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Direct Seeding Method with SRI Concept

Direct seeding method with SRI concept, so-called "**SRI direct Seeding**", has been tested in the field in eastern Indonesia and in India in 2005 to date. This method is to apply (i) direct seeding with wide spacing, and (ii) intermittent irrigation. Nowadays this method is expanding gradually in the existing direct seeding areas.

Results of these field trials of SRI direct seeding are reported as follows.

1. SRI Direct-seeding Method in Indonesia

During the 2005 and 2006 dry seasons, field trials for the SRI direct seeding method were performed in the Sadang irrigation scheme of DISIMP in South Sulawesi, Indonesia.

Table-1: SRI Direct Seeding Trials in Sadang Scheme in 2005 and 2006

Items	2005 dry season	2006 dry season
Location	Sadang scheme, Teppo Abokongan Water Users Association Federation, TP 1 tertiary block, Plot of Mr. Bunga)	Sadang scheme, Massiddi Adae Water Users Association Federation, P9 Ki Tertiary Block, Plot of Mr. Polewali)
Area Tested	0.5 ha	2.0 ha
Period	Seeding on 7 May 2005, Harvesting on 31 Aug. 2006 (116 days)	Seeding on 9 August 2006, Harvesting on 6 Dec. 2006 (119 days)
Seed quantity	3-5 seeds per planting hole (20 kg/ha in total)	5-8 seeds per planting hole (30 kg/ha in total)
Spacing	30 x 30 cm	30 x 30 cm
Yield	6.13 ton/ha (grain moisture content 14 %)	6.72 ton/ ha (grain moisture content 14 %)
Fertilizer	Same as recommendation from District Agriculture Service	Same as recommendation from District Agriculture Service
Watering	▪ 0-5 day after planting thin layer (0-1 cm) ▪ 6-60 day, intermittent with 1-2 cm depth ▪ 61day-2 week before harvest, continuous flow with 1-2 cm depth	▪ 0-5 day after planting thin layer (0-1 cm) ▪ 6-60 day, intermittent with 1-2 cm depth 61day-2 week before harvest, continuous flow with 1-2 cm depth

In spite of repeated instruction by the DISIMP consultant, farmers have used more seeds per planting hole because they were afraid that seeds be attacked by birds before growing.

Area of the SRI direct seeding has been increased in the Sadang scheme gradually. In the 2007 dry season, total area of the SRI direct seeding has reached 40 ha.

Table-2 shows the comparison between SRI direct seeding and Conventional Direct Seeding in Sadang scheme based on 40 ha from 2005 to 2007.

Table-2: Comparison between SRI Direct Seeding and Conventional Direct Seeding

Items	SRI Direct Seeding	Direct Seeding (Conventional)
Planting	Man power (2-3 seed per planting hole)	Using Tool (> 15 seed per planting hole)
Spacing	25 x 25 cm or 30 x 30 cm	Wide 20 cm or 25 cm, Length uncontrolled
Seed quantity	10-15 kg	60 – 100 kg
Fertilizer	Same as recommendation from District Agriculture Service	Same as recommendation from District Agriculture Service
Watering	▪ 0-5 day after planting thin layer (0-1 cm) ▪ 6-60 day, intermittent with 1-2 cm depth ▪ 61day-2 week before harvest, continuous flow with 1-2 cm depth	▪ 0-5 day after planting thin layer (0-1 cm) ▪ 6 day after planting - harvest continuous flow with depth 5-15 cm
Labor	22 man-day/ha by cropping season (excluding harvesting by sub-contact)	18 man-day/ha by cropping season (excluding harvesting by sub-contact)
Yield	6.0-7.9 ton/ha	4.5-5.8 ton/ha
Photograph		

From 3 years experience in the Sadang scheme of DISIMP, advantages and disadvantages of SRI direct-seedling are summarized as follows:

Advantage of SRI direct-seedling

- Paddy yield by SRI direct seedling is about 30% higher than conventional direct seeding.
- Irrigation water consumption by SRI direct seedling is about 30-40% less than conventional direct seeding.

Disadvantages of SRI direct seedling

- After planting, sometimes seeds are attacked by birds and rats. Extra labor is necessary for re-planting.
- There is no way to secure seed growing capacity. If it is low (sometimes 80% if using own seed), re-planting at the un-growing portion is necessary.
- If heavy rains attack before 3 days after seeding, many seeds will be washed away toward the lower area. In such case, extra labor for re-planting.

Introduction of SRI direct seedling method in the existing direct-seeding areas like Sadang scheme is possible but needs more efforts for dissemination to farmers:

(reported by Shuichi Sato, DISIMP - Nippon Koei)

2. SRI Direct Seeding Method in India

On 17 May 2007, Mr. Bala Reddy, KVK-Chitoor, Andhra Pradesh, India reported about "comparison of SRI and Direct Seeding Method in India" as follows:

In the 2006 *rabi* season, a field trial of directing-seeding using a 8-row drum seeder was done in a paddy field (0.5 acre = 0.405 ha) by a young and dynamic farmer, Mr. Nageswara Rao of Madibaka Village, Yerpedu Mandal, Chittoor District, Andhra Pradesh. Traditional paddy cultivation methods and SRI method were also simultaneously laid out along with the direct seeding with drum seeder in order to make comparison.

Comparison of practice of paddy cultivation method among traditional, SRI and direct seeding methods is summarized in Table-3.

Table-3: Comparison of Paddy Cultivation Method in 2006 Season (per acre)

Item	**Traditional (Transplanting)**	**SRI (Transplanting)**	**SRI Direct Seeding**
Seed rate	30 - 40 kg (equiv. 74 – 99 kg per ha)	2 kg (equiv. 4.9 kg/ha)	15 kg (equiv. 37 kg/ha)
Age of seedling for TP	30 - 40 days	8 – 12 days	0 days
Labor required for TP or seeding	20 days	15 days	3 days
Spacing	Zig-zag method	25 x 25 cm	20 x 8 cm
Irrigation water management	5 cm or more standing water from the day of transplanting to 10 days before harvesting	Intermittent irrigation to alternate wet – dry cycle during vegetative growth stage. No standing water during wet period.	
Weed control	1st weeding by herbicide, 2nd weeding by manual	1st weeding by rotary weeder, 2nd weeding by manual	1st weeding by herbicide, 2nd weeding by herbicide or by rotary weeder
Paddy yields	2,625 kg/acre (equiv. 6.5 tons/ha)	3,525 kg/acre (equiv. 8.7 tons/ha)	3,375 kg/acre (equiv. 8.3 tons/ha)
Total production costs	Rs. 9,700/acre	Rs. 9,500/acre	Rs. 8,300/acre
Gross return per acre	Rs.14,000	Rs.18,800	Rs.18,000
Net return per acre	Rs. 4,300	Rs. 9,300	Rs. 9,700
Benefit-cost ratio	1.44	1.97	2.16

Direct-seeding with drum seeder

22 days after SRI direct-seeding

The critical factors that aided in gaining the confidence of the farmers are:

1. Direct seeding method avoids raising nursery, pulling it and transplanting it due to which labor requirement is negligible. Due to Employment Guarantee Scheme (EGS) for the rural unemployed labor offering Rs.80/day the demand for agricultural labor is at its peak forcing the farmers to pay high wages for regular field operations.
2. Farmers can take up Paddy cultivation any time instantly as there is no requirement of raising any nursery.
3. Paddy cultivation using direct seeding method can be taken up in fields with heavy weed infestation also because herbicide application is the must.

4. Labor requirement for running conoweeder is reduced to 50% compared to SRI methodology since it is run in one direction only. The major hurdle in adoption of SRI technology i.e., drudgery in conoweeder running is overcomed in direct seeding method.
5. Farmers were of the opinion that they will be happy even if they recover normal yield with the drum seeding technology because they will save about Rs.1200 - 1500 per acre to be incurred on raising nursery and transplantation. Fortunately, due to loosening the soil with conoweeder, the yield from this method (45 bags per acre) is on par with SRI method (47 bags per acre) and far superior than traditional method (35 bags per acre).
6. Operating the conoweeder (15cm width wheels) is easy compared to that used in SRI method (25 cm width)

(reported by Prof. Dr. Norman Uphoff, Cornel University CIIFAD)