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Impact of System of Rice Intensification [SRI] Technology in Tamil Nadu

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Abstract

The SRI technology could be practiced in Tamil Nadu. It shows that large scale demonstrations in farmers' fields can be organized to cover maximum per cent of the irrigated area in the state with SRI method of cultivation. There is vast scope for limited irrigation during kuruvai and summer seasons wherein water is a limiting factor. The area under SRI practices can be increased in the major rice growing districts as Villupuram, Thanjavur, Tiruvarur, Nagapattinam, Thiruvannamalai, Cuddalore, Kancheepuram, Tirunelveli, Thiruvallur and Kanyakaumari which cover about 50 % of the total rice growing area of our state. This can be effected through large scale demonstrations in the farmers' holdings. Besides, giving wider publicity of SRI through posters, pamphlets and booklets. Training can be imparted to farmers highlighting the merits of SRI.
Really, these technology should give higher benefit to the farming communities than the any other traditional practices. Still, there is a lot of scope will to increase the area, production and productivity of the farm income.

Introduction

SRI [System of Rice Intensification] is a synergistic management technique involving four components of rice farming as planting, irrigation, weeding and nutrient management strategies. It includes early planting [2-14 day] old seedlings raised from *dapog* nursery or mat nursery, adopting wider spacing [22.5 x 22.5 cm], planting single seedling or just two seedlings per hill, shallow planting [2-3 cm depth], limited irrigation [2-3 cm depth] after the disappearance of hairline cracks, cono weeding and application of more composts. It proposes suitable alternatives to the existing practices in rice farming. The practices followed in conventional rice farming include transplanting 24 day old seedlings raised from field nursery at the rate of 2-3 seedlings per hill, continuous irrigation to 5 cm depth, manual hand weeding and integrated nutrient management strategies.

The system of rice intensification was developed at Madagascar by *Fr.Henri de Laulaine*, a social worker, by working closely with farmers and from observing rice plants very closely. This technology is highly flexible to the local needs and does not involve stringent principles.

Methodology

The System of Rice intensification was evaluated through field trials and demonstrations at Tamil Nadu

Rice Research Institute [TRRI], Aduthurai, Soil and Water Management Research Institute [SWMRI], Thanjavur, Agricultural College and Research Institute, Killikulam and Agricultural College and Research Institute, Madurai during 2000 -2003. After realizing the benefits of SRI, the technology was popularized through on-farm trials in the farmers' fields in major rice growing belts [Cauvery delta, Thambiraparani Basin, Periyar-Vaigai Aayacut, Lower Bhavani Project, Parambikulam Aliyar Project area and tankfed areas of Kancheepuram district] through research stations and KVKs of TNAU and also though extension personnel of Department of Agriculture.

A scheme on "System of Rice Intensification" was sanctioned by Government of Tamil Nadu in 2003. SRI packages were given wider publicity through posters, pamphlets, booklets and live models in farmers' day, farmers' meets etc. Special meetings and seminars were convened. Training was imparted to three hundred farmers and one hundred extension personnel highlighting the merits of SRI to persuade the farming community to adopt SRI technology. Adaptive research trials were conducted in two hundred farmers' fields. One acre demonstrations numbering 2415 were organized during 2005-06 in the paddy growing districts of Trichy, Nagapattinam, Tiruvarur, Thanjavur, Tirunelvei and Madurai. The adoption of SRI technology during this period [2005-06] was only 10 -15 % of rice area in Tamil Nadu. Agro-biological efficiency and economics of SRI Vs conventional planting are given.

Results and Discussion

Large scale demonstrations in farmers' fields can be organized to cover maximum per cent of the irrigated area in the state with SRI method of cultivation. There is vast scope for limited irrigation during kuruvai and summer seasons wherein water is a limiting factor. The area under SRI practices can be increased in the major rice growing districts as Villupuram, Thanjavur, Tiruvarur, Nagapattinam, Thiruvannamalai, Cuddalore, Kancheepuram, Tirunelveli, Thiruvallur and Kanyakaumari which cover about 50 % of the total rice growing area of our state. This can be effected through large scale demonstrations in the farmers' holdings. Besides, giving wider publicity of SRI through posters, pamphlets and booklets. Training can be imparted to farmers highlighting the merits of SRI.

Table 1: Efficiency of SRI compared to Conventional Planting

Parameter	Conventional Practice	SRI Practice	Advantage of SRI Practice
Seed rate	60 kg ha^{-1} - short 40 kg ha^{-1} - medium 30 kg ha^{-1} - long duration varieties 20 kg ha^{-1} - hybrids	5 - 8 kg ha^{-1}	Economy in seed rate
Age of seedling	21-35 days old	15 days old	Minimum transplanting shock
Plants per hill	Three	Single	Reduced intra-species competition
Planting depth	5 cm depth	Shallow planting	Minimum trauma to the root system
Plant spacing	15 x 10 cm - short duration 20 x 10 cm - medium duration 20 x 15 cm - long duration	22.5 x 22.5cm	Better root and canopy growth
Plant density	66 m^{-2} - short 50 m^{-2} - medium 33 m^{-2} - long duration	20 m^{-2}	Reduced seed rate
Irrigation	5 cm depth	2 - 3 cm depth after the appearance of hairline cracks	Maintenance of aerobic condition
Weed management	Hand weeding	Cono weeding / Rotary weeding	Aeration effects to roots

Benefits of SRI Technology

✓ **Less seed rate:** A seed rate of 5 - 8 kg depending on 1000 grain weight is sufficient to plant one hectare of land under SRI while in conventional method depending upon the duration group, 60 kg ha^{-1}- short duration, 40 kg ha^{-1} - medium duration and 30 kg ha^{-1} for long duration varieties and 20 kg ha^{-1} for hybrids is recommended.

✓ **Less nursery area:** A mat nursery area of 2.5 cents [100 sq.m] is sufficient to raise seedlings to cover one hectare of land in SRI while in conventional method, 20 cents per hectare is required.

✓ **Labour saving:** The labour required for nursery period is less [12 labourers] for SRI nursery compared to conventional nursery [30 labourers].

✓ **Water saving:** Water requirement under SRI method is only 600 to 700 mm through intermittent irrigation while in conventional method, 1200 -1500 mm of water is required for continuous flooding.

✓ **Aeration:** Cono weeding results in aeration to the root zone besides saving in labour to the tune of 50%.

✓ **Enhanced yield:** The additional yield advantage in SRI ranges from 500 to 1500 kg /ha over conventional method of planting. The reason is mainly attributed to more number of lengthy productive tillers with increased number of filled grains per panicle.

Economics of SRI technology

Table 2: Comparison of SRI with Conventional Nursery

S. No	Particulars	SRI Nursery	Conventional Nursery	Saving [%]
1	Nursery area	100 m^2	800 m^2	88
2	Seed cost [including biofertilizers]	Rs.73-105	Rs.665	85-90
3	Water use	24 cm^3	53 cm^3	55
4	Fertilizer cost	Rs.18	Rs.180	90
5	Labour cost [including ploughing charges, seed frame]	Rs.1188	Rs.1800	34
6	Miscellaneous [polythene sheet, rosecan]	Rs.119	-	-
	Total	**Rs. 1414**	**Rs. 2645**	**47**

Table 3: Economics of cultivation [ha^{-1}]

S. No	Particulars	Conventional practices [4500 kg]	SRI practices [5500 kg]
1	Income from grain [Rs. 6.00 /kg]	27,000/-	33,000/-
2	Income from straw [Rs. 0.60 /kg]	4,050/-	4950/-
3	Gross return	31,050/-	37,950/-
4	Cost of cultivation	21,621/-	20,160/-
5	Net return	9,429/-	17,790/-
6	B : C ratio	1.44	1.88

Table 4: Comparison of SRI with conventional cultivation [Main field]

S.No	Parti-culars	Tractor [hrs] @ Rs. 150/ hr		Bullock pair @ Rs. 200/ hr		Men labour @ Rs. 80 /manday		Women labour @ Rs. 40/ manday		Cost [Rs.]	
		Con	Sri	Con	Sri	Con	Sri	Con	Sri	Con	Sri
1	Mainfield prepa-ration	8	8	2	2	6	6	-	-	2080	2080
2	Manures and fertilizers	-	-	-	-	3	3	8	8	10336	10336
3	Trans-planting	-	-	-	-	5	5	30	45	1600	2200
4	Weeding	-	-	-	-	8	18	30	-	2110	1440
5	Irrigation	-	-	-	-	8	6	-	-	640	480
6	Plant Protection	-	-	-	-	2	2	2	2	840	840
7	Harvesting	2	2	-	-	10	10	18	18	1370	1370
	Total	**10**	**10**	**2**	**2**	**38**	**46**	**90**	**75**	**18976**	**18746**

CON : Conventional method SRI : System of Rice Intensification method

Total Cost of Cultivation [Nursery + Main field]

Conventional : Rs. 21,621/-

SRI : Rs. 20,160/-

Table 5: Cauvery Delta

Districts	Season			Total
	Kar /Kuruvai / Sornavari [Apr-July]	Samba / Thaladi / Pishanam [Aug-Nov]	Navarai /Kodai [Dec-March]	
Thanjavur	26959	130042	3607	**160608**
Thiruvarur	9752	137500	1356	**148608**
Nagapattinam	23701	112342	432	**136475**
Total	**60412**	**379884**	**5395**	**445691**

Table 6: Potential areas [in ha] for System of Rice Intensification in Tamil Nadu

Districts	Season			Total
	Kar /Kuruvai / Sornavari [Apr-July]	Samba / Thaladi / Pishanam [Aug-Nov]	Navarai /Kodai [Dec-March]	
Villupuram	42307	101693	17032	**1,61,032**
Thanjavur	26959	130042	3607	**1,60,608**
Thiruvarur	9752	137500	1356	**1,48,608**
Nagapattinam	23701	112342	432	**1,36,475**
Thiruvannamalai	29939	60074	26647	**1,16,660**
Cuddalore	23930	84141	6330	**1,14,401**
Kancheepuram	16424	54046	26827	**97,297**
Tirunelveli	24297	60256	2279	**86,832**
Thiruvallur	24479	27411	6393	**58,283**
Kanyakumari	10684	11332	0	**22,016**
Total	**2,32,472**	**7,78,837**	**90,903**	**11,02,212**

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