Indian J. Weed Sci. **37** (1 & 2) : 109-110 (2005) *Short Communication*

Efficacy of Certain New Herbicide Formulations in Transplanted Rice under Rainfed Shallow Lowland

Sanjoy Saha
Agronomy Division
Central Rice Research Institute, Cuttack-753 006 (Orissa), India

Transplanted rice is infested by heterogeneous type of weed flora under rainfed shallow lowland, which reduces yield upto 24-48% (Singh and Bhan, 1986). The use of herbicides offers selective and economical control of weeds right from the beginning, giving crop an advantage of good start and competitive superiority. A number of herbicides like butachlor, pretilachlor, anilofos, etc. have been recommended as pre-emergence for the control of early flushes of grassy weeds in transplanted rice field (Budhar *et al.*, 1991). However, increased trend of non-grassy weeds has been observed due to continuous use of these herbicides in transplanted rice field (Upadhyay and Gogoi, 1993). Keeping these facts in view, present investigation was undertaken to study the efficacy of certain new herbicides in transplanted rice under rainfed shallow lowland.

Two field trials were carried out during the wet seasons of 2002 and 2003 at the Central Rice Research Institute, Cuttack in an alluvial (Haplaquept) clay loam soil with pH 6.2, organic carbon 0.71%, total nitrogen 0.085%, Olsen's P 24 kg ha^{-1} and available K 98 kg ha^{-1} to find out the efficacy of high potency herbicides in transplanted rice. The trials with 10 treatments each were evaluated in a randomized block design with four replications. Twenty-five days old seedlings of variety 'Gayatri' were transplanted in third week of July. All the other recommended agronomic and plant protection measures were adopted to raise the crop.

The weed flora in the experimental field comprised *Echinochloa colona, Echinochloa crusgalli, Cyperus iria, Fimbristylis miliacea, Scirpus articulatus, Panicum repens, Leptochloa chinensis, Sphenochlea zeylanica, Ludwigia parviflora, Aeschynomene indica, Limnophylla heterophylla, Cleome viscose, Monochoria vaginalis* and *Melochia corchrifolia.* Broad leaf

Table 1. Effect of herbicides on weeds and rice (2002)

Treatment	Dose (g ha^{-1})	Time of application (DAT)	Weed density (No. m^{-2})	Weed dry weight (g m^{-2})	Panicles (No. m^{-2})	Grain yield (t ha^{-1})
Butachlor[1]	1500	3	49 (7.03)	30.9	236	5.16
Butachlor[2]	1250	3	32 (5.67)	23.3	248	5.40
Fentrazamide	12	5	43 (6.58)	28.6	241	5.26
Fentrazamide	15	5	18 (4.27)	12.2	259	5.60
Pyrazosulfuron-ethyl	20	8	37 (6.01)	25.2	246	5.35
Pyrazosulfuron-ethyl	25	8	11 (3.33)	9.1	263	5.65
Almix+butachlor	4+938	3	25 (5.02)	17.8	251	5.51
Butachlor fb almix	938 & 4	3 & 20	22 (4.73)	16.6	256	5.53
Hand weedings (3)	-	24, 40 & 60	3 (1.77)	2.2	279	5.82
Weedy	-	-	124 (11.17)	136.7	219	3.84
LSD (P=0.05)	-	-	2.12	10.81	15.53	0.27

Figures in parentheses are the means of original values.

DAT–Days after transplanting.

[1]50 EC formulation, [2]90 EC formulation.

Table 2. Effect of herbicides on weeds and rice (2003)

Treatment	Dose (g ha^{-1})	Time of application (DAT)	Weed density (No. m^{-2})	Weed dry weight (g m^{-2})	Panicles (No. m^{-2})	Grain yield (t ha^{-1})
Butachlor	938	3	58 (7.64)	44.4	226	4.96
Pretilachlor	500	3	44 (6.65)	30.6	245	5.27
Pretilachlor	750	3	28 (5.31)	23.1	251	5.50
Bensulfuron methyl	40	5	52 (7.24)	35.2	235	5.12
Bensulfuron methyl	50	5	37 (7.01)	28.8	246	5.30
Bensulfuron methyl+butachlor	40+938	5	23 (4.81)	20.7	253	5.52
Bensulfuron methyl+butachlor	50+938	5	17 (4.15)	13.4	261	5.60
Hand weedings (3)	-	20, 40 & 60	2 (1.43)	2.1	274	5.79
Hand weedings (2)	-	20 & 40	9 (8.20)	8.2	267	5.70
Weedy	-	-	131 (11.46)	140.2	199	3.65
LSD (P=0.05)	-	-	1.97	8.79	11.17	0.18

Figures in parentheses are the means of original values.
DAT–Days after transplanting.

weeds (46.2%) were the predominant weed flora in the experimental field followed by grasses (29.6%) and sedges (24.2%). All the treatments registered significantly lower number of weeds and dry matter than weedy check. Hand weeding thrice at 20, 40 and 60 days after transplanting (DAT) resulted in significantly lower weed density and dry weight of weeds as compared to herbicide treatments and weedy check with weed control efficiency (WCE) more than 98%.

Pyrazosulfuron ethyl at 25 g ha^{-1} was more effective in arresting weed population and their growth as compared to all other herbicide treatments with WCE 93.3% during 2002. The other herbicides which performed well for controlling the weeds were fentrazamide at 15 g ha^{-1} and butachlor fb almix at 938 and 4 g ha^{-1} (Table 1).

Bensulfuron methyl+butachlor was found to be very effective at 50+938 g ha^{-1} in controlling weeds during 2003 (Table 2). However, it was comparable with bensulfuron methyl+butachlor at 40 + 938 g ha^{-1} and pretilachlor at 750 g ha^{-1} in reducing the weed population and dry weight of weeds.

The highest grain yield of rice was obtained due to thrice hand weeding (Tables 1 and 2). The loss in grain yield due to unchecked weed competition was 34 and 37% during 2002 and 2003, respectively. The highest grain yield (5.65 t ha^{-1}) was obtained with pyrazosulfuron ethyl at 25 g ha^{-1} followed by fentrazamide at 15 g ha^{-1} (5.60 t ha^{-1}) during 2002, which was at par with hand weeding thrice. The other herbicides which performed well were butachlor fb almix at 938 and 4 g ha^{-1} and almix at 4 g ha^{-1} as tank mixture with butachlor at 938 g ha^{-1}.

During 2003, bensulfuron methyl+butachlor at 50+938 g ha^{-1} produced the highest grain yield (5.60 t ha^{-1}) and it was at par with hand weeding thrice (Table 2). The other herbicides which performed well were bensulfuron methyl+butachlor at 40+938 g ha^{-1} and pretilachlor at 750 g ha^{-1}. It was also observed that the practice of hand weeding twice produced yield comparable to hand weeding thrice with only 2% yield reduction which indicated that hand weeding twice at 20 and 40 days after transplanting was equally effective for controlling the weeds in transplanted rice field.

REFERENCES

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

Singh, O. P. and V. M. Bhan, 1986. Effect of herbicides and water submergence levels on control of weeds in transplanted rice. *Indian J. Weed Sci.* **18** : 226-230.

Upadhyay, U. C. and A. K.Gogoi, 1993. Integrated weed management in India with special reference to N. E. region. In : Proc. Intl. Symp. Indian Soc. Weed Sci., 18-20 Nov., Hisar. pp. 311-315.