

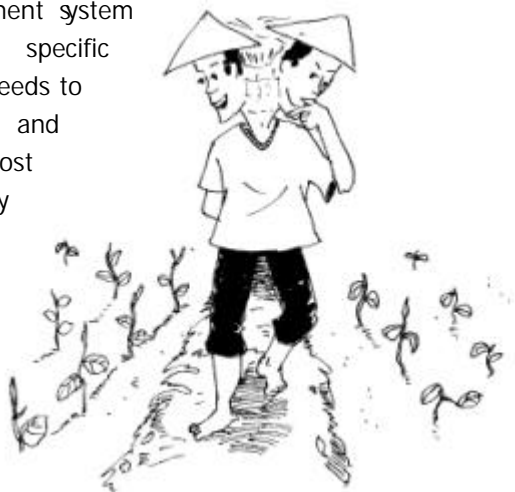
3 Experimentation

Background

Agricultural research and development of crop management technologies is generally carried out by formal research institutions. The International Potato Center (CIP) is one of the international agricultural research institutes with a mandate for sweetpotato, whilst in most countries where sweetpotato is a major crop there are local research institutes with specific efforts directed to this crop.

When farmers attempt to apply new technology developed by research institutions, they often find that the yields obtained on their fields are not as high as those obtained by researchers on the experimental station. Why does this happen? It is not because farmers are unable to apply the technology, but rather because farm conditions are generally different from those on the experimental station. Moreover, quite often farmers cannot apply a new technology, because inputs or equipment required are either too expensive, or not available on the local market.

In order to develop a management system and practices that suit the specific conditions of the farm, a farmer needs to be able to experiment to test and adjust new technologies. Most farmers actually automatically compare their farming methods with those of their neighbors. Some also compare the results of practices between different seasons or between different plots within their farms. Such comparisons yield insights about the range of productivity obtainable on the farm, however they do not permit farmers to



judge the relative merits of different management practices. For this farmers need to be able to design, implement and evaluate simple experiments in a systematic fashion.

Objectives

After completing this activity the participants:

- Are familiar with the stages of an experiment:
 - Determining the topic and defining the objective of an experiment.
 - Design.
 - Preparation.
 - Implementation.
 - Evaluation.
- Understand the basic principles of systematic experimental design.
- Have gained skills to design, implement and evaluate a simple experiment.

Materials

- Newsprint paper.
- Felt-tip markers.

Activity steps

A *Strengths and weaknesses of farmers' experiments*

The facilitator reviews the results of the group discussion from the previous FFS session about common problems in sweetpotato cultivation. Ask the participants whether they have ever experimented with the crop. If so, let the participants who have describe the experiments they have done. The group should analyze and discuss the strengths and weaknesses of those experiments, and draw conclusions about how experiments should be designed. List their answers on a newsprint sheet.

B *"Rules of the game"*

Present the basic principles of systematic experimentation, drawing wherever possible on ideas that emerged from the previous discussion, and making sure to cover each of the points below:

- Prioritizing and determining research topics (varying only one factor at a time in each experiment).
- Setting a clear objective.
- Determining treatments.
- Designing the experiment (replications, randomization, lay-out, variables to measure).
- Planning the implementation (locations, inputs, labor).
- Implementing the experiment (planting, monitoring, measuring variables, harvesting).
- Evaluating the experiment (simple data processing, analysis of results, drawing of conclusions).

C *Planning the FFS experiments*

- C.1 The participants are divided into four small groups. Each group discusses what they feel are the important topics that they want to investigate on the FFS field. They write their topics on a piece of paper and reach a common conclusion about the ranking of importance of these topics. Each group presents their conclusions to the whole group and then the whole group reaches an agreement about which topic(s) they will choose for the field school experiment (depending on the size of the field they can plan for one or more experiments).
- C.2 The group defines collectively the research objective and the treatments for each experiment. The title, objective and treatments for each experiment is recorded separately on a sheet of newsprint paper.
- C.3 In the small groups the participants design the experiments. Each group designs one experiment, and one or more groups may be assigned to work on the same trial. The design for each experiment includes: title, objectives, treatments, number of replications, lay-out in the form of a plot map, materials needed, variables to measure, and processing and evaluation procedures. All groups present their

design in a plenary session, compare and consolidate them, and come to a final collective design per experiment. The facilitator should watch whether the designs fulfil the criteria discussed previously.

- C.4 Plan the implementation of the experiment together with the participants. When are the plots planted and treated? Who provides the materials? Who is in charge of monitoring and recording data throughout the season? Make sure everybody knows what is to be done when.

For more information see:

- Experimentation (Part III, Section 6.2)

Notes