Season Long Training on

Growing Direct Seeded Rice

8 September 2014 to 25 February 2015

KVK Needamangalam, Tamil Nadu, India

TRAINING COMPLETION REPORT

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Poornima Shankar, Ahmad Salahuddin and R. Ganeshmoorthy

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Organization of the report

The report is organized into 3 sections

Part I: The training program

CSISA-Tamil Nadu Hub in association with Tamil Nadu Rice Research Institute (TRRI), Tamil Nadu Agricultural University (TNAU), Department of Agriculture (DoA) and in close collaboration of Krishi Vigyan Kendra (KVK) of Thiruvarur district at Needamangalam of TNAU organized a season long training (SLT) from 8 September 2014 to 25 February 2015. Growing rice with improved and mechanized direct seeding was the key theme in the training.

The training was based on a format developed at IRRI Los Banos, and was funded by CSISA, a collaborative project of CIMMYT, IRRI, ILRI and IFPRI, funded by BMGF and USAID with logistic support from TNAU and ICAR. The course curriculum was based IRRI's Rice Production Manual.

Introduction

Dry seeded rice (DSR) using a seed drill for sowing of rice in comparison to manual broadcasting has emerged as an attractive option for rice farmers in the Tamil Nadu due to the elimination of labour requirements for nursery preparation and maintenance, pulling out and transport of seedlings, and manual transplanting. Because the crop establishment is done without soil puddling, DSR also has a lower water requirement than transplanted rice crops. Furthermore, the total crop cycle is shortened by 10-15 days because of the absence of transplanting shock further reducing the water requirements. Both these features of DSR are of major importance for the Cauvery Delta and other major rice growing tracts of Tamil Nadu due to the increasing scarcity of labor and water for irrigation in the State. DSR can be readily adopted by small farmers as well as large farmers, provided that the required machinery is locally available (e.g., through custom hire of the required machinery). Best practice involves using a 2- or 4-wheel tractor drawn drill to seed in rows in dry or slightly moist soil. The Cauvery Delta Zone is situated in the mid eastern part of Tamil Nadu, and is known as the rice bowl of the state. The region has three seasons: winter (early November to mid- February), summer (March to mid-May), and the monsoon season (June to December). There are two distinct rainfall periods: the southwest monsoon from June to September and the northeast monsoon from October to December, with a dry season from January to May.

There are four cropping seasons in the Cauvery delta districts:

- Kuruvai (May/June to September/October)
- Samba (August/September to January)
- Thaladi (late September/October to January/February)
- Navarai/summer (December/January to March/April)

The time of release of water from Mettur Dam determines the rice production in the CDZ. When the water is released late, the harvest of Kuruvai crops and planting of Samba/Thaladi crops overlap, leading to a labor shortage. The major rice production constraints in the CDZ are Uncertainty about the period when water from Mettur Dam will be available for irrigation and Labor shortage during the peak periods of planting and harvest.

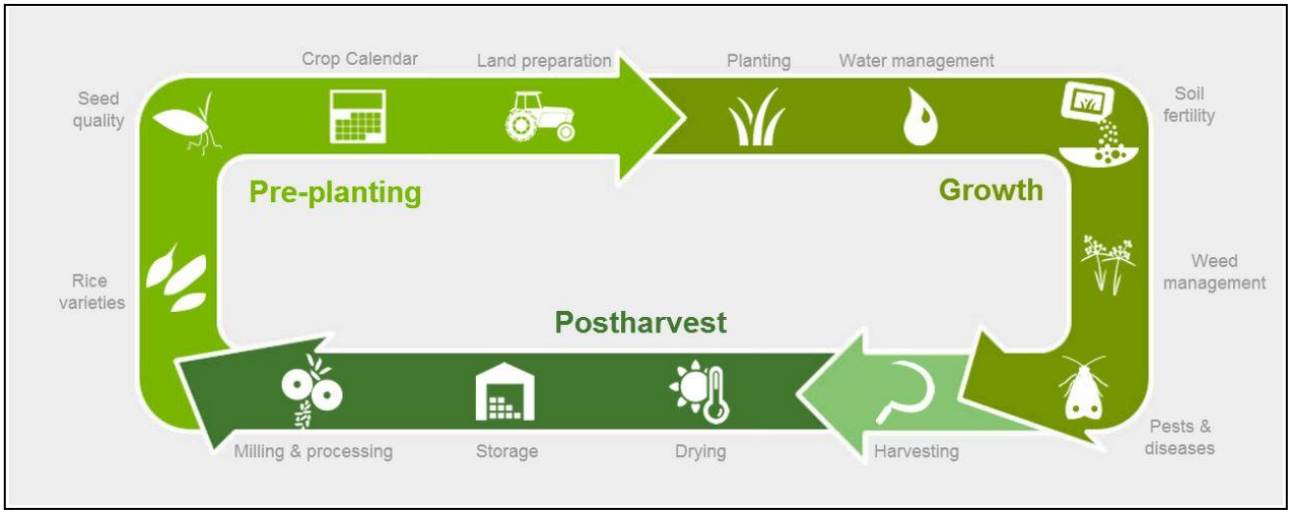
Tamil Nadu Agricultural University scientists in collaboration with the Cereal System Initiative for South Asia (CSISA) team has successfully fine-tuned as well as adapted the technology to local conditions and finally endorsed DSR for the benefits of the rice farming community in Tamil Nadu.

However, the expansion of this promising technology is slowed down by the lack of the required technical and practical know-how about DSR among the agricultural professionals and extension agents to transfer the alternative technologies. This training will also spread the awareness and hands on knowledge on the DSR technology among the workforce involved in extension activities. To enable the agricultural professionals with the necessary skills for this promising technology, a season-long training course in a Training of Trainers' (ToT) mode, on DSR was organized for the **Agriculture Officers of the Department of Agriculture**, Government of Tamil Nadu.

Background on the Training of Trainers Course on DSR

During the ToT, extension staff were exposed to all aspects of producing drill-seeded rice from seed-to-seed. The course included classroom session and practical exercises and application in the field. The ToT program was conducted at KVK Needamangalam.

The ToT was centered on the 'Rice Production Manual' developed by the Training Center of the International Rice Research Institute. It covered the 13 major steps for successful rice production from crop planning to milling and processing and consisted of 25 modules.



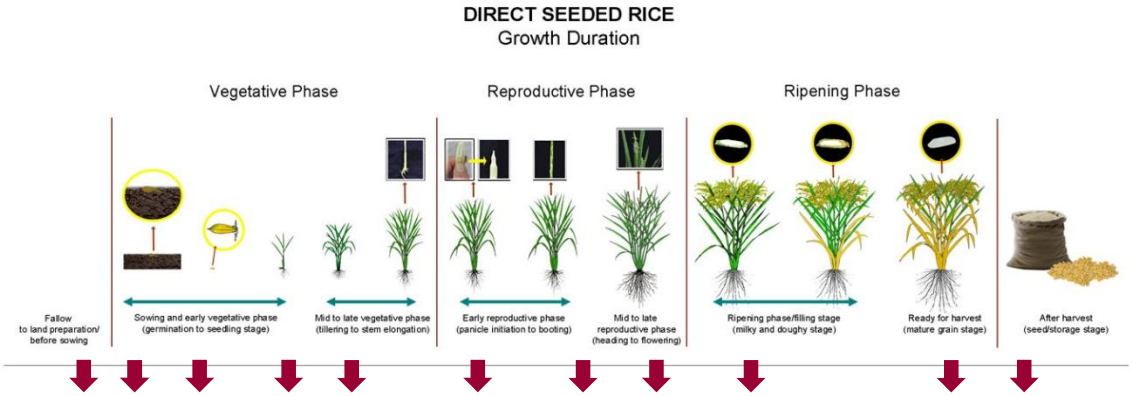
A listing of the available modules and an example module is provided at the end of the document as an appendix.

Prior to the course, the course materials were fine-tuned and adapted to the specific conditions of Tamil Nadu in a joint meeting by TNAU, IRRI and CSISA staff.

The 41 participants represented 11 blocks of Tiruvarur District in Tamil Nadu. The training course wasplanned for the samba crop season 2014 and featured training on a DSR crop. A complete list of participants with their contact details is provided as appendix 1. The variety that was used in the training is CoR 50, which is medium in duration. During the training course, the extension staff grew a drill-seeded rice crop with and without laser leveling and compared it to a manual broadcasted crop.

Course structure

A total of forty one persons attended the training, among which 38 were from Department of Agriculture (DoA) and 3 were from MSSRF (MS Swaminathan Research Foundation). The total duration of the training program was 10 training days over a 5 month period. The participants returned to the training venue at the appropriate crop stages for a training day. The diagram below depicts the rice growth stages for direct seeded rice with arrows below indicating the timing of the 10 training sessions.



Each training day was composed of a classroom session on an important component of managing a DSR crop and this was followed by practical exercises on the crop directly in the field, in the plot that was established at the beginning of the training. The practical sessions provided the participants with hands-on experience in machine usage and maintenance, cultivation techniques, management of nutrients, pests and weeds, harvest and its management.

A total of 15 resource persons from TRRI, TNAU, DoA, SWMRI-TNAU, KVK-TNAU conducted the training. A six-member CSISA-TN Hub team also supported the training as resource persons at different times.

Practical training

For the practical sessions, two plots of 0.23 ha each were established with the following treatments

Plot No.	Variety	Date of sowing	Area	Establishment	Leveling	Treatments
1	Co R 50	15 Sept. 2014	0.23 ha	Dry DSR	LLL	MW-LCC HB-LCC MW-SFR HB-SFR
2	Co R 50	15 Sept. 2014	0.23 ha	Dry DSR	Traditional	MW-LCC HB-LCC MW-SFR HB-SFR

FIELD NO. G2

SEASON LONG TRAINING

GROWING DIRECT SEEDED RICE

பயிர்காலம் முழுதும் பயிற்சி

நேரடி நெல் விதைப்பு

VARIETY: Co R 50

DATE OF SOWING: 15.09.2014

PLOT AREA: 0.23 ha

ESTABLISHMENT: DRY DIRECT SEEDING

LAND LEVELING: LASER LAND LEVELING

TREATMENTS:
T1: MW – LCC
T2: HB – LCC
T3: MW – SFR
T4: HB – SFR

MW - Manual Weeding

HB - Heribicide

LCC - Leaf Color Chart

SFR - State Fertilizer Recommendation

ரகம்: கோ ஆர் 50

விதைப்பு: 15.09.2014

வயல் அளவு: 0.23 ha

வளர்ப்பு முறை: நேரடி நெல் விதைப்பு

சமன் செய்தல்: லேசர் முறை

காரணிகள்:
T1: MW – LCC
T2: HB – LCC
T3: MW – SFR
T4: HB – SFR

MW - கை களை எடுத்தல்

HB - களைகொல்லி

LCC - இலை வண்ண அட்டை

SFR - மாநில உர பரிந்துரை

FIELD NO. G5

SEASON LONG TRAINING

GROWING DIRECT SEEDED RICE

பயிர்காலம் முழுதும் பயிற்சி

நேரடி நெல் விதைப்பு

VARIETY: Co R 50

DATE OF SOWING: 15.09.2014

PLOT AREA: 0.23 ha

ESTABLISHMENT: DRY DIRECT SEEDING

LAND LEVELING: TRADITIONAL LEVELING

TREATMENTS:
T1: MW – LCC
T2: HB – LCC
T3: MW – SFR
T4: HB – SFR

MW - Manual Weeding

HB - Heribicide

LCC - Leaf Color Chart

SFR - State Fertilizer Recommendation

ரகம்: கோ ஆர் 50

விதைப்பு: 15.09.2014

வயல் அளவு: 0.23 ha

வளர்ப்பு முறை: நேரடி நெல் விதைப்பு

சமன் செய்தல்: பாரம்பரிய முறை

காரணிகள்:
T1: MW – LCC
T2: HB – LCC
T3: MW – SFR
T4: HB – SFR

MW - கை களை எடுத்தல்

HB - களைகொல்லி

LCC - இலை வண்ண அட்டை

SFR - மாநில உர பரிந்துரை

Training – Day 1

The first day of the course comprised of an introduction to the course contents. In addition, a selection of the modules of the 'Crop Planning' section was taught in classroom sessions with exercises:

- **Rice Ecosystems**
- **Rice Morphology and Growth Stages**
- **Development of a 'Crop Calendar'**

The afternoon of day 1 was used for the introduction into the initial step of land preparation which is Laser Land Leveling. Following the classroom introduction, the training participants moved to the field training site to receive a hand-on introduction to the required equipment including the laser control unit and the hydraulic control system with the bucket. After that the course participants guided by the instructor laser leveled a field themselves and practiced all the required steps in the process:

- Surveying the field
- Measuring the scale
- Developing of field plan
- Setting up the hydraulic control system
- Checking and calibrating the laser transmitter
- Setting the bucket
- Actual field levelling operation

Training – Day 2

Day 2 of the course was centered on the requirement for mechanized land preparation with modules on

1. Land preparation

This section introduced the concept of soil preparation through tillage, different tillage implements, plowing patterns and hands-on experience in using different tillage equipment. It is kept in mind that land preparation or soil tillage is one of the most expensive and critical operations conducted on a farm each season and at the end the participants understood the reasons for tillage, identified different tillage implements, and had a basic understanding of how the implements operate and when they should be used.

2. Farm power

This session introduced the different power sources that are available on a farm as all operations require a certain amount of power and often the success of a crop is dependent on the ability to get the task completed on time. It also gave an overview of the different kind of tractors available to take on the required tasks on a farm.

3. Tractor operation and maintenance

Tractors are often the most expensive, sophisticated and potentially dangerous piece of equipment used on a farm. Tractor operators need to perform basic maintenance checks and be familiar with the location and understand the operation of each control lever or button on the tractor before attempting to use the machine. Regular maintenance checks will help to keep the machine in good working order and prevent unnecessary breakdowns at critical times. This lesson introduced the concept of basic tractor maintenance and operation.

Training – Day 3

The third training day comprised an introduction and overview about the benefits of DSR and highlighted the specific requirements and management needs to grow a successful and profitable DSR crop through the following parts

- **Characteristics and benefits of DSR**

This classrooms session gave an overview on the production practices and the overall benefits of DSR in terms of labor, water and cost saving. It also introduced the conditions in relation to soils, climate and topography under which DSR can be successfully implemented. The differences between a transplanted and a dry seeded crops established by seed drill were also highlighted.

- **Land preparation**

This lecture provided an outline of the suitable options of tillage operations for DSR and gave an introduction to the available implements for cultivation and sowing.

The practical exercises were conducted in the field with the required machinery. The exercises consisted of a thorough demonstration by the instructor and then allow the participants ample time to practice themselves in groups for getting hand-on-experience with the machinery and their operation. This section introduced the participants to the practical knowledge required for dry tillage using a cultivator and rotovator. This included the specifics of the involved machinery including the required settings and adjustments for mounting on a 4-wheel tractor.

Training Day 2 was completed in the classroom with the following parts that are also important planning steps for growing a successful rice crop:

- **Financial Management**

On completion of this section, participants understood the financial implications of growing a crop and how to plan financially at the onset of the season.

The terms of gross income, fixed and variable costs, gross margins and return to management and return to investment are important and introduced. By understanding these costs a farmer can determine what commodities he should produce, what yields and prices he needs to attain to make a profit and financial return against his investment and personal effort. On completion of this lesson, participants were able to calculate costs, calculate profits, and calculate long term returns.

- **Matching Equipment to Farm Size**

Selecting the correct size and type of equipment are important steps to maximize field efficiency and farm profitability. Matching equipment to a farm or business is a step by step process that requires an understanding of the most important tasks, the time required for their completion and the efficiency of each operation. At the end of this lesson, participants had an idea on the kind of equipment to use for the corresponding farm size.

Training – Day 4

The following sessions were offered with practical exercises:

- **Seed quality – Overview**
- **Measuring seed quality and definitions**

These two sessions sensitized the participants about the fact that good quality seed can increase yields by 5-20 %. They were familiarized with the parameters of seed quality and the method to test them. At the end of this section participants were able to test the seed lot for moisture content, germination, seed lot purity, and varietal purity.

The remainder of day 4 was used for practical hands-on exercises to establish the DSR crop with a seed drill:

1. Seed drill and it components

This part provided a detailed, practical demonstration of seed drill and all its important parts including the

- components of the frame and their adjustments
- seed and fertilizer boxes
- seed metering and delivery systems like inclined metering plates and fluted rollers
- seed delivery pipe
- power transmission unit and the chain mechanism

2. Field calibration for seed and fertilizer drill

The participants were introduced to the handling of possible changes of the desired row spacing through adjustment of the tine distance. In addition, adjustments of the seed and fertilizers rates with levers consisting of either nuts or scales were demonstrated. The participants also learnt the required skills of measuring the actual rates of the new settings. This section also highlighted potential sources of errors and failure of a seed drill and their possible solutions for future troubleshooting in the field.

3. Control of seeding depth

Shallow sowing is important for the success of DSR, therefore in this part of the instruction great emphasis was laid on the required skills for adjusting the depth control wheel of the seed drill and measuring the sowing depth in the field.

4. Sowing operation

The participants gathered knowledge and experience on deciding the correct seeding direction in specific plots for successful seed and fertilizer placement. In addition, the instructor shared their experience about successfully planting in line to allow the needed crop uniformity.

5. Specific nutrient management requirements in DSR

The option of applying the basal fertilizers rate during sowing through the seed drill was introduced. However, fertilization strategies need to take into account the low nutrient requirements of DSR crops during the early crop development stages and soil characteristics in a given location. This was explained in case studies. Iron deficiency can occur in DSR crops when grown on lighter soils (sandy loams and loams) with symptoms generally appear during the early vegetative stage in the form of yellowing, stunted plants, and seedling death. The participants learnt to distinguish iron deficiency from other nutrient disorders and cereal cyst nematode infestation and got introduced to management strategies against iron deficiency.

Training – Day 5

The training day started with a practical session on the maintenance of **seed drill (and fertilizer unit)**. The participants were introduced into the important tasks for the maintenance of the seed drill chain,

and fertilizer and seed boxes, as well as on how to conduct small repairs on specific component parts of the seed drill.

This was followed with a lesson on **weed management**, which is usually the biggest challenge for the successful adaption of DSR. A much larger range of weeds occurs in DSR than in puddled transplanted rice, and, if uncontrolled, the degree of infestation can be great enough to reduce rice yield to zero. Therefore, this practical demonstration introduced suitable physical and chemical weed control measures that can be applied before and during the growing period of DSR. At the end of this lesson participants had a basic understanding of weed management and were able to determine what weeds are present and their significance, determine the best time and options to control the weeds, and if herbicides are to be used to select the appropriate product and apply it safely.

The remainder of the day was reserved for the **water management** module. It provided the participants with a basic understanding of the water use efficiency for rice crops. The participants were sensitized that it is imperative that water is used more efficiently in rice production as agriculture is now in direct competition with industrial, domestic and non-agricultural sectors. At the end of this lesson, participants were able to describe the different water management practices that maximize water use efficiency and increase productivity in rice production systems. In addition, they understood how water management practices effect a crops development.

Training – Day 6

Day 6 focused on the development of an effective **nutrient management** strategy. This required knowledge of mineral nutrition in rice production. Of particular importance are the essential nutrients and their functions in rice growth and development. At the end of this lesson participants had a basic understanding of the nutrition requirements of the rice crop and the importance of essential nutrients.

The lessons focused on:

- The essential nutrients and their functions and deficiency symptoms in rice production
- Introducing the principles of site-specific nutrient management (SSNM) and the steps in determining fertilizer requirements
- Explaining the guidelines and procedures for using the leaf color chart to determine the N-status of leaves in a standing rice crop.

The practical part of this session focused on identification of nutrient deficiencies and toxicities and a field assessments concerning the nutritional status during a later crop stage. As part of the lesson on nutrient management, a portion of the DSR crop that is established by the participants had real time nitrogen management through the leaf color chart.

Training – Day 7 & 8

These two training days covered all aspects of crop protection and were comprised of the following modules:

- **Disease management**

Diseases are readily recognized by their symptoms and the associated visible changes in the plant. The organisms that cause diseases are known as pathogens. Many species of bacteria, fungus, nematode, virus and mycoplasma-like organisms cause diseases in rice. At the end of this lesson, participants were be able to identify the different diseases that affect rice and recommend suitable control measures for rice diseases. This included knowledge of the symptoms, biology of causal organism, prevention, control (natural, physical, chemical) of common diseases in rice including

- Rice blast
- Sheath blight
- Leaf scald
- Brown spot
- Narrow brown spot
- Stem rot
- Sheath rot
- Bakanae
- False smut
- Bacterial blight
- Tungro
- Grassy stunt
- Ragged stunt
- White tip
- Root knot

- **Insect and rodent control**

In a rice field, hundreds of species of insects, spiders, and other organisms are linked in an intricate food web. Many insect pest problems in tropical rice have been traced to disruptions of this food web by weather extremes, cultivation practices, and pesticide use. The inappropriate use of chemicals and the increase in cropping intensity have increased the occurrence of many insect pest outbreaks. At the end of this lesson, participants had an understanding of the important insects in rice, their management and control as well as of the different rodent pests in rice and the appropriate control measures.

- **Pesticide Safety and Knapsack Sprayer Use**

Great care must be taken when selecting and using agricultural chemicals as any movement of the chemical away from the target reduces the efficacy of the chemical and may cause damage to the environment. For a pesticide to work properly it must be applied correctly at the right stage of development of the pest. This module provided the participants with a basic understanding of herbicide

and pesticide application using a knapsack sprayer. At the end of this lesson participants had a basic understanding of the importance of

- Pest target selection,
- Water quality for spraying,
- Spray application equipment,
- Personal protection when spraying, and
- Knapsack sprayer calibration.

Both training days had a strong emphasis on the identification of pests and diseases in the field and practical exercises on the use and calibration of a knapsack sprayer.

Training – Day 9

With the grains ripening and turning golden, training day 9 focused on

1. Harvesting and Threshing

The goal of all harvesting systems is to maximize grain yield and to minimize grain damage and quality loss. Harvesting can be done manually using sickles and knives, or mechanically with the use of threshers or combine harvesters. Regardless of the method, basic guidelines should be followed that will ensure that grain quality is maintained during harvest operations and harvest losses are kept to a minimum. At the end of this section participants had a better understanding of the common systems of harvesting, safety precautions during harvesting operations, and proper procedures for cutting, threshing and cleaning of paddy.

2. Drying

Drying is the most critical operation after harvesting the rice crop. Delays in drying, incomplete drying of ineffective drying will reduce grain quality and result in losses. Options for drying paddy include both, traditional systems like sun drying and mechanical drying systems with different technological complexity and capacities for either the farm or the commercial level. For selecting appropriate drying systems for given site-specific conditions an understanding of the drying process, available technology options and their specific advantages and limitations is necessary. At the end of this section, participants had an introduction on the different drying systems for paddy and the basics of drying by understanding the different drying systems available for paddy drying, knowing the different components of a drying system, and understand how drying can affect rice quality.

The session on drying was supported by the introduction to the 'IRRI Rice Quality Assessment Kit' that has the following components:

- Graduated Cylinder (Flask): The cylinder is calibrated and is easy-to-read, raised graduation allows precise measuring of the volume of grain samples.
- Scale: The mini scale weighs samples in different modes: grams, ounces, troy ounces and penny weights. It can weigh a maximum of 250g.
- Caliper: Used to measure the length and width of the grain.
- Infrared Thermometer: The non-contact thermometer can be used for monitoring grain temperature in rice milling and drying.

- IRRI Moisture Tester: The affordable decision making, tells you whether your paddy needs drying, can be stored safely before milling or as seed.
- Indented Sheet Grader: Used to separate the broken rice (large & small) from the whole kernel.
- Magnifier: Double the size of the item being viewed. Used for observing cracks and insects in the grain.
- Rice Milling Chart: Indicates the level of polishing of white rice. It ranges from 8-14 % with 10-12 % the preferred range.

Training – Day 10

The final of the training comprised the following sections:

1. Storage

Grain will have to be stored at some time during the postharvest period. Poor storage management and facilities allow grain to reabsorb moisture and be attacked from insects, fungi, rodents and birds. Physical losses during storage often account for 10-15 % of the total grain harvested. Losses in quality result in lower germination and poorer eating attributes which also devalue the end product. On completion of this section, participants were able to determine the requirements for safe storage of grain. They gathered an understanding of the different storage options for rice, understand the performance of a hermetic storage system, identify the major grain storage pests and recommend control measures.

2. Milling and Processing

The objective of a rice milling system is to remove the husk and the bran layers from paddy rice to produce white rice that is sufficiently milled, free of impurities and contain a minimum number of broken kernels. The milling yield and quality of rice is dependent on the quality of the paddy, the milling equipment used and the skill of the mill operator. On completion of this section, participants were able to identify different rice milling systems and have an understanding of the different factors that affect grain quality.

As part of the lesson on milling a modern rice mill in the Thanjavur area was visited on an excursion.

The crop yield from SLT plots

The DSR plot with laser leveling gave better yield compared to the traditionally leveled plot. The harvest yield of LL-DSR was **4.5 t/ha** and Traditional-DSR was **4.2 t/ha**. All the SLT training participants and the some of the farmers witnessed the yield and performance of LL-DSR crop.

Part II. Course curriculum and dates

The overall coordinators for the training were Dr. Frank Mussgnug, Dr. Poornima Shankar, Mr. R. Ganeshmoorthy from IRRI, Dr. R. Rajendran from TRRI and Dr. Chozhan Kannan from KVK Needamangalam.

The following agenda was followed for the training.

Training module details	Training Interval days	Tentative Date	Responsible team
Day 1			
Participants introduction	7 DBS	8-Sep-14	Dr. R Rajendran (Director, TRRI), Dr. Chozhan (PC KVK), Dr. Frank Mussgnug (IRRI), Dr. Poornima Shankar (IRRI), Mr. R. Ganeshmorthy (IRRI)
Introduction to the training course contents - Class room presentation			
Rice eco systems - Presentation			
Classroom discussion – Agro ecology regions in India and TN			
Class room Exercises – Write a major eco systems in which you are working and what is the major rice eco systems in India and TN			
Morphology of the rice crop, basic growth phases of the rice plant, how to create a crop calendar - Presentation			
Classroom discussion – benefits of using crop calendar, steps involved in creating a crop calendar, creating a crop calendar for a 115-day variety crop - Interaction, Showing the crop calendar chart			
Classroom exercises - Prepare a crop calendar specific to the participants work location			
Field Exercises - Practical work on live rice plants during the determine the different growth stage of rice crop			
After noon Section			
Introduction to Laser land levelling - Class room Presentation & Showing LLL video			
Why LLL, Different systems of land leveling – Presentation, Classroom interaction			
Benefits of land leveling, Calculate the time and cost to level a field – Presentation, Classroom interaction			
Process of laser leveling the field - Interaction and practical field demonstration			

Ploughing the field, Surveying the field, Measuring the scale, Preparing a field plan, Setting up the hydraulic control system, Checking and calibrating the laser transmitter, Setting the bucket			
Field exercises – Survey a field and develop a field plan for the site, Draw a LLL components			
Actual Laser Leveling in the training site - Field demonstration			
Field exercise – Participants drive the experience of LLL unit			
Day 2			
Reasons for Tillage ,Types of Tillage, Ploughing patterns, Tillage implements for rice production, Puddling equipment, Operating tillage equipment - Presentation	6 DBS	09 Sept 2014	Dr. Mohankumar (TRRI), Dr. Kamaraj (KVK Needamangalam), Dr. Frank Mussgnug (IRRI)), Dr. Poornima Shankar (IRRI), and Mr. R. Ganesh moorthy
Identify the different types of tillage implements – Field exercises			
Land preparation - tillage implements, ploughing pattern and tillage - field exercises / demonstration			
After noon Section			
Tractor operation & maintenance - Common control and safety levers, Maintenance checks before starting the tractor, safe operating procedure – Classroom Presentation			
Explaining the Common control and safety levers in the tractor, Maintenance checks before starting the tractor - Field demonstration/ practical field Interaction			
Wrap Up discussion – Constrains in the tillage, ploughing, Tractor operation and maintenance			
Day 3			
Characteristics and benefits of DSR – Presentation & classroom interaction	3 DBS	12-Sep-14	Dr. Ravi (SWMRI), Dr. Frank Mussgnug (IRRI)), Dr. Poornima Shankar (IRRI), and Mr. R. Ganesh moorthy
Reasons for Tillage, Seeding rates , Establishment techniques for direct seeding, Calibration of seed rates - Presentation			
Establishment techniques for transplanting and nurseries, Germination test , Plant establishment test, Pre-germination of seeds - Presentation			
Field exercise: Land preparation for DSR			
Afternoon section			

Financial management - Understanding cost and return, Determining profitability - Presentation			
Assignment on cost calculations for ploughing operation and return on investment			
Day 4			
Classroom lecture on seed quality measurements, Measuring moisture content, Germination test, Seed lot purity, Varietal purity ,Seed definitions - Presentation	0 DAS	15-Sep-14	Dr. Saraswathi (TRRI), Dr. K. Subrahmaniyan, (TRRI), Dr. Kamarj (KVK Needamangalam), Dr. Frank Mussgnug (IRRI) and Mr. R. Ganesh moorthy
Differences between the races of rice, Understand the concept of modern rice varieties including inbreds, hybrids, new plant types and transgenics, An overview of rice breeding - Presentation			
Classroom exercise on Measuring moisture content, Germination test			
Field exercises in preparation of crop establishment – Seed treatment			
Field exercises on Seed drill and its components, Field calibration, seeding depth and drill maintenance			
Afternoon section			
DSR Demonstration / Field Exercises – Actual sowing in the field			
Wrap up / Classroom discussion – DSR sowing and constrains faced in the sowing			
Day 5			
Lessons on major weeds of rice in the delta district – Presentation & classroom discussion	21 DAS	7-Oct-14	Dr. Porpavai (SWMRI) and Dr. Rajendran (TRRI)
Chemical Control of weeds using herbicides – Presentation			
Population maintenance of DSR ,Water Management in DSR , Improving water use efficiency – Presentation			
Exercises on weed identification , Determine What weeds are present and their significance			
After noon section			
Field demonstration on Post emergence herbicide application for established DSR crop and crop monitoring population maintenance in DSR			
Field exercises on DSR population maintenance ,Water management practices in the training field			
Class room discussion – Major weeds affects DSR crop and the management practices			

Day 6			
Classroom session on nutrients requirements for rice - Essential nutrients for rice - Presentation	28 DAS	14-Oct-14	Dr. Amudha (KVK Sikkal) and Dr. M. Babu (SWMRI)
Site-Specific Nutrient Management (SSNM), Leaf Colour Chart (LCC) - Presentation			
Field demonstration on 1st top dressing of nitrogen application and introduction of use of LCC			
After noon section			
Field exercises on use of LCC in the training site			
Field exercise on Crop monitoring & identification of nutrient deficiency			
Class room discussion – Nutrient applied in the training field will be discussed			
Day 7			
Classroom lessons on insects, rodents in rice and their control– Presentation	51 DAS	6-Nov-14	Dr. Chozhan (KVK Needamangalam) and Dr. Chitra (SWMRI)
knapsack sprayer use and pesticide safety – Presentation			
After noon section			
Field exercises on Identification of insect, pest and diseases in the field			
Class room discussion – Pest & disease identified in the training site and their control measures			
Day 8			
Classroom lesson on sprayers types ,Calibration of knapsack sprayer & spraying technique – Presentation	58 DAS	13-Nov-14	Dr. Suresh (TRRI) and Dr. Rajappan (TRRI)
Field demonstration / exercise on Power sprayers , Knapsack sprayer and spraying techniques			
After noon section			
Field exercises on Identification of insect, pest and diseases in the field			
Class room discussion – Pest & disease identified in the training site and their control measures			
Day 9			
Lessons on harvesting ,threshing and drying - Basic harvesting operations , Harvesting systems , Time of harvesting , Crop cutting , Threshing, Combine harvesting, Portable moisture meter – Presentation	126-128 DAS	26-Jan-2015	Dr.Kamaraj (KVK Needamanagalam and Mr. R. Ganesh moorthy
Purpose of drying, Problems encountered with high moisture grain , drying process , Mechanical drying - Presentation & classroom discussion			

Practical Exercises On 'IRRI Rice Quality Assessment Kit' – IRRI Moisture Tester , Scale, Temperature Gun , Weighing Balance, Scale , Milling Grade Chart			
Afternoon section			
Harvest day with yield measurements - Combine harvesting in the field - field Exercise			
Class room discussion – Reporting the yield			
Day 10			
Rice storage – Safe storage conditions for grain, Grain Storage systems, Major storage pests in rice, Control of pests, Hermetic storage systems – Presentation	11 DAH 6-Feb-15 Dr. K.A. Ponnusamy (DEE, TNAU), Mr.Mailavaganan JDA Thiruvarur , Mr. R. Ganeshmoorthy, IICIPT group with rice mill		
Practical exercise for using Superbag			
Rice Milling & - Different rice milling systems, steps in multiple pass rice milling, head rice percentage / recovery - Presentation & practical Exercises in the class room			
Rice Quality - Different parts of the grain, Different factors that affect grain quality, varietal purity – Presentation & Practical exercises in the class room			
After noon Section			
Visit to modern rice mill in Thanjavur area for practical rice milling operation – Practical interaction with the modern rice mill staffs			
Valedictory Session			
Participatory feedback from the participants	25 March, 2015		Dr. Ahmad Salahuddin, Dr. Poornima Shankar, Mr. Jason Beebout, Mr. R. Ganeshmoorthy (IRRI)
Final closing the Training program	25 March, 2015		Dr. R. Rajendran, Dr. Poornima Shankar, Dr. Chozhan Kannan

DBS - Days before sowing
DAS - Days after sowing
DAH - Days after harvest

Part III. Participatory Evaluation

Introduction

Out of 41 total training participants only 22 were present in the SLT participatory evaluation session. A complete list of participants and their contact details are presented in the Annexure 1. The serial number indicated in different tables below refers to the person serial number that corresponds to the list of participants presented in the **Annexure 1**.

Objective of the evaluation exercise:

The objectives of the participatory assessment were to understand the following:

1) The effectiveness of the training from the point of view of the participants and other stakeholders
2) Whether there is a potential to utilize the expertise of the newly trained participants to train other field level staffs and farmers in their respective areas by repeating similar training

Method &tools

A systematic participatory approach was followed to capture participants' reflection presented in the table below. A two-hour time period was used to conduct the session.

Item of investigation	Tool	Logic
List of trainees with detail contact information	A list of trainees with mobile phone number and email address	To make a complete list of trainees database for the future; these trainees may be considered as the key contact resource persons for technology dissemination and capacity development for the future
Thoughts of the leaders of partners about the effectiveness of the training	Informal interaction with leaders from TRRI, TNAU, DoA, KVK, NGO	To identify: - what potential they see in the newly trained staffs - how to utilize them to train others - resources: possibilities and constraints - expectation from IRRI
Participatory assessment of the trainees:		
Trainees assess the training as 1) Very effective & very good, 2) effective & good and 3) not effective/good	Three sheets of papers with three signs & headings were hanged and the participants had the chance to indicate their opinions about the effectiveness	To identify the level of satisfaction among the trainees and to understand the specifics of the effectiveness of the training according to their definitions

	of the training; later they also expressed as to why they chose a particular position;	
Trainees identify their areas of expertise	Firstly, the trainees identify major areas of training according to their own priority using cards; as the second step the trainees chose three major areas of expertise they think they are confident enough to train others	To identify the areas of expertise of each individual trainee to be able to utilize them as resource persons for further training at local level; this also helps to build up a resource pool available at the district level
Trainees identify their job location	A district map was used to locate trainees in the district	To understand the coverage of the area in terms of presence of trained field workers; all 41 locations can be indicated at a later time to be able to plan effective future strategy

The team

Following team members from IRRI facilitated the evaluation session:

1. R Ganeshamurthy
2. Poornima Ravi Shankar
3. Jason Beebout
4. Ahmad Salahuddin

Optimism of the core partners of SLT

The presence of all key partners at the closing and their enthusiasm about the effectiveness of the SLT was evident in their informal comments before the closing ceremony and the formal comments while they were addressing in the closing session. The following important persons were present in the SLT closing session:

- Mr K. Mailvaghanan JDA,Thiruvarur district

- Dr R Rajendran, Director TRRI

- Dr KA Ponnusamy, Director of Extension Education, TNAU

- Dr K Chozhan, Program Coordinator, KVK Needamangalam, TNAU

- Dr A Kamraj, SLT Coordinator from KVK

- Dr R Ramesh AD

Some of their general comments about SLT:

- The training was unique
- Learning by doing in the training was excellent
- The training created a very good environment; other training are boring but this was less lecture but in a learning mode
- The trainees learned practical things
- Interacted directly with the trainees during training and observed enthusiasm among the trainees

In response to what could be done to scale up the training as we trained a group of field staffs, the responses of partners were:

- Confident that these group of trainees can conduct further training at the local level
- Master training program can be organized (Lead Farmers can be trained as Master Trainers)
- Farmer teachers could be trained as Master Trainers
- Initially ten Master Trainers can be identified by each trainee and then they can be trained by them
- As CSISA has successfully developed a package of practices for DSR, it would be easy for farmers to adopt the practices

Participatory assessment of the Training

The training was very good: 14 participants among the 21 participants present in the evaluation session commented that the training was very good. They also explained why they thought that was so:

Sl no.	Name of trainee	Reasons
6	G. Velmurugan	- since we had gaps – we could go back and witness the same problem on the field and then come back; - there was scope to learn about particular operation of interest - water saving was evident due to LLL vs non-LLL field - measurement exercise was good - good DSR yield - good confidence building - complete coverage of crops - good resource persons; porpavai, entomology was very good - as this was the first of its kind, very satisfied - easy to communicate - practical knowledge - empathize with farmers - live demo of field problems - reminded us of college days when we got into field
7	G. Manikandan	
8	V. Rajakumaran	
9	G. Murugan	
11	K. Bharathidasan	
14	S. Palanikumar	
15	P. Annadurai	
19	S. Sekar	
20	R. Manikkavasagam	
21	V. Mahesh Kannan	
26	M. Thiruchelvam	
29	S. Pandiyan	
36	D.Senthil Kumar	
41	P. Thilagaraj	

	- went into the field and identified pests - good hands-on experience with machines - LLL was very effective - calibrations was good - sprayer techniques demo and use was good - all are confident of running a similar training

The training was good: seven out of twenty one participants thought that the training was good as they see rooms of improvement on various aspects of the training. They also want to know more.

Sl no.	Name	Reasons
5	R. Rajendran	- we were able to learn here and immediately transferred the knowledge to farmers - were able to see changes/results immediately - pests & diseases were handled well, we got good knowledge - hands-on experience with machines - want to know more - want similar knowledge for pulses - training should have include farmers: 50-50; they would go and immediately communicate the knowledge to 4 more farmers - the training time coincided with the crop in the field - seed to seed was covered - LLL was good - got good self-motivation - tried out and got good farmer feed back - weed management would have been better; did not get clarity on pre, post, effectiveness - NM could have been better: how could it be easier, simple formula etc - all are confident of running a similar training
10	G. Sudhakar	
16	S. Rajendran	
22	J. Vengatesan	
24	V. Ravi	
30	R. Ramesh	
33	D. Saravanan	

There was no person among the participants present who said that the training was not good.

All the participants attended the self-assessment session showed their confidence of running and repeating the same training for the field workers and lead farmers in their respective locality.

Trainees developed their own areas of expertise through the training:

Different trainees have found different interests in choosing different aspects of the training. This reflects their confidence on particular aspects of the training module that they thought are their areas of expertise as well.

Considering all the trainees as part of a resource pool for future training, they also now know who has what kind of expertise. When they will organize training for farmers at local level they can call upon their colleagues from the resource pool to help them train farmers. They can always help each other as and when required according to their areas of expertise.

Each trainee was asked to indicate 3 most interesting fields of the training that the person thinks most confident about and think that s/he can train others as needed. The following table captures the choices of the trainees. This table reflects the nature of the resource-pool that would be available for the district.

Sl no.	Name of trainee	Pest & disease	Operating machine	Seed selection	Weed mgt	Water mgt	Laser leveling	Fertilizer Mgt	Field observation
3	S. Vijayakumar	*	*	*					
5	R. Rajendran	*							
6	G. Velmurugan	*					*		
7	G. Manikandan				*		*		*
8	V. Rajakumaran		*			*	*		
9	G. Murugan	*			*				*
10	G. Sudhakar	*				*	*		
11	K. Bharathidasan	*					*		*
14	S. Palanikumar	*	*				*		
15	P. Annadurai		*		*	*			*
16	S. Rajendran						*		
19	S. Sekar					*	*	*	*
20	R. Manikkavasagam	*					*	*	
21	V. Mahesh Kannan								
22	J. Vengatesan	*			*				
24	V. Ravi		*	*					
26	M. Thiruchelvam			*	*		*		*
29	S. Pandiyan		*		*				*
30	R. Ramesh								
33	D. Saravanan	*			*		*		

36	D.Senthil Kumar	*	*		*	
41	P. Thilagaraj			*	*	*

Locating workplace of each participant:

Most participants in the training were from the district of Thiruvarur and a few from Thanjavur. There was an effort to locate the working area of each participant to understand the geographic coverage and representation of the trainees from different parts of the district. The map as indicated below presents the locations they belong to in terms of their working area. It shows that the trainees have come from different corners of the Thiruvarur district. Any future effort to repeat the same training at their respective areas would be effective to cover the whole district. A map indicating locations of participants' working area is attached in the Annexure 2.

Each participant present in the session indicated their initial plan of action:

Participants were asked to indicate potential groups that they could train, potential source of resource that they could utilize, kind of support they would require to conduct such training and an indication of timeframe when they could organize such training in their respective areas. The following table captures some of their initial thoughts.

Sl no.	Name of trainee	Potential target group	Potential resource	Technical Support requirement	Timing
3	S. Vijayakumar	Self-help groups	From the department	KVK & TNAU	Kuruvai & Samba seasons
5	R. Rajendran	Farmers & Farmer groups	IRRI may provide financial support	KVK can run the training in the village	Samba season
6	G. Velmurugan	Farmers	DoA	KVK	Kuruvai season
7	G. Manikandan	Farmers	DoA	Agr Ext Centre	Samba season
8	V. Rajakumaran	Farmer groups	DoA	Farmer groups, local panchayet president	Kuruvai season
9	G. Murugan	Progressive farmers	Local DoA	SWMRI, IRRI (machinery)	Samba season
10	G. Sudhakar	Progressive farmers & extension agents	Local administration, panchayet	Research institutes, KVK	Kuruvai & Thaladi seasons
11	K. Bharathidasan	Direct sowing farmers	NGO, Scheme officer	Technical support from KVK, DoA	Kuruvai seasosn

14	S. Palanikumar	Leading farmers	DoA & Agr Eng Dept.	KVK, DoA, Ag Eng, IRRI	Kuruvai & Samba seasons
15	P. Annadurai	Farmers, Fig groups	DoA: AO, ADA, JDA	KVK lecturers	Samba season
16	S. Rajendran	Farmers groups	Agr Ext centre	KVK	Samba season
19	S. Sekar	Leading farmers & agricultural groups	DoA	Local Panchayet President	June: Kuruvai season
20	R. Manikkavasagam	Progressive farmers	DoA	KVK	Samba season
21	V. Mahesh Kannan	Farmers groups	DoA	KVK	Samba season
22	J. Vengatesan	Progressive farmers	DoA	KVK	Samba season
24	V. Ravi	Farmers	IRRI	KVK	Samba season
26	M. Thiruchelvam	Interested farmer groups	DoA	KVK	Samba season
29	S. Pandiyan	Leading farmers	DoA	KVK	Samba season
30	R. Ramesh	Progressive farmers	IRRI	KVK	Samba season
33	D. Saravanan	Progressive farmers	IRRI & KVK	KVK	Samba season
36	D.Senthil Kumar	Farmer groups	DoA	KVK	Samba season
41	P. Thilagaraj	Farmers & self-help groups	DoA fund & SHG self-finance	Technical support from KVK	Kuruvai season: May-June

Important observations from the table:

- Potential clients include: Progressive (lead) farmers, Farmer (self-help) groups, Framers
- Potential resources could be from: DoA, KVK, Local government sources, self-finance etc.
- Expect technical support mostly from the KVK, and few others: local government, IRRI, SWMRI etc.
- Preferred season when they want to conduct/repeat the training to train others are mainly during Samba season (14), during Kuruvai (5) and in both Samba and Kuruvai (2) and Kuruvai and Thaladi (1)

A visual presentation of the assessment process followed and the outputs are also captured in the **Annexure 3**.

Conclusion and recommendations

This participatory evaluation exercise opens up new ways to think about ToTs. A season-long training does not have to stop with the training event only. It promises a lot in terms of how it could be scaled up at local level by utilizing the human resources that are trained through the process. The participants feed-back suggests that it is possible and many follow-up activities are going to be taking place with little follow-up and support.

It also promises as an approach for the future. A ToT of such nature can well be planned along with a scaling up plan so that it can be followed up systematically up to the grassroots and making sure that it directly contributes to the knowledge system of the field workers and lead farmers at the village level.

The Tamil Nadu CSISA Hub team needs to follow it up together with other partners to see how much is happening at the grassroots. They also need to provide support as being asked by different trainees in order to help them plan and implement training at the grassroots level.

This example, once followed through to grassroots level, could be the foundation for the Impact Acceleration Unit in terms of its Capacity Scaling-up Approach. It would be a good topic for brainstorming within the team to think about what needs to be done more to make it to a viable approach for future use.

Annexure 1: Full list of SLT participants			
Location : KVK Needamangalam			
(All the participants from Thrivarur district except the participants from MSSRF)			
S.No.		**Name and Address**	**Contact No.& Email Id**
1	Name :	M. Shanmugasundaram	9750697686
	Designation	Deputy Agri Officer	
	Place :	Nannilam	
2	Name :	V. Sankar	9976052972
	Designation	Deputy Agri Officer	
	Place :	Muthupettai	
3	Name :	S. Vijayakumar	9442475669
	Designation	Agricultural Officer	
	Place :	Mannargudi	yeswek@gmail.com
4	Name :	I. Saminathan	9943792553
	Designation	Asst Agri Officer	
	Place :	Thiruthuraipoondi	
5	Name :	R. Rajendran	9943215017
	Designation	Asst Agri Officer	
	Place :	Muthupet	
6	Name :	G. Velmurugan	9965915789
	Designation	Assistant Agricultural Officer	
	Place :	Uaippur, Thiruvarur (B)	
7	Name :	G. Manikandan	9786108164
	Designation	Assistant Agricultural Officer	
	Place :	Nannilam	g.manikandan9517@gmail.com
8	Name :	V. Rajakumaran	8056801300
	Designation	Assistant Agricultural Officer	
	Place :	Nannilam	
9	Name :	G. Murugan	9566905625
	Desin:	Senior Tech.Assistant	

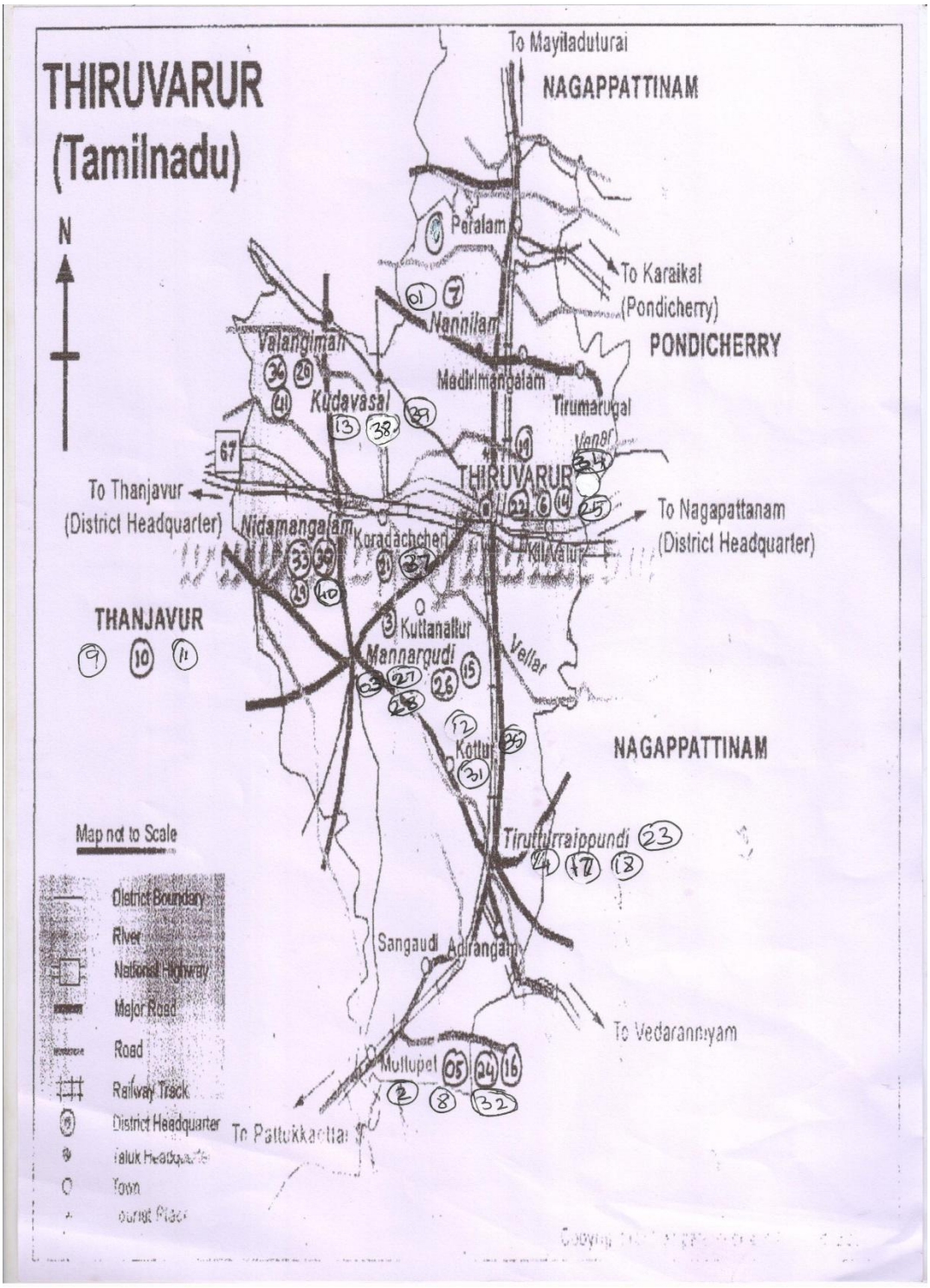
	Orga:	M.S.Swaminathan Research Foundation	thillaimuruga@gmail.com
	Place	Thiruvaiyaru	
	District	Thanjavur	
10	Name :	G. Sudhakar	9994402115
	Desin:	Scientist	
	Orga:	M.S.Swaminathan Research Foundation	sudhakargs78@gmail.com
	Place	Thiruvaiyaru	
	District	Thanjavur	
11	Name :	K. Bharathidasan	9842329317
	Desin:	Project Associate	
	Orga:	M.S.Swaminathan Research Foundation	bharathi317@gmail.com
	Place	Pudukkottai	
	District	Pudukottai	
12	Name :	M.A. Mohammed Thariq	9500896841
	Designation	Agricultural Officer	
	Place :	Kottur Block	adaktr123@gmail.com
		Thiruvarur District	
13	Name :	M. Kumanan	9442227851
	Designation	Asst.Agri Officer	
	Place :	Koradacheri	agri.mkumanan@gmail.com
		Thiruvarur District	
14	Name :	S. Palanikumar	9442276952
	Designation	Asst. Agri Officer	
	Place :	Thiruvarur	palanikumar.ns@gmail.com
15	Name :	P. Annadurai	9442703620
	Designation	Asst.Agri Officer	
	Place :	Thalayamangalam	
16	Name :	S. Rajendran	9626923757
	Designation	Asst.Agri Officer	
	Place :	Muthavanam (mpt)	
17	Name :	S. Magesh	9865588215

	Designation	Asst.Agri Officer	
	Place :	Deevamapuram	magesha32@gmail.com
18	Name :	D. Ramesh Kumar	9843932812
	Designation	Asst Agri Officer	
	Place :	Alathambadi	
		Thiruthuraipoondi	
19	Name :	S. Sekar	9943666215
	Designation	Asst Agri Officer	
	Place :	Thiruvarur	
20	Name :	R. Manikkavasagam	9976290160
	Designation	Asst Agri Officer	
	Place :	Alangudi	
21	Name :	V. Mahesh Kannan	9944004959
	Designation	Asst Agri Officer	
	Place :	Koradachery	kvmkannan@gmail.com
22	Name :	J. Vengatesan	9943497478
	Designation	Asst Agri Officer	suvethasuthis@gmail.com
	Place :	Thappalampulur	
23	Name :	P. DuraiRajan	9443823145
	Designation	Dy. Agri Officer	
	Place :	Thiruthuraipoondi	adattp123@yahoo.in
24	Name :	V. Ravi	8883436601
	Designation	Asst Agri Officer	
	Place :	Muthupettai	
25	Name :	P. Senthil	9715263086
	Designation	Agriculture Officer	
	Place :	Thiruvarur	senthilagriphd@gmail.com
26	Name :	M. Thiruchelvam	9003740665
	Designation	Asst Agri Officer	
	Place :	Koothanallur	mannaithirusha@gmail.com
27	Name :	N. Subhramaniyan	9486743282

	Designation	Asst Agri Officer	
	Place :	Vadapathimangalam	
28	Name :	N. Apoorvasamy	9976908313
	Designation	Asst Agri Officer	
	Place :	Melavasal	
		Mannargudi	
29	Name :	S. Pandiyan	8220672303
	Designation	Asst Agri Officer	
	Place :	Needamangalam	
30	Name :	R. Ramesh	9944458352
	Designation	Asst Agri Officer	
	Place :	Needamangalam	
31	Name :	P. Maniyan	9943972329
	Designation	Asst Agri Officer	
	Place :	Kottur	
32	Name :	K. Sathyamoorthy	9942365223
	Designation	Asst Agri Officer	
	Place :	Muthupattai	
33	Name :	D. Saravanan	9790466259
	Designation	Asst Agri Officer	
	Place :	Needamanagalam	
34	Name :	R. Kulandaivelu	99944665216
	Designation	Asst Agri Officer	
	Place :	Thiruvarur	
35	Name :	L. Alagesan	9865849069
	Designation	Asst Agri Officer	
	Place :	Kottur	
36	Name :	Senthil Kumar	9443866034
	Designation	Asst Agri Officer	
	Place :	Valangaiman	ocss1000@gmail.com
37	Name :	P. Kathaiyan	9442475245

	Designation	Asst Agri Officer	
	Place :	Koradacheri	
38	Name :	R. Sivaramakrishnan	9715844602
	Designation	Asst Agri Officer	
	Place :	Kudavasal	
39	Name :	G. Ramamoorthy	9843937866
	Designation	Asst Agri Officer	
	Place :	Kudavasal	
40	Name :	N. Elanchezhiyan	
	Designation	Asst. Director of Agriculture	
	Place :	Needamangalam	
41	Name :	B. Thilagaraj	9965679055
	Designation	Deputy Agricultural Officer	
	Place :	Valangaiman	

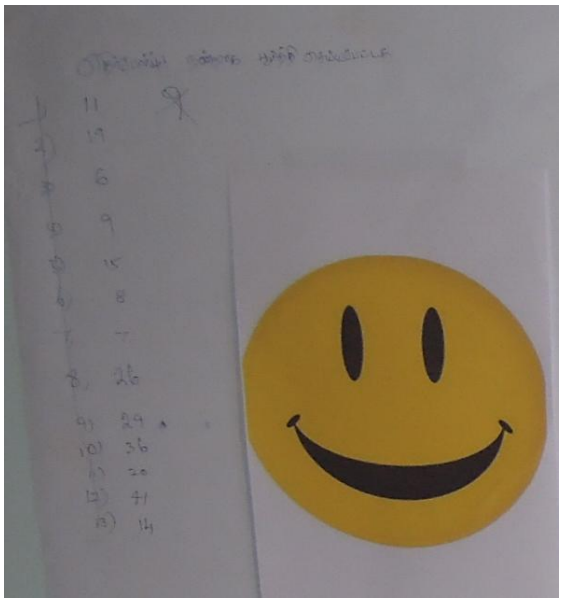
Annexure 2: Coverage of participants from different parts of Thiruvarur & Thanjavur districts



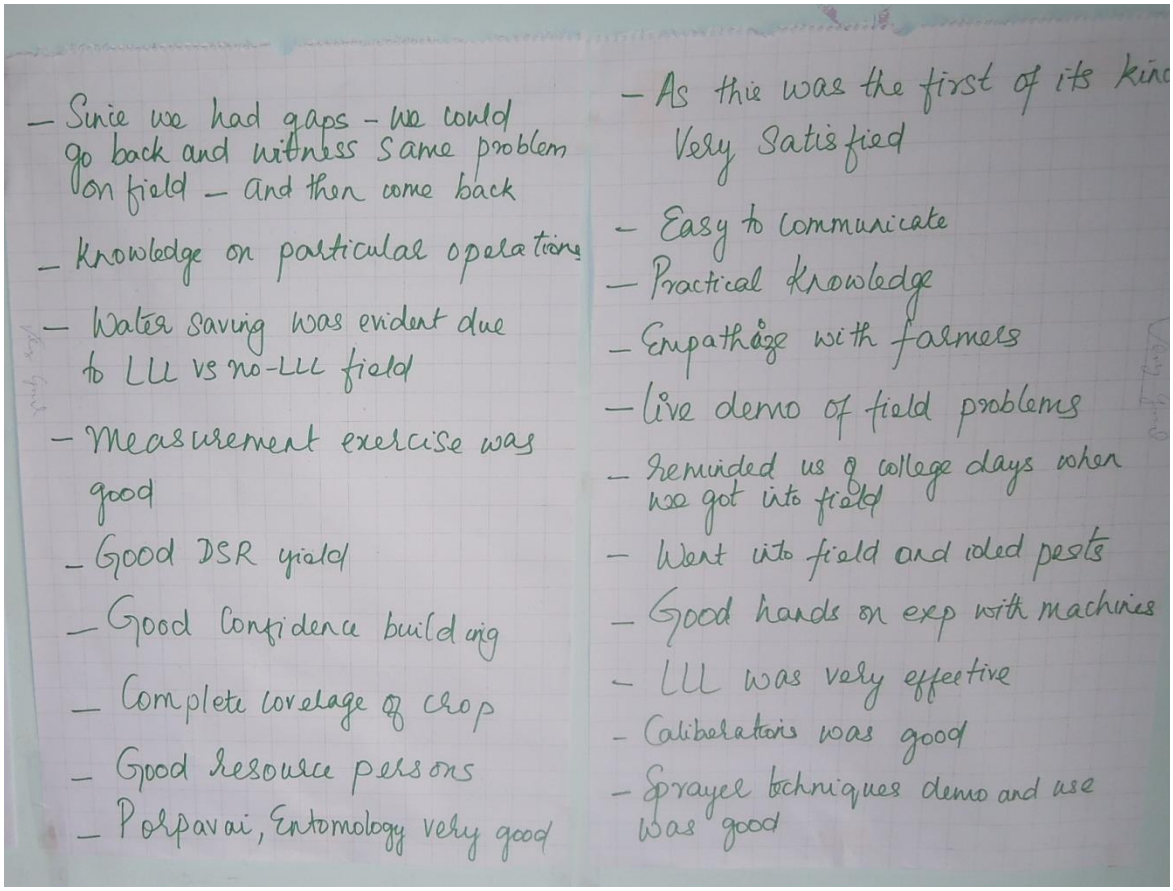
Note: all participants are marked here in the map

Annexure 3: Participatory evaluation by participants in pictures

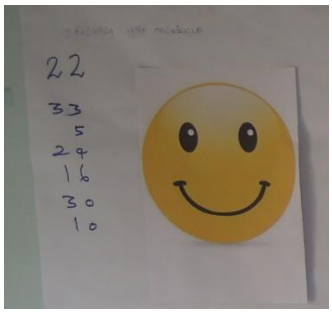
Those who identified the training as very good/exceeding expectations



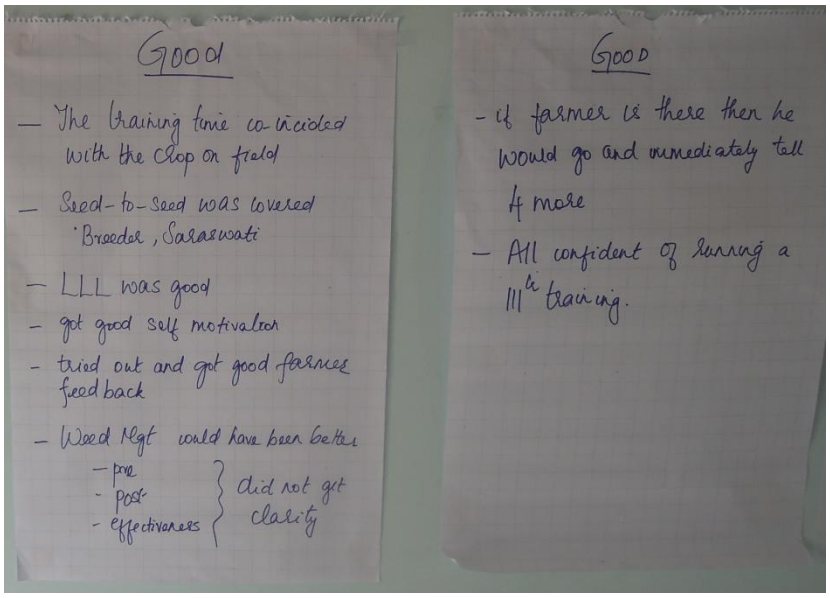
Their comments about the training:

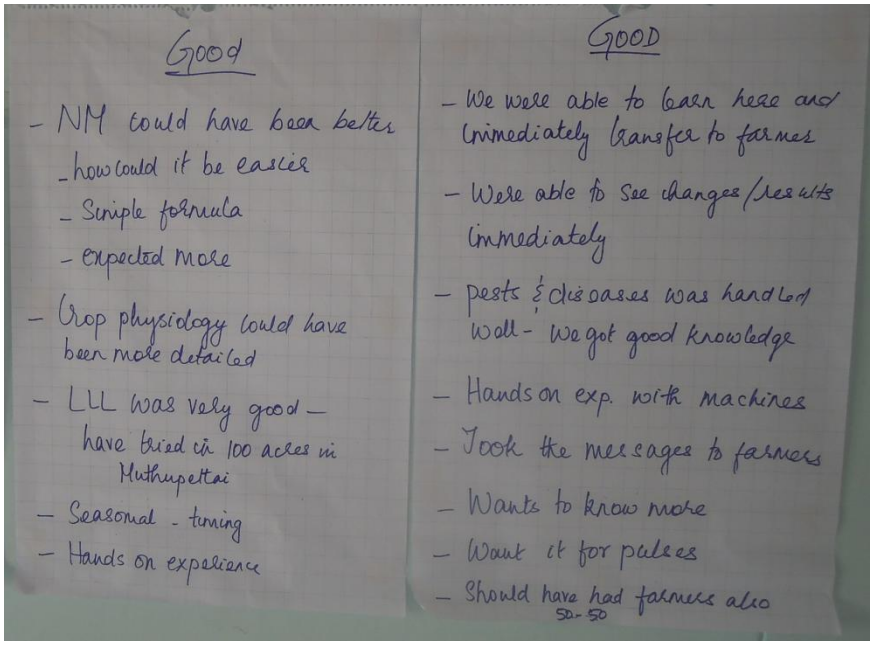


Those who identified the training as good but could be improved

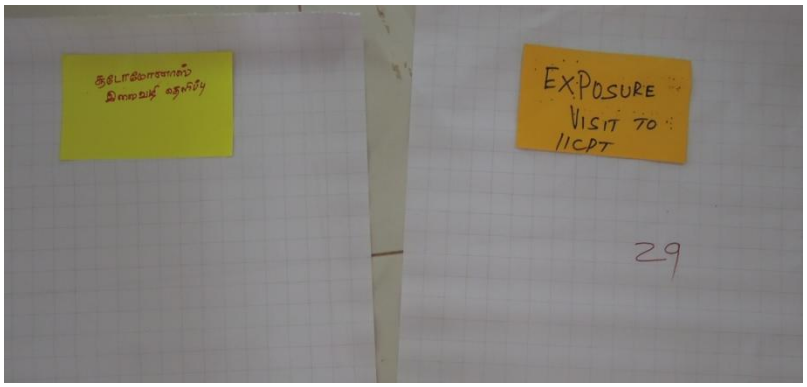


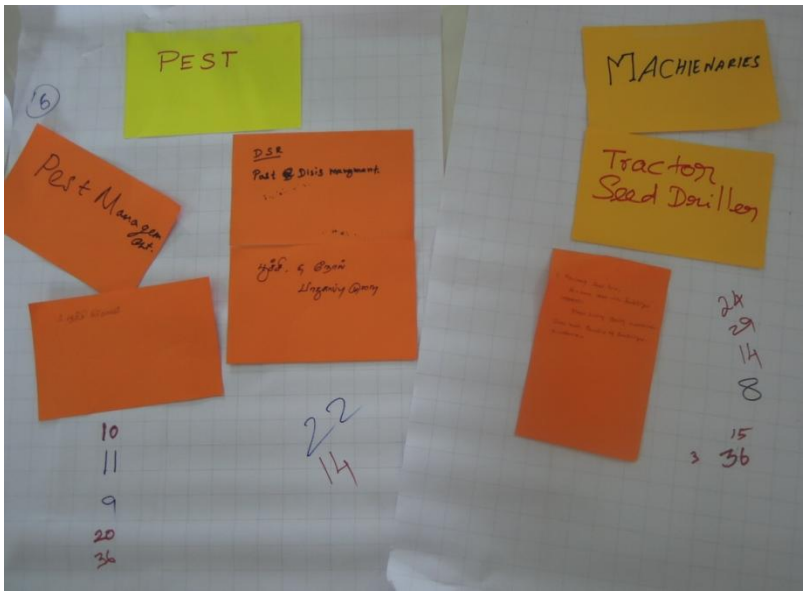
Their comments about the training:

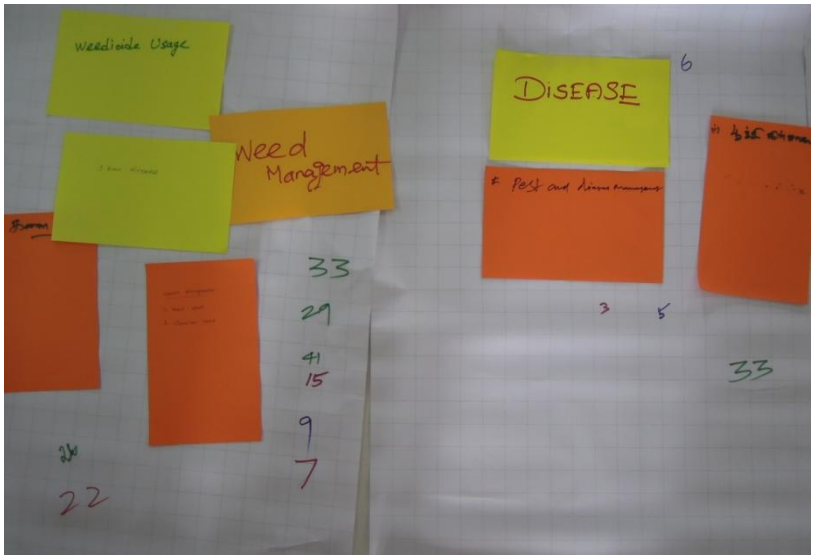


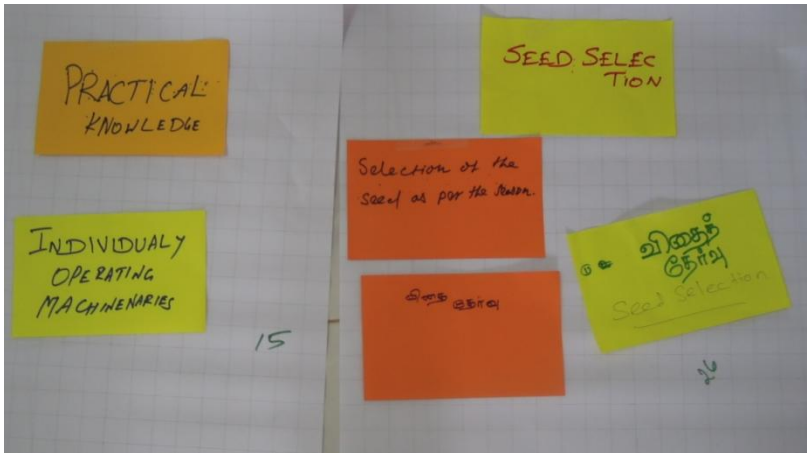


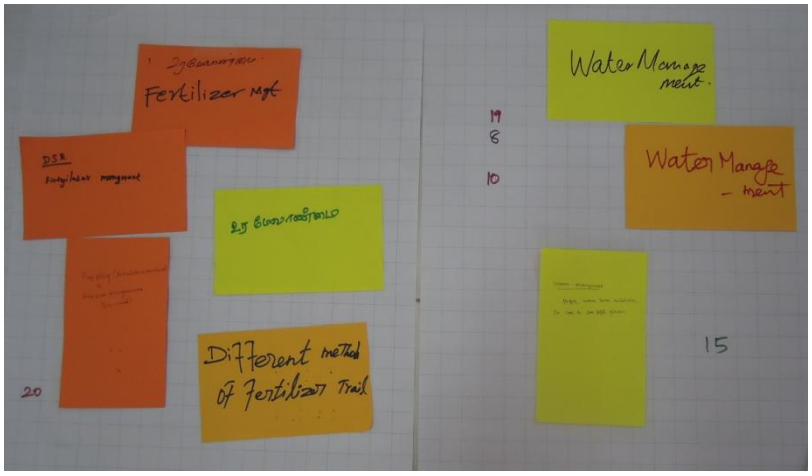
Participants identify which topics they would be comfortable as resource persons:

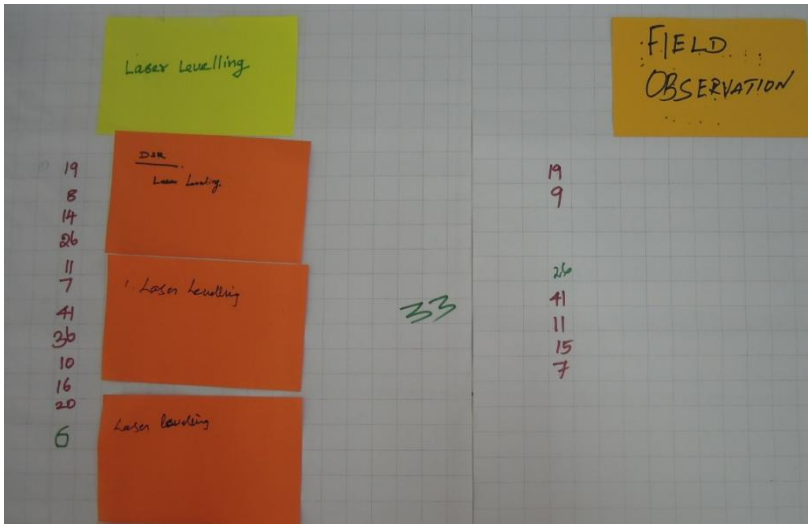







PRACTICAL KNOWLEDGE
SEED SELECTION
Selection of the seed as per the season.
INDIVIDUALY OPERATING MACHINENARIES
விதைத் தேர்வு
Seed Selection
15


Fertilizer Mgt
DSR
Different method of Fertilizer Trail
Water Management
Water Manage - ment
15


Laser Levelling
DSR
Laser Leveling
FIELD OBSERVATION
33

Other Pictures


தமிழ்நாடு வேளாண்மைப் பல்கலைக்கழகம்
வேளாண்மை அறிவியல் நிலையம்
நீடாமங்கலம் – 614 404. திருவாரூர் மாவட்டம்
KRISHI VIGYAN KENDRA

Appendix 4: Pictures from the training program

Inaugural

Laser land leveling

Plots established:

Seeding by participants

The 4 treatments


T3 : MW - SFR


T4 : HB - SFR

Germination testing

Introduction to DSR

Machine calibration

Mature crop

Sample Harvest

Sample Harvest - threshing

Post-harvest class at IICPT

Annexure 4: The Rice Production Manual

In order to systematically build the capacity of a large number of agriculture professionals it is important to have a cadre of trainers well versed on rice production techniques and related topics such as business development, etc. This training manual is designed to actively involve the participants in the learning process. Sessions include simulation skills, practice, discussions and field exposures to supplement classroom sessions using objective knowledge, attitudes and skill checklists.

This training manual has 24 lessons in 7 modules.

Module 1: Farm planning

Lesson 1: Financial Planning

Lesson 2: Crop Calendar

Module 2: Rice

Lesson 1: Rice Ecosystem

Lesson 2: Rice Morphology

Lesson 3: Rice Varieties

Module 3: Seed

Lesson 1: Seed production

Lesson 2: Seed quality

Lesson 3: Measuring seed quality

Module 4: Crop establishment

Lesson 1: Land leveling

Lesson 2: Land preparation

Lesson 3: Plant establishment

Module 5: Farm mechanization

Lesson 1: Farm power

Lesson 2: Tractor safe operation

Lesson 3: Matching equipment t farm size

Module 6: Crop management

Lesson 1: Nutrient management

Lesson 2: Water management

Lesson 3: Weed management

Lesson 4: Insect and rodent control

Lesson 5: Golden apple snail

Lesson 6: Plant diseases

Lesson 7: Spray application

Module 7: Rice harvest and management

Lesson 1: Harvesting and threshing

Lesson 2: Grain drying

Lesson 3: Storage and pest management

Lesson 4: Milling and grain quality

The SLT was based on this manual.