

Maximizing Yield of Paddy by Adopting SRI Principle

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The System of Rice Intensification (SRI) is a methodology aimed at increasing the yield of rice produced in farming. It is a low water, labor-intensive, organic method that uses younger seedlings singly spaced and typically hand weeded with special tools.

SRI (System of rice Intensification) is based on the following principles:

- Young seedlings between 8-12 days old (2 leaf stage) are transplanted to preserve potential for tillering and rooting ability;
- Careful planting of single seedlings rather than in clumps (Transplant seedlings singly, one per hill)
- Wider spacing at 25 cm x 25 cm. in square planting rather than in rows;
- Use of cono-weeder/ rotary hoe to aerate the soil as well as controlling weeds;
- Alternate wetting and dry method rather than continuous flooding in the field;
- Use of organic manure or vermicompost / FYM /Compost.

1. Material and Methods

The System of Rice Intensification is not a new method or technology. Artificial environment is created for growth and development of rice plant for exploitation of its full genetic yield potential. It can be accomplished by the following methods:

1.1 Raising nursery

(a) Selection of site

In SRI method, utmost care should be taken in the preparation of nursery bed, as 8-12 days old seedlings (2-3 leaf stage) are transplanted. The nursery bed should be preferably prepared in the center / corner of the plot for quick / efficient transplanting. Center

(b) Size of bed

For one acre transplantation, the nursery bed can be raised in (40-60 sq meter) plot. Depending upon the situation, two beds can be raised each measuring (20-30 sq meters) per 1 kg seed.

A bed with a width of 125 cm or 4 feet is ideal. Length of the bed can be decided by the farmers depending on the ground situation. As the roots of 8-10 days old seedlings grow up to 3 inches (7.5 cm), it is necessary to prepare raised beds of 5-6 inches (12.5-15 cm). To drain excess water, appropriate channels should be provided on all sides by making drainage cum irrigation channels (0.5-1 feet width).



(c) Bed preparation

Nursery bed is prepared with application of farm yard manures (FYM) and soil in four alternating layers. 1st layer: 1 inch (2.54 cm) thick well decomposed FYM, 2nd layer: 1 .5 inch (3.75 cm) soil, 3rd Layer: 1 inch (2.54 cm) thick well decomposed FYM, 4th layer: 2.5 inch (6.3 cm) soil. All these layers should be mixed well as it will helps in easy penetration of roots. Besides compost or vermi compost can also be used and spread it over all the bed in 3-5 cm layer.

(d) Seed Rate

2 kg of seeds (5 kg / ha) is required to transplant in one acre of land. Seed should be thinly spread to avoid crowding of seedlings. Care should be taken that no two seeds should touch each other.

(e) Seed Treatment

Healthy and pure seeds are used. Soak the seeds for 12 hours in water. Drain the water and treat the seed with *Trichoderma* (3 gm / kg seed). There after transfer the treated seeds to a water soaked gunny bag. Leave it for 24 hours. Sprouted seeds are taken to the nursery for sowing. To ensure uniform broadcasting, divide the seed into four part and broadcast thinly over the bed (each part at a time). It is better to broadcast seeds in the evening.

(f) Mulching

Cover the bed with paddy straw, to cover from direct exposure to the sun and also to ensure protection from birds. Depending upon requirement, apply water with rose cans twice daily. Care should be taken to see that the seeds do not come out while watering. Remove the straw once seeds germinate.

2.2 Preparation of main field:

Land selected for SRI should be well leveled. When the plot is irrigated the water should spread uniformly across the field. Similarly, whenever needed there should be provision to drain the excess rain water.

Transplanting of SRI paddy by rope marker

2.3 Method of transplanting:

2.3.1: The field should be well puddled and leveled. After leveling the field, a marker can be used to lay out the plot into wider spacing i.e., 25 cm x 25 cm row to row and plant to plant. This can also be done with the help of rope by marking.



2.3.2: Young rice seedlings 8 to 12 days old (2-3 leaf stage) is considered to be ideal for transplanting as compared to 25-30 days old seedlings in traditional method of rice cultivation.

2.3.3 Care should be taken to prevent any harm to seedlings while pulling them from nursery or at the time of transplanting. Transplanting of tender seedlings need care to minimize root trauma. Young seedlings are planted shallow horizontally thus establish quickly.

2.4 Nutrient Management:

Organic manures / vermi compost are recommended in SRI cultivation as they give better response and improve soil health. Application of FYM / compost (10-12 t/ha) before ploughing and incorporation of in situ grown 45-60 days old green manures crops are beneficial. Though complete organic manuring is recommended for SRI, in case of short supply of organics, fertilizer supplementation (as per recommended dose by KVK or Agriculture University) may be adopted for better yields. It is better to incorporate 50 % of recommended fertilizers (NPK) through in-organic manner. Use of LCC has more advantage in Nutrient management

2.5 Water management:

SRI method does not require continuous flooding. Irrigation is given to maintain soil moisture near saturation initially and water is let in when surface soil develops hairline cracks. The irrigation intervals, however, vary with soil texture. Soils having low water holding capacity require frequent irrigation.

As the soil is not flooded, the roots of the paddy plants grow healthy, deeply in all directions. The root growth is extensive also due to the wide spacing. As the field is intermittently irrigated and dried, the microorganisms grow well which make nutrients available to the plants. This method also helps in better growth and spread of roots.

The field should be irrigated again when the soil develops hair line cracks. After the panicle initiation stage until maturity, one inch of water should be maintained in the field until maturity. The water can be drained after 70 per cent of the grains in the panicle get hardened.

2.6 Weed Management:

As there is no standing water in SRI method, the chances of weeds would be more. There are several advantages of turning the weeds into the soil by using an implement called 'weeder'. Use the weeder on the 10th and 20th day after transplanting. The weeding problem is addressed to a large extent with this effort.



Alternate wetting and drying in SRI results in weed growth which if unchecked in time may cause immense loss in yield. In SRI, the weeds are incorporated by operating cono- weeder between rows at the right time, which also supply nutrients to the crop as green manures. First weeding is to be done 10-12 days after planting. Further weeding may be undertaken depending on the necessity at 10-15 days interval until crop reaches panicle stage.

Experiments Results:

Sl	Trail Name	Variety	Method Of sowing	Yield (Kg/ha
1	100% Chemical	MTU1010	Traditional	3875
2	100% Chemical	MTU1010	SRI	5225
3	50% Chemical	MTU1010	SRI(Random)	4430
5	100% Organic(Composting Based)	MTU1010	Traditional	3350
7	100% Chemical	MTU1010	SRI(Random)	4320

During our two seasons intensive trials we concluded that production of paddy per hectare is 25-30 % more in SRI then the traditional method.