

INFLUENCE OF DIFFERENT WEED MANAGEMENT PRACTICES AND ESTABLISHMENT TECHNIQUES ON YIELD AND ECONOMICS OF RICE UNDER THE IRRIGATED CONDITIONS OF JAMMU
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ABSTRACT: Experiments were conducted in sandy loam soil slightly alkaline in soil reaction with medium available phosphorous and potassium and low in available nitrogen and organic carbon during two consecutive *khari*f seasons in factorial randomized block design with three replications to find out the effects of weed management practices and establishment techniques on yield and economics of rice. The results revealed that the treatment where mechanical hoeing using cono-weeder twice was used showed superiority of the treatment with respect to crop productivity as weed management practice which was statistically similar to other weed management treatments like fenoxaprop-p-ethyl (Puma super) @ 0.06 kg a.i ha⁻¹ + 1 HW, metsulfuron methyl + chlorimuron ethyl (Almix) @ 0.004 kg a.i ha⁻¹ + 1 HW and fenoxaprop-p-ethyl when applied alone whereas the latter two treatments were at par with the treatment metsulfuron methyl + chlorimuron ethyl (Almix) @ 0.004 kg a.i ha⁻¹. Among the establishment methods of rice, statistically non-significant results were obtained with respect to grain yield, straw yield and harvest index in conventional and SRI methods of rice establishment. Higher B:C ratio was observed with the mechanical hoeing using conoweeder twice (1.78) which was closely followed by metsulfuron methyl + chlorimuron ethyl (Almix) @ 0.004 kg a.i ha⁻¹ and fenoxaprop-p-ethyl (Puma super) @ 0.06kg a.i ha⁻¹.

KEY WORDS: SRI, Transplanting, Weed management, Rice, yield

Profitability from rice (*Oryza sativa* L.) production is considered to be less owing to high cost of cultivation and generally poor productivity. Appropriate seedling age at transplanting is essential for satisfactory yield. At present, the general recommendation is to transplant 25-27 days old rice seedlings. Uphoff (2002), while emphasizing system of (SRI) technique of Fr. Henri de Laulanie, opined that early transplanting at young seedling age preserves plants potential for much greater tillering more root growth, and better yield. The problem of extensive weed incidence during early stages of rice crop growth cannot be undermined which competes with crop plants for moisture, nutrients, light, space and other growth factors. Hand weeding, though efficient yet is a costly affair. For keeping weed population under threshold level, there is a need for an evaluation of appropriate weed control methods over and above the existing practice. Hence, agronomical manipulations such as establishment techniques with appropriate weed management method may offer an effective option for better control of weeds in rice, thereby enhancing rice yield.

RESULTS AND DISCUSSION

Among the weed management treatments, statistically higher grain and straw yield of rice recorded in the treatment mechanical hoeing using cono-weeder twice which was statistically at par with fenoxaprop-p-ethyl (Puma super) @ 0.06 kg a.i ha⁻¹ + 1 HW at 30 DAT, metsulfuron methyl + chlorimuron ethyl (Almix) @ 0.004 kg a.i ha⁻¹ + 1 HW at 30 DAT and fenoxaprop-p-ethyl (Puma super) @ 0.06 kg a.i ha⁻¹ which were significantly superior to control and other treatments (Table 1). Poonam *et al.* (2016) also reported that using cono weeder twice at 15 and 30 DAT was found to be most effective treatment in management of weeds. However, under establishment methods, statistically

non-significant results were observed in grain and straw yields of both conventional and SRI methods of establishment, but slight higher values were recorded under conventional method. This is in conformity with the results of Latif *et al.* (2004) and Dixit *et al.* (2007). Higher B:C ratio was observed with the mechanical hoeing using conoweeder twice (1.78) which was closely followed by metsulfuron methyl + chlorimuron ethyl (Almix) @ 0.004 kg a.i ha⁻¹ and fenoxaprop-p-ethyl (Puma super) @ 0.06kg a.i ha⁻¹ with the B:C values of 1.55 and 1.55, respectively (Table 1). Among the rice establishment methods, crop planted under conventional method registered more economic returns as compared to that planted under SRI method with the corresponding B:C ratio values of 1.61 and 1.38, respectively.

CONCLUSION

Henceforth, based on the two years of investigation it can be safely concluded that mechanical hoeing using conoweeder, fenoxaprop-p-ethyl (Puma super) @ 0.06 kg a.i ha⁻¹ + 1 HW and metsulfuron methyl + chlorimuron ethyl (Almix) @ 0.004 kg a.i ha⁻¹ + 1 HW may be recommended for efficient weed management in rice for resource rich farmers where grassy weeds are relatively more predominant irrespective of whether rice is established by conventional or SRI methods, especially with reference to SRI when the cut off dates coincides with transplanting under the subtropical agro-ecosystems of Jammu region. However, for realizing higher B:C ratio, mechanical hoeing using cono-weeder, metsulfuron methyl + chlorimuron ethyl (Almix) @ 0.004 kg a.i ha⁻¹ and fenoxaprop-p-ethyl can be recommended as they prove to be economically better.

MATERIALS AND METHODS

Field experiments were conducted at Sher-e-Kashmir University of Agricultural Sciences and Technology of Jammu during consecutive *kharif* seasons to examine the effect of weed management practices and establishment techniques on yield and economics of rice. The soil of the experimental field was sandy loam in texture. The experiment was laid out in factorial randomized block design with fourteen treatment combinations, which comprised of seven weed management practices and two establishment methods viz: Conventional transplanting (27 days old seedling and 2-3 seedling hill⁻¹) and System of rice intensification SRI (10 days old seedling and 1 seedling hill⁻¹) with three replications. Rice crop was grown with a uniform application of recommended NPK (120 kg N, 60 kg P₂O₅ and 25 kg K₂O ha⁻¹) in conventionally established plots while in SRI established crop, 25% of the recommended dose of NPK was supplied through well decomposed FYM on oven dried N content basis (0.62%) and remaining amount of NPK was supplied through inorganic sources of nutrients through urea, DAP and MOP, respectively.

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Table- 1: Grain yield, weed index and economics of rice as influenced by different weed management practices and establishment techniques

Treatments	Grain Yield (t/ha)		Mean (t/ha)	Straw Yield (t/ha)		Mean (t/ha)	Weed Index (%)		Mean	B:C ratio
	I st Year	2 nd year		I st Year	2 nd year		I st Year	2 nd year		
Weed Management										
Weedy Check	3.08	3.15	3.12	4.46	4.63	4.55	34.04	33.71	33.86	1.19
Weed Free	4.67	4.73	4.7	5.82	6.08	5.95	0.00	0.00	0.00	1.45
Almix (Chlorimuron + MSM) @ 0.004 kg a.i ha ⁻¹ (20 DAT)	3.7	3.82	3.76	5.07	5.3	5.19	20.63	19.53	20.08	1.55
Almix (Chlorimuron + MSM) @ 0.004 kg a.i ha ⁻¹ (20DAT) + 1 H.W at 30 DAT	4.05	4.17	4.11	5.14	5.36	5.25	13.04	12.20	12.62	1.50
Fenoxaprop @ 0.06 kg a.i ha ⁻¹ (20 DAT)	3.98	4.87	4.43	5.08	5.34	5.21	14.56	13.87	14.22	1.55
Fenoxaprop @ 0.06 kg a.i ha ⁻¹ (20 DAT) + 1 H.W at 30 DAT	4.15	4.27	4.21	5.25	5.65	5.45	10.98	10.05	10.52	1.41
Mechanical hoeing with Cono-weeder at 15 and 30 DAT	4.26	4.39	4.34	5.38	5.74	5.56	8.70	7.41	8.06	1.78
CD ($p=0.05$)	0.34	0.31	--	0.32	0.34	--	--	--	--	--
Establishment Techniques										
Conventional transplanting (27 days old seedlings and 2-3 seedlings hill ⁻¹)	3.99	4.11	4.05	5.17	5.42	5.3	14.37	13.40	13.89	1.61
SRI (10 days old seedlings and 1 seedling hill ⁻¹)	3.97	4.06	4.02	5.18	5.46	5.32	14.75	14.26	14.51	1.38
CD ($p=0.05$)	NS	NS	--	NS	NS	--	--	--	--	

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