

**GUIDELINES FOR CONDUCTING  
FARMERS' FIELD SCHOOL ON IMPROVED  
PACKAGE OF PRACTICES.**

**for**

**RICE**

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## **Abbreviations**

CIPMC	Central Integrated Pest Management Centre
ETL	Economic Threshold Level
FAO	Food and Agriculture Organization of United Nations
FFS	Farmers' Field School
ICAR:	Indian Council of Agricultural Research
IPM	Integrated Pest Management
IRCM	Integrated Rice Crop Management
IRRI	International Rice Research Institute
NGO	Non-Government Organizations
KVK	Krishi Vigyan Kendras
NFSM	National Food Security Mission
NRC	National Research Centres
SAU	State Agricultural Universities
SDA	State Department of Agriculture
SRI	System of Rice Intensification

## **IMPORTANT**

**These guidelines have been prepared for a Farmers' Field School composed of twenty sessions; however, the implementing agency can adjust the number of sessions depending upon the requirement and resources available by merging two or more sessions**

## 1. Introduction

Lot of scientific information is being generated by the State Agricultural Universities (SAUs), Indian Council of Agricultural Research (ICAR) Institutes and other public and private organizations to serve millions of farm families in different agro-ecological regions of the country. Some of this information find ready acceptance of the farmer while most are not adopted. It is estimated that about 70% of the available technologies are not adopted by the farmers<sup>1</sup>. The common alleged causes for the observed gaps are:

- Inadequate /ineffective extension;
- Inadequate input supplies;
- Inadequate credit support;
- Inadequate market infrastructure; and
- Farmers' lethargy/indifference.

In addition to the above mentioned causes the more important reasons for low acceptance of technologies is due to technology being:

- Not economically viable;
- Not operationally feasible;
- Not stable;
- Not matching with the farmers' needs; and
- Not compatible with the farmers' overall farming system.

The technology, therefore, is required to be fine tuned better to fit the requirements of the farmers in a given farming situation.

### 1.1 Concept of Farmers' Field School (FFS):

It is a participatory approach to disseminate and fine tune the production technology in such a way that adoption rate becomes high. Fine-tuning of the production technology based on the location specific conditions and resources available with the farmers enhances the adoption rate. The FFS approach is a direct response to the needs of the farmers. Unlike other extension tools FFS is a season long two-way communication between the farmers and the facilitator who may be an extension or research worker.

### 1.2 Origin of FFS:

The term FFS has its origin in Indonesia. The first FFS were designed and managed by the Food and Agriculture Organization (FAO) of the United Nations in Indonesia in 1989 to train the trainers and farmers in Integrated Pest Management (IPM) in a participatory mode. Training techniques were used to achieve learning objectives, which are not

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<sup>1</sup> Technology Assessment and Refinement Through Institutional-Village Linkage Programme – An Approach paper prepared by Extension Division of ICAR

limited to those of the work domain alone, but also include interactive and empowerment domains. The approach is integrated and organized in such a way so that farmers are not the objects of training but are able to use their experience as the subject of training.

### **1.3 Salient Features of FFS:**

FFS is a group-based learning process that includes hands-on training methods in which farmers test management methods/production technologies for themselves and learn concepts directly. Training also includes communication skills, skills in identification and problem solving, in leadership, in interaction and discussion methods. Training in the field school follows the season long cycle and the field is the primary learning venue. Farmers learn by carrying out themselves the various activities related to the particular farming practice they want to learn/evaluate. The field school offers farmers an opportunity to learn by doing, by being involved in experimentation, discussion and decision-making. This strengthens the role of farmers in the research-extension-farmer chain. It also improves the sense of ownership of technological packages and new knowledge and skills. Other features of the FFS are:

- It is flexible, non-lecture based field study using a field that allows the “field to be the teacher”.
- It has strong emphasis on observation, analysis, discussion and debate, which allows new ecological concepts to be combined with local knowledge;
- Technically competent facilitator leads group activities, but is not seen as the “all-knowing source” of the “right information” and a focus on farmers becoming “experts” and “farmer facilitators” in their own communities.

### **1.4 Final Out Put of FFS:**

Based on season-long observations and hands-on activities in FFS combined with their own experiences and needs, farmers make effective decisions. When farmers have this basic knowledge they are better clients for extension and research systems because they have more specific questions and demands. They also are able to hold these systems accountable for their output and benefits. Finally they are able to protect themselves from dubious sources

In order to implement the FFS successfully, development of course curriculum is of utmost importance. Since most of the technologies are location specific, therefore, it is not possible to develop a common curriculum for any of the crop for the country or even for a state. However, common guidelines can be developed, based on which the state level National Food Security Mission (NFSM) Consultants in different states can fine-tune these guidelines and develop specific course curriculum to suit the local conditions for the conduct of FFS.

### **1.5 Objective of Farmers’ Field School:**

The objective of FFS is to provide first hand information to the farmers in their fields to enable them to evaluate, fine tune and adopt the best crop production and crop protection technologies suitable to their location and resources for higher production and productivity.

## **1.6 Selection of Farmers for FFS:**

In order to create awareness about the improved technology under the NFSM-Rice for every 100 ha of rice area there will be one demonstration. These demonstrations are to be laid down in three categories i.e. on package of practices, on System of Rice Intensification (SRI) and on Hybrid Rice. Since for every 1000 ha of rice area there is proposed to be one FFS, which mean that for every ten demonstrations on rice, there will be one FFS. It is also envisaged that these demonstrations will be used for the conduct of FFS. District wise number of FFS and demonstrations on Improved Package of Practices, SRI and Hybrid rice proposed under NFSM are given in **Annexure-I**

The farmers participating in each FFS are to be selected by the District Agriculture Officer in consultation with village Panchayats and Zilla Parishads. Farmers selected for FFS should be as far as possible within contiguous area in a village or neighboring villages. The selection of farmers should be done well in advance so that other modalities/arrangements for the conduct of FFS are made in consultation with the farmers on whose field FFS is to be conducted. The knowledge of specific assistance being provided to the farmer for the conduct of Field demonstration is essential so that the facilitator knows what other inputs and arrangements are to be made for the conduct of this school through out the season.

## **1.7 Selection of Site for FFS and Expectations from Contact Farmer:**

One of the sites selected for demonstration is to be selected for the conduct of FFS. Care should be taken that this site is a central point for other participant in the FFS for easy access. Cooperation of this farmer is key to success of the FFS. Some inputs are to be stored and some logistic arrangements such as provision of tea/snacks, are to be made with his assistance. Some activities are to be planned well in advance of the scheduled day for FFS. Some of the operations are to be carried out within 2-5 days of the first operation that will not fit in the schedule. Similarly the use of some of the inputs like seed treatment, application of herbicides and micronutrients may preclude the opportunity to demonstrate some of the situations like disease symptoms, appearance of weeds and symptoms of micronutrient deficiency which are otherwise important for hands on activities and knowledge for the farmers. Therefore, it is important to have a small plot of about 500 square meters or so adjoining the demonstration plot (site of FFS) where such situations will develop and can be used for observation as well as hands on activities.

## **1.8 Arrangements for the Conduct of FFS:**

Arrangements for the conduct of these schools such as, soil testing of this piece of land, provision of inputs, equipments and implements; participation of experts from the SAU/KVK/ICAR institutes/Government of India and other organisations; stationary and other training material such as posters & charts, manuals, other preparation like multiplication of structured questionnaire; and the arrangements for tea and snacks during the conduct of these schools are to be made by the facilitator before hand. Tentative list of field visits/demonstration, inviting some progressive farmers to deliver a talk on his success story should also be arranged well in advance. Similarly some of the activities are

to be carried out at a time when the FFS is not held; arrangements to carry out such activities is to be made so that the contact farmer undertake these activities on behalf of FFS and explain to other farmers in the subsequent session.

### **1.9 Sources of Facilitator and Technical Experts:**

The main source of facilitator and technical experts is from State Department of Agriculture (SDA), State Agricultural Universities, (SAU), Krishi Vigyan Kendras, (KVK), and Non-Government Organizations (NGO) etc. However, SDA and KVK will be the main actors. Out of 136 NFSM-rice districts 126 districts has a KVK. Similarly each NFSM state has at least one Agricultural University, which has its regional stations, established on regional basis. Out of 96 ICAR institutes/National Research Centres (NRC) and Directorates, some can be of little assistance to provide technical experts and guidance for implementing FFS. Directorate of Plant Protection, Quarantine and storage, Faridabad, Government of India is one of the pioneer organization that initiated the implementation of FFS on Integrated Pest Management in the country and has established 31 Central Integrated Pest Management Centres, (CIPMCs) in 28 states and 1 UT. These centres are already conducting FFS on IPM in different states on various crops including rice. These centres can provide some manpower as well as technical guidance and martial for the conduct of FFS. State Department of Agriculture should get in touch with these centres in their respective states to establish cooperative mechanism.

### **1.10 Methodology to be Followed:**

The FFS are organised on weekly basis preferably early in the morning for 4-5 hours. On some weeks there may not be any school depending upon the field activity. Every week three type of activities are proposed. These are:

- Group Discussion on the structured questions and Presentation.
- Field observations and follow up activities.
- Hands on Activity on pre determined activity

Every day before the start of field activities farmers are asked to make some discussion on structured questions and present the outcome. This whole exercise of structured discussion and presentation should be completed within one hour so that there is ample time for hands on activities and other field observations.

Farmers are divided in 4-5 groups of convenient size to make some structured discussion on a topic. A week-by-week list of structures questions is given in **Annexure-II**. At least one farmer in each group should be able to read and write to lead the discussion and document the outcome. A structured form is provided to each group to guide the discussion and document the outcome. Each group present the outcome of the group discussion and handover the filled structured forms to the facilitator. The facilitator will compile and supplement the outcome of various groups. Facilitator uses this information in finalising the gap analysis exercise to be undertaken in the first week of FFS.



This session is followed by some field observations on predetermined activity and then some hands on activity. A list of hands-on-activities on specific week is given in **Annexure-II**. Facilitator may adjust these activities according to local conditions.

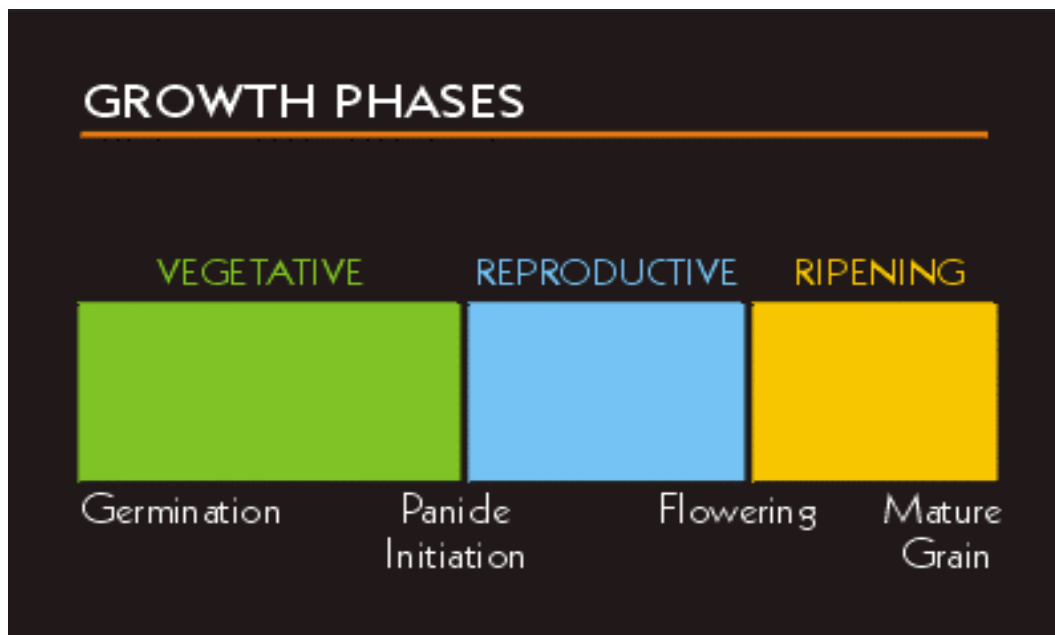
### 1.11 Week-by-Week Activities and Expected Output:

Week-by-Week activities and expected out put of these FFS are given as under:  
According to International Rice Research Institute (IRRI) Growth Stages/phases of Rice Plant are divided into three stages as follow:

- **Vegetative** (germination to panicle initiation);
- **Reproductive** (panicle initiation to flowering); and
- **Ripening** (flowering to mature grain)

#### Vegetative Stage:

- This stage is from germination to Panicle initiation.
- This the longest phase and determines if a variety is short or long duration variety.
- Most of Agronomic and Plant Protection activities take place in this phase.



- In the tropics, the reproductive phase is about 35 days and the ripening phase is about 30 days.
- The differences in growth duration are determined by changes in the length of the vegetative phase.
- For example, IR64 which matures in 110 days has a 45-day vegetative phase, whereas IR8 which matures in 130 days has a 65-day vegetative phase

## PERIOD/GROWTH PHASES



### **Reproductive Stage:**

- This stage is from end of Panicle initiation to flowering (35 days).
- A few agronomic and more plant protection activities take place in this stage.

### **Ripening Stage:**

- This stage is from end of Flowering to maturity (30 days).
- Mainly Plant Protection activities and harvesting takes place.

## 2. Activities of FFS in Vegetative Stage

### 2.1 Activities in Week I:

Some elderly and respected person in the area formally opens FFS. To popularise the NFSM, a brief description of NFSM in general and NFSM-Rice in particular is given to the farmers, which may contain pattern of assistance under various components, especially the components meant for direct assistance to the farmers. Facilitator will also explain the ways and means to avail the assistance under NFSM-Rice. A pamphlet indicating the pattern of assistance under NFSM-Rice for various components in local language is distributed as given in **Annexure-III**. Farmers are provided with these pamphlets with a request to disseminate this information to other farmers in the area to avail assistance under NFSM (Extra pamphlets are also given for distribution).

The facilitator explains the objectives and methodology for the conduct of the school. Facilitator informs the members of the FFS about the conduct of various demonstrations being organised in the area (Demonstration on Improved Package of Practices; on SRI and on Hybrid rice). The members of the FFS are asked to visit these demonstrations regularly as and when possible and take note of salient features/activities of these demonstrations.

Farmers are divided into homogeneous groups of convenient size. As far as possible, during each session a structured form is given to guide the discussion. This structured form will help the facilitator to document the farmers' practices and level of information they have about recent production technologies developed by the research systems. Farmers are explained in simple language the importance of soil testing.

A questionnaire regarding baseline survey to determine the socio-economic status and existing level of technology adoption and productivity status in the area is got filled up from each and every farmer. Questionnaire also includes expectations of the farmers from FFS. A copy of model questionnaire is placed at **Annexure-IV** and the facilitator may modify it according to his/her situation. The activities to be taken up next week are discussed

#### **Hands on Activity:**

- Farmers are demonstrated how to take the soil sample and farmers practice taking of a soil sample.
- Soil sample is sent to soils laboratory for analysis.
- Farmers are requested to bring the soil sample from their fields next time.

#### **OUTPUT:**

- Farmers know the technique of taking a soil sample.
- Farmers are aware about the assistance available under NFSM and the message is disseminated through these farmers to other farmers in the area.

- Facilitator has gathered the information regarding socio-economic profile of the farmers and existing practices of rice production.
- Farmers are aware of the type of demonstrations being organised in their vicinity.

**Homework for the Facilitator:** From the information obtained the facilitator may fill the other column of the table corresponding to each question regarding what are the recommended practices, and find out what are the gaps/ production constraints. This table can be further refined in the subsequent weeks from the out come of structured questions in each session.

## 2.2 Activities in Week-II:

### Group Discussion and presentation:

- Name the varieties/Hybrids recommended by Research system.
- Name the varieties/Hybrids you will grow
- Why will you grow those varieties/Hybrids?
- Is there any advantage of growing hybrids?
- From where do you buy the seed and at what cost?
- How do you select healthy seed?

**IMPORTANT:** Facilitator explains the varieties/Hybrids recommended for the area. He further explains which variety to be used under which conditions as per the recommendations.

**Regarding Base line Survey:** Facilitator will discuss the summary of the outcome of the base line survey and indicate what are the existing practices by the farmers. Facilitator ensures that all the points of the questionnaires are properly discussed one by one and find out reasons why the recommendations are not followed; suggestion from the farmers can be taken as to what can be done to fill or minimize the gap<sup>2</sup>.

This discussion will provide:

- What is the size of gap?
- Why the gap exists? And
- What can be done to fill or narrow down this gap?

The activities to be taken up next week are discussed.

**Soil Samples:** Farmers have brought the soil samples from their respective fields. These samples can be sent to soil testing laboratory and arrangements are made to get the results to be discussed in week IV.

### OUTPUT :

- Facilitator knows what the size of the gap is, why the gap exists and what can be done to fill the gap.

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<sup>2</sup> M.A.Kareem. Situation specific extension strategies in agricultural development. MANAGE

- Farmers know how to select healthy seed

### **Hands on Activity:**

**Selection of healthy seed:** Facilitator explains the benefits of selection of healthy seed.

- Prepare the salt solution (1.08 specific gravity) required for seed dipping by mixing 1.65 kg Common salt in 10 litres of water.
- Test the salt solution concentration with a fresh egg, which would float in the solution. If egg sinks, add more salt to increase the concentration.
- Pour the seed selected for nursery in the salt solution. Stir the seed well in the solution, allow it to settle down, and discard the floating seeds.
- Select the seed, which has settled down in the solution.
- Same salt solution may be used again to test another seed lot.
- Farmers are intentionally given a sample of poor quality seed and they select the healthy seed

## **2.3 Activities in Week-III:**

### **Group Discussion and presentation:**

- Do you apply some soil ameliorants if yes which one, in what quantity and how it is applied?
- From where do you get soil ameliorants?
- Which are the seed borne diseases and methods to control them?
- Do you know purpose and methods of seed treatment?
- Do you know how to pre-germinate the seed?
- Do you follow this practice?
- If yes what are the advantages? If no why?
- What do you understand by Integrated Pest Management (IPM)

Depending on the outcome of farmers' presentation facilitator explains the recommendations regarding application of soil ameliorants, seed rate, and method of seed treatment. Facilitator briefly explains the IPM. He further indicates that the group will be discussing the IPM throughout the duration of FFS. A small note on IPM is also distributed as per ANNEXURE-V. This note also includes general recommendation regarding safe use of pesticides and first-aid precautions.

Farmers are asked to practise the seed treatment and pre-germination of seeds. Arrangements are to be made that some of the farmers may pre-germinate the seeds to be used for sowing of nursery in the next session of FFS.

The activities to be taken up next week are discussed.

### **Hands on Activities:**

- Practice on seed treatment as per the local recommendations.
- Practice of pre-germination of seed for nursery sowing.
- Land preparation for sowing of nursery.

### **Method of Seed Treatment:**

- Soak the selected seed in 10 litres of water containing 5 gm Emisan and 1 gm streptomycin for 8 to 10 hours to kill the primary inoculum.(or any other chemical recommended by the concerned SAU)
- Farmers may practice seed treatment as per the recommendations.

### **Method of pre-germinating the seed:**

**OUTPUT:**

- Farmers are aware of the soil ameliorants to be used and method of application.
- Farmers are aware of advantages and method of pre-germinating the seed
- Farmers are aware of the soil born diseases and method of seed treatment to control these diseases.
- Farmers have practiced the land preparation for sowing of nursery.

**2.4 Activities in Week IV:**

**Group Discussion and presentation:**

Results of the soil analysis are available. Farmers are requested to discuss the:

- How do you raise the rice nursery –on flat land or raised seedbed?
- Which method of growing nursery is adopted: dry or wet method and why?
- How much organic manure and chemical fertiliser for raising nursery is used?
- How and when do you apply the chemical fertiliser?
- Do you apply some micronutrients? If yes which micronutrients and in what quantity?
- How do you manage the water and weed in the nursery?

Facilitator may supplement the information on the above points as per the recommendations made for the area. Facilitator also provide information about selection of site for raising nursery

**Precaution:** Do not grow the rice nursery at the site of last year's threshing to avoid mixing with left over seeds of last year threshing

**Hands on Activity:**

- The farmers sow a small plot of nursery on a raised bed.
- To check the damage from birds, broadcast a thin layer of well-decomposed farmyard manure immediately after broadcasting rice seed

Farmers are aware of the activities to be carried out by some farmer on their behalf. The activities to be taken up next week are discussed.

**OUTPUT:**

- Farmers have better understanding about seedbed preparation.
- Farmers are aware of the nutrient status of their fields.
- Farmers have better understanding about nutrient requirement of nursery and method of application of fertilizer to nursery.
- Farmers have better understanding about the raising of nursery and its after care including weed control and water management.

**2.5 Activities Week V:**

NO SCHOOL Nursery is 7 day old

**2.6 Activities in Week VI:**

Nursery is 14 day old

**Observations:** In addition to discuss the structured questions from now onwards farmers will also be making some field observations before their presentation.

**Group Discussion, Field observations and presentation:**

- Which are the important weeds, insect, and diseases in the nursery? Farmers will observe the nursery for appearance of weeds, insect, and diseases and discuss how to control them?
- Do you make some arrangements of drainage in the main field? If yes how? If no Why?

- What is the method of irrigation? Is it from field to field or through channels? What are the advantages and disadvantages of both?
- Farmers also discuss how much fertilizer and at what stage it is to be used for the main crop.
- At what age the seedlings are transplanted.
- Farmers will present their observations

**Facilitator may explain:**

- If there are any symptoms of deficiency of micronutrients in the nursery.
- He can also carry the charts/photographs of deficiency symptoms.
- Facilitator will provide the information for application of micro-nutrients as foliar spray as per the recommendations in the district.
- Farmers may be asked to prepare the solution of micronutrients and spray the same if required.
- Farmers are shown the method of land preparation for transplanting with application of soil amendments.

**Hands on Activity:**

- Second dose of Nitrogen is applied as per recommendation
- Observe the nursery for deficiency of micronutrients like Zinc and Iron. If observed, spray these micronutrients in recommended doses.
- Observe presence of insect and diseases in the nursery and spray if required
- Hand weeding is done.

The activities to be taken up next week are discussed.

**OUTPUT:**

- Farmers are aware of the methods of weed control.
- Farmers can identify the symptoms of micronutrient deficiency in the rice nursery and know what to do.
- Farmers are aware of fertiliser recommendations and methods to apply them.
- Farmers are aware of the latest recommendations about methods of land preparation

**2.7 Activities in Week VII:**

Nursery is 21 day old

**Group Discussion, Field Observations and Presentation:**

- How many days old seedlings are transplanted?
- Do you transplant in rows or at random and why?



- What are the advantages of each?
- Do you know all the insects are not harmful? Name the useful/friendly insects and why they are called friendly?

**Facilitator's Interventions:**

- Based on the presentation, the facilitator provides additional information on the Above-mentioned points especially IPM.
- Safe use of pesticides is explained to farmers.

**Hands on Activity:**

- Land preparation for transplanting to take place next week.
- Application of herbicides in the main field

**OUTPUT:**

- Farmers have better understanding about the age and method of transplanting rice.
- Farmers have better understanding about harmful and useful insects of rice.

**2.8 Activities in Week VIII:**

Nursery is 28 day old and is ready for transplanting. Land is made ready for transplanting, however, some activities like application of fertilizer may be undertaken.

Time of transplanting is a single factor, which influence the rice yield and vacate the field for timely sowing of wheat. Timely transplanting also save lot of water.

### **Group Discussion, Field observations and presentation**

- How do you control the weeds in rice field?
- Do you use herbicides? If yes name the herbicide and indicate the dose and method of application.
- At what time do you apply herbicide?
- Have you heard the term System of Rice Intensification (SRI) and Integrated **Rice** Crop Management (IRCM)? If yes what are these terms?

### **Out come of the discussion is presented.**

- Facilitator informs the method of use of herbicides and may provide list of herbicides along with the dose/rate and method of application recommended by the research system.
- Facilitator explains the chemical method of weed control. Also explains application of herbicides during land preparation and 3-4 days after transplanting.
- Facilitator may introduce the concept of SRI and IRCM.

### **Observations to be made by the Facilitator:**

#### **Hands on Activity:**

- Final activities for land preparation like application of basal dose fertilizer are done.
  - Farmers uproot the nursery.
  - Rice is transplanted in the field.
  - Herbicides are applied in some other adjoining field, which was transplanted 2-3 days earlier.
- 
- Facilitator observe how the uprooting the nursery is done, method of transplanting, No. of seedlings planted per hill and the extent of plant population being maintained per unit area.
  - After some time the facilitator intervenes to correct the method of uprooting the nursery and method of transplanting if it is not done as per the recommendations.
  - If the farmers are not following the desired method of uprooting and planting the nursery then facilitator finds out what are the reasons: Farmers are not aware of these techniques or there are some limitations for the framers to follow these.
  - The activities to be taken up next week are discussed

### **IMPORTANT:**

1. Facilitator will note down the observations regarding uprooting and transplanting to be recorded in the gap Analysis.
2. Facilitator may advise the farmers that continuous use of a single group of herbicides year after year results in the appearance of new weed types. To check this hence it is better to use different group of recommended herbicides in rotation.

**Output:**

- Farmers are aware of the advantages of timely transplanting
- Farmers are aware of the herbicides available for controlling weeds.
- Farmers are aware of methods of land preparation and application of fertilizer for transplanting rice.
- Farmers are aware of uprooting the seedlings and method of transplanting such as number of seedlings to be planted per hill and spacing etc.
- Farmers have better understanding of application of herbicides.
- Farmers have some idea about SRI and IRCM.
- The activities to be taken up next week are discussed.

**2.9 Activities in Week IX:**

Transplanted rice is 7 day old after transplanting. Farmers are brought to some field where a mechanical transplanter is being used. Similarly farmers may be shown some fields of SRI if available in the area

**OUTPUT:**

- Farmers have better understanding about the benefits of using transplanter.
- Farmers have better understanding about SRI.

**2.10 Activities in Week X:**

Transplanted rice is 14 days old after transplanting: (Time for weeding in those fields where no herbicides were applied)

**Group Discussion, Field observations and presentation**

- Farmers observe the field for insect, pest and diseases and discuss the major insect pests and diseases present in the area and their control measures.
- List the important insects and diseases present in rice field and method to control them.
- Do you know that all insect, pest and diseases are not present in all parts of the country? (List of insects of national and regional importance is provided. ANNEXURE-V).
- What is the nature of damage by these insects and diseases?
- Methods to control the insect, pests and diseases of the region are discussed.
- Farmers observe for deficiency symptoms of micronutrients.

## **Farmers present the findings of their observations and the action to be taken**

- Water is kept standing for two weeks in the fields transplanted with rice.
- Now water is drained.
- Weed control through a weeder (Any type of weeder)
- Observations are made for deficiency of Micronutrients i.e zinc and Iron.
- If the micronutrients were applied then deficiencies may not appear and another field with some deficiencies is to be located well in advance.
- Similarly if the herbicides were used then there will be no weeds and facilitator/contact farmer has to identify some field in the nearby area for practicing rotary weeder

## **Observations by the Facilitator:**

- Facilitator observes the use of rotary weeder by the farmers and suggests corrective measures.
- Facilitator explains the additional insect, pest and diseases of importance if the farmers did not name some. He also gives the control measures.
- The activities to be taken up next week are discussed

### **Hands on activity:**

- Farmers use the rotary weeder.
- Farmers spray the pesticide to control the existing pests.
- Farmers prepare solution of micronutrients for spray.
- Farmers spray micronutrients and spray in a deficient field located around the FFS

## **OUTPUT:**

- Farmers are familiar with the right use of rotary weeder.
- Farmers have identified the existing insect pest and diseases and know how to control them.
- Farmers are aware of insect pests and diseases of national and regional importance and means to control them
- Farmers have practiced the preparation and spray of micronutrients.

## **2.11 Activities in Week XI:**

Transplanted rice is 21 days old. This is time for application of second dose of N

## **Group Discussion, Field observations and presentation:**

- Farmers discuss the concept of IPM
- Do you know what are the pheromone traps and light traps and how to use them?
- What do you mean by economic threshold level (ETL)?

- What do you mean by biological control of insects?
- Farmers observe the field for presence of insect pest and disease, their nature of damage and control measures.
- Farmers present the findings and propose control measures.

#### **Facilitator's Interventions:**

- Facilitator supplements the information with regard to insect pest and diseases.
- He may show the samples of pheromone traps and light traps and demonstrate how to use them.
- Facilitator provides information about the ETLs about various insect important for the area. (Information about Economic Threshold Levels is given in **Annexure-V**)

Facilitator also arranges some photographs /charts for insect pest and diseases and their nature of damage. These charts have been prepared by the Directorate of Plant Protection, Quarantine and storage, Ministry of Agriculture, Govt. of India.

#### **Hands on Activity:**

- Second dose of Nitrogen is applied. (May be 1/3 or 1/2 of N depending on recommendation in the area).
- Farmers observe and count the number of insects per plant or per unit area and ETL is decided
- Farmers install pheromone traps in the field.

**IMPORTANT:** Water should not be standing in the field when the second dose of fertiliser is applied. Irrigate the field on the third day after fertiliser application.

The activities to be taken up next week are discussed

#### **OUTPUT:**

- Farmers are aware of common insect pest and diseases, their nature of damage and control measures.
- Farmers are aware as to at what population of insects the chemicals are to be applied. They are aware of the concept of ETL.

#### **2.12 Activities in week XII:**

Transplanted rice is 28 days old; Time for second weeding

#### **Group Discussion, Field observations and Presentation:**

- Farmers observe the crop condition in the field and observe insect, pest and diseases.
- Farmers discuss the concept of IPM among themselves
- Farmers discuss the extent of insect pest and diseases and find out if the ETL has reached or not.

- Farmers may indicate what pesticides to be used to control the insect, pest and diseases present in the field.
- Farmers discuss the nature of damage done by rodents and how to control them?

**Presentation by a progressive farmer:**

A progressive farmer from the near by area who has excelled in rice production by adopting some improved technology is invited to share his views with the farmers. This farmer may be a farmer who has adopted SRI, or has adopted balanced use of fertilizer, Uses herbicides etc.

**Facilitator's Interventions:**

- Facilitator supplement the information on IPM including control of rodents
- Some literature on IPM like package of practices for IPM in rice is distributed.

**Hands on Activities:**

- Second weeding is done using rotary weeder.
- Number of insects per plant/per unit area are calculated to find out ETL
- Pesticides may be sprayed to control the insect, pest and diseases

The activities to be taken up next week are discussed

**OUTPUT:**

- Farmers are aware of IPM including damage done by rodents.
- Farmers know how to calculate ETL
- Second weeding is over.

### 3. Activities in Reproductive stage

This phase is from end of panicle initiation to flowering, which is about 35 days of duration. A few agronomic and more plant protection activities take place in this stage. Depending on the variety being used, the period of this stage may vary from variety to variety.

#### 3.1 Activities in week XIII:

Transplanted rice is 35 day old

**Field Visit:** May arrange a visit to some demonstrations. Even a visit to the progressive farmer who gave presentation in the previous week may be organised.

#### 3.2 Activities in week XIV:

Transplanted rice is 42 days old: Time for Third dose of N ( If the recommendation in the area is to apply N in two more doses in addition to a basal dose )

#### Group Discussion, Field observations and Presentation:

- Do you know what are the harmful effects of applying excessive nitrogen particularly during flowering?
- Farmers observe the crop condition in the field and observe the presence of insect, pest and diseases.
- Do you know what is insect net/sweep net and how to use it?
- They observe the damage done by these pests and symptoms of diseases.
- Farmers present their findings about insect pest and diseases as well as for useful insects.
- The activities to be taken up next week are discussed

#### Facilitator's Interventions:

Facilitator supplement the information about useful insects or friendly insects of Farmers

#### **Hands on Activities:**

- Third dose of N is applied.
- Number of insects per plant/per unit area are calculated.
- Pheromone traps are examined
- Use of insect net is practiced.
- Identify the useful insects
- Farmers to count live burrows per unit area and apply chemicals to control them.

#### OUTPUT:

- Farmers are aware of adverse effect of excessive nitrogenous fertilizer particularly during flowering.
- Farmers are aware of the concept of IPM
- Farmers know how to use the insect net.
- Farmers know how to control rodents.
- Farmers are able to identify insect, pest and diseases and the nature of damage done by them
- Farmers are also aware of useful insects

### **3.3 Activities in week XV:**

Transplanted rice is 49 days old. No School

### **3.4 Activities in Weak XVI:**

Transplanted rice is 56 days old

### **Group Discussion, Field observations and Presentation**

- Do you keep your own seed for next year?
- How do you handle the plot meant for seed Production?
- What is the correct stage of harvesting and threshing?
- Discussion on IPM continues.

#### **Hands on Activities:**

- Rouging is done in the seed Plot.
- IPM activities continue. Pheromone traps are examined

### **3.5 Activities in Week XVII:**

Transplanted rice is 63 days old. No School.



#### 4. Activities in Ripening Stage

This stage is from end of Flowering to maturity, which is about 30-day duration. The main activities in this stage are about plant protection and towards end the harvesting takes place.

##### 4.1 Activities in Week XVIII:

Transplanted rice is 63 days old

##### Group Discussion, Field observations and Presentation

- Discussion on method of seed multiplication continues
- Farmers observe the field for IPM activities.

##### **Hands on Activities:**

- One more rouging for the seed production plot may be done
- Some activities of IPM may take place. Pheromone traps are examined

##### 4.2 Activities in Week XIX:

Transplanted rice is 70 days old

##### Group Discussion, Field observations and presentation

- Farmers to discuss the stage of harvesting. What are the disadvantages of delayed harvesting?
- Information about storage and marketing is Discussed

##### Facilitator's Interventions:

Facilitator supplements the information about harvesting. During this period following activities may be taken depending on the variety being grown to match the growing stage:

##### **Hands on Activities**

- some activities concerning Plant protection may be undertaken.
- Harvesting and threshing of the crop takes place.

##### 4.3 Activities in Week XX:

Transplanted rice is 77 days old

A Field day is organised

##### 4.4 Activities in Week XXI to XXIV:

(Transplanted rice is 84 days to 112 days old after transplanting)

- Discussion on Harvesting and Threshing may take place.
- Actual Harvesting and Threshing takes place.

**4.5 Activities in Week XXV :  
(Crop should have been harvested.)**

**Group Discussion and Presentation:**

- How the crop was harvested and threshed?
- When the crop was sent or will be sent to market?
- What are the advantages taking the produce directly to market after threshing?
- Do you get the produce cleaned before selling? If yes where do you get the produce cleaned?
- How do you and for how long dry the produce?
- Technical Adoption : Questions from the questionnaire at annexure-IV may be filled again by these farmers to assess the impact of Farmers' Field School on knowledge and understanding of participating farmers.

**ANNEXURE-I****District wise number of FFS and Demonstrations on Improved Package of Practices, SRI and Hybrid Rice proposed under NFSM and Presence of KVK in these districts**

State	District	Presence of KVK	Number Per year on*					
			FFS	Total Demon.	Demon. On Package	Demon. on SRI	Demon. On HR	
Andhra Pradesh	Adilabad	Yes	16	162	97	41	24	
	Guntur	Yes	35	352	211	88	53	
	Khammam	Yes	28	284	170	71	43	
	Krishna	Yes	46	460	276	115	69	
	Mahboobnagar	Yes	20	198	119	50	30	
	Medak	Yes	17	172	103	43	26	
	Nalgonda	Yes	25	246	148	62	37	
	Nellore	Yes	31	310	186	78	47	
	Srikakulam	Yes	38	382	229	96	57	
	Vishakhapatnam	Yes	18	178	107	45	27	
	Viziangram	Yes	23	226	136	57	34	
		<b>State Total</b>		<b>297</b>	<b>2970</b>	<b>1782</b>	<b>743</b>	<b>446</b>
	Assam	Barpeta	Yes	35	351	211	88	53
Bongaigaon		Yes	21	205	123	51	31	
Darrang		Yes	31	313	188	78	47	
Dhemaji		Yes	14	144	86	36	22	
Goalpara		Yes	15	145	87	36	22	
Karbi-Anglong		Yes	26	264	158	66	40	
Kokrajhar		Yes	19	191	114	48	29	
Lakhimpur		Yes	23	228	137	57	34	
Morigaon		No	17	167	100	42	25	
Nalbari		Yes	30	295	177	74	44	
Sonitpur		Yes	34	340	204	85	51	
Nagaon		Yes	51	505	303	126	76	
Tinsukia		Yes	14	137	82	34	21	
		<b>State Total</b>		<b>329</b>	<b>3286</b>	<b>1972</b>	<b>822</b>	<b>493</b>
Bihar	Araria	Yes	17	167	100	42	25	
	Banka	Yes	20	201	121	50	30	
	Champan (East)	Yes	22	216	129	54	32	
	Champan (West)	Yes	18	180	108	45	27	
	Darbhangha	Yes	14	142	85	35	21	
	Gaya	Yes	32	318	191	80	48	
	Jamui	Yes	11	106	63	26	16	
	Katihar	Yes	15	152	91	38	23	
	Kishanganj	Yes	17	172	103	43	26	
	Madhubani	Yes	27	270	162	68	41	
	Madhepura	Yes	12	117	70	29	18	
	Muzaffarpur	Yes	23	233	140	58	35	
	Nalanda	Yes	20	198	119	50	30	
	Saharsa	Yes	13	133	80	33	20	

State	District	Presence of KVK	Number Per year on*				
			FFS	Total Demon.	Demon. On Package	Demon. On SRI	Demon. On HR
	Samastipur	Yes	10	101	61	25	15
	Sitamarhi	Yes	16	161	96	40	24
	Siwan	Yes	12	124	74	31	19
	Supaul	Yes	18	179	108	45	27
	<b>State Total</b>		<b>317</b>	<b>3169</b>	<b>1901</b>	<b>792</b>	<b>475</b>
<b>Chhattisgarh</b>	Dantewada	Yes	42	416	250	104	62
	Janjgir-Champa	Yes	51	506	304	127	76
	Jashpur	yes	36	361	216	90	54
	Kawardha	Yes	19	186	111	46	28
	Korba	Yes	22	220	132	55	33
	Koriya	Yes	14	140	84	35	21
	Raigarh	Yes	49	485	291	121	73
	Raipur	Yes	104	1042	625	260	156
	Rajnandgaon	Yes	52	516	310	129	77
	Sarguja	Yes	63	628	377	157	94
	<b>State Total</b>		<b>450</b>	<b>4500</b>	<b>2700</b>	<b>1125</b>	<b>675</b>
<b>Gujarat</b>	Dahod*	Yes	11	109	66	27	16
	Panchmahals*	Yes	12	123	74	31	19
	<b>State Total</b>		<b>23</b>	<b>233</b>	<b>140</b>	<b>58</b>	<b>35</b>
<b>Jharkhand</b>	Gumla	Yes	26	261	157	65	39
	Hazaribagh	Yes	12	116	69	29	17
	Ranchi	Yes	32	318	191	80	48
	Simdega	Yes	17	165	99	41	25
	Singhbhumi	Yes	31	309	185	77	46
	<b>State Total</b>	Yes	<b>117</b>	<b>1169</b>	<b>702</b>	<b>292</b>	<b>175</b>
<b>Karnataka</b>	Belgaum	Yes	14	143	86	36	21
	Dakshin Kannada	Yes	12	118	71	29	18
	Hassan	Yes	11	109	66	27	16
	Raichur	Yes	22	216	130	54	32
	Shimoga	Yes	26	256	154	64	38
	Udupi	Yes	12	125	75	31	19
	Uttar Kannada	Yes	16	164	99	41	25
	<b>State Total</b>		<b>113</b>	<b>1131</b>	<b>678</b>	<b>283</b>	<b>170</b>
<b>Kerala</b>	Palakkad*	Yes	21	206	124	52	31
	<b>State Total</b>		<b>21</b>	<b>206</b>	<b>124</b>	<b>52</b>	<b>31</b>

State	District	Presence of KVK	Number Per year on*				
			FFS	Total Demon.	Demon. On Package	Demon. on SRI	Demon. On HR
Madhya Pradesh	Anup Pur	No	20	198	119	49	30
	Damoh	Yes	11	105	63	26	16
	Dindori	Yes	15	155	93	39	23
	Katni	Yes	22	222	133	55	33
	Mandla	Yes	23	225	135	56	34
	Panna	Yes	12	119	71	30	18
	Rewa	Yes	29	294	177	74	44
	Satna	Yes	20	205	123	51	31
	Sahdol	Yes	21	215	129	54	32
		<b>State Total</b>		<b>174</b>	<b>1737</b>	<b>1042</b>	<b>434</b>
Maharashtra	Bhandara	Yes	35	347	208	87	52
	Chandrapur	Yes	29	287	172	72	43
	Gadchiroli	Yes	29	292	175	73	44
	Gondia	Yes	35	353	212	88	53
	Nasik	Yes	10	101	61	25	15
	Pune	Yes	12	121	72	30	18
		<b>State Total</b>		<b>150</b>	<b>1501</b>	<b>900</b>	<b>375</b>
Orissa	Angul	Yes	23	235	141	59	35
	Bolangir	No	46	462	277	115	69
	Boudha	Yes	14	137	82	34	21
	Deoghar	Yes	10	101	61	25	15
	Dhenkanal	Yes	25	245	147	61	37
	Jajpur	Yes	28	278	167	70	42
	Jharsuguda	Yes	12	117	70	29	18
	Kalahandi	Yes	53	535	321	134	80
	Keonjhar	Yes	41	411	247	103	62
	Malkangiri	Yes	17	170	102	43	26
	Nawapara	Yes	21	211	127	53	32
	Nawrangpur	Yes	35	352	211	88	53
	Nayagarh	Yes	19	190	114	48	29
	Phulbani	Yes	12	116	70	29	17
	Sundargarh	Yes	47	467	280	117	70
		<b>State Total</b>		<b>403</b>	<b>4027</b>	<b>2416</b>	<b>1007</b>
Tamil Nadu	Nagapattinam	Yes	27	272	163	68	41
	Pudukottai	Yes	16	160	96	40	24
	Ramanathapuram	Yes	24	242	145	61	36
	Sivagangai	Yes	14	144	86	36	22
	Thituvapur	Yes	24	243	146	61	36
		<b>State Total</b>		<b>106</b>	<b>1060</b>	<b>636</b>	<b>265</b>

State	District	Presence of KVK	Number Per year on*				
			FFS	Total Demon.	Demon. On Package	Demon. on SRI	Demon. On HR
Uttar Pradesh	Azamgarh	Yes	41	411	246	103	62
	Badaun	Yes	15	147	88	37	22
	Behraich	Yes	31	313	188	78	47
	Ballia	Yes	25	246	148	61	37
	Balrampur	Yes	20	197	118	49	29
	Banda	Yes	12	122	73	30	18
	Bareilly	Yes	32	320	192	80	48
	Basti	Yes	24	238	143	59	36
	Deoria	No	26	262	157	65	39
	Fatehpur	Yes	17	171	102	43	26
	Ghazipur	Yes	31	311	187	78	47
	Gonda	Yes	26	261	156	65	39
	Gorakhpur	Yes	30	302	181	76	45
	Hardoi	Yes	26	261	156	65	39
	Mainpuri	Yes	12	116	70	29	17
	Mau	Yes	18	182	109	46	27
	Mirzapur	Yes	21	207	124	52	31
	Raebareilly	Yes	28	275	165	69	41
	Rampur	Yes	28	277	166	69	42
	Saharanpur	Yes	12	116	70	29	17
	Shravasti	No	13	133	80	33	20
	Siddhrthanagar	Yes	35	346	208	87	52
	Sitapur	Yes	28	282	169	70	42
	Sonbhadra	Yes	19	192	115	48	29
	Sultanpur	Yes	32	315	189	79	47
	Unnao	Yes	17	175	105	44	26
	<b>State Total</b>		<b>618</b>	<b>6176</b>	<b>3705</b>	<b>1544</b>	<b>926</b>
West Bengal	24 Paraganas (South)	Yes	89	895	537	224	134
	Cooch-Behar	Yes	55	552	331	138	83
	Dinajpur (North)	Yes	59	591	355	148	89
	Howrah	Yes	28	283	170	71	42
	Jalpaiguri	Yes	48	480	288	120	72
	Midnapur (East)	No	57	569	342	142	85
	Midnapur (West)	Yes	134	1344	806	336	202
	Purulia	Yes	59	589	353	147	88
	<b>State Total</b>		<b>530</b>	<b>5304</b>	<b>3182</b>	<b>1326</b>	<b>796</b>
<b>All-India</b>	<b>All India</b>		<b>3647</b>	<b>36470</b>	<b>21882</b>	<b>9117</b>	<b>5470</b>

\* Number of Demonstrations on Improved Package: SRI:HR are in the ratio of 12:5:3 as given in annexure-IIIa of the guidelines

**ANNEXURE-II**

**List of Structured Questions and Hands on Activities in Different Weeks During the Conduct of Farmers' Field School.**

<b>Week</b>	<b>Structured Questions</b>	<b>Hands on Activities</b>
I	A questionnaire regarding baseline survey to determine the socio-economic status and existing level of technology adoption and productivity status in the district is got filled up from each and every farmer	<ul style="list-style-type: none"> <li>○ Farmers are demonstrated how to take the soil sample and farmers practice taking of a soil sample.</li> <li>○ Soil sample is sent to soils laboratory for analysis.</li> <li>○ Farmers are requested to bring the soil sample from their fields next time.</li> </ul>
II	<ul style="list-style-type: none"> <li>➤ Name the varieties/Hybrids recommended by Research system.</li> <li>➤ Name the varieties/Hybrids you will grow?</li> <li>➤ Why will you grow those varieties/Hybrids?</li> <li>➤ Is there any advantage of growing hybrids?</li> <li>➤ From where do you buy the seed and at what cost?</li> <li>➤ How do you select healthy seed?</li> </ul>	<ul style="list-style-type: none"> <li>○ Practice on seed treatment as per the local recommendations.</li> <li>○ Practice of pre-germination of seed for nursery sowing.</li> <li>○ Land preparation for sowing of nursery.</li> </ul>
III	<ul style="list-style-type: none"> <li>➤ From where do you get soil ameliorants?</li> <li>➤ Which are the seed borne diseases and methods to control them?</li> <li>➤ Do you know purpose and methods of seed treatment?</li> <li>➤ Do you know how to pre-germinate the seed?</li> <li>➤ Do you follow this practice?</li> <li>➤ If yes what are the advantages? If no why?</li> <li>➤ What do you understand by Integrated Pest Management (IPM)</li> </ul>	<ul style="list-style-type: none"> <li>○ Practice on seed treatment as per the local recommendations.</li> <li>○ Practice of pre-germination of seed for nursery sowing.</li> <li>○ Land preparation for sowing of nursery.</li> </ul>
IV	<ul style="list-style-type: none"> <li>➤ How do you raise the rice nursery –on flat land or raised seedbed?</li> <li>➤ Which method of growing nursery is adopted: dry or wet method and why?</li> <li>➤ How much organic manure and chemical fertiliser for raising nursery is used?</li> <li>➤ How and when do you apply the chemical fertiliser?</li> <li>➤ Do you apply some micronutrients? If yes which micronutrients and in what quantity?</li> <li>➤ How do you manage the water and weed in the nursery?</li> </ul>	<ul style="list-style-type: none"> <li>○ The farmers sow a small plot of nursery on a raised bed.</li> <li>○ To check the damage from birds, broadcast a thin layer of well-decomposed farmyard manure immediately after broadcasting rice seed</li> </ul>

<b>Week</b>	<b>Structured Questions</b>	<b>Hands on Activities</b>
V	NO SCHOOL	
VI	<ul style="list-style-type: none"> <li>➤ Which are the important weeds, insect, and diseases in the nursery? Farmers will observe the nursery for appearance of weeds, insect, and diseases and discuss how to control them?</li> <li>➤ Do you make some arrangements of drainage in the main field? If yes how? If no Why?</li> <li>➤ What is the method of irrigation? Is it from field to field or through channels? What are the advantages and disadvantages of both?</li> <li>➤ Farmers also discuss how much fertilizer and at what stage it is to be used for the main crop.</li> <li>➤ At what age the seedlings are transplanted.</li> </ul>	<ul style="list-style-type: none"> <li>○ Second dose of Nitrogen is applied as per recommendation</li> <li>○ Observe the nursery for deficiency of micronutrients like Zinc and Iron. If observed spray these micronutrients in recommended doses.</li> <li>○ Observe presence of insect and diseases in the nursery and spary if required</li> <li>○ Hand weeding is done.</li> </ul>
VII	<ul style="list-style-type: none"> <li>➤ How many days old seedlings are transplanted?</li> <li>➤ Do you transplant in rows or at random and why?</li> <li>➤ What are the advantages of each?</li> <li>➤ Do you know all the insects are not harmful? Name the useful/friendly insects and why they are called friendly?</li> </ul>	<ul style="list-style-type: none"> <li>○ Land preparation for transplanting to take place next week.</li> <li>○ Application of Herbicides in the main field</li> </ul>
VIII	<ul style="list-style-type: none"> <li>➤ How do you control the weeds in rice field?</li> <li>➤ Do you use herbicides? If yes name the herbicide and indicate the dose and method of application.</li> <li>➤ At what time do you apply herbicide?</li> <li>➤ Have you heard the term SRI and IRCM? If yes what are these terms?</li> </ul>	<ul style="list-style-type: none"> <li>○ Final activities for land preparation like application of basal dose fertilizer are done.</li> <li>○ Farmers uproot the nursery.</li> <li>○ Rice is transplanted in the field.</li> <li>○ Herbicides are applied in some other adjoining field, which was transplanted 2-3 days earlier</li> </ul>
IX	FIELD VISIT – MECHANICAL TRANSPLANTER	



Week	Structured Questions	Hands on Activities
X	<ul style="list-style-type: none"> <li>➤ Farmers observe the field for insect, pest and diseases and discuss the major insect pests and diseases present in the area and their control measures.</li> <li>➤ List the important insects and diseases present in field and methods to control them.</li> <li>➤ Do you know all the insects, pests and diseases are not present in all parts of the country? (List of insects of diseases national and regional importance is provided)</li> <li>➤ What is the nature of damage by these insects and diseases?</li> <li>➤ Methods to control the insect, pests and diseases of the region are discussed.</li> </ul> <p>Farmers observe for deficiency symptoms of micronutrients</p>	<ul style="list-style-type: none"> <li>○ Farmers use the rotary weeder.</li> <li>○ Farmers spray the pesticide to control the existing pests.</li> <li>○ Farmers prepare solution of micronutrients and in a deficient field located near the site of FFS</li> </ul>
XI	<ul style="list-style-type: none"> <li>➤ Farmers discuss the concept of IPM</li> <li>➤ Do you know what are the Pheromone traps and light traps and how to use them?</li> <li>➤ What do you mean by Economic threshold level?</li> <li>➤ What do you mean by biological control of insects?</li> <li>➤ Farmers observe the field for presence of insect pest and disease, their nature of damage and control measures.</li> <li>➤ Farmers present the findings and propose control measures.</li> </ul>	<ul style="list-style-type: none"> <li>○ Second dose of Nitrogen is applied. (May be 1/3 or 1/2 of N depending on recommendation in the area).</li> <li>○ Farmers observe and count the number of insects per plant or per unit area and ETL is decided</li> <li>○ Farmers install pheromone traps in the field.</li> </ul>
XII	<ul style="list-style-type: none"> <li>➤ Farmers observe the crop condition in the field and observe insect, pest and diseases.</li> <li>➤ Farmers discuss the concept of IPM among themselves</li> <li>➤ Farmers discuss the extent of insect pest and diseases and find out if the ETL has reached or not.</li> <li>➤ Farmers may indicate what pesticides to be used to control the insect, pest and diseases present in the field.</li> <li>➤ Farmers discuss the nature of damage done by rodents and how to control them?</li> </ul>	<ul style="list-style-type: none"> <li>○ Second weeding is done using rotary weeder.</li> <li>○ Number of insects per plant/per unit area are calculated to find out ETL</li> <li>○ Pesticides may be sprayed to control the insect, pest and diseases</li> </ul>
XIII	FIELD VISIT	

<b>Week</b>	<b>Structured Questions</b>	<b>Hands on Activities</b>
XIV	<ul style="list-style-type: none"> <li>➤ Do you know what are the harmful effects of applying excessive nitrogen particularly during flowering?</li> <li>➤ Farmers observe the crop condition in the field and observe the presence of insect, pest and diseases.</li> <li>➤ Do you know what is insect net/sweep net and how to use it?</li> <li>➤ They observe the damage done by these pests and symptoms of diseases.</li> <li>➤ Farmers present their findings about insect pest and diseases as well as for useful insects.</li> </ul>	<ul style="list-style-type: none"> <li>○ Third dose of N is applied.</li> <li>○ Number of insects per plant/per unit area are calculated.</li> <li>○ Pheromone traps are examined</li> <li>○ Use of insect net is practiced.</li> <li>○ Identify the useful insects</li> <li>○ Farmers to count live burrows per unit area and apply chemicals to control them.</li> </ul>
XV	NO SCHOOL	
XVI	<ul style="list-style-type: none"> <li>➤ Do you keep your own seed for next year?</li> <li>➤ How do you handle the plot meant for seed Production?</li> <li>➤ What is the correct stage of harvesting and threshing?</li> <li>➤ Discussion on IPM continues.</li> </ul>	<ul style="list-style-type: none"> <li>○ Rouging is done in the seed Plot.</li> <li>○ IPM activities continue.</li> <li>○ Pheromone traps are examined</li> </ul>
XVII	NO SCHOOL	
XVIII	<ul style="list-style-type: none"> <li>➤ Discussion on method of seed multiplication continues</li> <li>➤ Discussion on IPM activities.</li> </ul>	<ul style="list-style-type: none"> <li>○ One more rouging for the seed production plot may be done</li> <li>○ Some activities of IPM may take place. Pheromone traps are examined</li> </ul>
XIX	<ul style="list-style-type: none"> <li>➤ Farmers to discuss the stage of harvesting. What are the disadvantages of delayed harvesting?</li> <li>➤ Information about storage and marketing is Discussed</li> </ul>	<ul style="list-style-type: none"> <li>○ some activities concerning Plant protection may be undertaken.</li> <li>○ Harvesting and threshing of the crop takes place.</li> </ul>
XX	FIELD DAY	

<b>Week</b>	<b>Structured Questions</b>	<b>Hands on Activities</b>
XXI to XXIV	FFS is scheduled depending on the crop stage ➤ Discussion on Harvesting and Threshing may take place.	FFS is scheduled depending on the crop stage. ○ Actual Harvesting and Threshing takes place.
XXV	<ul style="list-style-type: none"> <li>➤ How the crop was harvested and threshed?</li> <li>➤ When the crop was sent or will be sent to market?</li> <li>➤ What are the advantages taking the produce directly to market after threshing?</li> <li>➤ Do you get the produce cleaned before selling? If yes where do you get the produce cleaned?</li> <li>➤ How do you and for how long dry the produce?</li> <li>➤ Technical Adoption Questions from the questionnaire at annexure-IV may be filled again by these farmers to assess the impact of Farmers' Field School on knowledge and understanding of participating farmers.</li> </ul>	

**Assistance available to farmers under National Food Security Mission-Rice**

**1.Demonstrations:** There will be one demonstration of 0.4 hectares for every 100 hectares of area in the identified districts. The demonstration is to be conducted in a contiguous block by putting an equal area under farmer's practices. These demonstrations can be for

- i. Improved Package of Practices
- ii. System of Rice Intensification (SRI)
- iii. Hybrid Rice.

Assistance is provided to selected farmers for organising demonstrations on their fields. Seeds and other critical inputs required for the conduct of these demonstrations is provided free of cost well in time. Suitable placards indicating:

- i. Name of the farmer
- ii. Type of demonstration or objective of demonstration
- iii. Name of variety
- iv. Amount of inputs used such as Fertilizer, micronutrients and lime etc
- v. Date of sowing/transplanting.
- vi. Spacing- line-to-line and plant-to-plant.

**1.1. How to participate in these demonstrations:** Interested farmers may contact Block Agriculture officer or District Agriculture officer for conducting a demonstration on his/her fields.

**2. Distribution of Seed Minikits:** Minikits are meant for introduction and popularisation of latest released/pre-released varieties and their propagation among the farmers. Each minikit is of 5 Kg seed, which is supplied to selected farmers free of cost. One minikit will be distributed for every 50 hectare of rice area. Only one minikit of 5 kg each is to be given to one farmer.

**2.1 How to participate in seed minikit programme:** Selection of beneficiaries for distribution of seed Minikits will be done in consultation with village panchayats and Zila Parishads . Interested farmers may contact village panchayats/Zila Parishads or Block Agriculture officer/District Agriculture officer for registering his/her participation in the seed minikit programme.

**3. Subsidy for purchase of seed:** Seeds of approved varieties and Rice Hybrids will be supplied to farmers at subsidised rates. Extent of subsidy will be Rs 20/kg in case of Hybrids of rice and Rs.5/kg in case of varieties. This assistance will be available only for those varieties/hybrids, which were released during the last 15 years. The seed producing agencies (National Seed Corporation/ State Farm Corporation of India/State seed corporations/State Agricultural Universities/Private seed Producing agencies) authorised

by the state will distribute this seed in the identified districts. These agencies will reduce the cost seed to the extent of subsidy provided by the government.

**3.1 How to avail subsidy for seed:** Selection of beneficiaries for distribution of seed will also be done in consultation with village panchayats and Zila Parishads . Interested farmers may contact village panchayats/Zila Parishads or Block Agriculture officer/District Agriculture officer for obtaining the quality seed of rice varieties and rice hybrids.

**4. Assistance for micronutrients in Rice:** An assistance of Rs.500/- per ha or 50% of the cost of micronutrients, which ever is less, will be given to the farmers. The farmers once given assistance will not be eligible to get the assistance for the same land next year.

**5. Assistance for application of Lime in Rice:** An assistance of Rs.500/- per ha or 50% of the cost, which ever is less, will be given to those farmers whose soil is acidic. The farmers once given assistance will not be eligible to get the assistance for the same land next year.

**6. Assistance for purchase of farm machines:** Assistance for purchase of zero-till-seed drill / seed drill / multi crop planter/power weeder @ Rs.15,000.00 per farmers; Rotavator @ Rs.30,000 or 50% of the cost which ever is less.

**7. Assistance for purchase of pump sets:** An assistance of 50% of the cost of the pump sets or Rs 10,000/per pump set of up to 10 H.P per farmer, whichever is less, would be provided under the programme. The pumps must be ISI Standard or certified by Farm Machines Training Institute of GOI, CIAE, Bhopal or SAUs.

**8. Assistance for purchase of Conoweeders, Knap Sack Sprayers and other farm implements:** Assistance for the purchase of Cono weeders and other implements will be provided @ Rs.3000/- or 50% of the cost of these implements which ever is less.

**9. Assistance for Plant Protection Chemicals and Bio-pesticides for Rice:** Assistance for the promotion of Integrated Pest Management, including plant protection chemicals and bio-pesticides is provided to all farmers in the identified districts. The assistance is limited to a maximum of two ha per farmer.

**10. Assistance for conducting Farmer Fields School:** Training of farmers on FFS Pattern will be organised in the identified districts. The objective of the FFS is to provide first hand information to the farmers in their field to enable them to adopt the best crop production/crop protection technologies for higher production and productivity

## ANNEXURE-IV

### **A model questionnaire for conducting base line survey about the extent of production technology being adopted by the farmers.**

Questionnaire: Socio-Economic and other information of a Farmer

Name of the farmer:	
Address of the farmer:	
Education level:	
Number of family members including your self?	
Which is the KVK or other research station near to you and how far is it?	
Have you ever visited this station? If so when and why?	
Which of the following items he posses:	Telephone/ Mobile phone /TV / Scooter/motorbike /Car
Size of Land Holding:	
Extent of Irrigated Area	
Extent of Rainfed area	
Source of Irrigation:	
Do you knows how a soil sample is taken?	
When did you get the soil tested?	
From which laboratory the soil was tested?	
What were the results?	
In your opinion did you get some benefit for getting soil analysed?	
Crops being grown / Crop Rotation adopted by you?	
What agricultural machinery you own?	

### Technology Adoption Questionnaire

Question	Farmers Practice	Recommended Practice
From where do you buy the seed?		
Name the varieties being grown by you and Why?		
Which are the other varieties available in the area?		
Do you grow Hybrid rice? If yes name the hybrid?		
What Seed Rate (Kg/Ha) do you use?		
Do you know how to select healthy seed through water treatment? If yes do you use this technique? If no why?		
Do you know how to treat seed against diseases?		
Have you ever did the seed treatment? If yes do you use this technique? If no why?		
Do you use pre-germinated or not for raising nursery?		
Which method of raising nursery do you use? Dry or wet? Raised bed or flat?		
Quantity and type of Fertiliser used in nursery?		
Quantity and type of Micronutrients applied to Nursery?		
Do you split the N application for raising nursery.? If yes how?		
What Plant Protection measures are taken in Nursery?		
At what age seedlings are transplanted?		
Method of Field Preparation for transplanting?		
Do you use any Soil amendments Lime/gypsum		

What kind of and in what quantity fertilizer is applied to rice?		
In how many doses you apply N		
Do you use Micronutrients in the main field? If yes which and how much		
How do you transplant rice: in lines or at random?		
No. of hills per unit area		
No. of plants per hill.		
Method of weeding		
Hand weeding		
Use of rotary weeder		
Use of herbicides. If yes which herbicide and how it is applied?		
Common insects and their control measures		
Common Diseases and their control measures		
What are your expectations from this season long exercise of Farmers' Field School?		



**Integrated Pest Management**

A number of insect, pests and diseases attack rice plant at different growth stages. Rice crop can be protected from these pests by a number of ways such as use of resistant varieties, use of insecticides, cultural methods and by bio-control means. However, a single approach to insect pest control may not be the best on long term basis. Insects develop resistance to insecticides and new biotypes evolve to attack resistance varieties. Continuous use of insecticides may harm the environments and kill natural enemies, thus changing minor pests to major pests. Some of the insect pests and diseases are of national importance while others are important in different regions. A list of these insects' pests and diseases is given below:

**List of Insects pests of National and Regional Importance<sup>3</sup>**

**MAJOR PESTS:-**

**A. Pest of National Significance:**

**1. Insect- pests**

- 1.1 Yellow stem borer (*Sciropophaga insertulas*)
- 1.2 Brown plant hopper (*Nilaparvata lugens*)
- 1.3 Gallmidge (*Orseolia oryzae*)
- 1.4 Leaf folder (*Cnaphalocrosis medinalis*)
- 1.5 White backed planthopper (*Sogatella furcifera*)

**2. Diseases**

1. Rice blast (*Pyricularia oryzae*)
2. Sheath blight (*Rhizoctonia solani*)
3. Bacterial leaf blight (*Xanthomonas campestris pv oryzae*)

**3. Weeds**

- 3.1 *Panicum* spp.
- 3.2 *Echinochloa* spp.
- 3.3 *Cyperus* spp.

**4. Rodents**

- 4.1 Smaller bandicoot (*Bandicota bengalensis*)
- 4.2 Soft furred field rat (*Millardia meltada*)
- 4.3 Field mice (*Mus* spp)

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<sup>3</sup> Adapted from Integrated Pest Management Package for Rice A publication of Government of India, Ministry of Agriculture, Directorate of Plant Protection, Quarantine & Storage, Faridabad.

## B. Pest of regional significance:

### 1. Insects

- 1.1 Gundhi bug (*Leptocorisa varicornis*) – Mainly in upland rice in Bihar, Madhya Pradesh, Orissa, Uttar Pradesh and West Bengal.
- 1.2 Rice hispa (*Dicladispa armigera*)- Bihar, West Bengal, Assam, Orissa, Meghalaya, Miroram, Tripura, Punjab, Himachal Pradesh, Uttar Pradesh and Uttaranchal.
- 1.3 Green leafhopper (*Nephotettix* sp.) – Bihar, West Bengal, Assam, Orissa, Madhya Pradesh, Andhra Pradesh, Tamil Nadu and Punjab.
- 1.4 Climbing cutworm/Rice Ear Cutting Caterpillar/Armyworm (*Mythimna separata*)- In coastal rice growing areas, Haryana, Punjab and Uttar Pradesh.
- 1.5 Caseworm (*Nymphula depunctalis*) – In low lying and water logged areas.
- 1.6 Swarming caterpillar (*Spodoptera mauritia*) – Punjab, Orissa, West Bengal.
- 1.7 Thrips (*Baliothrips biformis*) – In upland rice in Orissa, Andhra Pradesh, Madhya Pradesh, Punjab, Haryana, Assam, Tamil Nadu.
- 1.8 Termite (*Odontotermes* spp.) – In rainfed upland areas, irrigated rice-wheat system.
- 1.9 Mealy bug (*Ripersia oryzae*) – In upland rice in Uttar Pradesh, Bihar, West Bengal, Orissa, Madhya Pradesh, Tamil Nadu, Kerala, Pondicherry, Karnataka.
- 1.10 Root weevil (*Echinochemus oryzae*) – Haryana, Punjab, Tamil Nadu.
- 1.11 Mites (*Oligonychus oryzae*) – Andhra Pradesh, Orissa.

### 2. Disease

- 2.1 Sheath rot (*Sarocladium oryzae*)
- 2.2 Rice Tungro Virus.
- 2.3 Brown spot (*Helminthosporium oryzae*) – In upland and ill drained low land.
- 2.4 False smut (*Ustilaginoidea virens*)
- 2.5 Udbatta (*Ephelis oryzae*) – In Karnataka, Orissa.
- 2.6 Bacterial leaf streak (*Xanthomonas translucens* f. sp. *oryzicola*)
- 2.7 Grassy stunt virus – in Kerala.

### 3. Weeds

- 3.1 *Commelina bengalensis*
- 3.2 *Eclipta alba*
- 3.3 *Ischaemum rugosum*
- 3.4 *Eleusine indica*
- 3.5 *Amaranthus spinosus*
- 3.6 *Monochrea vaginalis*
- 3.7 *Digitaria sanguinalis*
- 3.8 *Fimbristylis littoralis*

4. **Rodents** : Indian gerbil (*Tatera indica*) – upland rice.

## 5. Nematodes

- 5.1 Root knot nematode (*Meloidogyne graminicola*) – West Bengal, Assam, Orissa & Tripura, Eastern Uttar Pradesh, Karnataka, Himachal Pradesh.
- 5.2 Whitetip nematode (*Aphelenchoides besseyi*)
- 5.3 Ufra (*Ditylenchus angustus*) – West Bengal and Assam.
- 5.4 Rice root nematode (*Hirschmanniella oryzae*)
- 5.5 Cyst nematode (*Heterodera oryzae*)- in Kerala only.
- 5.6 Root lesion nematode (*Pratylenchus indicus*) – upland Orissa.

**Integrated Pest Management (IPM)** technology advocates the management of the pest population in such a manner that economic loss is avoided and adverse side effects of chemical pesticides are minimized. The IPM package encompasses various management strategies for containing the pest and disease problem. Pest monitoring is one of the important components of IPM to take proper decision to manage any pest problem. It can be done through Agro-Ecosystem Analysis (AESAs), field scouting, light, pheromone, sticky/yellow pan traps. The economic threshold levels (ETL) of important pests and disease is given in table 1. Appropriate control measures need to be taken when pest population crosses these levels.

IPM technology manages the pest population in such a manner that economic loss is avoided and adverse side effects of chemical pesticides are minimized. The IPM package encompass various management strategies for containing the pest and disease problem. Pest monitoring is one of the important components of IPM to take proper decision to manage any pest problem. It can be done through Agro-Ecosystem Analysis (AESAs), field scouting, light, pheromone, sticky/yellow pan traps.

**Table1. Economic Threshold Levels (ETLs) of various insect pests and diseases**

<b>S. No.</b>	<b>Crop Stage and pest</b>	<b>Economic Threshold Levels (ETLs)</b>
<b>A.</b>	<b>Nursery:</b>	
	1. Green leafhopper	1-2 insects/hill in Rice Tungro Disease (RTD) endemic areas
	2. Gall midge	1 silver shoot (gall)/sqm.
	3. Stem borer	1 moth or 1 egg mass/sgm.
<b>B.</b>	<b>Planting to pre-tillering :</b>	
	1. Leaf folder	1 freshly damaged leaf/hill or 10% damaged leaves.
	2. Yellow stemborer	5% dead-hearts or one egg mass or one moth/sqm.
	3. Gall midge	1 gall/sqm in endemic areas or 5% affected tillers in non-endemic areas
	4. Brown Planthopper	5 to 10 insects/hill
	5. Green leafhopper	10-15 insects/hill (in RTV endemic areas 2 insects/hill)
	6. White backed planthopper	5-10 or more insects/hill
	7. Rice hispa	2 adults or 2 damaged leaves/hill
<b>C.</b>	<b>Mid tillering:</b>	
	1. Leaf folder	1-2 freshly damaged leaves/hill
	2. Stem borer	5% dead hearts or 1 egg mass or 1 adult/sqm
	3. Gall midge	5% silver shoots
	4. Brown planthopper	5 to 10 insects/hill
	5 Green leafhopper	10-20 insects/hill (2 insects/hill in RTD endemic areas)
	6. Hispa	1 adult or 1-2 damaged leaves/hill or 10% damaged leaves
	7. Blast	5-10% disease severity
	8. Bacterial leaf blight	2 to5% disease severity
	9. Sheath blight	5% or more affected tillers
	10. Tungro	1 affected hill/sqm. And 2 GLH/Hill
<b>D.</b>	<b>Panicle initiation to booting:</b>	
	1. Stem borer	1 egg mass or 1 moth/sqm. Or 5% dead hearts
	2. Leaf folder	1-2 freshly damaged leaves/hill or 10% damaged leaves
	3. Green leafhopper	20 insects/hill
	4. Brown planthopper	5 to 10 insects/hill
	5. White backed planthopper	5 to 10 insects/hill
	6. Blast	2-5% leaf area damaged
	7. Bacterial leaf blight	2-5% disease severity
	8. Sheath blight	5% or more tillers affected
<b>E.</b>	<b>Flowering and after:</b>	
	1. Brown planthopper	5 to 10 insects/hill
	2. Climbing cutworm/Rice ear cutting caterpillar/ Armyworm	4-5 larvae/sqm.
	3. Gundhi bug	1-2 bugs/hill
	4. Blast	5% leaf area damaged or 2% neck blast
	5. Sheath rot/brown spot	2-5% tillers affected
	6. Sheath blight	5% or more tillers affected

## **General Recommendation Regarding Safe Use of Pesticides and First -Aid Precautions**

### **Purchase:**

1. Do not purchase pesticides without proper/approved LABELS
2. Read the label carefully and follow the manufacturer's instructions
3. Purchase only JUST required quantity of pesticide for a single application.
4. Do not purchase leaking containers, loose, unsealed or torn bags.

### **Storage:**

1. Avoid storage of pesticides in the house premises.
2. Keep pesticides in labelled, original containers with intact seal only.
3. Do not transfer pesticides to other containers.
4. Store pesticides in a safe and locked place, out of the reach of children, irresponsible persons and pets.
5. Never store pesticides near food/feed/fodder or medicines.

### **Handling:**

1. Never carry/transport pesticides along with food material.
2. Avoid carrying bulk pesticides (dust/granules) on head, shoulder or on the back.
3. Do not tear open the pesticides bags, but cut them with knife.
4. In the handling of pesticides, the necessary protective clothing and devices must be used.

### **Precautions for preparing spray solution:**

1. Use clean water
2. Always protect your NOSE, EYES, MOUTH, EARS and HANDS.
3. Use hand gloves, face mask and cover your head with a cap.
4. Use polythene bags as hand gloves, handkerchief or piece of clean cloth as mask and a cap or towel to cover the head. (Do not use polythene bag contaminated with pesticides).
5. Read the label on the container before preparing spray solution.
6. Prepare spray solution as per instructions.
7. Prepare spray solution as per requirement.
8. Concentrated pesticides must not fall hands etc. while opening sealed containers.
9. The preparation of spray solutions from concentrated pesticides should be done in drums using long sticks to protect the operation from splashing and to permit stirring from a standing position.
10. Do not mix granules with water.
11. Avoid spilling of pesticide solution while filling the sprayer tank.
12. Do not smell the spray tank.
13. Do not blow, suck or apply your mouth to any sprinkler, nozzle or other spraying equipment.

14. The sprayer should use cotton cloths, trousers and full sleeve shirts, rubber boots, gloves and goggles. They should be washed and changed as frequently as possible.
  15. Do not eat, drink, smoke or chew while preparing solution.
  16. A worker suffering from cold or cough should not be engaged for spraying.
  17. Spray should always be done in direction of the blowing wind to avoid skin exposure and inhalation.
  18. Operator should not work more than eight hours a day.
  19. Wash hands thoroughly with soap and water.
- Every time the sprayer duster is filled with pesticides,
  - Before eating, drinking or smoking and
  - At the end of the day's work

### **Equipment:**

1. Select right kind of equipment.
2. Do not use leaky, defective equipment.
3. Select right kind of nozzle.
4. Do not use same sprayer for herbicides and insecticides.

### **Disposal:**

1. Left over spray solution, water contaminated, as a result of washing the equipment and drums, must be disposed off by scattering it over barren land, if possible.
2. DO not use empty containers of pesticides for any purpose. Destroy them by making holes and bury them afterwards.
3. Do not burn herbicide cartons, but burn them deep

### **FIRST -AID PRECAUTIONS:**

In case of pesticide poisoning, call a physician immediately. Awaiting the physician apply the FIRST-AID:

#### **1. Swallowed Poisons:**

- Remove poison from the patient's stomach immediately by inducing vomiting. Give one teaspoonful (15g) common salt in a glass of warm water (emetic) and repeat until the vomit fluid is clear. Gentle stroking or touching the throat with a finger or placing the blunt end of spoon will help induce vomiting when the stomach is full of fluid.
- If the patient is already vomiting, do not give common salt in warm water but give a large amount of warm water and follow specific directions as suggested. DO not induce vomiting if the patient is in a coma.

## **2. Inhaled Poison:**

- Carry the patient ( do not let him walk) to fresh air immediately.
- Open all doors and windows.
- Loosen all tight cloths
- Apply artificial respiration if breathing has stopped or is irregular. Avoid vigorous application of pressure to the chest
- Cover the patient with a blanket
- Keep the patient as quite as possible
- If the patient is convulsing, keep him in bed in some dark room
- Avoid any jarring noise
- Do not give alcohol in any form.

## **3. Skin Contamination:**

- Drench the skin with water (giving shower with a hose or pump)
- Apply a stream of water to the skin while removing clothing.
- Cleans the skin thoroughly with water.
- Rapid washing is most important for reducing the extent of injury

## **4. Prevention of Collapse:**

- Cover the patient with a light blanket.
- Do not use a hot-water bottle.
- Raise the feet of the patient on the bed.
- Apply elastic bands to arm and legs.
- Give strong tea or coffee
- Give hypodermic injection of stimulants, such as caffeine and epinerphrine.
- Give fluid administration of dextrose, 5 per cent intravenously.
- Give blood or plasma transfusion.
- Do not exhaust the patient by too much or too vigorous treatment.

## **5. Eye Contamination:**

- Hold eyelids open.
- Wash the eyes gently with stream of running water immediately. A delay of even a few seconds greatly increases the extent of injury.
- Continue washing until the physician arrives.
- Do not use chemicals. They may increase the extent of injury

Source: Package of Practices for Crops of Punjab. Kharif 2007. Punjab Agricultural University, Ludhiana. Pp.206-208.

Integrated Pest Management Package for RICE. Directorate of Plant Protection, Quarantine and Storage, Government of India Faridabad.

