



On Farm Evaluation of System of Rice Intensification

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ABSTRACT

An on farm trial was conducted in farmers' fields in Guntur district during *kharif* season in 2004-05 and 2005-06 to evaluate the performance of System of Rice Intensification (SRI) against farmers' practice to increase the rice productivity. The package of practices as recommended for SRI was adopted and the influence on crop growth, yield parameters and yield was studied. In SRI, total number of tillers per hill increased by 119 per cent, number of effective tillers per hill was increased by 56.67 per cent and number of filled grains in panicle was increased by 13.30 per cent when compared to farmers' practice. The increase in number of tillers, number of effective tillers and number of filled grains per panicle has resulted in the increase of grain and straw yield in SRI. An increase of 23.69 per cent in grain yield was recorded in SRI (68.28 q ha⁻¹) when compared to farmers' practice (55.20 q ha⁻¹). The straw yield was also increased by 32.03 per cent (79.35 q ha⁻¹) in SRI when compared to farmers' practice (60.10 q ha⁻¹).

Key words : Grain yield, On farm evaluation, Rice, Straw yield, System of rice intensification,

Rice is the most important crop of Andhra Pradesh. It was cultivated in an area of 25.26 lakh ha. with a production of 63.77 lakh tones and a productivity of 2524 kg ha⁻¹ during *kharif*, and in 14.56 lakh ha. with a production of 53.27 lakh tones and a productivity of 3659 kg ha⁻¹ during *rabi* in 2005-06 (<http://agri.ap.nic.in>). The rice yields have reached a plateau and increase in per hectare yields was not upto the expected level over the last one decade with the traditional method of cultivation. Alternate methods of rice cultivation like direct sowing by seed drill, broad casting of sprouted seeds, sowing of sprouted seeds in lines by seed drum, semi dry (or) aerobic cultivation etc. were tried but found to be suitable for various contingencies like late release of canal water, limited availability of water, shortage of labour etc. rather than to increase the yield. System of Rice Intensification (SRI) is reported to give better results in terms of yield and profit per unit of land, water, seed and labour in rice cultivation when compared to traditional method (Up Hoff, 2001 and Thakur et al, 2010). Hence, the present study was conducted in farmers' fields to evaluate the SRI in the local conditions for enhancing rice productivity in comparison to farmers' practice.

MATERIAL AND METHODS

An on farm trial was conducted in farmers' fields in Guntur district at five locations each during *kharif* season in 2004-05 & 2005-06. The soils of the experimental fields were heavy black, neutral to

slightly alkaline in reaction, low in available nitrogen and phosphorus and medium in available potash.

As envisaged in the package of System of Rice Intensification (SRI), rice nursery was raised with the variety BPT.5204 by broadcasting sprouted seeds @ 5.0 kg/100m² on raised beds. The main field was thoroughly puddled and leveled, and lines were marked at a spacing of 25cm X 25cm by using a manual roller marker. At the intersecting points of the marked lines, single seedlings of 12 day old were transplanted carefully with minimum transplantation shock, accommodating 16 seedlings per square meter. Soil moisture in the SRI plots was maintained in saturated condition by giving light irrigations from transplantation to primordial initiation. To avoid stress to the crop during the critical stages a thin film (2-3cms depth) of water was maintained from primordial initiation to one week before the harvest of crop. There after, irrigation was stopped and the crop was allowed to mature on residual soil moisture. The crop was harvested at physiological maturity. Inter cultivation was done manually with cono weeder for four times at an interval of 10 days starting from the tenth day after transplantation, to smother the weed growth and to facilitate aeration of soil. Other crop management practices like fertilizer application, plant protection, harvesting, threshing were done as per the recommended package. Data on crop growth, yield parameters and yield were recorded both in SRI and farmers' practice and were compared.

Table 1. Yield parameters and yield of Rice as influenced by System of Rice Intensification.

Treatments	Number of hills m ⁻²			Number of tillers hill ⁻¹			Number of effective tillers hill ⁻¹		
	2004-05	2005-06	Average	2004-05	2005-06	Average	2004-05	2005-06	Average
System of Rice Intensification (SRI)	16.00	16.00	16.00	49.00	43.00	46.00	24.00	23.00	23.50
Farmers Practice	25.40	24.20	24.80	22.40	19.60	21.00	15.60	14.40	15.00
% increase/ decrease	-	-	(-) 35.48	-	-	(+) 119.00	-	-	(+) 56.67

Table Continued...

Treatments	Number of filled grains panicle ⁻¹			Grain yield (q ha ⁻¹)			Straw yield (q ha ⁻¹)		
	2004-05	2005-06	Average	2004-05	2005-06	Average	2004-05	2005-06	Average
System of Rice Intensification (SRI)	179.60	169.60	174.60	76.50	60.05	68.28	89.57	69.12	79.35
Farmers Practice	160.00	148.20	154.10	62.13	49.27	55.20	67.59	52.60	60.10
% increase/ decrease	-	-	(+) 13.30	-	-	(+) 23.69	-	-	(+) 32.03

Table Continued...

Treatments	Biological yield (q ha ⁻¹)			Harvest index		
	2004-05	2005-06	Average	2004-05	2005-06	Average
System of Rice Intensification (SRI)	166.05	129.17	147.61	0.46	0.46	0.46
Farmers Practice	128.72	101.87	115.30	0.47	0.48	0.48
% increase/ decrease	-	-	(+) 28.02	-	-	(-) 4.17

RESULTS AND DISCUSSION

The data on growth, yield attributes and yield (Table.1) revealed that the number of tillers per hill increased by 119 per cent and the number of effective tillers per hill increased by 56.67 per cent in SRI when compared to farmers' practice. The increase in the number of tillers and number of effective tillers can be attributed to the transplanting of young seedlings (10-12 day old) in SRI. The filled grains per panicle also increased by 13.30 per cent in SRI. The increase in filled grains per panicle could be attributed to the earliness in tiller production in SRI as compared to farmers' practice. Increase in total

tillers per hill, effective tillers per hill and filled grains in panicle in SRI was also reported by Up Hoff, 2001 and Satyanarayana et al, 2007. Even though total number of tillers per hill and number of effective tillers per hill in SRI is more than in farmers' practice, the per cent of effective tillers to total tillers in SRI is 51 only when compared to 71 per cent in farmers' practice which indicates that some refinement in SRI technology is needed to suite to the local conditions and to increase the yields further.

The grain yield recorded in SRI (68.28q ha⁻¹) was 23.69 per cent more when compared to farmers' practice (55.20 q ha⁻¹). The increase in grain yield

can be attributed to the increase in number of effective tillers, and increase in the no. of filled grains per panicle. The results are in concurrence with the results reported by up Hoff, 2001, Satyanarayana et al, 2007 and takhur et al, 2010.

An increase of 32.03 per cent (79.35q ha⁻¹) was recorded in straw yield in SRI when compared to 60.10 q ha⁻¹ which was recorded in farmers' practice. The increase in straw yield can be attributed to the increase in the total number of tillers in SRI. The increase in straw yield in SRI was also reported by Up Hoff, 2001 and Satyanarayana et al, 2007.

An increase of 28.02 per cent in total biological yield (147.61 q ha⁻¹) was recorded in SRI as compared to 115.30 q ha⁻¹ in farmers practice which can be attributed to the better plant growth and yield and yield parameters in SRI than in farmers' practice. The results are concurrence with the results reported by Up Hoff, 2001 and Satyanarayana et al, 2007.

A harvest index of 0.46 was recorded in SRI which was less when compared to 0.48 in farmers' practice. The lesser harvest index in SRI may be due to the more no. of tillers and more straw yield recorded than in farmers' practice.

Hence, from the present study it can be concluded that the System of Rice Intensification (SRI) is suitable for the local conditions and the per hectare rice yields from the present levels can be increased by adopting SRI.

LITERATURE CITED

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