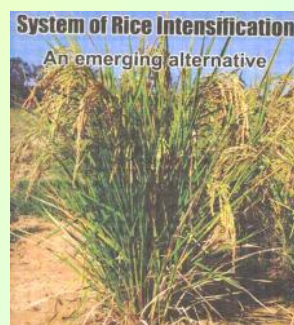


SRI (System of Rice Intensification) method of Paddy Cultivation under Farmers Field School Approach in Ghanasaren micro-watershed at Bhaludunguri village, Nuapada district under WORLP ---A Case Study

Farmer Field School- Learning by doing & observing; is typically a group of farmers (roughly 20-25) who meet periodically (usually once in a week) in a designated field throughout the major part of the crop cycle. Farmers devote considerable time to agro ecosystem analysis and they are encouraged to make observations of important processes and relationships, such as the habits of harmful insects and actions of natural enemies. In regular sessions from planting till harvest, groups of neighboring farmers observe and discuss dynamics of the crop's ecosystem.

System of Rice Intensification (SRI): is a cultivation practice for Rice that is taken up in a different and more biologically enriched environment for growth. Yields are increased by 50 – 100% or more, with a reduction in plant populations (by 80 – 90%), less water (by 25-50%), without using new 'improved' varieties (all varieties respond to the methods) or using chemical fertilizers (just adding compost to the soil), with usually lowered costs of production, and thus considerably increased net economic returns per hectare.



KEY FEATURES OF SRI:



- Transplant young seedlings
- Reduce plant population
- Maintain aerated soil conditions
- Provide as much organic matter as possible to the soil
- Actively aerate the soil
- Re-emphasize biology
- Rediscover the potentials of synergy and symbiosis

LAND PREPARATION:



1. Land preparation of the main field in SRI

- Summer ploughing using bullock pairs
- Land leveling done using bullock drawn leveler
- Puddling and incorporating the uprooted weeds in the puddle for increasing the fertility of the field
- Application of FYM / MULTIPLEX
- Preparation of beds of width 6', height 6" with 1" drains in between beds for safe disposal of excess water.

The beds were marked by the wooden marker maintaining row-to-row & seedling-to-seedling distance up to 10" X 10".

The objectives of maintaining 10" Spacing are:

- To have deep percolation of tap root & profuse growth of the adventitious root by means of good aeration.
- Sufficient area for nutrient absorption by the root.
- Easy for intercultural operation maintaining plant density & avoiding competition for nutrient in the soil.



2- Nursery bed

APPLICATION OF BIO-FERTILISER AND SEEDLING TREATMENT:

- Root treatment of the seedlings by liquid bio fertilizer such: Azospirillum, Azatobacter, P.S.M, Potash etc.
- (1st dose: 100ml. Azospirillum +100 ml. Azatobacter +200 ml. P.S.M+200 ml. Potash per acre with ponded water at one corner of the main field)
- By the root treatment of the seedlings with aforesaid liquid fertilizers ensured the fixation of N, P, K from the atmosphere and helped the seedlings be resistant against diseases and pests.



Farmers were involved in preparation of FYM mixed with bio fertilizers.



(2nd dose: 100 ml. Azospirillum +100 ml. Azatobacter + 200 ml. P.S.M+200 ml. potash + 10-15 lt. Water + 80-100 kg dry FYM). The mixture was kept for 7 days under shade with polythene covered and the same was applied in the field in crispy form.

CAPACITY BUILDING

COMPONENT: Concept & objectives of FFS were made understood to the participating

farmers. The key components taken care of in the FFS module were Soil sample collection & testing, Summer ploughing, tillage & Mulching, Identification of good seeds, seed treatment, Nursery raising, Main field preparation, Preparation of organic manure & Pest (Magic & vermin. compost & Vermi. wash) Utility & application of liquid Fertilizer (Azospirillum, Azatobacter, P.S.M, Potash) I.N.M, I.P.M, I.W.M in different stages of cultivation such as: transplanting, tillering, panicle initiation, flowering & harvesting.



The off- field training sessions were supplemented with

- Leaflet,
- books
- coloring chart
- study material
- Interactive--- session

While the on-farm sessions were concentrated upon demonstration and hand-on application of improved techniques. The participating farmers were facilitated to undertake different practices on-field by themselves in order to gain experience.

During FFS in-house training sessions the Audio – Visual method of teaching imparted gave much insight to the farmers about: Comparative study between SRI & traditional method of paddy cultivation, Conceptual clarity in terms of sustainability & productivity. The requisite involvement, responsibility, technical know-how about doses of fertilizer, I.N.M, I.P.M, I.W.M, etc. in different physiological phases of paddy.





8- Lunch session under FFS

A sense of togetherness: ---

After the tired & exhaustive On- farm & off- farm sessions, trainees along with L.S.T & W.D.T members having their lunch during FFS training.



9. Transplanting Phase – SRI Method

GERMINATION:

It took 4 -5 days for 85% and 6 days for 95% germination of seeds in the nursery bed. At this stage plants were found to bear at least 4 to 5 leaves with height of 5 to 6". The nursery bed is given irrigation by the rose cane in every 5 days interval. The raised beds were provided with the drainage channels of 1 ft. width.

SEEDLING STAGE:

Hills were placed at 10" (25 cm) spacing. During tillering stage in demonstration plot each clump was found to bear around 35-50 nos. of tillers, projecting the advantages over the traditional method of paddy cultivation.



10- Tender seedlings of 10-12 days old transplanted



11-A snapshot of tillering stage of demo plot of SRI method under F.F.S.

Actively aerate the soil. When the field is not flooded, weed growth becomes a greater problem. The best way to control weeder is with a rotary hoe, cono weeder or other implement that aerates the soil while it eliminates weeds. This stimulates the growth of soil organisms that fix or cycle N, solubilize P, improve soil structure and functioning, induce systemic resistance, produce phytohormones, etc. Herbicides or manual weeding control weeds but do not enhance the productivity of soil systems.



12- Inter cultural operation by Mandua (Locally) weeder

Profuse tillering is noticed due to vigorous root growth and healthy panicles. Excessive induced biological



13-Tender Seedlings of 10-12 days old transplanted

activities and aeration in the root zone has helped good vegetative growth of plants. Grain filling was also faster



14-Profuse Tillering of paddy under SRI



A group of farmers on Exposure visit to expose themselves to SRI Method of paddy cultivation undertaken under FFS at Bhaludungri - WORLP (Interacting with the farmers of FFS)

TILLERING:

The tillering continued up to 60 DAT. Profuse tillering is observed at this stage. The effective tillers per hill were on an average 30 to 35 tillers. At this stage the field is maintained dry and wet alternately. At this stage the weeding operation was done by the *Mandwa* weeder and incorporated into the soil. The tillering growth was in geometric progression as is seen in the graph enclosed. The number of clumps per acre was 64000 per acre. The tillering, its growth and development phase is also known as Phyllocron stage of the crop.



15-Close view of tillers in a hill

STEM ELONGATION:

The stem elongation continued up to 80 DAT and in the vegetative log phase. In this stage the crop switches over from veg. to reproductive phase. The water was maintained at 3-5 cm. In this period of time the stem elongated 2 to 3 cm in every week.

PANICLE INITIATION:

At 60 to 75 DAT the panicle initiation started. The field is maintained alternately dry and wet.

PANICLE DEVELOPMENT:

At 75 to 80 DAT the rachis get fully developed.



16-Panicle initiation stage of the crop



17-Flowering stage of the crop

FLOWERING:

At 80 to 85 DAT the flowering gets completed. At this stage the water is maintained at 4 to 6 cm. The pest- Swarmy caterpillar is detected and Monocrotophos altered with Nuvacron is applied for its control.

MILK GRAIN:

The milk grain formation gets completed within 90 DAT. The number of grains on an average is 80 to 100 per panicle.

DOUGH GRAIN:

The grains complete dough stage within 95 to 100 DAT. The grains are filled and the coloration changed from whitish color to golden yellow color.



18-Doughing/milking stage of the crop

MATURE GRAIN STAGE:

The grain continued to mature up to 120 DAT.

Harvested the crop around 20-25% moisture in the grain. The crop attained physiological maturity at 105 DAT. The plot was drained 10-15 days before harvest.



19-Ripening stage of the crop



20-Threshing –cum–winnowing process

THRESHING & CLEANING OF GRAINS:

The crop cutting was carried under 5x5 mt. space at two locations and per acre yield is found to be 24 qtl. in the FFS plot. A field day was observed.

Participating farmers seen engaged in undertaking post-harvest activities in their farm yard.