

Managing experiments, making observations and recording information during the vegetative phase

This module is specifically designed for the group of farmers conducting experiments, and refers to the experiments initiated during previous modules. In this module, two different experiments are covered: one concerns the new varieties introduced in Module 5 and the other the alternative fertilizer doses introduced in Module 10. It should be clear that this module could be adapted to any other type of field experiment. Module 19 also refers to Section 7 of Module 12, which addresses the establishment of experiments. Apart from the management aspects, this module also deals with making observations and recording information specifically from the experiments. It is important to mention that the observations and recording discussed in this module do *not* concern the IRM field; the IRM field is dealt with in Modules 11, 14, 18 and 23.

Module 19 and Module 24 form another set of modules designed to provide detailed information on the implementation and monitoring of farmers' experiments (*see also* Reference 17). In addition to this general recording form, the facilitator may plan to collect other detailed experimental data from the farmer-led experiments. In that case, other data-recording forms must be designed for the researcher's use.

- ❶ Recall the experimental objectives, design and treatments.
- ❷ Summarize the progress in the implementation of the experiments.
- ❸ Make field observations.
- ❹ Synthesize the observations in plenary session.
- ❺ Introduce pair-wise comparison for the experimental treatments.
- ❻ Introduce the recording of information and recording forms for the experiments.



Learning objectives

At the end of this module, farmers will:

- Have reviewed the different treatments of the experiments being implemented by farmers.
- Be able to decide on the management practices to carry out in the experimental fields.
- Be able to decide on the observations and records to be made for the current experiments.
- Know how to record the information on a pre-established recording form.



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. The facilitator asks if the farmers have put in place any new practice on their IRM fields.
2. One of the PLAR-IRM team members explains the learning objectives and procedures for the current module. The facilitator clearly indicates that this module does not deal with the IRM fields, but with experimentation and therefore specifically addresses the group of farmers who are conducting experiments.

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3. The farmers recall the experimental objectives, design and treatments for each experiment:
 - Objectives and hypotheses: what is the aim of the experiment and what do we want to learn through this experiment?
 - What are the treatments used in the experiment: what varieties are compared or what alternative fertilizer doses are compared? What is the control treatment?
 - For the fertilizer experiment, the facilitator should check what the farmers know about plant nutrients (N, P, K) and their role in plant nutrition.
4. The facilitator and the farmers discuss the progress made in setting up the experiments, and prepare a table with the names of the farmers and the key dates for action in each experiment.

Example of a summary table

<i>Type of experiment: e.g. varietal test on iron toxicity</i>				
Farmer's name	Sowing date	Transplanting date	Observations	
...				
<i>Type of experiment: e.g. inorganic fertilizer doses</i>				
Farmer's name	Sowing date	Transplanting date	Date 1 st urea application	Date 2 nd urea application
...				

This table allows each farmer to identify the interventions to be carried out during the coming weeks. It also allows them to choose the fields to be visited by the PLAR-IRM team.

5. The facilitator leads a discussion on the importance of regular observation of the experimental fields and the necessity to develop performance indicators, which allow comparison between treatments.
6. The facilitator explains the *procedure* for making observations on the experiments:
 - A farmer-facilitator and a farmer-rapporteur are chosen for each sub-group.
 - Each sub-group of farmers will visit the four experimental sites—if there are two types of experiments, two fields for each experiment will be visited.
 - Farmers in each of the sub-groups will make field observations:
 - The farmers will observe and judge the overall performance of the field and the crop: soil, water, cleanliness of field and bunds (i.e. absence of weeds), plant health status and plant development stage as compared to surrounding fields;
 - The farmers will make comparisons between the treatments and with the control treatment, and decide on the ‘comparison indicators’ (e.g. color, height, stem vigor, tillering, vegetative cover);



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- The farmers will discuss the reasons for these different results: is there a relation between the treatments and the experimental factors, or are the differences based on other factors such as management practices or environmental conditions?
7. The farmers who are conducting experiments and the facilitator depart to the field to visit the four experimental sites, previously identified by the facilitators.
 - The facilitator helps the farmer-facilitator if necessary.
 - The farmer-rapporteur takes notes.
 8. Back at the PLAR Center, the farmers report, summarize and comment on their results.
 - The farmer-rapporteur of the first sub-group presents the results of the first site: (i) overall performance of the field, environment and plants, (ii) ‘comparison indicators’ between treatments, (iii) causes of differences between treatments.
 - The facilitator synthesizes the results in the four-column table.

Example: Experiment 1:...

Overall performance	Comparison indicator	Cause of difference between treatments
Field 1		
Field 2		

- After summarizing the information for the first experiment (Field 1), the second experiment (Field 2) is dealt with.
9. The facilitator then introduces the pair-wise comparison method: he/she prepares a matrix table with the treatments in rows and columns.

Matrix for pair-wise comparison of treatments (to do for each type of experiment)

	Treatment 1	Treatment 2	Treatment 3	Treatment 4
Treatment 1				
Treatment 2				
Treatment 3				
Treatment 4				

For each white cell, the farmers' preference from the pair of treatments compared is recorded.

- Farmers are invited to identify the best treatment for each pair, and this choice is recorded in the corresponding cell. It is clear that the opinions of the farmers may differ. When this is the case, it is possible to record the number of farmers choosing one treatment rather than the other.
- The farmers discuss the reasons for their choices.

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10. The facilitator leads a discussion on the benefits of recording information about the experiments. The farmers decide what information they want to record:
 - Information about the management practices:
 - dates of: sowing, transplanting, fertilizer application, weeding, insecticide application, irrigation, etc.
 - Information about the comparison indicators between treatments (e.g.):
 - color, vigor, height, health, plant density;
 - tillering;
 - cleanliness of field.
11. The facilitator introduces a recording form for each type of test. This form should be simple enough to allow the farmers to record their data with the help of the facilitator or any other field agent. This form consists of a single page and will be filled in during the session for Module 24.

An example of a recording form is shown on the facing page; nevertheless this form will have to be adapted to the type of experiment and to the information that the farmers and the facilitator decide to record. The form consists of three parts:

- Data about management practices, mainly the dates of interventions (leave empty rows to be filled-in during session on Module 24).
- Data on comparison observations (leave empty rows to be filled-in during session on Module 24).

The pair-wise comparison matrix of treatments (two: one to fill in during the vegetative phase and the other during the maturity–harvest phase; *see* Module 24).





For practical reasons, a draft form can be presented during this session, but will have to be finalized by the facilitators after the session. Each farmer participating in the test receives a copy. Keep in mind that the farmers should always bring their recording forms when coming to the PLAR-IRM Center.

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Example of a recording form (to establish for each type of test)

Name:	Sex: Male? Female?
Village:	Age:
Inland valley site:	

	Treatment 1	Treatment 2	
Management practices			
Sowing date			
Transplanting date			
Fertilizer application: - 1: Date/type/quantity - 2: Date/type/quantity - 3: Date/type/quantity			
Weeding: - 1: Date - 2: Date			

Comparison observations

Color of plants			
Vigor of plants			

Pair-wise comparison matrix of treatments (vegetative phase)

	Treatment 1	Treatment 2	Treatment 3	Treatment 4
Treatment 1				
Treatment 2				
Treatment 3				
Treatment 4				

For each white cell, the farmers' preference from the pair of treatments compared is recorded.

Pair-wise comparison matrix of treatments (maturity-harvest phase)

	Treatment 1	Treatment 2	Treatment 3	Treatment 4
Treatment 1				
Treatment 2				
Treatment 3				
Treatment 4				

For each white cell, the farmers' preference from the pair of treatments compared is recorded.

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12. 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.
13. The facilitator asks volunteer farmers to conclude the session, and then invites farmers to the next session.



Time required

- Three hours



Materials required

- Strong packing paper, markers.
- Summary table (Section 4), synthesis table (Section 8) and comparison matrix (Section 9); these can be prepared in advance on strong packing paper.
- A draft form of the recording form (Section 11) can be prepared on A4 format.

Box 19

During the session in Bamoro, we first discussed the on-going experiments on the management of soil fertility. It became clear that the farmers were not well aware of the existence of the different treatments. We therefore reviewed the different treatments and their effectiveness.

Subsequently, we discussed the varietal experiments, which the farmers understand more easily. They knew that the varieties WITA 7, 9 and 12 had been chosen for their good yields, WITA 4 and WAB 638 for their good taste, Suakoko 8 for the zones susceptible to inundation, and WITA 1, 3 and CK4 for the zones known for iron toxicity. The farmers had noticed the good tillering and green leaves of WITA 4.

Then we left for the field. Some farmers had difficulties filling in the form. There was not enough space to fill in the observations. The sheet has to be split into two or three pages. It would also be efficient to use symbols for the illiterate farmers. Farmers had difficulties rating weed infestation. The sheet had to be refined. We took samples of plants suffering from waterlogging, from African rice gall midge and from stem borer.

Afterwards, the results were discussed in plenary session. These discussions made clear that there were problems of diseases and insects in Bamoro. A weed called 'lettuce' was also a problem here.