting with a knapsack sprayer in 375 l ha^{-1} volume with flood nozzle.

The major weed flora observed in the experimental field were : *Sphenoclea zeylanica, Fimbristylis geminata, Eleocharis acutangula, Sacciolepsis interrupta* and *Dicanthium annulatum* (Table 1). *E. acutangula* and *S. interrupta* were the early emerged weeds, while *Panicum repens*, *S. zeylanica*, *F. geminata* and *D. annulatum* emerged after about a month of transplanting. All the weed control treatments resulted in significant reduction in weed density as compared to unweeded check (Table 1). Weed density at 30 DAT did not vary significantly due to different formulations and doses of oxadiargyl. Butachlor was as effective as oxadiargyl. Both the formulations of oxadiargyl at 100 g ha^{-1} resulted in the lowest weed density at 60 DAT. All weed control treatments significantly reduced weed thy matter accumulation over unweeded check at 30 and 60 DAT. Both formulations of oxadiargyl at different doses were at par in respect of weed dry matter accumulation. Butachlor and oxadiargyl were equally effective in reducing weed dry matter production.

Different treatments did not show any phytotoxicity symptoms in rice in terms of yellowing, necrosis, scorching, epinasty or hyponasty at any of the stages of crop growth irrespective of formulation. Grain yield of rice was significantly increased due to different treatments over unweeded check. However, no significant variation in grain yield was recorded due to different doses and formulations of oxadiargyl and butachlor.

REFERENCES

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Table 1. Effect of treatments on weeds (No. m^{-2}) and rice yield

Treatment	Dose ($g\ ha^{-1}$)	30 DAT		60 DAT		90 DAT		Weed dry weight ($g\ m^{-2}$)		Grain yield ($kg\ ha^{-1}$)
		Sacciopepsis interrupta	*Eleocharis acutungula*	*Fimbristylis geminata*	*Sphenoclea zeylanica*	*Dicanthium annulatum*	*Panicum repens*	30 DAT	60 DAT	
Weedy	-	9	5	28	28	43	19	17.3	44.7	2537
1. Oxadiargyl	70	2	1	4	6	13	5	10.0	21.3	4123
1. Oxadiargyl	90	0	0	0	2	4	1	9.3	19.7	4267
1. Oxadiargyl	100	0	0	0	4	1	0	8.7	18.3	4617
Oxadiargyl	70	0	1	6	18	15	4	9.3	26.7	4050
Oxadiargyl	90	0	0	0	2	3	2	83	22.7	4217
Oxadiargyl	100	0	0	0	0	1	1	9.3	18.0	4543
Butachlor 50 EC	1250	0	0	3	0	16	6	10.6	22.7	3850
								3.0	5.2	794

1. Oxadiargyl=80 WP formulation, others 6 EC formulation.