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Documented by:

Ly, Tung
F. T. Balaña

In Collaboration with:

I. A. M. Dante	S. B. Singzon
F. M. Gabunada	C. N. Bernadas, Jr.
S. C. Bantugan	R. C. De Pedro, Jr.
A. M. Garciano	J. O. Pilapil

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3. Increasing Farmer Participation in FSR/E: the ATIP Experience with Farmer Testing Groups*

by

F. WORMAN, Y. MERAPE, and D. NORMAN**

INTRODUCTION

Increasing farmer participation in agricultural research and extension activities has been a prominent theme of numerous articles (for some examples see Farrington and Martin, 1987) and workshops (including a workshop at the Institute of Development Studies, University of Sussex, on "Farmers and Agricultural Research: Complementary Methods", July 27-31, 1987 and a workshop at the Informationcentre for Low External Input Agriculture (ILEIA), Leusden, The Netherlands on "Operational Approaches in Participative Technology Development in Sustainable Agriculture," 11-12 April, 1988).

In Botswana, the Agricultural Technology Improvement Project (ATIP), is completing its third cropping season of actively involving farmers in the research process through farmer testing groups. More than 250 farmers, researchers and extensionists have been collaborating to test new ideas for improving farm productivity through farmer managed, farmer implemented (FMFI) trials.

In this part we will describe the agricultural setting in Botswana, discuss ATIP's approach to farmer participation and, using the ILEIA guidelines, present operational approaches for two types of farmer groups.

THE BOTSWANA SETTING

Botswana, located in the central part of Southern Africa is a semi-arid area receiving 450-500 mm of rain a year in the cropping areas (less in the western and southern regions). Poor soils and a highly variable rainfall distribution between years, within years, and even between land area in the same village, create a harsh environment for rainfed crop production. Following six years of drought, the

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** Agricultural Economist, Agricultural Technology Improvement Project; Senior Rural Sociologist, Rural Sociology Unit; and Agricultural Economist, Agricultural Technology Improvement Project, respectively. Ministry of Agriculture, Botswana. The views expressed in this paper are the authors and do not necessarily reflect those of the Botswana Ministry of Agriculture.

1987-88 cropping season saw precipitation more than double the average. With the rain came pests and crop damage due to flooding, lowering yields well below early season expectations.

Diamonds and beef exports are the major income producers for Botswana. Approximately two-thirds of the population live in rural areas where 70 percent are engaged in small scale arable agriculture. There are 83,300 rural households (1986 Agricultural Statistics) which cultivate approximately 300,000 hectares of land; less than 1 percent of the total land in Botswana. Of the total rural households, 30,400 (36.5%) do not own cattle, while ten percent of the households own approximately 80 percent (2 million head) of the national herd. Most rural households operate a small mixed crop-livestock farming system. The mixed cropping system is based on sorghum with millet, cowpeas, groundnuts, and melons as secondary crops. The traditional cultivation pattern is to plant small areas by broadcasting seed and ploughing with a moldboard plough. This is done after each planting rain for a three to four month period. Oxen, tractor and donkey traction are used, with only half of the households controlling their own traction. Yields tend to be low, approximately 250 kgs for sorghum, and Botswana farmers normally produce only about 30 percent of the country's basic grain requirements.

Farm families generally rely on livestock (both cattle and small stock) and off-farm activities, supplemented by government relief programmes, for their subsistence. Hence the limited resource farmer does not operate as a subsistence farmer, but as a substitution farmer, who will use any grain harvested to substitute for food which would have been purchased with funds from other source.

THE INSTITUTIONAL SETTING

In Botswana, as in most countries, there are four groups with a direct interest in agricultural development. These groups are the farmers, the extension service, the agricultural research establishment and policy makers (planning/development). (Norman, 1987). The latter three groups are institutionally separated, each within its own department in the Ministry of Agriculture. This institutional separation has led to vertical integration within the departments but has tended to discourage horizontal integration. As is typical of such situations, development tend to be top down with little feedback from farmers to the other groups. (Norman and Collinson, 1986).

In 1982, the government of Botswana and USAID initiated the Agricultural Technology Improvement Project to conduct on-farm research, primarily in crop production technologies. The on-farm research programme of ATIP has had two primary goals: (a) to identify and test relevant, improved arable production technologies; and (b) to develop appropriate, low cost methods for on-farm research and

extension. ATIP took as its point of departure the farming systems approach to research. One of the corner stones of this approach is a "bottom-up" perspective of the research and development process (Norman, 1980).

Institutionally ATIP is located within the Department of Agricultural Research, Ministry of Agriculture. The project has two field teams composed of agronomists, agricultural economists and in one case an animal scientist. One team is located at Mahalapye in the east central part of the country while the other is located in Francistown in the north east. These teams are back stopped by a team leader located at the main research station and a Research Extension Liaison Officer within the Ministry. One team has been localized and the other one will hopefully be localized before the project ends in 1990.

ATIP'S APPROACH TO FARMER INVOLVEMENT

ATIP began its research work by investigating modified tillage-planting practices and by conducting an in-depth diagnostic study of the farming system through a multi-year, multiple visit study. Limitations with existing technologies meant that most trials work was aimed at answering technical questions and so was carried on in a researcher managed and implemented (RMRI) and research managed, farmer implemented (RMFI) mode. This kind of trials work required a major investment of researcher time, so trials were limited to the most important problems. There were, however, a number of non-critical interventions which deserved investigation, but could not be investigated due to lack of researcher time. In addition, it was soon realized that the complexity of household-farm interactions required increased farmer involvement in the selection of technologies for testing, the design of trials and the assessment of trial outcomes. The farmer needed to be included as a partner in the process, and not just a client.

The emphasis for the last three seasons has been to promote the partnership of farmers, research and extension. ATIP's aim is to include farmer in research and extension activities as other than clients. Farmers can contribute to research and extension from their experiences by communicating those experiences to researchers, extensionists, and with other farmers. In addition farmers can expand their horizons and concept of what is possible through this communication and through training activities.

One of the primary methods of attempting to increase the interaction with farmers (and extension workers) has been through farmer testing groups. In the 1985-86 season both the Mahalapye and Francistown initiated work with farmer testing groups. The objectives and procedure for group formation and administration have been somewhat different in the two locations. The groups in the

Mahalapye area were formed in direct response to special circumstances and access problems of women and poorer households. The groups were organized to facilitate trial management, to create an opportunity for on-going dialogue about problems and opportunities and to assess interventions. Groups were formed in three villages and were composed of representatives of different target populations, i.e. women head of households, participants in prior ATIP trials, and both spouses for small conjugal units. Each group elected a chairperson and set its own meeting dates. In later seasons the targeting of group members has been less emphasized (Norman et al, 1988)

The Francistown group work began with twelve farmers in one village testing one technology. It has, in the 1987-88 season, expanded to 130 farmers in four villages testing over a dozen technologies. Because of the harsh environment found in Botswana, farmers tend to make a sequence of cropping decisions depending on how the season develops. In response to this pattern of decision making, ATIP has worked with a series of options rather than attempting to develop a set technology package. Farmers in the Francistown groups choose one or more technology options from those being studied to test (FMFI) on their field. The groups are organized by the ATIP staff as part of their research programme and do not have a formal organization of their own.

In 1987-88 an extension run farmer options testing group was organized as a joint ATIP-extension trial. Members of this group tested a limited number of technologies. The group was run by the local Agricultural Demonstrator (AD) with assistance from the District Agricultural Officer (DAO) and ATIP.

ATIP operates in a setting where there are multiple clients for the research results. The aim is to integrate farmer involvement and feedback into the research and extension structure. Thus farmers are encouraged not only to propose technologies for study, but are also asked to follow a basic trial format in their on-farm testing. The basic testing pattern is to plant side-by-side plots of traditional and new technologies on the same day. This provides a comparative situation which farmers can observe, and also allows some data collection and analysis. Replications within the group are also encourage by having a limited number of technologies to be tested.

GROUP APPROACHES IN BOTSWANA

Groups (and committees) are a major feature of village life in Botswana. Most villages will have a Village Development Committee, a Parent Teachers Association, a Social Health Committee, a Farmers Committee (to advise and assist the AD) and one or more special purpose (drift fence, small stock dosing group, etc.) agricultural groups.

In 1975 an Agricultural Group Development programme was started in the Ministry of Agriculture with the aim of broadening extension outreach. Agricultural Management Association Officers are posted to the Regional Agricultural Offices and have primary responsibility for supporting ADs in helping farmers increase production through group extension methods. Unfortunately the majority of agricultural groups exist in name only (Ntseane, 1986).

Most groups/committees tend to be elective in nature and Ntseane (1986) identified the following major characteristics of group members:

- a) Most of the agricultural groups are dominated by males. Female members represent their husbands in most cases and do not make decisions but rather implement them with the rest of the community.
- b) Education and wealth are important in being elected into a committee.
- c) Many members are re-elected several times and often serve on more than one committee.

Despite the number of groups in most villages, the experience with groups contributing to development has not been outstanding. Baker [1988] indicates that local institutions research has consistently led to the following observations:

- a) Most group organizations are making few contributions to village development due to lack of participation and funding.
- b) Activities which respond to local felt needs are consistently more successful than activities formed by outside organization.
- c) The abilities and interests of particular individuals impact significantly on group success.

Groups which have a specific focus and which provide individual benefits for the members seem to have the best chance of success whether or not they have a formal legal organization. Part of the reason ATIP testing groups appear to be popular is that they do have a focus and the benefits accrue to individual members based on their own input.

When groups are discussed in Botswana, and in most places, the image is one of a formal legally recognized organization which exists to perform a specific function with all members providing an input to the group activity. A good example of such a group is an agricultural production cooperative. The ATIP testing groups are not defined in

this way but are instead associations of individuals who are working on their own trials and sharing their experiences with others. In a study of the Francistown option testing groups, Ntseane [1988] found that group members did not favor the formulation of more formal legalized groups.

ATIP EXPERIENCE WITH GROUPS

Typology of Groups

At the 1987 workshop on "Farmers and Agricultural Research: Complementary Methods" held at the University of Sussex, Norman presented a tentative typology of groups which had been developed by ATIP. [Norman et al. 1988] The proposed typology included design groups, focused testing groups and researcher managed options testing groups. To this we would like to add extension managed option testing groups. The characteristics of each type of group are listed in Table 1.

The distinguishing characteristics of the design and focused testing groups are the relative homogeneity of circumstances among group members and the small range of technologies tested. Researchers play a relatively greater role in determining the agenda of the design groups. The focused testing groups serve as a vehicle for organizing and assessing FMFI trials. The researcher managed options testing group examines a wide range of options tested by a heterogeneous group of volunteer farmers. The extension managed options testing group conducts local testing of a limited number of recommended technologies and one or two technologies in the final phase of farmer testing before recommendation.

Operational Approaches to Options Testing Groups

The following descriptions of the Researcher Managed Options Testing Group and Extension Managed Options Testing Group are based on the Francistown ATIP Team experience and are reported using the operation approaches format suggested by ILEIA. [Worman and Heinrich, 1988].

RESEARCHER MANAGED OPTIONS TESTING GROUPS

Desired output

These groups are organized as a part of the overall research strategy of the Francistown team. The objectives for the groups are:

- a) To test a broad range of innovation (technologies) under FMFI conditions for increased productivity and grain yield dependability.

- b) To involve farmers and ADs (local extensionists) in the systems/technology development process.
- c) To determine what types of innovations are most appealing to farmers with different resource situations (recommendation domains).
- d) To further refine the use of the group process for including farmer input into farming systems research.

Procedures

There are three primary sets of actors in the groups:

- a) The ATIP research staff, composed of agronomists, agricultural economists, and animal scientists in Francistown; and ATIP village staff consisting of a senior technical officer and four to six enumerators and/or field assistants.
- b) The village AD.
- c) Farmer members of the group.

Secondary actors include on-station researchers who are collaborating in particular trials; and district and regional extension staff (Regional and District Agricultural Officers, (crops Production Officer, and the ALDEP — a programme to provide equipment to resource poor farmers - Manager).

Between cropping seasons, the ATIP Francistown staff meets with regional and district extension officers, researchers at the experiment station, and village level ATIP staff to discuss plans for the coming year's research. Technologies to be tested by the farmer groups, as well as those to be tested in researcher managed trials, are identified by these parties and form the basis for the ATIP workplan.

Approximately two months prior to the normal beginning of the cropping season (the on-set of rains) a traditional village meeting is called by the village headman at which the Francistown staff and the senior technical officer in the village make a formal report describing the results of the previous years' research (both researcher managed trials and farmer group trials). They also describe the plans for farmer group activities for the coming year, and invite anyone wishing to participate in the farmer group to attend the first group meeting.

Before the first group meeting, the Francistown staff holds a workshop for village staff to assure that all new technologies, particularly mechanical technologies, are understood and that the village staff can teach farmers how to use new equipment. The trial

procedures are reviewed and data collection forms are discussed. Village staff are also asked for suggestions to make groups function more smoothly and efficiently.

Four to six weeks after the village meeting, the first farmer group meeting is held, chaired by the ATIP village senior technical officer. (The local AD and any interested district or regional extension staff or experiment station researchers are invited to attend farmer group meetings). At this meeting the Francistown staff reviews a wide range of technologies available for FMFI testing in terms of their uses and input requirements. These options include technologies tested in farmer groups previously, those tested in researcher managed trials and ready for broader farmer testing, technologies (particularly seed varieties) which experiment station researchers wish tested, and technologies which the extension staff wish to have included. Farmers are encouraged to make additional suggestions.

The trials procedure are described by the research staff. The procedure is generally to have a side-by-side comparison (10 metre by 50 metre plots) planted on the same day. The technology being tested is in one plot, with the traditional broadcast, plough-down technology in the second plot. Variety trials involving 2 to 5 varieties are done in side-by-side plots, again planted on the same day and using the same planting method across plots.

Farmers are then asked to select one or more technologies which they want to test on their own fields. ATIP village staff record all trials, assist farmers in staking the trial plots, and provide seed, fertilizer, or other inputs required for the particular trial. Technologies involving new machinery and variety trials tend to be limited by material availability.

Typical technologies tested include: a tractor mounted plough/-planter; an animal drawn two-furrow plough; a double ploughing/-broadcast planting system; an animal drawn row planter and two types of hand held row planters; contour band ploughing; phosphate fertilizer; crop variety trials; the use of short season crop varieties to reduce the risk of crop failures; and the use of fodder crops.

In subsequent monthly meetings the trial procedures are discussed several times and, where necessary, village staff visit farmers to assist in implementation (particularly with new equipment). During monthly meetings farmers report on trial progress, problems and their observations concerning the trials. Francistown staff visit each trial at least once during the season to record details of the trial and assess the accuracy of its implementation.

Group meetings serve as a forum to address solutions to particular problems, such as insect infestations, and also allow senior extension staff and experiment station researchers an opportunity to discuss relevant topics with a group of farmers. These meetings often produce in-depth discussions between farmers and visitors, and have been responsible for the modification of some experiment station research, so that it more accurately addresses the farmer's actual problems.

Late in the season the farmer group members participate in a field day. The field day is organized by the farmer group and ATIP staff with input, and sometime exhibits, from extension. Selected trials, both RMFI and FMFI trials, are visited and the farmer on whose field the trial is located describes the trial and her/his observations concerning the trial. Farmers from other villages attend these field days as do district and regional extension staff and experiment station research staff. There is generally a very lively discussion of each trial.

When trials are harvested (by the farmer), the yields are weighed and recorded by the village staff. A final group meeting is held to discuss the results of each trial. The Francistown staff conducts a formal end-of-season survey of participants and analyzes the data collected. This information along with researcher and extension evaluation of the groups are presented in a progress report for distribution to village staff, extension, experiment station researchers and other interested parties.

Skill and means for actors

Village level staff require a workshop to introduce any new technologies and to practice with new equipment. Trial procedures, material distribution (seeds, machinery, etc.) and data collection procedures must all be reviewed and agreed upon. This usually takes place in the context of a general workshop on the entire research programme and involves one day at a central location and one or more visits to each village. One to two additional field assistants are employed part time to assist in staking fields and other tasks to free more senior village level staff to make field visits and to train or assist farmers with implementing trials. Finally, the village staff must be available to weigh and record yields from the trials. The senior technical officer chairs the group meetings and the training for this has been on-the-job, with suggestion by Francistown staff.

Group members receive training in trials implementation procedures, the theory behind the technologies (where appropriate), and the use of new equipment.

The village AD is asked to attend monthly meetings and to make any materials or equipment normally available through government

programmes, available to group members. Other extension staff participate as they choose or by special invitation.

Francistown staff is committed to planning meetings with experiment station and regional extension staff — part of the planning process for the entire research programme. The Francistown staff organizes and conducts training for village staff and one or more members attend each group meeting. The staff also organizes the food and transportation for field days, with actual preparation being the responsibility of the groups. In addition, the Francistown staff devotes time to field visits to train village staff in assessing the trials and to address specific problems which may arise.

Materials and equipment for the trials come from several sources. The research station provides seeds, fertilizers and some equipment for trials. ATIP provides other equipment for trials and support equipment, such as scales to weigh the harvest. To date, training costs have not been great as they are part of normal training activities. One of the major costs has been for field days, amounting to approximately US\$400 per village for food. Transportation for Francistown staff, and for field days, is provided out of normal government funds.

Limitations and risks

Several limitations to the group approach, as we have used it, have been identified. These include:

- a) The farmer's groups do not have an organization apart from the research programme. They have been established as a part of the overall research programme.
- b) Farmer groups tend to serve as a focal point for extensionists and researchers to interact with farmers about subjects that are not part of the trials work. While this type of exchange is useful for all parties, it may become too extensive, and thus have a negative effect by taking time needed for actual trials work. The groups, because they meet on a regular basis, also become a focal point for allowing out-of-country visitors an opportunity to meet with a large group of farmers in one location. Again occasional visitors are helpful to the group, but too many detract from group activities.
- c) A continuing question is how much support, in terms of seed, equipment and other inputs, should be provided by researchers. It appears obvious that any new equipment, seed variety, or other input, which is not locally available, must be provided if farmers are to conduct appropriate trials. However, it may be argued that farmers should provide all locally available inputs. ATIP Francistown has taken the position that providing small measured

quantities of seed for standard size trial plots provides better comparisons than having farmers provide their own seed and determine the quantity sown. It also aids in trials analysis, and seed quantities do not exceed 200 grams per plot for small grains, and 1 kg per plot for large seeded legumes.

- d) A related question is when do farmers stop testing and start adopting? Farmers have indicated an interest in planting larger areas, with ATIP provided inputs. The problem then becomes one of determining when a farmer is conducting a large scale trial (which may deserve support) and when the trial is actually an adopted technology and should be fully farmer supported. There is an additional question of what to do when a piece of equipment is not locally available, but farmers wish to use it extensively.
- e) One of the problems associated with group trials is the desire of participants to have researchers visit the trial sites on a regular basis, as is done with researcher managed trials. With a large number of farmers participating in groups, individual field visits by research staff are impractical. Yet there is a strong desire for such visits on the part of the participants.
- f) Having farmers select their own trials, rather than having researchers assign trials, means that more popular options may be heavily tested, while other options are not tested at all. To date, we have accepted this as the price for allowing greater farmer input and freedom.
- g) Conducting trials may be very difficult for farmers who do not control their own draft power, e.g., many cattle were killed by drought last year, leaving some farmers with insufficient oxen to form a team. As a consequence, many farmers were forced to hire tractors. Tractor drivers were very reluctant to perform "small plot" work. So, many farmers who signed up for trials were unable to implement them.

Experience

ATIP Francistown began options testing group work three seasons ago with a group of 12 farmers testing one technology in one village. The second year groups were formed in two additional villages, included 97 participants, and the number of technologies was expanded to five major and several minor technologies. During the current year approximately 130 farmers have signed up to test more than a dozen technologies in the three groups.

Annexes

Norman, Baker, Heinrich and Worman, "Technology Development Farmer Groups: Experiences from Botswana", Experimental Agriculture, forthcoming, 1988.

Worman, Heinrich, Masikara, Mabongo and Block, "1986-87 Farmer's Groups Technology Options Testing Trial", ATIP PR F87-6, October 1987.

EXTENSION MANAGED OPTIONS TESTING GROUPSDesired output

The extension service in Botswana is currently very committed to administering drought relief programmes. Thus, the traditional role of extending recommended agricultural technologies has been greatly reduced. Further, a single AD may have well over 500 households under his/her responsibility. Without good communication systems, many of the constraints these households face may go unaddressed. The farmer group approach offers a means of working with a number of farmers at one time, thus improving the efficiency of the AD. The desired outputs for the extension managed farmer testing groups are:

- a) Provide a method for ADs to increase their efficiency by addressing a large number of farmers (on technical issues) at once, rather than having to make numerous individual visits to households and fields. (The group format allows the AD to perform a teaching function at the beginning of the year, and a backup function throughout the cropping season, through monthly meetings.)
- b) Allow farmers to field test recommendations, under extension guidance, and to provide a basis for local field days.
- c) Provide a forum for researcher back-up in extension activities.
- d) Provide a test to see if farmer groups are practical under extension conditions.

As was discussed above, ADs are officially encouraged to work with groups of farmers, but date, the system has not been employed for the testing of extension recommended technologies in the Francistown Region.

Procedures

Prior to the cropping season ATIP staff met with regional agricultural officers to discuss establishing a pilot extension managed option testing farmer group. With the Regional Agricultural Officer's approval, the DAO identified one extension area for the pilot group. The DAO and the AD from the area met with ATIP staff to discuss the group work. The regional Crop Officer and the ALDEP Manager were also included in the discussions. This group decided on a limited number of technologies, including types of equipment provided through ALDEP programme, which were to be presented for testing. Logistical details were also arranged.

Just prior to the normal beginning of the cropping season, the AD asked the village headman to call a traditional village meeting at which he, and the ATIP Francistown staff, described the farmer group work in other villages and invited interested farmers to attend the initial group meeting to be held two weeks later. At the initial group meeting the AD and ATIP staff discussed the technologies available for testing and how tests were to be conducted. Farmers were asked to indicate in which test or tests they wished to participate.

At subsequent monthly meetings implementations of trials were discussed. The farmers were to decide on their own how large to make the test plots, and to stake the plots accordingly. While side-by-side comparisons were recommended, many trials were implemented without a comparison, and so became demonstrations rather than true trials. A field assistant was hired to assist the AD in working with farmers to collect data, provide seeds and equipment, etc.

Monthly meetings to discuss trials were held. Farmers described their trial experience, identified problems, and report their observations on the trial to the group. The farmer group meetings were chaired by the AD. All meetings were attended by ATIP and district extension staff. ATIP and extension staff visited all trials at least once during the season.

A field day was held near the end of the season. Farmers from other villages, extension (including the Director of Field Services) and research staff all participated.

After harvest the ATIP staff will conduct a formal end-of-season survey of participating farmers to obtain farmer assessments of the trials they participated in and the group activities. This information will be included with extension and researcher evaluations of the group activity in a progress report.

kills and means for actors

The DAO and AD had the most time commitment to this group. The D needed training in group management and also in some of the echnologies, particularly some of the equipment. This was provided y the ATIP staff on an informal basis. The field assistant hired to ork with the AD did not receive any training, and so did not perform ell. Better training is needed for both the AD and field assistant.

ATIP staff attended farmer group meetings and made field visits. one equipment, seeds, etc. were provided by ATIP. Other equipment ame from the extension programme. A proposal has been prepared to und a regional level staff position to provide support and training or ADs working with farmer groups.

imitations and risks

Because of the limited time available for the AD to work with the roup, and due to an untrained field assistant, the level of support o group members was low, and many trials were not implemented, or ere poorly implemented. Partly this is a function learning how to ork with groups.

The approach is limited in that it does take AD time, a commodity n short supply due to other demands. There is also the risk of eightened farmer expectations, which may not be met. Other imitations will probably be identified when the season's experiences re analyzed.

xperience

ATIP and the extension service are completing the first season of orking with this type of group.

ONCLUDING COMMENTS

The ATIP approach to farmer involvement in farming systems esearch is to attempt to integrate farmer participation into the esearch/extension establishment through the use of farmer testing roups to facilitate FMFI trials. The use of farmer testing groups as a number of advantages for the researcher and extension agent.

- 1) The researcher has limited time for conducting researcher managed trials, and the FMFI trials conducted through the group format can expand the number of technologies being researched.
- 2) The extension agent also has great demands on his/her time for administering drought relief and other government programmes. With limited time to devote to extension of technologies, the

best use of the time is to work with groups of farmers. By having farmers testing the technologies they are more involved than in traditional extension demonstration plots, and are in fact testing the recommended technologies for acceptability under local conditions.

- c) The communication between farmers, extensionists and researchers is increased. Farmers, through their choices of trials, provide valuable information on what technologies are of interest to them. Research and extension staff also receive early and continuing feedback on technologies.
- d) The inclusion of extension personnel in the research process means they have a chance to suggest modifications during the trials, and also become familiar with new technologies they will later extend.
- e) There are a number of advantages to joint farmer/researcher/extension field days. First, there is a great deal of interest when farmers describe their experiences and conclusions to other farmers. Second, inter-village competition can develop, lending an incentive to try new technologies. Third, extension and researchers can get added information, as farmers tend to ask more question of other farmers than they do of researchers. Finally, the use of side-by-side comparisons facilitates discussions.

A number of problems working with farmer testing groups have been discussed above. Several additional issues can be raised.

- a) To date statistical analysis of data collected on farmer trials has been minimal due to the small amount of hard data collected. The limited amount of data which can reasonably be collected from farmer groups, is one reason why farmer group work must be part of a large research programme — so that questions needing more intensive analysis can be handled by researcher managed trials. The development of assessment tools and ways of collecting more statistically analyzable data from the farmer group trials are important methodological concerns. The ability to generate hard data is important in legitimizing farmer trials within the research establishment.
- b) The question of determining an optimum size group, and keeping the group to that size are problems which remain. There is a need for group continuity but also it is desirable to have new farmers participate in the groups as they bring new ideas and involve a larger number of farmers in the development process.
- c) For many of the problems raised in group discussions there may be no identifiable solution that is technically and socio-

economically viable. This lack of implementable solutions can be frustrating for all parties concerned.

Nonetheless, farmer reaction to the farmer testing groups has been quite positive, and the approach has been beneficial in focusing research on farmer identified problems.

Table 1. Typology of farmer groups

CHARACTERISTIC	DESIGN	FOCUSED-TESTING	RESEARCH MANAGED OPTIONS TESTING		EXTENSION MANAGED OPTIONS TESTING	
			TESTING	TESTING	TESTING	TESTING
Objectives	Farmer involvement in technology design.	Discuss farmer's own problems. Measure economic benefits. Farmer assessment.	Increased farmer and extension involvement. Large scale assessment.	Local farmer and extension testing for local adaptability.		
Numbers of Trial Types	1 to 3	4 to 6	10 to 12	4 to 6		
Trial: Proposal Selection Management Implementation	Researcher Researcher Researcher Researcher/ Farmer	Researcher Researcher/Farmer Farmer Farmer	Researcher/Extn. Farmer Farmer Farmer	Extn./Researcher Farmer Farmer Farmer		
Quantitative Measurement/a Assessment: Researcher Farmer	Most Most Least	Middle Middle Middle	Least Least Most	Minimal Minimal Most		
Group: Size Nature Selection	2-3 farmers Heterogeneous Technical situation appropriate for design work.	10-15 farmers Homogeneous Socio-economic situation for targeted technology.	20-40 farmers Heterogeneous Volunteers from village meeting.	25-35 farmers Heterogeneous Volunteers from village meeting.		
Frequency of Meeting	2-3 times a season	Monthly in season	Monthly in season	Monthly in season		

Relative to the other types of groups.

Researcher/Farmer/Extn. Farmer/Extn. Farmer/Extn. Farmer/Extn.

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