International Journal of Agricultural Sciences
Volume 8 |Issue 2| June, 2012 | 491-493

RESEARCH PAPER

Yield and economics of rice (*Oryza sativa*) genotypes in system of rice intensification (SRI) under Central Uttar Pradesh condition

RAJIV*, H.G. PRAKASH[1] AND D.P. SINGH
Department of Vegetable Science, Directorate of Extension, C.S.Azad University of Agriculture and Technology, KANPUR (U.P.) INDIA (Email : rajiv.gram@gmail.com,rajiv.agro69@gmail.com)

Abstract : A field experiment was conducted during *Kharif*, 2008 at K.V.K. Farm Thariaon, Fatehpur (U.P.) with SRI technique of rice cultivation. Treatments comprised 2 genotypes (PR -113 and PHB-71) in main plots, 2 age of seedlings (10 and 12 days) in sub-plots and 2 plant spacings (25 x 25 and 30 x 30 cm) in sub-sub plots of a split plot design. Each treatment plot received uniform dose of 75 kg N+37.5 kg P_2O_5 + 30 kg K_2O + 12.5 kg $ZnSO_4$/ha. The results revealed that hybrid PHB-71 recorded significantly higher values of growth and yield attributes and produced 1156 kg/ha or 15.7 per cent more grain yield and earned Rs. 17874/ha or 36.7 per cent more net return than the high yielding variety PR-113. Among seedlings age, 10 day old seedlings performed significantly better than 12 day seedlings in respect to growth and yield attributes. Grain yield with 10 day seedlings transplanting was recorded 256 kg/ha or 3.3 per cent more than 12 day old seedlings. Similarly, 10 day old seed lings earned Rs. 2429 / ha or 4.3 per cent higher net return than the transplanting of 12 day old seedlings. Difference between two plant spacings was not found significant in yield or economics of rice.

Key Words : Rice, SRI, Genotypes, Yield, Economics

View Point Article : Rajiv, Prakash, H.G. and Singh, D.P. (2012). Yield and economics of rice (*Oryza sativa*) genotypes in system of rice intensification (SRI) under Central Uttar Pradesh condition. *Internat. J. agric. Sci.*, **8**(2): 491-493.

Article History : Received : 23.04.2012**; Revised :** 15.05.2012**; Accepted :** 29.05.2012

INTRODUCTION

The system of rice intensification (SRI) is a new method of transplanted rice culture. It is particularly well suited for cultivation of hybrid rice, since it not only saves the seed cost (75% saving) but also helps in saving about 30-40 per cent water (Subbaiah *et al*., 2005). It was reported by Uphoff (2003) that SRI method comprises of three basic concepts : transplanting young seedlings, at wider spacing in square pattern and keeping soil moist and aerated during vegetative phase. Later some modifications were tried in SRI method to suit the local needs. The proponents of SRI have claimed substantial increases in rice productivity (Sinha and Talati, 2007). Hybrid rice due to it's higher yield potential is getting importance in rice growing areas of Uttar Pradesh. With a view to exploit the yield potential of hybrid rice, SRI method was tested with some modifications in central part of Uttar Pradesh.

MATERIALS AND METHODS

A field experiment was conducted at Krishi Vigyan Kendra Farm, Thariaon , Fatehpur (U.P.) during *Kharif*, 2008 to study the age of seedlings and plant spacings on performance of two rice genotypes under transplanted condition. The experimental soil was clay loam in texture and alkaline in reaction (pH 7.8) having 0.35 per cent organic carbon, 164.7 kg/ha available nitrogen, 17.50 kg/ha available P_2O_5 and 218.6 kg/ha available K_2O. The treatments comprised 8 combination of 2 genotypes (PR-113 and PHB-71), 2 age of

* **Author for correspondence.**
[1]Department of Animal Husbandry and Dairying, C.S.Azad University of Agriculture and Technology, KANPUR (U.P.) INDIA

seedlings (10 and 12 days) and 2 plant spacings (25 x 25 cm and 30 x 30 cm). The experiment was laid out in split-plot design with genotypes in main plots, seedlings age in sub-plots and plant spacings in sub-sub plots with 3 replications. Net plot size was kept 9 m x 6 m or 54 m^2. Nursery was sown on 27 and 29 June in two nursery beds side by side, consequently with same date of transplanting (9 July). An uniform dose of 37.5 kg N + 37.5 kg P_2O_5 + 30 kg K_2O + 12.5 kg zinc sulphate / ha alongwith 10 tonnes FYM / ha (0.51 % N, 0.20 % P and 0.53% K) was applied to each treatment plot at the time of last puddling. Next day, transplanting was done on well leveled plot. Nitrogen @ 18.75 kg/ha was top dressed each at maximum tillering and panicle initiation stages. Weeds were controlled by incorporating them into the soil twice at 12 and 20 days after transplanting with the help of cono weeder. No water other than rains was applied in standing crop during vegetative phase, but in reproductive phase, submergence water condition was maintained through additional irrigation as and when required. The observations were recorded on growth, yield attributes and yield under different treatments. The economice of hybrid rice in SRI method was also calculated by taking into account the prevailing cost of inputs and prices of crop products.

RESULTS AND DISCUSSION

The results of the present study alongwith relevant discussion have been presented as under:

Performance of genotypes

It is evident from Table 1 that hybrid PHB-71 performed significantly better than high yielding variety PR-113 in all characters studied. It showed earliness in flowering by about a week than variety PR-113. Hybrid PHB-71 produced grain yield 1156 kg/ha or 15.7 per cent higher than variety PR-113. Similarly, the net return of hybrid PHB-71 was worked out Rs. 17874/ha or 36.7 per cent higher with 3.58 B:C ratio than the variety PR-113 with B:C ratio of 2.78 . Higher grain yield of hybrid was attributed to growth and yield attributes of rice. More root spread and deeper root system in hybrid rice might have utilized plant nutrients more efficiently than variety, which resulted in improved growth and yield attributes. Net return seems to be attributed to higher grain yield in case of hybrid rice. Subbaiah *et al.* (2005) also stated that rice hybrids performed better under SRI method of cultivation as compared to high yielding variety in multilocational trials.

Effect of seedling age:

The transplanting of 10 day old seedlings recorded significantly higher values of all growth characters, yield attributes, grain yield and economic parameters compared to 12 days old seedlings transplanting (Table 1). However, flowering was recorded one day earlier in 10 day seedlings than 12 day seedlings transplanting. Grain yield with 10 day seedling transplanting was recorded 256 kg/ha or 3.3 per cent higher than 12 day seedlings. Similarly, net return with 10 day seedlings was computed Rs. 2429/ha or 4.3 per cent more than 12 day seedlings transplanting. Higher grain yield with 10 day seedlings transplanting might be attributed to better growth and yield attributes than with 12 day old seedlings. More development of roots in 10 days old seedlings transplanting

Table 1 : Effect of genotypes, age of seedlings and plant spacings on growth, yield attributes, yield and economic parameters of transplanted rice grown with SRI method

Treatments	Growth characters					Yield attributes				Grain yield (q/ha)	Economic parameters		
	Plant height (cm)	Root spread (cm)	Root depth (cm)	No. of tillers/ hill	No. of days to 50% flowering	No. of spikes / hill	Spike length	Test weight (g)	No. of grains per spike		Gross income (Rs. /ha)	Net return (Rs. /ha)	B:C ratio
Genotypes													
PR-113	99.87	10.88	21.81	46.42	83.58	21.58	27.07	22.92	290.50	73.68	66310	48751	2.78
PHB-71	103.92	14.09	24.54	55.00	76.26	27.58	30.82	25.65	321.42	85.24	85245	66625	3.58
S.E. ±	0.19	0.38	0.09	0.30	0.17	0.43	0.06	0.07	0.17	0.17	169	169	0.01
C.D. (P=0.05)	0.84	1.63	0.40	1.29	0.72	1.86	0.27	0.29	0.72	0.74	728	728	0.04
Age of seedlings													
10 days	102.47	13.12	24.02	52.42	79.42	26.08	29.57	24.65	308.67	80.74	76992	58902	3.24
12 days	101.32	11.85	22.32	49.00	80.42	23.08	28.22	23.92	302.25	78.18	74563	56473	3.11
S.E. ±	0.08	0.10	0.07	0.58	0.24	0.61	0.25	0.13	0.12	0.12	122	122	0.01
C.D. (P=0.05)	0.22	0.27	0.21	1.62	0.65	1.68	0.70	0.36	0.33	0.34	338	338	0.02
Plant spacing													
25x25 cm	101.50	12.06	22.63	49.83	80.08	23.67	28.52	24.14	304.25	78.89	75241	57151	3.15
30 x 30 cm	102.30	12.91	23.72	51.58	79.75	25.50	29.37	24.43	307.67	80.03	76315	58225	3.20
S.E. ±	0.09	0.39	0.05	0.88	0.49	0.93	0.51	0.43	1.27	0.53	496	496	0.03
C.D. (P=0.05)	0.20	NS	0.12	NS	NS	NS	NS	NS	2.93	NS	NS	NS	NS

NS = Non-significant

might have increased the utilization of plant nutrients from soil which may be responsible for improvement in growth and yield attributes and there by higher grain yield and net return.

Effect of plant spacings

Plant spacing of 30 cm x 30 cm recorded higher values of all growth and yield attributes, yield and economic parameters than 25 cm x 25 cm spacing, but in most of the cases, difference between two spacings was not significant (Table 1). However, plant heights, root depth and number of grains/spike showed significant improvement in 30 cm x 30 cm spacing over 25 cm x 25 cm spacing. It might be associated with more space available / plant. Non-significant difference between two plant spacings indicates that 25 cm x 25 cm plant spacing was sufficient for proper growth and development of individual plant. That is why the 25 cm x 25 cm spacing is recommended for rice transplanting in SRI method (Subbaiah *et al.,* 2005).

No useful interaction between treatment factors was found significant in present study.

The results of present study may be concluded that growing of hybrid rice with SRI method of cultivation using 10 day old seedlings transplanted at 25 cm x 25 cm spacing is more productive and remunerative for rice culture.

REFERENCES

Sinha, S.K. and Talati, J. (2007). Productivity impacts of the system of rice intensification (SRI) : a case study in West Bengal, India. *Agric. Water Management,* **87**: 55-60.

Subbaiah, S.V., Singh, S.P., Kumar, R.M., Viraktamath, B.C. and Ahmed, M.I. (2005). *Agrotechniques for hybrid rice cultivation and seed production*. pp. 13-14. Directorate of Rice Research Hyderabad (A.P.) INDIA.

Uphoff, N. (2003). SRI – Higher yields with fewer external inputs? The system of rice intensification and potential contributions to agricultural sustainability. *Internat. J. Agric. Sustainability,* **1** (1): 38-50.

*_*_*_*_*_*