1. PILOT TESTING

PROJECT STRUCTURE

The CIAT research staff directly funded by this Project currently comprises the senior staff sociologist (co-ordinator), two assistant agronomists, and an assistant sociologist. The Project has developed several collaborative activities or "sub-projects" conjointly with CIAT and ICA scientists for implementing participatory research activities. These involve senior scientists and support staff from CIAT's Bean Program (principally breeding, on-farm agronomy and economics), Seed Unit (bean storage), Cassava Program (breeding, utilization and on-farm agronomy), Pastures Program (production systems), CIAT-CIMMYT Maize Program and CIAT-IFDC Soils Studies Project. A working group consisting of CIAT and ICA scientists was formed in early 1988 to examine what technology has been developed which could be evaluated with participatory methods, for testing new cropping systems addressing soil conservation issues in the Project's pilot-testing area.

In 1987 the structure for pilot testing of participatory methodologies was set up with the Instituto Colombiano Agropecuario (ICA), the Colombian state agricultural research and extension program. This structure was devised by national and regional steering committees set up for the Project by ICA; scientists from the ICA, Palmira, experiment station work with the Project, and a new off-station research unit (CRECED) in the Project's pilot-testing area in the Department of Cauca. Links with ICA extension staff in pilot testing sites were also established by the steering committees; and these were expanded in number through Project training activities. ICA teams and extensionists completed an informal farming systems survey and a survey on bean production for pilot testing sites with Project support to diagnose farmers' problems and needs.

METHODOLOGY DEVELOPMENT IN PARTICIPATORY PROBLEM DIAGNOSIS

The Project has supported several types of diagnostic research to assess the advantages and disadvantages of different approaches, with the integral involvement of ICA staff. In 1987-8 these included collection of secondary data, an informal survey, a formal survey, and participatory group diagnoses with farmers.

An important achievement of the Project to date is to have generated data on the human resource requirements, costs and substantive conclusions of participatory group diagnosis. Numerous participatory group diagnoses were carried out in pilot testing sites as summarized in Table 1; as a result comparison can be made of survey and participatory methods for farming-system level problem identification and for single commodities. This work provides a comprehensive basis for comparative analysis of methodologies for problem diagnosis, which can be used to assess the benefits of participatory approaches.

FARMER EVALUATIONS

A major component of project activities in 1987-8 has been the conduct of on-farm trials and farmer evaluations (Table 2). A strong focus on farmer evaluation in the Project reflects the demand for this methodology: in particular, varietal evaluation is an area where researchers perceive a need for farmer participation to help get breeding objectives in tune with farmers' preferences. Work on farmer evaluations has had two main objectives:

1. To systematize techniques for participatory farmer evaluations in the form of training materials.

Table 1. Participatory group diagnosis, 1987-8.

Site	Type/Topic	No. farmers participating
Methodology testing in pilot testing sites		
CALDONO (La Llanada)	Commodity specific: Cassava	15
MORALES (Carpintero)	Commodity specific: Beans	30
CAJIBIO (Michinchal)	Commodity specific: Beans	28
CAJIBIO (Las Casitas	Commodity specific: Beans	18
CALDONO (Pescador)	Soil conservation	15
Field training exercises in pilot testing sites		
CAJIBIO (Michinchal)	Production system	65
CALDONO (El Socorro)	Commodity specific: Climbing bean/maize associations	16
CALDONO (Pescador)	Commodity specific: Pastures	36
MORALES (Carpintero)	Commodity specific: Cassava	44
CAJIBIO (San Gabriel)	Production system	100
INZA (San Andrés de Pisimbala)	Production system	40
EL TAMBO (Seguengue)	Problems of sugarcane	50
Implemented by trainees outside pilot sites		
CAJIBIO (El Rosario)	Production system	20
CAJIBIO (San Lorenzo)	Production system	56
CONTADERO (San Francisco)	Commodity specific: Beans	22
IPIALES (Chaguaipe, Narmo)	Commodity specific: Beans	30

2. To assess the benefits of early evaluation of station-developed technology with farmers in terms of generating feedback to station-scientists.

Table 2. Farmer evaluations of on-farm trials, 1987-8.

Sites	Type	Technology	No. of evaluations	No. farmers participating
Pilot testing sites				
CAJIBIO (Michinchal)	Group	Climbing beans/maize associations	3	7
CALDONO (Various)	Individual	Bush bean varieties (at two stages of crop development)	12	6
CALDONO	Group	Maize varieties		
CALDONO (El Socorro)[1]	Group	Climbing beans/maize associations	1	19
MORALES (Various)[1]	Individual	Bush bean varieties (two stages)	14	7
CAJIBIO (Las Casitas)	Group	Bush bean varieties (two stages)	2	6
CALDONO (La Llanada)[1]	Group	Cassava varieties	1	20
CALDONO (Pescador)[1]	Group	Bush bean varieties (two stages)	2	22
MORALES (San Antonio)[1]	Group	Bush bean harvest	1	15
CAJIBIO (Michinchal)[1]	Group	Bush bean varieties (two stages)	6	15
Other sites				
NORTH COAST (Various)[2]	Group	Cassava varieties	9	38
IPIALES (Various)[2]	Group	Climbing bean/maize associations	5	135
VALLE (Various)[2]	Individual	Snap-bean varieties	7	7

[1] Field training exercises.
[2] Conducted independently by CIAT or ICA staff trained by Project.

Farmer Evaluations of Bush Bean Varieties

Participatory diagnosis was carried out with groups of farmers to obtain an analysis and prioritization of their problems in the bean crop. Table 3 illustrates the results obtained in one site, where beans are grown by small farmers principally for consumption purposes. In response to the priority given by farmers to problems of resistance, evaluation

trials of bush bean varieties were carried out in three sites in Cauca in 1987 to obtain information on farmers' varietal preferences, as feedback to plant breeders. Results from these trials show the importance of grain quality characteristics to farmers' varietal selection.

Table 3. Farmers' priorities from group diagnosis of problems in the bean crop. Carpintero, Cauca, Colombia, 1987 B.

Problem	Score[1]
Problems of disease ("chamusquina")	15
- Generally related to climatic conditions	
- Specifically "cenicilla" (mildew)	
- Farmers lack of knowledge of chemical control	
- Local varieties are very susceptible to disease	
Pests	11
- Specifically "cogollo" (Macrodactylus spp.)	
- Ants (Atta sp.)	
Poor seed quality	9
- Storage problems	
- Poor germination	
Marketing problems	5
- Because of fluctuating prices which fall steeply at harvest time	
Credit	3
- Beans are too risky to plant with short-term credit	
Need to experiment with planting dates, early varieties	2
- Problem of late season drought	
- Early planting (to obtain better prices)	

[1] Score based on the priority ranking given by three groups of farmers.

Table 4 summarizes the ranking obtained for ten varieties with respect to yield, economic value (reflecting price differentials for different grain types), and farmers' preferences (varieties were ranked in order of preference by

farmers participating in the trials). Two red grain types (PVA-7 and Radical) were highly preferred over other higher-yielding varieties, reflecting their higher price in local markets. However, a "non-commercial" type of grain which obtains the lowest price (BAT-1297) was ranked overall in third place.

Table 4. Farmer evaluations of bush bean varieties grown in farmer-managed trials. Three sites, Cauca, Colombia, 1987 B.

	Yield kg/ha	Price $/kg	Value $/ha	Preference score‡	Yield Ranking	Value Ranking	Preference Ranking
BAT-1297	1166.0	240	279.840	92	1	8	3
SANGRETORO BITACO	1047.7	360	377.172	80	2	1	4
AND-683	1005.9	360	362.124	76	3	2	6
PVA-1261	964.2	336	323.971	79	4	5	5
PVA-7	938.2	360	337.757	100	5	3	1
RADICAL	906.9	360	326.484	96	6	4	2
CALIMA	876.6	336	294.537	80	7	6	4
AND-336	859.7	336	288.859	65	8	7	8
A-486	837.2	300	251.160	66	9	9	7
AFR-205	743.6	300	223.080	52	10	10	9

‡ Preference score based on ten varieties ranked 1st = score 10, 2nd = score 9, 3rd = score 8 ... etc. Scores are expressed as a percentage of top score = 100 percent.

Disaggregation of the overall preference ranking into two groups of farmers in Table 5, helps to explain this result. Consumption-oriented farmers selected the highest-yielding, but less commercial type in preference to all others. The preference ranking obtained from market-oriented farmers shows how little disposed they were to accept improved Calima types such as PVA-1261, criticized (as illustrated in Table 6) by

them for its poor color. The consumption-oriented farmers were less-exacting, and ranked improved Calima types in third place. Market-oriented farmers ranked improved Calima types in eighth place.

TABLE 5. Farmer rankings of bean varieties. Three sites, Cauca, Colombia, 1987B.

Variety	All sites (N = 18)	Consumption-oriented farmers (N = 10)	Market-oriented farmers (N = 8)
PVA-7	1	6	1
RADICAL	2	2	3
NON-COMMERCIAL TYPES‡	3	1	9
SANGRETORO B.	4	4	5
CALIMA	4	7	2
IMPROVED CALIMA TYPES‡‡	5	3	8
AND-683	6	5	4
A-486	7	8	7
AND-336	8	9	6
AFR-205	9	10	9

‡ BAT-1297, BAT-41, ARGENTINO.

‡‡ PVA-1261, ICA L-64, FRIJOL ICA P-11.

One reason why small commercial producers are so exacting with respect to grain quality (see Table 7) is that they find that prime quality beans such as the reds, have a better probability of maintaining a good price in the market when regional bean prices as a whole are declining shortly after harvest. Any minor deficiency in quality, they say, will be exploited by middlemen to bargain down the price paid to the

Table 6. Farmer evaluation of bean varieties. Pescador, Morales and Cajibio (Cauca, Colombia), Semester B, 1987.

Reasons for not selecting (N=18 farmers)	Bush bean variety										
	AFR 205	ICA L-64	BAT 1297	BAT 41	FR.ICA P-11	AND 336	A-486	AND 683	PVA 1261	Ca-lima	S.T. Ritaco
Disease attack	X				X	X	X			X	
Low production	X				X	X					
Weak commerce because of grain color	X (purple)	X (pale red)			X		X		X (pale red)		
Weak commerce because of small grain			X	X							
Light weight grain	X										
Susceptible to storage pests							X			X	
Mixed grains (segregation)											X
Rapid decoloration after harvest							X				
Short pod (disliked in fresh market)						X					
The plant did not develop well								X			
Type of plant (sprawling)								X			
Low production in association with cassava									X		
Pods become yellowish and do not produce grain						X					

farmer in a buyers' market. In such circumstances, the small farmer expects to have dificulties in finding a buyer for small grain types, and they expect to have to accept a lower price for other relatively inferior grain types. One conclusion that can be drawn from the differences in farmer preferences shown in Table 5 is that the release of varieties with relatively inferior marketability (or grain quality) might benefit small consumption-oriented producers, although such varieties would likely achieve little acceptance from market-oriented bean producers.

Table 7. Farmer evaluation of bean varieties. Pescador, Morales and Cajibio (Cauca, Colombia), Semester B, 1987.

Reasons for not selecting	No. of times mentioned (N = 18 farmers)
Weak commerce because of grain color	10
Weak commerce because of small grain	6
Susceptible to diseases	10
Low production	7
Light weight grain	2
Short pod, not good for fresh market	1
The plant did not develop well	1
Susceptible to storage pests	1

One year after the trials, a series of follow-up interviews are in progress with farmers participating in the trials, to study what happens to the seed of new varieties: whether these are further evaluated and rejected by farmers; whether farmers multiply and distribute seed; and to what extent they are lost because farmers are unable to maintain stocks of beans from one planting season to the next -- either because they consume them, or have seed storage problems.

As a result of these evaluations, a breeders' nursery composed of 104 lines principally those with red grain types, was planted in Cauca and evaluated with farmers to assess the acceptability of the grain quality. Three independent evaluations with different groups of farmers identified a subset of 37 CIAT lines acceptable for grain quality and yield equal or superior to the local check, Calima; and a further subset of 11 CIAT lines acceptable for grain quality and yield compared to a farmer-introduced red grain variety (Duva). This information was utilized by the CIAT Andean bean breeder to plan new crosses. Several lines selected by farmers as well as a number of lines rejected on the basis of quality, were planted in on-farm sites for continuing assessment with farmers.

Farmer experimentation

Participatory research monitors farmers' indigenous experimentation with new varieties. A bean variety newly-introduced by Cauca farmers (Calima de vara) is being included in the local evaluation nursery, and seed was obtained for the breeder for evaluation on station. A survey shows that farmer experimentation with varieties has increased substantially in one study site for which information has been analyzed to date, in the year 1988. This experimentation excludes formal trials carried out with the intervention of outside agencies (such as ICA or the CIAT project). The evaluation trials which emphasize the role of the farmer in selecting materials desired locally, may have provided a stimulus to indigenous experimentation with varieties (Figure 1).

An important objective of monitoring farmer experimentation is to identify opportunities for formal research to support and strengthen this effort. Farmer experimentation indicates where farmers perceive potential for

technical change. From the point of view of methodology development for participatory research, it is of interest to assess whether adoption or useful feedback to researchers can be generated by forging links between farmer experimentation, and the participation of farmers in designing and evaluating on-farm trials. To address these objectives, a study is in progress to evaluate the potential of climbing beans for mid-altitude (1200-1800 masl) sites in Cauca. The study of farmer experimentation shows that farmers are abandoning the traditional system of maize intercropped with staked climbing beans, due to a shortage of staking material. Instead, farmers are experimenting with monocropped maize, planted on slopes instead of as is traditional, in valley bottoms; and monocropped bush beans. These issues were analyzed by a group of farmers in a participatory diagnosis, and the group outlined an experiment to evaluate new climbing bean materials in the traditional intercropping system, and in association with an improved maize, supporting the beans. Results of the first trial showed that alternative maize varieties were required; several were planted in collaboration with ICA/CIMMYT and evaluated by farmers. From these, farmers selected an acceptable improved maize variety, which was included in a second planting of the climbing bean trial. Farmer experimentation meanwhile, has introduced a new climbing bean into the area, which is being staked and monocropped. The CIAT climbing bean materials will therefore, also be tested in this system and efforts are underway to identify new sources of staking material which might also be utilized for forage or in contour strips for soil conservation.

In 1988, cassava varietal trials for farmer evaluation were planted. On-farm trials are summarized in Table 8.

In collaborative efforts with the CIAT Cassava and Bean Programs, staff from CIAT and ICA trained by the Project have conducted farmer evaluations in several areas of Colombia outside the Project's pilot-testing sites (see Table 2).

Table 8. On-farm trials with ICA and CIAT programs, in pilot testing sites. 1987-8.

Technology/type of trial	Status/year planted	No. sites
Bush bean varieties (farmer evaluation)	1987B	22
	Ongoing/1988B	10
Climbing bean/maize varieties in association (farmer evaluation)	1987B	5
	1988B	2
Cassava varieties (farmer evaluation)	Ongoing/1988A	20
Bush bean varieties (observation nurseries)	1988A	2
	1988B	2
Varietal differences in fertilizer response (beans) (exploratory)	1988A	1
Fertilizer sources for cassava (exploratory)	Ongoing/1988	4
Fertilizer sources for maize (exploratory)	1988A	2
Maize varieties (farmer evaluations)	1988A	2
	Ongoing/1988B	2
Planting densities (bush bean) - farmer design	1988B	3

2. TRAINING

TRAINING IN THE PILOT TESTING AREA

The training approach of the Project has evolved to accomodate several different levels of training needs and objectives. The hierarchical division of responsibilities for planning and execution of on-farm research which exists in many national programs means that station researchers and extension supervisors are primarily responsible for planning surveys or experiments, while field on-farm research and extension staff are expected to carry out the interviewing or to plant the trials in farmers fields. This division of functions means that training has to be carried out at different levels: for planners and supervisors a full understanding of participatory research concepts and strategy is necessary; although they need to be familiar with skills required for field work, they are

unlikely to be the people actually doing the field work. Field work practitioners are the audience for whom practical training in field work skills is indispensable. These two audiences for training have different statuses in national program organizations and different levels of prior training and skills, and it has been necessary to adopt a training strategy which involves two components:

1. "Awareness training" for station researchers and extension supervisors, with less emphasis on skills.

2. Skill training for field researchers.

The training approach of the Project initially emphasized short sequential workshops, practical field exercises with small groups, and on-the-job training in the pilot testing area. The overall approach involves collaborative field testing of methods which provides Colombian national program staff with exposure to these and involves them in methodology development; then systematizing these experiences into training materials; and finally development of a format for formal training. For example, "awareness-training" was initiated with a one-day seminar at the ICA-Palmira research station to which senior program leaders, research staff and senior extensionists were invited. Participatory research concepts and methods were presented and discussed (including presentation of the video "The IPRA Method" produced by the Project). An important result of this seminar was the strong interest expressed in farmer evaluations of new varieties by ICA breeders in the maize, beans, cassava and pastures programs. Subsequently, a presentation on participatory research concepts and strategy was made to an audience consisting primarily of extension field staff and including representatives of the scientists' working groups. Methodology for farmer evaluations was a focus of this session, which was followed up by practical implementation of farmer evaluations in field training exercises with extension

and research staff to give them the opportunity to observe practice evaluation techniques (see Table 2). Field training exercises in farmer evaluations have involved very small groups in any one session in part because of the importance of this to effective interaction with individual farmers. Experience with group evaluations has provided the basis for developing an approach to training with larger groups of trainees. Results of farmer evaluations provide the material for a manual and plans for a short course for teaching evaluation techniques, discussed in detail in the sections on training materials, and future plans for training.

A formal three day workshop was held at CIAT in February, 1988, on "Participación del *pequeño* agricultor en el diagnóstico para investigación en fincas: Metodologías y resultados". The thirty-five invited participants included scientists from the ICA-Palmira Experiment Station, extensionists from Cauca, CIAT staff, ICA farming systems project staff, and ICA communications specialists with experience in group diagnoses for agricultural extension purposes in other regions of Colombia. The purpose of the workshop was to familiarize representatives of these different groups with each others' work; to provide "awareness training" in participatory group diagnosis for ICA-Palmira scientists who had little or no familiarity with this technique; and to discuss the application of group diagnosis with farmers towards planning on-farm research. Many participants in this workshop met for the first time to exchange ideas and information about acitivities which have much in common methodologically, but few knew anything about the others' experiences. A short course on participatory diagnosis was given for 34 participants in August; and in October 25 participants received training in skills for managing human relations in participatory on-farm research (see Table 8).

These represent "first-stage" training activities. The short courses were primarily oriented towards training on-farm

researchers in skills and methods for participatory research. Follow-up to the formal training involved implementing

Table 9. Summary of training activities. 1987-8.

Type of training	No. of events	Ave. No. participants per event
Courses	2	23.5
Formal workshop	1	35.0
Seminars and informal workshops	4	20.0
CIAT on-farm research course	1	21.0
Field training exercises in participatory diagnosis	11	8.0
Field training exercise in farmer evaluation	7	3.5
Thesis research (undergraduate)	-	1.0

No. of personnel participating

ICA	- From pilot testing area	52
ICA/CIAT	- From outside pilot testing area	96
	TOTAL	148

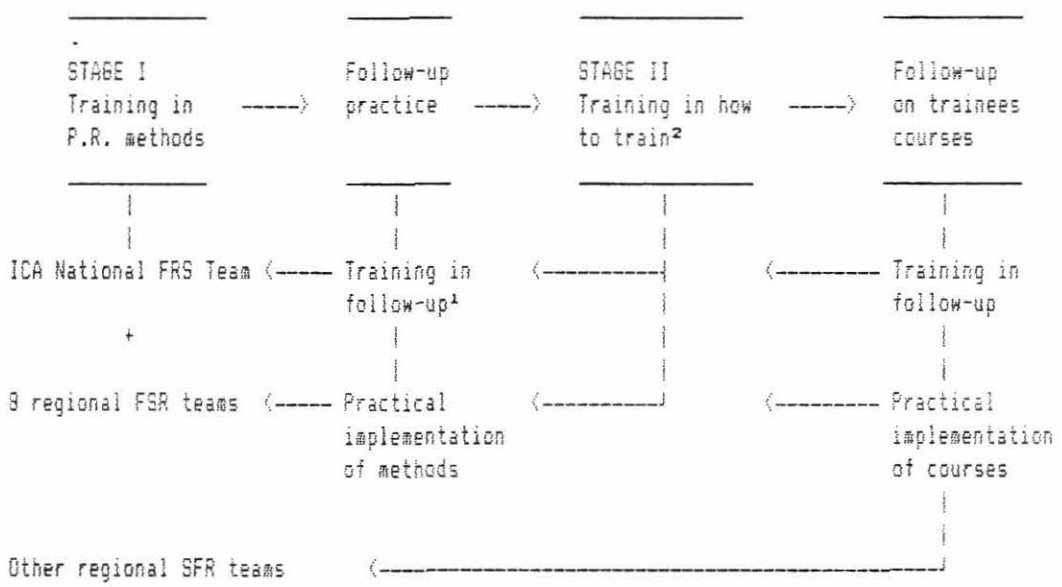
participatory group diagnoses in field exercises (see Table 1). At successive field training exercises, participants progressed from acting as observers, to acting as moderators in small groups supported by Project staff, to carrying out an entire group diagnosis session with Project staff acting as observers. These field diagnosis sessions with farmers address issues raised in the formal workshop, such as integrating a systems perspective into the diagnosis, so that the ICA staff involved contribute actively to the development of methodology to meet needs and short-comings of the approach raised in the previous workshop. As a result of this training, ICA and CIAT staff have taken the initiative in conducting participatory group diagnoses outside the pilot testing sites with and without Project support (see Table 1).

This approach has been formalized into a model for training with the Colombian national program, specifically ICA's newly-formed teams of on-farm researchers drawn from different regions of the country. The Project's model for training (Figure 1) involves a first stage of training regional teams in subject matter (ie. participatory research methods). Because of the importance to effective learning of practical implementation of the subject matter and skills taught at stage I, a follow-up on practical field implementation is included in the training procedure. This follow-up trains national program trainers in how to manage the practical field implementation by trainees as a training exercise.

In stage II, training of trainers is directed at selected individuals or teams from stage I who will have regional training responsibilities. During this stage they prepare a course, and teaching plan which they are required to carry out in their own region after training at CIAT. Follow-up, with team teaching by trainee trainers and CIAT staff, re-inforces the skills taught in stage II.

Implementation of this approach in 1988 is summarized in Figure 1. A first stage training was carried out in 1988 with 9 ICA regional farming system research teams in collaboration with four additional teams of national program trainers in Colombia. Selected teams have been provided with follow-up by the Project when they implement participatory research exercises, such as group diagnosis with farmers. The Project provides training to ICA national trainers in how to carry out follow-up training for regional teams.

In the second stage of training, selected regional teams will receive training in how to prepare and conduct courses and follow-up training, based on the prototype course developed by the Project and national ICA trainers. Regional teams will



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[1] Follow-up by Project and ICA trainers in 2 locations in 1988. The remaining six regional teams to receive follow-up by ICA trainers.

[2] Planned for early 1989.

Figure 1. Implementation of the Project's training approach with ICA, Colombia.

train other farming systems research professionals and extension staff in their region. Two such courses on farming systems research incorporating Project methods and materials for participatory research were taught by the national team of trainers in 1988.

TRAINING OUTSIDE THE PILOT TESTING AREA

Farmer evaluations of technology have been a significant area of training activity outside the pilot testing area. Project staff contributed to a two-day workshop on farmer evaluations with ICA staff drawn from various departments on the North Coast of Colombia where this methodology is being implemented with the ICA and CIAT cassava breeding programs. Research assistants of the CIAT bean program agronomy section

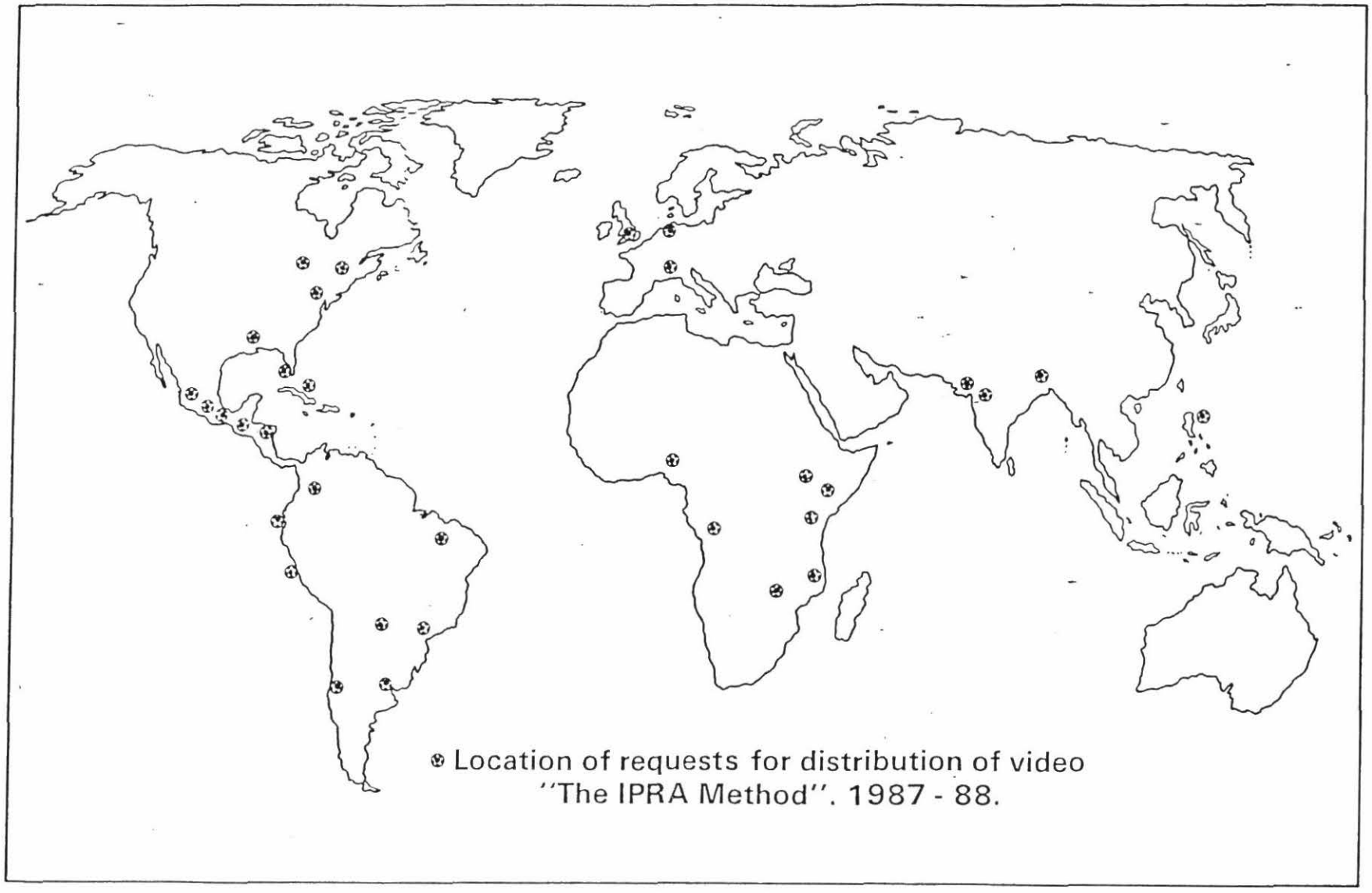
received training in participatory diagnosis and farmer evaluation methodologies. As a result of this training participatory diagnosis and evaluations have been integrated into on-farm research activities in Colombia other than those directly carried out by the Project, and are virtually self-sustaining, with the Project staff providing occasional support (see Tables 1 and 3).

The Project also collaborated in training for the Andean Bean Project, providing orientation for the project anthropologist and introducing participatory group evaluation with farmers into a ten-day workshop held for on-farm researchers in Cajamarca, Peru.

TRAINING MATERIALS

The development of training materials for participatory research, as is the case with training carried out by the Project, has to address a broad spectrum of needs and a varied audience. There is a need to communicate concepts, strategy and results of participatory methods to a research audience, as well as practical guidelines for the development of skills to field work practitioners.

In 1987, a twenty-minute video program in English and Spanish titled "The IPRA Method: Participatory Research for Agriculture" was produced. Distribution of 60 copies of the video has been done to date exclusively on the basis of requests for copies (Figure 2). A list of recipients is maintained so that the Project can mail out a follow-up questionnaire to find out how the video is being utilized, and with what response; this information will be incorporated into a written study guide with suggestions for trainers on how to use the video for training purposes.



⚽ Location of requests for distribution of video "The IPRA Method". 1987 - 88.

The manual titled "Farmer Evaluations of Technology. A Handbook" was revised as a result of Project experience in developing techniques for varietal evaluations with small farmers in 1978-8. The manual is oriented at on-farm researchers and trainers of on-farm workers. It covers practical techniques for exploratory evaluations which involve interviewing without set questionnaires; development of evaluation interviews; techniques for measuring farmers' preferences; management of group evaluations; analysis and reporting of data from farmer evaluations.

A second manual was developed for training involving attitudinal sensitization and skills for communicating with farmers in participatory research, titled "Técnicas de Interacción Investigador-Agricultor". This manual was tested in training sessions and is being revised on the basis of this experience.

NETWORKING AND PUBLICATIONS

In July 1987 the Project joined an international network of researchers interested in participatory methods for on-farm research, which was formed at a workshop held at the Institute for Development Studies (IDS), University of Sussex, England. A European-regional workshop was held by the network in Holland in April, 1988: This Project's methodology on farmer evaluations was one selected for special publication by this workshop. The Project took part in a Latin American Regional Workshop of the network in May, 1988.