

# Realise full potential of Paddy Plant

# SRI Method of Paddy Cultivation



## **To achieve higher productivity in paddy:**

- ✧ A plant should have more number of tillers
- ✧ The number of effective tillers should be higher
- ✧ The number of grains in a panicle should be higher
- ✧ The grain weight should be more

**SRI Method of Paddy cultivation helps in achieving the above.**

**The objective of this booklet is to give the principles and opportunities behind the above aspects.**

## **SRI Method of Paddy Cultivation**

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**Dialogue**  
ON WATER, FOOD AND ENVIRONMENT

# How to use the potential and full capabilities of a plant...

In Nature plants are the only beings that can prepare their own food



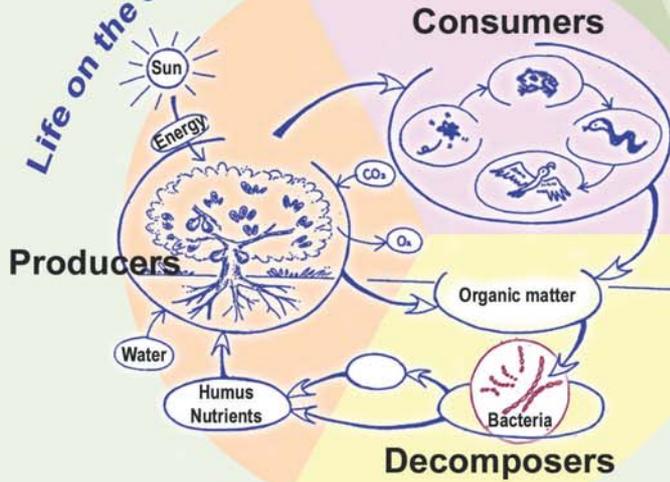
What do plants need to prepare their food?

Air

Nutrients

Water

Life on the earth can be mainly classified into three categories



A plant that can produce its own food is made dependent on chemical fertilisers and pesticides.

Is this the right way of agriculture?



Is this not one of the reasons for farmers becoming indebted?



If a plant has to fully utilize its potentiality...

- \* The feeder roots that take in water and nutrients should be healthy and widespread
- \* The soil should be fertile and alive with several micro-organisms
- \* The plant should be healthy and strong

SRI method of cultivation helps in achieving the above objectives. This method can be followed in crops such as paddy, finger millet (ragi), sugarcane and others. Let us explore the SRI method of practices in paddy cultivation



## 1. SRI Method means\_

**SRI is an acronym for System of Rice Intensification. This improved method of rice cultivation was developed in 1983 in Madagascar and has now spread to many parts of the world.**

**SRI is neither a new variety nor a hybrid...**

**It is only a method of cultivating paddy.**

**Any paddy variety can be cultivated by this method.**



**SRI practices collated in this book are based on farmers' practices and their experiences. As innovation and local adaptation are the hallmarks of SRI, farmers should further refine these practices according to their local situation.**

**T**here is a notion that what has been done in research plots and by scientists is modern and desirable. However, it is farmers who played a key role in designing and developing SRI method of cultivation practices. Thus every farmer has to be a scientist and an experimenter. Farmer should not blindly follow what is suggested by others. One has to understand the principles behind and decide upon what to do based on local situation and available resources. This is the key aspect in SRI method of cultivation.

**For the paddy plant to achieve its full potential and give high yield:**

- \* A plant should have more number of tillers
- \* The number of effective tillers should be higher
- \* Panicle length and number of grains per panicle should be higher
- \* The grain weight should be more
- \* The roots should have extensive and healthy growth

Let us explore different methods in achieving the above objectives. Along with various opportunities let us explore the limitations, problems and challenges in each of the aspects. Let farmer's fields be experimenting grounds.

## Attributes in SRI method that help in achieving higher productivity

### Wide planting:

With wide spacing each plant gets more space, air and sunlight. As a result each plant gives more tillers. The roots would grow healthily and extensively and take in more nutrients. As the plant is strong and healthy the number of tillers would be more. The panicle length would be more. The panicle has more number of grains and the grain weight would also be more.



### Less seed:

As wide spacing is adopted the seed required would be less. This results in the advantages mentioned above. Further it is easy to use and produce quality seed.

### Transplanting young seedling:

The seedling should be transplanted when it is in 2 leaf stage. When the seedling is transplanted carefully in this stage it grows healthily and generates more number of tillers. It can achieve the potential of giving higher yield.



### Less water:

When the water is stagnating in the field the roots die due to lack of air. The dead roots are brown/ rusty in colour. The soil should have soil particles, air and moisture in equal proportions. The paddy plant can survive even when there is standing water. But, for a healthy paddy plant water should not be in stagnated situation in the field. When irrigation is provided intermittently the roots are aerated and grow healthily.

### Turning back the weeds into the soil:

Instead of weeding and throwing the weeds outside the plot there are several advantages of turning the weeds into the soil by using a 'weeder'. This results in two advantages: firstly, the soil gets aerated and secondly, the weeds get decomposed in the soil and turn into organic matter. Due to this the roots and the plant grow healthily and higher yields can be achieved.



### Use of organic manures:

Organic matter is the food for life forms teeming in the soil. When organic matter is added the microorganisms in the soil multiply manifold. The microorganisms bring nutrients into available form and are made available to them as and when they are needed.

**Farmers who want to cultivate paddy by SRI method:**

- \* Should level their plots
- \* Should plan for drainage channels, if needed
- \* Should make plots of small size

### **Problems and Challenges**

Wherever paddy is cultivated under canals nurseries are raised in advance and farmers would be ready for transplantation when irrigated water is released into the canals. Under rainfed areas the farmers start transplantation as soon as the tank gets filled. Several experiments should be done to integrate green manure crop into the cropping pattern. Methods of cultivating green manure with less water and quick ways of decomposing should be explored.

Silt Application



## **2. Selection of Suitable Soils**

### **What are suitable soils:**

- \* Soils that are not affected by salinity
- \* Level fields that are convenient to irrigate and drain
- \* Fertile soils

Farmers who want to follow SRI method should first get the soil tested and know all the details.

### **2.1 Saline Soils**

Saline or alkali soils are not suitable for SRI cultivation. In saline soils paddy yields would be satisfactory when it is cultivated under flooded conditions. But in SRI method the field is drained intermittently. When soil is allowed to dry the salts accumulate in the surface resulting in damage to the rice plant.

### **2.2 Level plots**

Land selected for SRI method should be level. When the plot is irrigated the water should spread uniformly across the field. Similarly, whenever needed there should be facility to drain the excess water.

### **2.3 Fertile soils**

SRI method of cultivation responds better to organic manures rather than chemical fertilisers. The organic matter is the food for the soil microorganisms. When the soil is alive with microorganisms then the nutrients needed for the plant would be in readily available form. This means that rather than the nutrients in the soil the form in which they are present is more important. When soil is rich with microorganisms then the plant grows healthily, develops resistance to pests and diseases and yields higher. Thus methods of improving the soil fertility should be taken up right from the beginning. At least two methods from the following should be practiced every year.



### Application of tank silt

Tank silt should be applied at the rate of 15-20 cartloads per acre (40-50 tons/ha). This improves the moisture holding capacity of the soil, which in turn results in better yields.

### Farm Yard manure (FYM)

Application of well decomposed FYM/ compost is a must for SRI method of cultivation. At least 15 cartloads or 3 tractor loads (6tons) of FYM/ compost should be applied per every acre. FYM should be of very good quality. Of late preparation and use of vermicompost is gaining popularity.

### Green manure crop

Green manure crops helps in significantly improving the soil fertility. Green manure crops I cultivated upto 50% flowering stage and ploughed back into the soil. Sunnhemp and sesbania are the common green manure crops. Green manure crop is cultivated for about 45 days and it takes another 10 days to get decomposed into organic matter. Sow the paddy nursery on the day of incorporating the green manure crop into the soil. By the time the green manure crop gets decomposed the nursery would be ready for transplantation. Ensuring water for raising and decomposing and the time period are essential for the green manure crop.

### Livestock Penning

This is a traditional practice in which cattle, goats and sheep are flocked in the field during the night. The soil gets enriched with the dung and urine of the animals.



Sheep penning



Green manure



FYM heap

*In the fields that are leveled newly the top soil gets disturbed. As a result during the first year no crop would be successful. It is better to avoid SRI method of cultivation in such fields.*

### Quality check for FYM heap

- \* There is complete breakdown of the physical structure of all the raw materials used and they can no longer be identified
- \* The heap is in dark brown to black colour
- \* There is sweet and earthy smell
- \* The mass is spongy and moisture retaining and
- \* Presence of micro organisms visible to normal eye

### Dabholkar method of green manuring

This method is gaining popularity in the recent years. Normally a single, preferably leguminous crops is cultivated for green manure. However, in Dabholkar method at least 4 species from each of the categories mentioned below are selected and a total of 25 kg is seed is used per acre. From the first 4 categories take seed of 6 kg each and from the fifth category take 1 kg seed.

1. Cereals (Jowar, Bajra, Foxtail millet, Finger millet, *Samalu*)
2. Pulses (Blackgram, greengram, Bengalgram, Beans)
3. Oilseeds (Sesame, Groundnut, Sunflower, Castor)
4. Green manures (Sesbania, Sunnhemp, horsegram, *Pillipesara*)
5. spices (Mustard, Coriander, *Methi, Ajwain*)



### **Transporting the uprooted seedlings to the main field**

Transporting the young seedlings to the main field is one of the problems. The means to overcome this problem are:

- \* Take up nursery raising near to the main field.
- \* For every acre have one nursery of 400 sq.ft. either in the centre or on one side of the field
- \* Raise nursery in banana trunk leaf or plastic trays
- \* Raise nursery in 'mat' method



## **3. Raising Nursery**

In SRI method, utmost care should be taken in the preparation of nursery bed, as 8-12 days old seedlings are transplanted.

### **3.1 Bed Preparation**

The bed should be 4 feet wide. The length can vary depending on the need and space available. Two kgs seed would be needed for transplanting in one acre. For raising this, a nursery bed of 400 sq.ft. would be required. Depending upon the convenience a single bed or several smaller beds (say, 4 beds of 4 x 25 feet) can be prepared. As the roots of 8-12 day old seedling would grow upto 30 inches, it is necessary to prepare raised beds of 5-6 inches.

Nursery bed is prepared in this manner:

- 1<sup>st</sup> layer:** 1 inch thick well decomposed FYM
- 2<sup>nd</sup> layer:** 1 ½ inch soil
- 3<sup>rd</sup> layer:** 1 inch thick well decomposed FYM
- 4<sup>th</sup> layer:** 2 ½ inch soil

All these layers should be thoroughly mixed.

Make a channel around the nursery bed. To prevent the wet soil dropping down the bed should be made secure on all sides with wooden planks, bamboos or any other suitable material.

Farm yard manure helps in easy presentation of roots. The plants that are grown in well decomposed manure gain resistance to diseases. Later, in the main field also the plant grows healthily without any diseases.

### **Benefits with less seed**

- \* Cost is less; if needed, even foundation seed can be used
- \* Quality seeds can be carefully selected/ collected
- \* After the soaking the grains in water, the ill filled grains that float can be removed, or even hand picking can be done
- \* Seed production can be taken up with even less quantity of seed, if SRI method is followed again, with less quantity of seed large areas can be covered within one year itself

### 3.2 Seed soaking, broadcasting

Using pre-soaked and germinated seeds is one of the methods in raising nursery. There are other methods of raising nursery also.

Here let us learn about the process of pre-soaking and germinating seeds before sowing them in the nursery.

**Germinating the seeds:** Soak the paddy seed for 12 hours. Transfer the soaked seed into a gunny bag or make a heap and cover it with gunny clothe. Leave it for 24 hours. At this time the seed germinates. You can observe the white root or radicle emerges from the seed. This seed is used for sowing on the nursery bed. If sowing is delayed, the roots grow and get matted together making it difficult to sow the seeds with wider spacing.

**Broadcasting the seed:** To ensure uniform broadcasting, make the seed into 4 equal parts. Broadcast each part separately one after the other. Two seeds should be separated by a distance of length of one seed. It is better to broadcast the seeds in the evenings.

**Covering the seed:** Cover the seed with a thin layer of well decomposed FYM or dry soil. Even paddy straw can be used for this purpose. The seed is protected from direct sun and rain by this layer. It also protects from being eaten away by birds and ants. When straw is used as a layer it should be removed after the appearance of the shoots.

**Watering the beds:** Depending upon the need, watered the bed daily in the morning and evening. The water should be gently sprinkled over the bed. One can use the garden rose can for this purpose. When pots are used for watering, use one hand to break the force of the water. The nursery can be watered by letting in water into the canal surrounding the nursery bed.

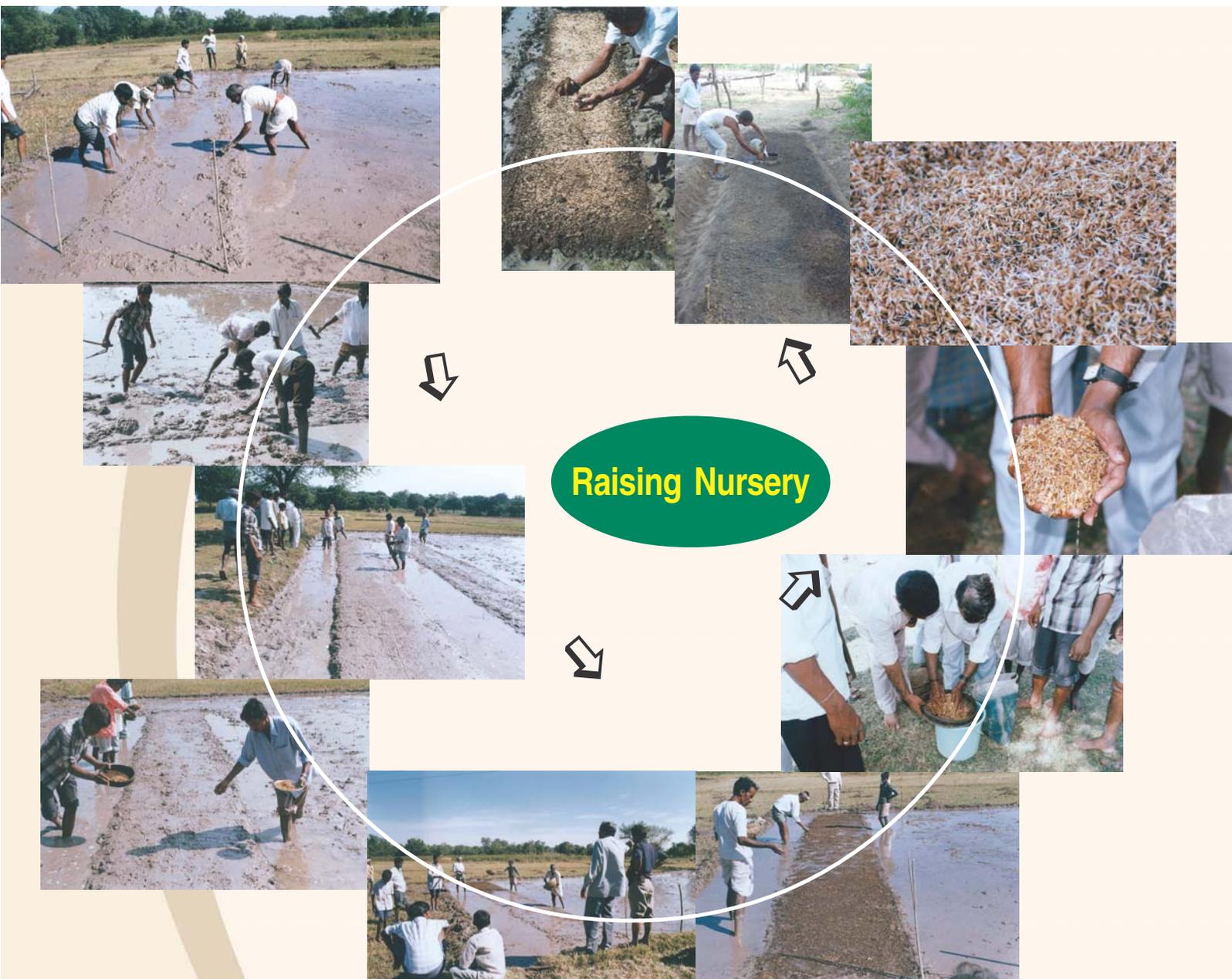
#### **Community Nurseries:**

Having seedlings ready for transplantation by the time rains are received is an important issue. As less seed is needed and young seedlings of 8-12 days are planted one can plan for community nurseries. Nursery beds can be sown in a staggered manner with 2-3 days interval. This ensures that seedlings are available at different times. This might result in certain wastage of seedlings but the objective of timely transplantation would be ensured.



Seedling





**Raising Nursery**

**Nursery raising by 'mat' method**

The nursery is raised on polythene sheet or empty fertiliser bags. A steel or wooden frame with four compartments is used. The dimensions of the frame are 1 x 0.5 metres. Each compartment would measure 0.125 sq.metres. The nursery bed of 4 cm thickness is prepared using well decomposed FYM and soil. Broadcast the seed on the bed and cover it with mud. After watering the nursery bed the frame can be removed and reused. For the first 5 days the beds are watered using rose can 2-3 times, every day depending on the need. Later the nursery can be watered by letting in water into the canal around the nursery bed. The nursery is uprooted in chunks and transported to the main field.




## Phyllocrons and Paddy yields

In SRI method the first 4-5 weeks after transplantation the field would look terrible. The plants are small and wide apart. As there is no standing water the land looks dried up. However, in this stage the plant is preparing itself to tiller. The tillering starts in the second month and is in exponential stage in the third month. To understand this one has to know about 'phyllocron' in paddy.

'Phyllocron' is the time taken to form a new tiller with a leaf and root. This is mainly influenced by the temperature followed by day length, humidity, soil moisture, soil texture, availability of nutrients, aeration and sunlight. If all the conditions are favourable one phyllocron is completed in 5 days. Or else it might take 6-7 days or even more. It is ideal that the rice plant complete 12 phyllocrons by the time vegetative phase is over and panicle initiation has taken place. A new tiller after completing two phyllocrons also starts tillering. This means that the number of new tillers increases geometrically.

If germination is considered as the first phyllocron stage, then it is ideal to transplant it in 2<sup>nd</sup> or 3<sup>rd</sup> phyllocron stage. By this the phenomenal growth that would take place from the 4<sup>th</sup> phyllocron would not get disturbed. The phyllocron stage and number of tillers would be as follows. This is what happens in SRI method.



	Phyllocron stage											
	1	2	3	4	5	6	7	8	9	10	11	12
New tillers	1	0	0	1	1	2	3	5	8	12	20	31
Total tillers	1	1	1	2	3	5	8	13	21	33	53	84



## 4. Preparation of Main Field

**P**reparation of the main field in SRI is the same as in conventional method. However it is ideal that the field is dry ploughed and puddling by tractor is avoided. Particularly in black soils the field should be ploughed and kept ready during summer itself. The field should be watered and transplanted. This way it would be easy to operate the weeder later. As puddling by tractor is not done the weeder would not get stuck and less energy would be sufficient to run the weeder.

The field should be level and there should be no standing water while transplanting.

If the plots are small and leveled water management becomes easy. If needed, canals should be prepared for irrigating and draining the SRI plots.

### 4.1 Wide spacing

Wide spacing is important in SRI method. The row to row distance and within a row plant to plant distance should be 10 x 10 inches (25 x 25 cms). With this spacing there would be 16 plant per square metre in SRI method. If there is any doubt regarding the survival of plant then two plants can be transplanted per hill. In the conventional method 33-40 hills are transplanted per square metre with 4-5 plants per hill.

### 4.2 Use of Marker

There are several ways by which to transplant at 10 x 10 inches spacing. Take a rope and tie a knot or a stick at every 10 inches. Using this rope as guide, transplant one row after the other.

However, markers are available to help transplanting at 10 x 10 inches spacing. There are markers made out of wood as well as iron. There are bar markers which have to be drawn either way to form a grid and roller markers which would form grids at one go.



Marking in the field



Marker

#### What spacing to be followed

We have seen that with wider spacing the plant grows healthily and yields better. It was also recommended that 25 x 25 cm. spacing should be followed in SRI method. However, there are several farmers who have experimented with 50 x 50 cm. and 1 x 1 metre spacing and obtained good yields.

The paddy seedling has to be transplanted where the vertical and horizontal lines meet. The roller marker gives 8 grids at a time.

For the rows to be straight it is ideal that a rope is tied along the length of the field and the marker is drawn along the rope. After pulling the marker once, i.e. for every 2 metres it is ideal to leave 12-13 inches path. Tie a rope as guide and draw the marker again along the rope.

The roller marker should be pulled at a certain speed. Otherwise the roller wouldn't turn and gets dragged on the field.

### 4.3 Leaving pathways

Farmers are advised to leave paths for every 2 metres. Farmers have adopted this practice. However, the farmers first transplant the entire field. Paths are made later by tying a rope at ever 2 metres; the plants on both the sides are uprooted and retransplanted aaway from the path. In SRI method when roller marker is used after pulling the marker once lengthwise across the field, i.e. after every 8 rows, the marker should be pulled after leaving a gap of 12-13 inches. The path in between every 8 rows is sued for transplanting also.

These paths result in good aeration of the paddy fields. As a result the pest and disease intensity gets reduced. Normally we observe that the plants along the bunds and paths growing healthily. In paddy fields the plants along these pathways also grow healthily. These paths are also useful for observation and interculture operations. However, as wide spacing is used in SRI method some farmers are avoiding these paths.

For smooth transplantation, field operations like cleaning of bunds, leveling and marking should be completed a day before transplantation.

#### Different types of markers

Farmers have prepared different types of markers using rope, wood and iron. There are markers with 4 rows and super markers with 16 rows.

In Andhra Pradesh during Sankranti time rangolis are drawn using a small drum (approx. ½ inch wide and 4 inches long) with holes. Based on this the farmers have designed the roller marker. In the roller marker the horizontal and vertical lines are formed by pulling it, thus forming grids.



Roller marker



Koundinya marker



Wooden marker

#### Problems with markers

- \* In roller marker, instead of the roller rotating it gets dragged on the field
- \* Whenever there is an obstruction like stone, stubble or stem the roller marker jumps and the grids are not formed
- \* After cultivating and incorporating the green manure crop it is difficult to form lines with a marker





Transplanting at the marker points

## 5. Transplantation

**Y**oung, 8-12 day seedlings are transplanted in SRI method. The nursery should be raised with utmost care. Similarly, care should be taken to transplant the seedling without experiencing any 'shock'. The seedling should not be damaged either during or uprooting or transplanting in the main field. The family members and farm labourers engaged in this activity should be educated in this regard.

In the conventional method, the practice is to pull the seedlings by holding the plant. But in SRI method the plants would be very small. So a metal sheet is pushed 4-5 inches below the nursery and lifted on to the plate. This means that the seedlings along with the soil are taken on to the sheet. This can be transported to the main field on the metal sheet itself or transferred into a wicker basket or gamela. After uprooting the seedling transplantation should be completed as soon as possible, preferably within half an hour. This minimizes the trauma to the seedling.



Using trays to lift the seedling

When the nursery is raised in plastic trays or banana trunk leaves, they can be transported along with them.

When the nursery is raised in 'mat' method, it would be easier to lift the nursery in patches and transport it to the main field.

It is important to see that peaceful atmosphere prevails during transplantation. Transplantation should be done with utmost care and concentration. Transplanting wouldn't be proper amidst shouts, quarrels and tension.

### 5.1 Method of Transplanting

In the conventional method, seedlings are transplanted by thrusting them into the soil using the middle and the pointing fingers. With this the root takes a 'U' turn. This means that the





roots are looking upwards. Thus the root takes time to turn downward again and get established in the soil.

However, in SRI method the seedlings are transplanted shallow with the roots forming a 'L' shape. Start at 1 inch above the intersection of the horizontal and vertical lines and gently pull down using the pointing finger. The seedling is taken along with the soil using the thumb and pointing finger. As a result the seedling establishes quickly and grows healthily. The field should be lightly irrigated either on the same day or the day after transplantation.

Initially, SRI method requires 10-15 persons to transplant one acre. Once the farmers/ labourers gain experience it can be completed with fewer persons.

### Direct sowing

In certain regions there is the practice of direct sowing of paddy. The same system can be adopted in SRI method also. Direct sowing can be done at the spacing followed in SRI method.

Some farmers are experimenting with forming paddy seed pellets with soil for directly sowing them. To reduce drudgery/ labour experiments are being conducted to drop the seeds using a hollow iron rod/ tube.

The field should be prepared as in transplanting and marker should be used to form the grids. 3 days prior to this the required paddy seed should be soaked and kept for germination as in nursery system. 1 to 3 germinated seeds should be dropped at the grid junctions. Another person should cover the seed using organic manure.

There is an advantage in transplanting the seedling as soon as possible after it is uprooted from the nursery. This helps the plant to put up extensive and healthy root system, resulting in the plant realizing its full yield potential.

Transplanted field





## 6. Weed Management

**A**s there is no standing water in SRI method, weeds would be more. Instead of weeding manually and throwing the weeds outside the plot there are several advantages of turning the weeds into the soil by using an implement called 'weeder'.

Weeds are useful for the soil as organic manure. So the weeds should be allowed to grow and then turned into the soil intermittently. Use the weeder on the 10th and 20th day after transplantation. The weeding problem is addressed to a large extent with this effort. If the weeder is used on 30th and 40th day after transplantation, there will be more aeration to the plant roots resulting in their healthy growth. As the plant is strong and healthy, the number of tillers would be more.

Weeder should be moved front and back between every two rows. Start using the weeder, when the weeds are small, i.e; on 10th day after transplantation. If the rice plant is tender or weeds are less, weeding should be done manually.



Mandava weeder

By using the weeder, the first advantage is the control of weeds and also adding organic matter to the soil. This gives the benefit of cultivating a green manure crop. Further, the soil gets aerated and the roots are exposed to air. This results in profuse growth of diverse soil micro organisms which make nutrients available to the plant.

Under no circumstances, chemical herbicides should be used in SRI method.

In Gujarat, there is an experience of managing weeds by cultivating *Berseem* as an inter crop along with Paddy. Similarly suitable inter crops can be chosen as per the local conditions for effective weed management.

While weeding with the weeder in one acre of crop, a person has to traverse a distance of 16 kilo metres. So a weeder should be efficient in its function and easy to use so as to reduce the drudgery on labour.

### Equipment Bank

To reduce the problems of farmers, either in terms of cost or availability, *equipment bank* is one way out. A village or a group of farmers should have certain number of weeders and markers which in turn can be used by the members as per their need.



### Important principles of Weeders

- \* The space between two rice plants is wider after transplantation, which gets reduced with progressive tillering. Accordingly, the width of the weeder should be adjustable.
- \* There should be arrangement to clean the mud that gets stuck to the teeth.
- \* It should be of low cost and easy to be prepared locally.
- \* It should be light and durable.
- \* The design should be in such a way that it reduces the walking distance.
- \* If the weeder is mechanized, the drudgery would be less.

Cono Weeder



Kollur Weeder



Single Drum Weeder



Mechanized Weeder



Japan Weeder



Raichur Weeder



Star Weeder

### Mandava Weeder



The weeders that are available in the market are a bit costly. There are some problems with the design also. When these are being used in heavy soils, there are several problems. Different weeders were studied and by combining the advantages of each one, a new 'mandava' weeder has been designed. The weeder got its name after 'Chinna Mandava', a village in Khammam district in Andhra Pradesh, where it has been tested and fine tuned.

**Low cost :** The weeder can be manufactured within a cost of Rs 550/-

**Convenient Design :** It is of less weight and can be used in all types of soils.

**Technically Efficient :** It incorporates the weeds deep into soil.

**Operational Flexibility :** It is easy to operate without drudgery. It has flexible movement.

Rice plant can grow in water but it is not necessary that the Paddy field be inundated with water



The SRI plots should have secured water resources so as to irrigate the field as and when required. When paddy is cultivated under borewells, the electricity supply is not ensured. Further there is a problem of the motor getting damaged. Hence the farmers resort to flood the fields from the beginning. A suitable solution should be identified for such situations.

Until the farmers gain the confidence in SRI method, few alternative methods can be followed. For example, instead of waiting until the field develops hairline cracks before irrigating, start with lesser intervals and slowly increase the gap between the two irrigations.

## 7. Water Management

The farmers grow paddy under flooded conditions so as to control the weeds. In canal command areas as well as borewell irrigated areas, more water than is required is being used for paddy. What happens when the soil is flooded with water?... The roots die due to lack of aeration.

That is why the fields are not flooded under SRI method. Irrigation water is provided so as to wet the soil. The field should be irrigated again when the soil develops hairline cracks. Depending upon the soil and the environment conditions, the frequency of irrigation should be decided.

As the soil is not flooded, the roots of the paddy plant grow healthily, deeply in all directions. The root growth is extensive also due to the wide spacing. As the field is intermittently irrigated and dried, the micro organisms well which make nutrients available to the plant.

A day before using the weeder, the field should be lightly irrigated. After the weeding, under no circumstances the water should be drained out of the field. If this water is drained, all the nutrients would be lost from the field.

After the panicle initiation stage until maturity, one inch of water should be maintained in the field. The water can be removed after 70% of the grains get hardened.

If the plot is uneven, water would be stagnating at low points and field dried up at high points. If irrigation water is to be used efficiently then the plots should be small and levelled.

Instead of letting in the water until it reaches the end of the field, it may be stopped (depending upon the local conditions) after 3/4 of the field is irrigated. The water automatically spreads to the entire field. If any excess water is to be drained out of the field, it may be used to raise vegetables in a small plot at the end of the field or plants on the bunds.



## 8. Pest & Disease Management

The uniqueness of SRI method lies in not using the chemical pesticides and herbicides. Wider spacing and use of organic manures results in healthy growth of the plants and incidence of the pests and diseases is naturally low. The pests can be easily managed by using some organic concoctions either as a preventive measure or as and when needed. *Amrit Jalam* is one such concoction.



### Preparation of Amrit Jalam

#### Required materials:

Cow urine - one Litre

Cow dund - One Kilo

Jaggery (organic) - 250 grams

Water (chlorine free) - 10 litres

#### Preparation and Use:

Mix all the above materials in a plastic container or an earthen pot. Let them ferment for 24 hours. Dilute this with water in the ratio of 1:10. Filter the solution using a fine cloth. This can be used for spraying.

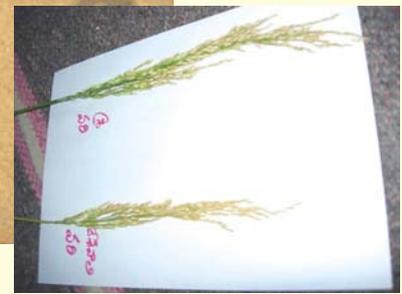
Amrit Jalam can be stored for a period of 30 days. However it has to be stirred daily. When urea is used, the plants grow succulently and are easily susceptible to pests and diseases. When Amrit Jalam is sprayed, it not only gives nitrogen to the plants but also repels harmful insects and micro organisms.



### Harvesting

The grain matures even while the crop is green in colour. Hence farmers should be ready to undertake timely harvesting.





### Advantages of SRI

- ❖ Saving on seed cost as the seed requirement is less
- ❖ Saving on water as Irrigated - Dry method is followed
- ❖ Cost of external inputs gets reduced as chemical fertilizers and pesticides are not used
- ❖ Incidence of pests and diseases is low as the soil is allowed to dry intermittently.
- ❖ More healthy and tasty rice as a result of organic farming practices.
- ❖ Higher yields due to profuse tillering, increased panicle length and grain weight
- ❖ Seed multiplication with less quantity of parent seed.
- ❖ Farmers can produce their own quality seed.

'SRI' paddy



Conventional paddy

