

Establishing a nursery

A nursery that has been carefully established will produce uniform and vigorous rice seedlings that can be uprooted easily for transplanting (Reference 13). This module deals mainly with the technical aspects of establishing a good nursery. It is strongly recommended that a practical session in the field be included. Note that the planning of all field preparations, including seedling-nursery establishment will be addressed in Module 9.

- ❶ Summarize notions of quality seeds.
- ❷ Discuss farmers' current practices in nursery establishment and give advice if necessary.
- ❸ Observe farmer practices and demonstrate how to lay out a nursery.



Learning objectives

At the end of this module, farmers will:

- Be able to understand how to establish a good nursery and produce high-quality seedlings (vigorous, hardy stem, green, adequate root development, etc.).
- Be able to establish rice nurseries according to the land area to be transplanted.
- Choose a suitable location within their fields for volunteer farmers to set up a nursery for the varietal selection experiment (Module 5).



Procedure

1. Farmers and the PLAR-IRM team meet at the PLAR-IRM Center. The facilitator briefly reviews the previous module and invites farmers' feedback.
2. One of the PLAR-IRM team members explains the learning objectives and procedures for the current module.
3. Review of farmers' notions of quality seed (Module 5):
 - Farmers are invited to list the characteristics of good-quality seeds. If necessary, the facilitator adds aspects of homogeneous shape and color, purity versus contaminated seeds.
 - The facilitator summarizes the importance of conducting a germination test before sowing. Experienced farmers are invited to explain how they carry out germination tests.
 - Farmers summarize their seed-priming practices and the facilitator highlights the importance of seed priming, if necessary (Reference 13).
4. Discussion of different farmers' practices for laying out nursery beds. The facilitator addresses the topics below through questions on farmer experience. Care should be taken to adequately cover the various experiences and practices that exist among farmers, by asking whether there are farmers who have a different opinion or other experiences or practices. The facilitator should ensure that farmers explain why they have a certain opinion or practices.

Module 8

Establishing a nursery

- Site selection:
 - the facilitator introduces the following elements:
 - the site can be in the valley bottom, hydromorphic zone or uplands—consider aspects of drainage, irrigation, protection against theft, distance between the nursery and the transplanting area, etc.,
 - protection against predators,
 - shading by large trees and their effects on plant vigor,
 - soil type and consequences on plant vigor, ease of uprooting the seedlings, etc.

If necessary, the facilitator pays special attention to the following aspects: the requirements for sunlight, water, air and good soil to produce healthy seedlings.

- Seedbed laying out and sowing: The facilitator introduces the following notions:
 - seedbed length, width and height,
 - seedbed position in relationship to the slope,
 - leveling: horizontal level of the seedbed,
 - texture of the topsoil,
 - sowing option: broadcast, in rows; wet or dry seeding,
 - seedbed covering and protection.



If necessary, the facilitator focuses on the so-called 'standard' bed area to calculate the total requirement of nursery area, as well as on the need for homogeneous moisture distribution over the whole bed so as to ensure optimal and homogeneous germination.

- The facilitator pays special attention on how to determine the quantity of seeds to sow and the nursery area based on the area to be transplanted (refer to Reference 16):
 - The facilitator asks farmers if they generally produce too many, not enough or just enough seedlings. Farmers share their experience in estimating the seed quantity used and the nursery area based on the area to transplant;
 - On a large sheet, a three-column table is drawn with these headings: area to transplant, nursery area, and seed quantity;
 - The facilitator invites a few volunteer farmers to give details on surface areas of their nursery beds and the quantity of seeds they use. In the first column, the surface area of the field to be transplanted is noted, followed by the nursery area and the quantity of seeds required;

Field area to be transplanted (m ²)	Nursery area to be established (m ²)	Quantity of seeds to be sown (kg)
1000	20	4
...
2500	50	10

- The facilitator introduces the idea of using a standard area for a nursery corresponding to a standard area to be transplanted—a nursery area of 50 m², using 10 kg of good-quality seeds can be used to transplant 2500 m²;
 - Farmers discuss the differences between farmer practices and ‘standards,’ and modify the table as necessary.
5. Farmers and the facilitator go to the field to observe and comment on farmers’ practices in establishing a nursery. They also take part in the demonstration of actual nursery establishment. First, farmers observe and comment on an existing seedling nursery. The facilitator leads the discussion by addressing the following topics:
- The choice of location and conditions: light, space, protection, soil type.
 - The position, shape and size of the seedbed.
 - The texture of the topsoil of the seedbed.
 - The quality of seeds used and the germination capacity.
 - Establishment of a good seedbed. The key elements for the establishment of a good seedbed are addressed, namely:
 - The location and establishment conditions: flat ground next to a source of water and to the field to be transplanted;
 - Transplanting the bed: 1 m × 10 m; length perpendicular to the slope;
 - Digging drainage–irrigation furrows all around the area transplanted, and leveling the seedbed with the soil from the furrow;
 - Hand-tillage and turning of the soil with the hand-hoe. The bed is preferably raised by 5–10 cm. However, on heavier soils and when the land is well leveled, it is not necessary to raise the bed. In that case, the soil from digging the drainage–irrigation furrow is not placed on the bed but outside the bed, thereby constructing a small bund. The level of the bed should, however, be higher than the lowest level of the furrow to enable irrigation and drainage;
 - Puddling and leveling of the seedbed;
 - Broadcast sowing of primed seeds and light (gentle) compaction; to facilitate compaction it is recommended that the primed seeds are ‘thrown’ on the seedbed in such a way that they more or less stick to the soil and are therefore less likely to be washed away by irrigation water;



Module 8

Establishing a nursery

- Covering of the seedbed with rice straw, topsoil, etc.;
 - Moisture conservation.¹
6. The facilitator returns to the variety test (Module 5, Section 10). He/she specifies that farmers participating in this experimentation (i.e. the group of farmers conducting experiments) delimit part of the nursery bed for each variety tested. The farmer labels the varieties by putting the label tag in a plastic bag, which is tied to a stick beside each variety.
 7. Back at the PLAR-IRM Center. Evaluation: the facilitator asks what the farmers appreciated (or did not appreciate), what they learnt, and what they intend to do with their newly obtained knowledge.
 8. The facilitator asks volunteer farmers to conclude the session, and then invites farmers to the next session.



Time required

- Two–three hours



Materials required

- Flipchart pad and markers; shovel or hoe; rope and pegs.
- Two kilograms of primed rice seeds; rice straw.

Box 8

Farmers of Bamoro said that they generally produce too many seedlings. They concluded that, in fact, they use too many seeds. A key reason is that they did not know the quantity of seeds they should use in relation to the surface area to be transplanted. Moreover, farmers did not know the viability of their seeds because they did not generally conduct a germination test. They, therefore, compensated for possible inadequate germination by increasing the quantities of seed sown.

After the discussions, farmers—accompanied by the PLAR-IRM team—went to a selected site. Farmers were asked to make observations on a nursery already sown on that field. There were many problems with the seedbed: it was improperly made, oriented in the direction of the slope, and not quite uniform in width; one end was therefore drier than the other. Besides, seed distribution in the bed was not homogeneous. Seeds had been eaten by birds. The standard seedbed dimensions were not respected; the female farmer had made a nursery bed of 2 m × 6 m; furthermore, the seedbed was not high enough to protect plants in case of heavy rain.

After these observations, a demonstration was made of the establishment of a seedbed to serve as an example of how to make a good seedbed. With a one-meter stick, a bed was made of 1 m × 10 m and 15-cm height: higher to reduce risks of flooding, and narrower to make it potentially easier to water; primed seeds were sown and covered with a light layer of sand; the seedbed was also covered with straw for the first 5 days. The dimension of 10 m enables easily calculation of the number of nursery beds needed for the area of a given field. After demarcating the area of the seedbed, furrows were made around the seedbed. Next, grasses were removed and the seedbed was tilled with a hand-hoe, producing a loose topsoil layer.

1. For one week after sowing, keep a 3–5 cm water layer.