

Effect of Planting Methods and Weed Management on Transplanted Summer Rice

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Productivity of rice in Assam is very low due to several constraints and severe crop-weed competition is one of the major factors limiting crop yield. Weeds cause grain yield reduction of 35 to 55% (Gautam and Mishra, 1995) even under transplanted condition. The weed infestation in rice is also reported to be influenced by cropping season and planting method (Rao and Pillai, 1974). Hand weeding, though efficient but is costly and difficult many a times due to continuous rain during summer season. Application of pre-emergence herbicides alone many a times is not sufficient to give effective control of weeds. Agronomic manipulations such as planting methods with herbicides may offer an effective option for better control of weeds in summer rice. In cognizance of the above, the present study was undertaken.

A field experiment was conducted at Instructional-cum-Research Farm of the University, Jorhat during summer seasons of 1999 and 2000. The soil of the experimental area was sandy loam, acidic (pH 5.2) and had 252.0, 6.2 and 98.5 kg ha⁻¹ of N, P₂O₅ and K₂O, respectively. Treatments comprised three planting methods viz., closer (10 x 10 cm), normal (15 x 15 cm) and farmers' practice (haphazard planting) and four weed control practices viz., butachlor at 1.5 kg ha⁻¹, anilofos at 0.4 kg ha⁻¹, hand weeding at 25 DAT and weedy. The herbicides were applied three days after transplanting by mixing with water in 500 l ha⁻¹. Twenty-six days old seedlings of rice variety "Luit" were transplanted as per treatment. The experiment was laid out in factorial randomized block design with three replications.

The major weed flora observed in the experimental field consisted of grasses—*Echinochloa colona* (8%), *Echinochloa crusgalli* (18%), *Sacciolepis interrupta* (11%); sedges—*Cyperus iria* (10%), *Scirpus juncoideus* (19%), *Fimbristylis* spp. (10%) and broadleaved—*Ladwigia perennis* (6%), *Monochoria vaginalis* (14%) and *Eichhornia crassipes* (4%). Emergence of grasses and sedges started from 7-10 days after transplanting and broadleaved emerged at 30-35 DAT.

The lowest weed density and dry matter accumulation were recorded in closely planted crop (Table 1). This might be due to increased canopy coverage with higher plant population per unit area, which resulted in reduced light penetration. Butachlor at 1.5 kg ha⁻¹ and anilofos at 0.4 kg ha⁻¹ were at par with hand weeding and recorded significantly lower weed density and dry matter accumulation over weedy check.

Contrary to weed density and dry matter accumulation, normal planting resulted in significantly higher grain yield over closer planting and farmers' practice in the first year of experimentation, while closer planting recorded the highest grain yield during the second year of study. The lowest grain yield was recorded in the farmers' method of planting. Hand weeding recorded the highest grain yield and was at par with butachlor at 1.5 kg ha⁻¹ or anilofos at 0.4 kg ha⁻¹. Different planting methods could not show any significant variation in straw yield of rice. All the weed control practices tried were at par and resulted in significantly higher straw yield of rice over weedy check. The highest panicle number was recorded with normal planting, while the lowest panicle

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Table 1. Effect of planting methods and weed control practices on weeds and rice

Treatment	Weed density (No. m ⁻²) 45 DAT		Weed dry weight (g m ⁻²) 45 DAT		Panicle (No. m ⁻²)		Grain yield (kg ha ⁻¹)		Straw yield (kg ha ⁻¹)		
	1999	2000	1999	2000	1999	2000	1999	2000	1999	2000	
	Mean		Mean		Mean		Mean		Mean		
Planting methods											
Closer (10 x 10 cm)	5	6	4.4	6.8	298	203	3532	2210	2871	5247	3248
Normal (15 x 15 cm)	6	7	4.8	7.1	309	196	3602	2000	2801	5409	3020
Farmers' practice (Haphazard planting)	6	7	4.9	7.3	282	192	3393	1636	2514	5254	2836
LSD (P=0.05)	0.5	0.7	0.1	0.2	11	NS	53	55	-	NS	NS
Weed control practices											
Butachlor 1.5 kg ha ⁻¹	5	5	4.3	7.6	612	237	3559	1978	2768	5269	2967
Anilofos 0.4 kg ha ⁻¹	6	6	4.5	7.1	306	232	3540	1892	2716	5276	2875
Hand weeding 25 DAT	4	6	3.7	7.2	302	228	3816	2271	3043	5561	3451
Weedy	9	9	6.3	8.3	269	196	3108	1357	2232	5108	2055
LSD (P=0.05)	1.1	1.6	0.7	0.6	14	16	390	640	-	423	376

NS--Not Significant.

number was recorded in farmers' method of planting.

REFERENCES

Gautam, K. C. and J. S. Mishra, 1995. Problem, prospects

and new approaches in weed management. *Pesticides Information* **21** : 7-19.

Rao, M. V. and K. G. Pillai, 1974. Efficiency of weedicides for rice in India. Paper presented at the International Rice Research Conference, 22-25 April, IRRI, Manila, Philippines.