

Output 3: Strengthened capacity of NARS to design and execute IPM R&D, to apply molecular tools for pathogen and pest detection, diagnosis, diversity studies and to devise novel disease and pest management strategies.

Activity 3.1. Developing integrated pest management components

Contributors: J. M. Bueno I. Rodríguez, X. Tapia, and C. Cardona

Highlight:

€ Continued and expanded diffusion of technology activities within the DFID-funded project on Sustainable Management of Whiteflies

Rationale

Whiteflies have become the target of excessive pesticide use by snap bean and dry bean farmers in the Andean zone. A management system for whiteflies that contribute to reduce pesticide use has been developed and tested with farmers in Colombia and Ecuador (see 2002-2004 PE-1 Annual Reports). In 2005 we continued and expanded diffusion of technology activities at both sites in Colombia and Ecuador. Work was initiated at a third site in Bolivia.

Materials and Methods

Following the renewal of the DFID project, diffusion activities were planned and contacts with collaborating partners were made. Preparation of technical and extension bulletins was initiated. New collaborators in Bolivia were trained. A large-scale demonstration trial was conducted in the Tenerife area of Colombia.

Results and Discussion

The large-scale demonstration plot allowed us to validate with success, in a new site, the technology that had been developed in previous years. As in previous trials, and as compared with farmers' practices, alternative management strategies based on judicious timing of applications and use of action thresholds resulted in yields that did not differ from those obtained by farmers with their traditional management approaches (Table 3.1.1). We were able to demonstrate that with a combination of cultural practices, the use of systemic insecticides as seed dressing and proper timing of foliar applications farmers can obtain higher benefit/cost ratios with a 60-70% reduction in the amount of applications made per cropping cycle.

Other activities were:

1. Training of Vladimir Lino (Proinpa), a new collaborating partner in Bolivia
2. Reinitiating Farmers Schools activities in the Chota region of Ecuador
3. Writing, editing and printing of a technical bulletin on management of whiteflies (Figure 3.1.1) and extension bulletins for Colombia, Ecuador, and Bolivia (Figure 3.1.2).

Table 3.1.1. Yields (Kg/ha) and economic returns obtained with two approaches for control of the greenhouse whitefly *Trialeurodes vaporariorum* in Tenerife, one of the reference sites in Colombia. Unreplicated demonstrative trial. No statistical analysis performed.

Treatment	No. of insecticide applications	Yield (Kg/ha)	Costs (\$/ha)		Benefits (\$/ha)		Benefit/cost ratio
			Variable	Total	Total	Net	
CIAT's proposal ^a	3	9327	275	1655	4145	2490	2.50
Farmers practices ^b	7	7998	408	1788	3554	1767	1.99

^a Seed treatment with imidacloprid followed by two foliar applications of conventional insecticides at pre-established action thresholds; ^b 6-7 foliar applications of conventional insecticides.



Figure 3.1.1. Title page of the technical bulletin produced in 2005. This publication will be extensively used in diffusion of technology activities during 2006 and beyond.



Figure 3.1.2. Title pages of extension bulletins produced in 2005. These publications will be extensively used in Colombia (A), Ecuador (B), and Bolivia (C).

Activity 3.2. Diagnosing plant diseases and technical assistance

Contributors: E. Álvarez, J. F. Mejía, G. Llano, J. P. Castillo, E. Gómez, and J. Loke

Rationale

Plant disease diagnoses are carried out by the Cassava Pathology Program as a service to help Colombian institutions and individuals diagnose plant disease problems in their crops. Diagnoses are based on visual observations of symptoms expressed by infected plants and additional laboratory analysis.

Bacteriological and fungal diagnoses were performed on different samples obtained from Colombian farmers and institutions (Table 3.2.1).

Table 3.2.1. Bacteria and fungi isolated from different crops and identified at the CIAT Cassava Pathology Laboratory, Palmira, Colombia.

Location	Host plant	Disease	Detection method	Microorganism identified
Rozo, Valle del Cauca	<i>Heliconia</i>	Bacterial wilt	Isolation on selective medium, pathogenicity, and DNA sequence analysis	<i>Ralstonia solanacearum</i>
Montenegro, Quindío	Plantain	Bacterial wilt	Isolation on selective medium, pathogenicity, and DNA sequence analysis	<i>R. solanacearum</i>
Popayán, Cauca	Tomato	Bacterial speck	Isolation	<i>Pseudomonas syringae</i> pv. <i>tomato</i>
Montenegro, Quindío	Squash			<i>Xanthomonas</i> sp.
Buga, Valle del Cauca	Cacao	Moniliasis		<i>Moniliophthora roreri</i>
Tauramena, Casanare	Cassava	Cassava bacterial blight	Isolation	<i>X. axonopodis</i> pv. <i>manihotis</i>
Montenegro, Quindío	Banana	Fusarium wilt	Isolation	<i>Fusarium oxysporum</i>
Montenegro, Quindío	Plantain	Bacterial wilt	Isolation on selective medium, pathogenicity, and DNA sequence analysis	<i>R. solanacearum</i>
Dapa, Valle del Cauca; Fusagasuga	<i>Thea sinensis</i> ; Tomato		Isolation	<i>Colletotrichum</i>

Activity 3.3. Evaluating novel / innovative approaches in scaling up integrated pest and disease management (IPDM) technologies

Contributors: E.Minja, S Komba, S. Kaaria, R.Buruchara, E.Lubega, D. Andima, M Ugen, F. Opio, R. Muthoni, E. Ulicky, J. Ogecha, P. Sanginga, H. Mziray and M. Mfoi

Highlights:

- € Novel approaches with potential for promoting IPDM technologies were evaluated at target project sites
- € Trained modified farmer field school (MFFS) groups were effective in knowledge sharing and dissemination of IPDM technologies
- € Cohesive and dynamic farmer research groups (FRGs, over 300 groups with more than 50,000 well trained farmers) have evolved at project sites in Uganda, Kenya, Tanzania and Malawi
- € Farmer to farmer knowledge sharing enhanced technology dissemination and adoption (60-85% adoption rate)
- € Farmers used traditional (drama, songs, poems) and conventional (seminars, demonstration and learning plots, field days and visits, radio, promotional materials) pathways in technology dissemination
- € The process of learning by doing and seeing succeeded in using the psychology of development that helped to build farmers' confidence in the effectiveness of indigenous practices that they blended with improved technologies
- € The approach and processes used in the project has helped to improve the skills of individual farmers and groups in the identification and management of production constraints (such as diseases, insect pests, soil fertility and markets), demand and search for information on solutions and new technologies
- € The practical sessions used in implementing project activities helped to empower men and women farmers in the management of their own resources

Rationale

The purpose of the bean IPDM promotion activities was to contribute to the reduction of losses caused by bean pests through effective targeting, dissemination and adoption of integrated pest management strategies that are acceptable to smallholder farmers in eastern, central and southern Africa. Useful practical experiences have been gained, successes achieved and lessons learnt during the promotion of technologies at target sites. There was need to document farmer adoption behaviour and social economic effects on adopters' livelihoods. Such information will form the basis for developing guidelines for adapting useful approaches, methods and processes to scale-up the adoption of IPM and allied technologies. The guidelines will be shared with key partners to exchange positive and negative experiences and to train current and new partners in future active research.

Materials and Methods

The adoption studies were planned and conducted at three project sites each in Uganda, Kenya and Tanzania. The sites are Kabale district in south western Uganda, Kisii and Rachuonyo districts in Nyanza province, Kenya and Hai district in northern Tanzania. Random and purposive random sampling methods were used to gather primary and secondary data. Data were analyzed using the SPSS program. Studies in Dedza district, central Malawi have delayed and are planned to be conducted by end of March 2006.

Formal questionnaires were administered during interviews with individual farmers, farmer groups and key informants. A total of 100 farmers (53 men, 47 women) out of over than 500 were interviewed. In Kenya, 61 farmers (25 men, 36 women) out of 4000 farmers were involved in the study. In northern Tanzania, where over 6000 farmers are aware of bean IPM technologies, the study sample interviewees comprised a total of 236 individual bean farmers (114 men, 122 women) in 39 farmer groups (out of 77) from 27 villages (out of 76).

Results and Discussion

Kabale, south western Uganda: The studies in Kabale and Hai districts have been completed and documented. The data and results from Kisii and Rachuonyo districts in Kenya have been analysed and report preparation is in progress. In Kabale, (Uganda) the effectiveness of using a trained modified farmer field school (MFFS) group as an option of enhancing farmer knowledge and disseminating IPDM technologies to several peer groups was assessed. The potential for participatory farmer research groups (PFRG) was assessed in Hai (Tanzania) and a combination of MFFS and PFRC) was assessed in Kisii and Rachuonyo districts in Kenya. Farmer / community behaviour in adopting or rejecting IPDM technologies was monitored and documented. The effectiveness and impact of project approach and processes used in disseminating and promoting IPDM technologies on the social economic situation of participating and non participating farmers was assessed and documented. A draft guideline for use by partners to scale up the dissemination of IPDM technologies in the region has been prepared.

The results show that once farmers and other stakeholders understood the pest problems and participated in the processes for developing management options, they gained knowledge, experience and confidence that enable them to effectively disseminate the information using diverse pathways at different sites. Such pathways included various traditional (drama, songs, poems and word of mouth) and conventional (training seminars, demonstrations and learning plots, field days and visits, radio, displays, promotional materials, village information centres, radio and TV). Farmer to farmer dissemination of information and technologies was the most commonly used method. New farmers adopted technologies from innovative farmers with slight or no modifications.

Results from Kabale show that there have been a shift from growing beans as a basic food requirement where only a surplus could be sold to a production status intended to earn income (Table 3.3.1).

Table 3.3.1. Importance of beans in the farming system.

Reason	Before project (2000)		After project (2005)	
	Frequency	Percent	Frequency	Percent
Food only	17	34	16	16
Food and sell some	33	66	72	72
Both food and cash	0	0	11	11
Mainly cash	0	0	1	1

The study in Kabale also showed that the participatory group approach and processes have helped even the farmers who could neither read nor write to learn effectively and be able to also train others informally. In addition, project activities have influenced change in gender related traditions where, more men are now involved in bean production. This shift could be result of the crop becoming an important source of household income especially now when it is recovering from serious disease and insect pest problems and the high demand for food and improved seed.

A variety of IPDM innovations have been adopted and were being practiced by the beneficiaries. It was found that the more farmers are aware of a specified technology and its benefits and they recognize that it can address their need, the more they are likely to adopt and practice it. Adoption was also dependent on the cost and ease of implementing it. The most widely and less adopted technologies are shown in Table 3.3.2.

Beneficiaries and collaborators observed that it was much easier to access information and technologies through groups than individuals. The IPDM groups in particular had accrued numerous benefits to all development stakeholders. Adoption of technologies was more related to access than preference. For example, there was a positive correlation between the use of manure and digging of trenches, and the size of land (Table 3.3.3). The table shows that farmers with more land had adopted the application of manure and digging of soil conservation trenches. However, due to the hilly terrain, manure application was most common near the homestead fields.

All IPDM groups are interested in bean seed production. Groups sell the available seed at group and household level although they all showed concerns that they did not have enough seed. Some members sell seed to acquire money for renting additional land. The stronger groups have entered the seed market through links with local NGOs (such as Africare and CARE).

According to beneficiaries, the MFFS approach had extra advantages over the other approaches. Seventy one percent (71%) of the responses indicated that the MFFS was better than the rest of the approaches. Out of these, practical learning impressed fifty eight percent (58%), 10% confessed to have acquired better understanding while 3% liked the good interaction the approach accorded participants and trainers. Other additional advantages from focus group discussions were:

- € The practical sessions helped learners to understand better and acquire skills that they are currently applying in other enterprises
- € The testing allowed them a chance to adopt varieties that were doing well in their localities
- € The approach enabled those who could neither read nor write to learn effectively and can also train others informally

Table 3.3.2. Technologies adopted by IPDM groups and how they have helped the farmers in Kabale district, south western Uganda

a) Technologies adopted (mostly for purposes of managing BRR)		
Technology	How the technology has helped	Sustainability plan
Application of compost manure (46%)	Increased production (26%), soil fertility improvement (6%), reduced disease (5%), cheap (4%) tasty bean leaves, controlled BSM	Dig compost pits (18%) Rare livestock (11%) Plant fodder (6%)
Changed varieties (8%)	Increased yield (4%)	Save own seed (5%)
Use of FYM (64%)	Increase yields (37%), increases soil fertility (8%), cheap (6%), controls pests/diseases (4%)	Rare livestock (19%) Dig compost pits (15%) Plant fodder for animals (6%)
Planting in lines (15%)	Use less seed (3%), get high yield (5%) and reduced time in weeding & harvesting	Continue practice (8%) Planning fields (2%)
Digging trenches & stabilizing bunds with agro-forestry trees and grasses (22%)	Stops erosion (3%), controls floods (9%) provide stakes, firewood and animal fodder & improves soil fertility	Construction of drainage channels (16%)
b) Technologies that were learnt but were being adopted on a relatively small scale		
Technology	How the technology has helped	Why limited adoption
Resting land/fallowing	Rejuvenates soil fertility, increases soil and crop production	Inadequate land, available is continually farmed
Seed selection & separating of varieties	Access to quality seed, increased demand in the market and by other farmers	Little seed available
Controlled soil & bush burning	Reduces erosion, adds manure to the soil	Inadequate knowledge
Use of chemical sprays	Control of pests and diseases, increased production	Inadequate income/expensive
Crop rotation	Control soil exhaustion by limiting heavy feeders e.g. Irish potatoes & wheat	Inadequate land/need for all crops
Rouging volunteer plants (few people)	Controls diseases (mostly used in the Irish potato enterprise)	Volunteers are a source of early food during period of scarcity
Potting tree seedlings	Healthy seedlings produced, easy handling	
Use of inorganic fertilizers	Increased production	Expensive/Inadequate income

Table 3.3.3. Relationship between size of land and adoption of selected soil fertility management technologies in Kabale district, south western Uganda.

Innovation	% age adopting	Average land size (ha)*	%age not Adopting	Average land size (ha)*
Use of FYM	60	2.5	18	2.3
Use of compost manure	43	2.7	35	2.3
Digging of trenches	12	2.7	66	2.5

* A hectare was interpreted to be an equivalent of the size of a football pitch. Respondents had difficulty in estimating the sizes of plots they owned, particularly where they needed to add more than 1 plot to make a hectare

Kisii site, Nyanza province in Kenya: Results on adoption of IPDM technologies by farmers revealed that farmers had identified and ranked bean production constraints that included insect pests and diseases. Among the major insect pests in order of importance according to farmers' responses are aphids, cutworms, bean stem maggots (BSM) and bruchids while diseases in order of importance are bean mosaic viruses, blight, leaf rust, root rots, anthracnose and angular leaf spot. Farmers had also used their own traditional technologies in insect pests, diseases and soil fertility management. The studies also showed the farmers tested and adopted several different technologies that include use of improved crop varieties, regular scouting of pests, timely planting, use of botanical plant extracts (such as *Tephrosia*, *Tithonia*, Marigold, Datura, Neem and dry sisal leaves) use of conventional chemical pesticides and fertilizers, timely weeding and harvesting, proper drying and clean storage and soil nutrient management (such as use of compost and manure).

The studies further indicated that 85% of interviewed farmers had adopted several of the IPDM technologies that they had tested at a rate ranging from 92-95% for three of the technologies (Table 3.3.4). A detailed analysis showed that over 80% of the farmers had adopted more than 7 IPDM technologies in a period of over 3 years while 65.4% (n=52), 71.7% (n=53) and 71.2% (n=52) had adopted the use of improved varieties, regular scouting and timely weeding, respectively for more than 4 years (Table 3.3.5).

Table 3.3.4. Overall farmer adoption of IPDM technologies at Kisii site, Nyanza province in Kenya.

IPDM technology	Percent adoption	Number interviewed
Use of improved crop varieties	94.4	52
Regular scouting for pests	94.6	53
Timely weeding	92.6	52

Table 3.3.5. Adoption rate for three of the most preferred bean IPDM technologies by farmers in Nyanza province, Kenya between 2000 and 2004.

Year	IPDM technology					
	Tolerant crop varieties		Timely weeding		Use of botanical pesticides	
	Count (n=49)	%	Count (n=49)	%	Count (n=43)	%
2000	15	31.9	15	30.6	13	30.2
2003	38	80.9	28	77.6	34	79.1
2004	46	97.9	48	98.0	42	97.7

The data from three locations at Kisii site also indicated that farmers (76.2%, n=42) had adopted improved bean varieties (Table 3.3.6) because they are high yielding; tolerant to insect pests, diseases, drought and infertile soils, early maturing, suitable for food and sale at the local market.

Table 3.3.6. Comparison of farmers growing the most preferred pest tolerant bean varieties in Kasipul, Kabondo and Mosocho divisions in Nyanza province, Kenya.

Bean variety	Kasipul		Kabondo		Mosocho	
	Count	%	Count	%	Count	%
G8047	10	66.7	22	81.5	2	10.5
EXL52	5	33.3	20	74.1	5	26.3
Red Harricot	6	40	1	0.04	10	52.6
ARA4	4	26.7	6	22.2	10	52.6
KK15					7	36.8
Wairimu	13	86.7	9	33.3	3	15.8
EXL55	5	33.3	14	51.9	2	10.5
GLPS Nyayo (Lyamungo 85&90)	4	26.7	6	22.2	1	0.05
PAN150	3	20.0	4	0.2		
KK8					13	68.4
KK22					6	31.6
KK20					8	42.1

Interviewed farmers also narrated the benefits that they gained from the adoption of IPDM technologies (Table 3.3.7). These farmers further mentioned the effects of adopting the IPDM technologies on their households as i) the increased crop yield enabled them to have sufficient food at household level during periods of scarcity (59.6%, n=52), ii) improvement in general family health (53.9%, n=45), iii) general increases in household income (41.7%, n=48) and increased household food supply all year round (53.9%, n=13).

Table 3.3.7. Benefits from the use of selected IPDM technologies by farmers at Kisii project site in Nyanza province, Kenya.

IPDM technology	First benefit	Count	%	Second benefit	Count	%
Improved crop varieties	Leads to high yields	52	84.6	Effective against insects & diseases	52	15.4
Regular scouting	Effective against insects & diseases	51	58.8	Leads to high quality seeds	51	21.6
Timely weeding	Reduce soil nutrient competition	53	52.8	Leads to high yields	53	43.4
Use of botanicals	Cheap and easy to use	55	69.1	Effective against insects & diseases	55	25.5
Use of conventional chemicals	Effective against insects & diseases	55	85.5	Leads to high yields	55	14.5
Soil nutrient management	Improved soil fertility	55	63.6	Leads to high yields	55	16.4
Cropping system	Effective against insects & diseases	53	62.3	Leads to high yields	53	24.5
Timely harvesting	Effective against insects & diseases	53	60.4	Leads to high quality seeds	53	32.1
Drying, cleaning & sorting	Cheap and easy to use	55	41.8	Leads to high	55	25.5
Type of storage facility	Cheap and easy to use	55	65.5	Leads to high quality seeds	55	16.4
Storage pest control	Effective against insects & diseases	50	54.0	Cheap and easy to use	50	34.0

Other effects were increased in income controlled by women farmers and improvement in farmers to farmer and community relationships. The overall survey sample results are indicated in Figure 3.3.1. The negative changes experienced by farmers using the IPDM technologies include: increases in the amount of work done by women, increase in domestic fights between husbands and wives, and reduced prices of beans at the local market. The control of household income resulting from increased yield and income could be the main cause for the domestic fights. It is most likely that use of IPDM technologies that helped to increase yields in most households resulted in market price reduction as mentioned by the farmers. This observation shows the need for appropriate storage facilities and formation of credit and savings associations to enable farmers to store their grain and use loans for settling household needs until market prices become favorable. It is most likely that use of IPDM technologies that helped to increase yields in most households resulted in market price reduction as mentioned by the farmers. This observation shows the need for appropriate storage facilities and formation of credit and savings associations to enable farmers to store their grain and use loans for settling household needs until market prices become favorable.

The most effective bean IPDM technology dissemination channels that were mentioned by farmers include use of farmer research groups, setting up demonstration and learning plots, organizing and conducting field days, facilitating tours, conducting seminars and training workshops, using media particularly local radio, preparation and distribution of promotional materials (such as posters, leaflets, field guides, manuals), setting up village information centers (VICs), neighborhood and friendly exchanges, and consultations with researchers, extension and other service providers including NGOs, CBOs and stockists.

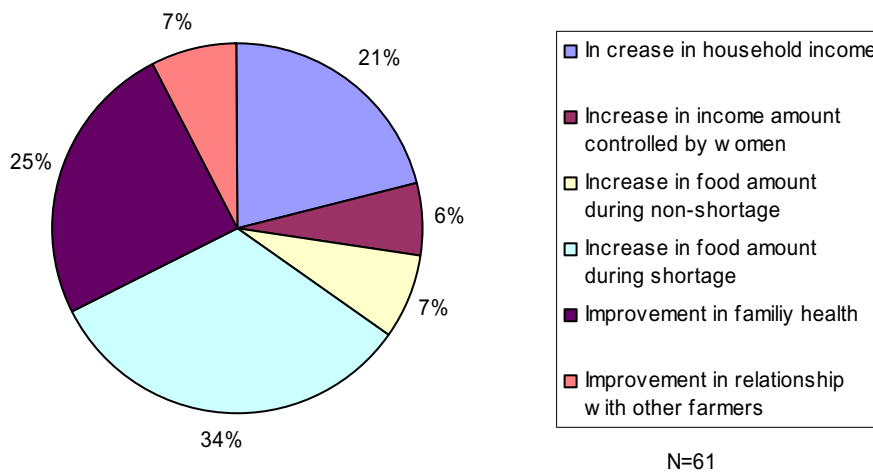


Figure 3.3.1. Positive changes perceived and mentioned by farmers from the use of IPDM technologies based on overall survey sample at Kisii site, Nyanza province in Kenya.

Northern (Hai district) and southern Tanzania: The studies in Hai district indicated that all IPDM research group members were knowledgeable on a number of practices and technologies. The source of information on such technologies varied between groups. Most information was obtained from the village extension officers – VEOs and the IPDM participating group members (Table 3.3.8).

Owners and users of the village information centers and collaborating partners have been sensitized to stock the centers with information materials on other aspects of community development according to users' demand. For example, publications on health issues (such as Malaria control, HIV/AIDS management and nutrition), education (adult education, general newsletters and magazines), agribusiness and general knowledge are found in some of the centers. Community members have been demanding different information materials after visiting the centers. Some members are keen to buy some of the materials for personal use. More farmer activity reports were printed and distributed to existing village information centers and primary school libraries in some of the project locations. New village information centers have been set up in northern Tanzania and Kisii project areas and more materials have been prepared and distributed to these VICs.

Table 3.3.8. Source of information on IPDM technologies for farmer research groups in Hai district, northern Tanzania.

Source	Percentage of farmers responding
Village extension officers	72
IPDM farmer groups	68
Demonstration and learning plots	55
Field days	46
Farmer friends	44
Researchers	36
Training workshops and seminars	32
Leaflets	28
Radio	26
Study tours/Cross visits	18
Non Governmental Organisations	10
Village information centres (VICs)	9
Market places	6
Copying from farmers	5
Traders	3

IPDM group members used different methods to disseminate information on IPDM technologies. The first approach was farmer research groups where group members organize meetings, attend seminars and workshops, set up learning and demonstration plots, monitor pests problem and control them, evaluate technology performance and organize field days and visits to share and disseminate information. Secondly, individual approach where each farmer talks to other farmers or demonstrate different technology options in their individual fields and train other farmers (Tables 3.3.9 & 3.3.10).

Table 3.3.9. Dissemination methods for IPDM technologies in Hai district, northern Tanzania

Dissemination method	IPDM groups		Participating farmers	
	Number	Percentage (n=12)	Number	Percentage (n=136)
Demonstration plots	7	58%	124	92%
Field day	4	33%	-	-
Radio	2	17%	-	-
Markets	1	8%	-	-
Religious places	3	25%	-	-
Village meetings	4	33%	-	-
Talk to other farmers	9	75%	118	87%
Leaflets	-	-	3	2%

Table 3.3.10. Dissemination methods/channels used by IPDM farmer groups segregated by gender in Hai district, northern Tanzania.

Dissemination method/channel	Male (n=54)	Female (n=60)	Total farmers (n=114)
Demonstrate on my own/group plot	42(78%)	38 (63%)	80 (70%)
Talk to other farmers	27(50%)	38(63%)	65 (57%)
Leaflets	10(18%)	3(5%)	13 (11%)

The groups mentioned other dissemination methods such as advertising in mosques or churches, talking to neighbors and relatives from within and outside the village, radio messages and participation in agricultural shows such as Nane Nane (National Farmers' Day). As the result of these efforts, the focus group discussion members estimated the number of farmers who are knowledgeable and use some of the IPDM technologies as it ranged from 40% to 80% depending on the age of the farmer research group.

Among the interviewed farmers in Hai district, 91% considered IPDM technologies to be advantageous in farm production, 86% reported increases in bean and maize production, 18% reported that the technologies were safe and relatively cheap compared to conventional chemical pesticides and fertilizers and 17% indicated that the technologies were easy to use. Farmers reported social economic benefits such as access to inputs, improved skills, information and new technologies that have helped them to increase farm production, resulting in increased household income and food security. The increased income was used to pay children school fees, purchase extra and better food, acquire better building materials and clothing, hired additional land for cultivation and some farmers were able to purchase livestock. Other benefits included reduced use of conventional chemical pesticides and fertilizers and links to new partners for information and services.

As farmer groups continued to be innovative in northern Tanzania, they have demanded to additional services and new technologies. In 2005 such farmers tested traditional and locally available organic fertilizers (animal manure, Minjingu Rock Phosphate and Minjingu Rock Phosphate + Solubilizers) on different bean varieties at Sanya Juu, Mogabiri and Makisoro villages in Hai, Tarime and in Arumeru districts, respectively. A screen house trial on two of these varieties was set up at SARI in Arusha (Table 3.3.11 and Figures 3.3.2 – 3.3.4).

The data in the table shows the advantages of combining farmer yard manure and the rock phosphate where the moisture retention, nitrogen and other contents in the farm yard manure enhances the solubility of the rock. During a field day conducted by Sanya Juu bean IPM groups, farmers noted and were impressed by the vigorous stand and foliage retention of the fertilized bean plants (Figure 3.3.2), the pod and seed setting and the larger seed size compared to unfertilized plants. Bean stems and haulms are a source of quality livestock fodder that is used by all zero grazing livestock farmers in northern Tanzania.

Table 3.3.11. Bean grain yield response to on-farm organic fertilizer trials at Sanya Juu village, Hai district, northern Tanzania in March-July 2005 planting season.

Organic fertilizers	Mean bean grain yields on 3 varieties (tons/ha)		
	Lyamungu 90	JESCA	Selian 94
Unfertilized control	3.5d	4.1c	4.2d
Minjingu Rock Phosphate (MRP)	4.3c	5.8b	5.0c
Farm yard manure (FYM)	4.9b	7.1a	6.3b
Minjingu + Farm yard manure	6.8a	7.5a	7.1a
LSD at 0.05	0.006	0.007	0.006
CV (%)	13.8	14.3	12.8

Columns followed by the same letter are not significantly different (P=0.05)



Bean plants with Minjingu

Bean plants without Minjingu

Figure 3.3.2. Bean plants response to Minjingu Rock Phosphate (MRP) application at Sanya Juu village, Hai district in northern Tanzania during March-July planting season in 2005.

Links with Farm Inputs Promotions Africa Ltd- FIPS (an NGO) and Minjingu Mines & Fertiliser Ltd (private company) has helped to create awareness with farmers in Arumeru, Moshi and Tarime districts in northern Tanzania. Bean farmer groups in the 3 districts experimented with Minjingu Rock Phosphate (MRP) that has been fortified with Ca at 16%, K9%, N7% and S 5% help in the solubility of the rock and enable it to become available to short duration and fast growing crops including beans and vegetables. The company further agreed to pack the fertilizer in small packets (1kg) for distribution to bean farmer groups for demonstrations in their home gardens.

More than 200 samples (@ 1kg) of the fertilizer mixture were distributed to farmers in the three districts. Experiments in Arumeru and Tarime were conducted on bush beans while in Moshi it was tested on bush and climbing beans. The currently ending short rain season was characterized by erratic rainfall (Moshi and Tarime) and irrigation water shortages (Arumeru and Moshi) but generally farmers were impressed with the vigorous bean plant growth, larger biomass and the comparatively low severity of bean stem

maggots damage (Figure 3.3.3), improved tolerance to water stress, higher grain yield (1.5-3.0 times) compared to the unfertilized plants (Figure 3.3.4), larger seed size, higher number of seeds per pod and plot (such as 260 compared to 80 seeds per farmer plot at Makisoro village in Arumeru).



Figure 3.3.3. Response of bean plants to Minjingu Mazao at Mogabiri in Tarime, northern Tanzania.

Improved bean seed testing and dissemination has cut across Uganda, Kenya, Tanzania and Malawi as the one of the major activities in IPDM technology promotion. In Uganda and Kenya it addressed the root rot, bean stem maggots and soil fertility constraints while bean stem maggots, bean foliage beetles, aphids and soil fertility were the main focus in Malawi and Tanzania. In the southern highlands of Tanzania for example, the Uyole Agricultural Research Institute (ARI Uyole) sold and distributed over 3000 kg of improved bean seed to farmers in collaboration with partners especially the Evangelical Lutheran Church of Tanzania (ELCT) in Mbozi district and the extension services in all other districts (Table 3.3.12).

Table 3.3.12. Improved bean seed distribution and variety demonstrations in Mbozi district, southern Tanzania during 2005/06 planting season.

Bean variety/line	Amount of seed (kg) purchased and distributed	Number of varieties/lines in on-farm trials	Key partners
Uyole 96	2050	-	Farmers (19 women, 48 men) in 13 villages, ELCT, Extension
Uyole 98	350	-	ARI Uyole, Extension
Uyole 94	100	-	ELCT Mlowo congregation
Wanja (G22501)	200	-	Farmers, Extension
Urafiki	30	-	Farmers, Extension
Calima lines	-	6	ARI Uyole, Farmers, Extension personnel
DRK lines	-	3	Farmers in 4 villages (26 women, 22 men)
Sugar lines	-	2	ELCT, Farmers, extension
Yellow type	-	1	Farmers, Extension

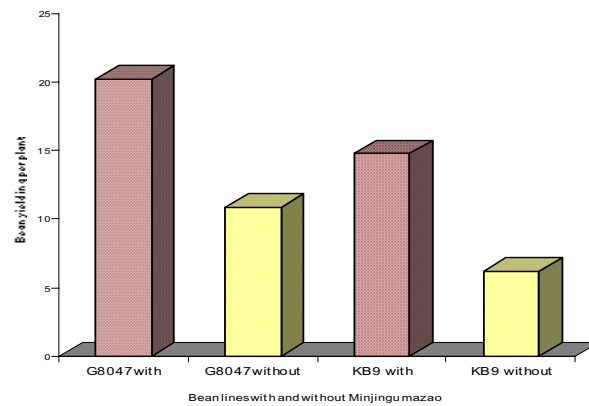


Figure 3.3.4. Grain yield response to Minjingu mazao fertilizer in screen house experiment.

Activity 3.4. Capacity building

Contributors: Staff members of PE-1 and partners

Table 3.4.1. List of students supervised in 2005.

BSc Thesis

Name	Supervisor	University	Title
Javier Francisco Abello C. (Feb. 2004 – Aug. 2005)	Segenet Kelemu (CIAT) Celsa García (Universidad Nacional)	Universidad Nacional de Colombia, Bogotá	Transformación del hongo <i>Acremonium implicatum</i> (J. Gilma & E.V. Abbott) W. Gams, con el gen que codifica para la proteína verde fluorescente (<i>gfp</i>), mediada por <i>Agrobacterium tumefaciens</i> Smith & Townsend.
Jorge Alejandro Corredor (Aug. 2004 – March 2005)	Elizabeth Álvarez (CIAT) Gerardo Martínez (Universidad de Caldas)	Universidad de Caldas	Evaluation of the association of morphological and biochemical characteristics of cassava (<i>Manihot esculenta</i> Crantz) roots with resistance to root caused by <i>Phytophthora tropicalis</i> and postharvest physiological deterioration.
José Luis Claros (Feb. 2005 – Sept. 2005)	Elizabeth Álvarez (CIAT) Martín Fregene (CIAT) Jaime Eduardo Muñoz (Universidad Nacional)	Universidad Nacional de Colombia	Identifying resistance gene analogs associated with bacterial wilt in the ACR cassava family

Table 3.4.1. List of students supervised in 2005, cont'd

BSc Thesis			
Name	Supervisor	University	Title
Eduardo Gómez Aug 2004 – Sept.2005	Elizabeth Álvarez (CIAT) Clemencia Forero de La Rotta (Universidad Javeriana)	Universidad Pontificia Javeriana, Bogotá	Identifying and characterizing isolates of <i>Ralstonia solanacearum</i> obtained from areas affected by bacterial wilt of plantain in Colombia
Carolina Buitrago Aya (Mar 2004 – Oct. 2005)	Andreas Gaigl (CIAT) James Montoya (Universidad del Valle)	Universidad del Valle, Colombia	Evaluación de la patogenicidad y virulencia de <i>Bacillus popilliae</i> Dutky sobre larvas de segundo instar de <i>Phyllophaga menetriesi</i> Blanchard (Coleoptera: Melolonthinae)
Anyimilehidi Mazo Vargas	James Montoya (Univalle) Anthony Bellotti (CIAT)	Universidad del Valle, Colombia	Efecto del algodón Bollgard® (Bt) sobre la diversidad y abundancia de artrópodos del suelo durante su segundo año en el Valle del Cauca
Luz Adriana Mesa Becerra (Oct. 2005 – Oct. 2006)	Elizabeth Alvarez (CIAT) Julio C. Torres (Universidad del Quindío)	Universidad del Quindío, Colombia	Alternativas de manejo de Moko de plátano en focos afectados (Finca La Florida)
Andrés Rincón (Jul. 2005 – Dec. 2005)	Elizabeth Alvarez (CIAT) Andreas Gaigl (CIAT) Inés María Ulloa (Universidad del Valle)	Universidad del Valle, Colombia	Evaluación ex ante de efecto económico y financiero para el manejo integrado de suelos, plagas y enfermedades de la yuca en las regiones del Cauca y Llanos Orientales
Lorena Cortes (March 2004- May 2005)	George Mahuku (CIAT)	Universidad del Valle	Efecto de las diferentes fuentes de abono verde en el suelo sobre el manejo de hongos causantes de pudriciones en el frijol (<i>Phaseolus vulgaris</i> , L. Fabaceae).
Eliana del Pilar Macea (Aug. 2005-Aug 2006)	Anthony Bellotti (CIAT) Jaime Montoya Lerma	Universidad del Valle	Identificación de marcadores moleculares asociados con la característica de resistencia al acaró verde en yuca
Gabriel A. Torres Londoño (Oct. 2005 – Oct. 2006)	Anthony Bellotti (CIAT) Gerardo Martínez López, (Universidad de Caldas)	Universidad de Caldas, Colombia	Evaluación de <i>Sogatella kolophon</i> (Kirkaldy) y <i>Empoasca bispinata</i> (Davidson & Delong) como posibles especies vectoras de la Enfermedad del Cuero de Sapo en yuca
Víctor Hugo Treviño Henao (Oct. 2005 – Oct. 2006)	Elizabeth Alvarez (CIAT) Julio César Torres Arbeláez (Universidad del Quindío)	Universidad del Quindío, Colombia	Alternativas de manejo de Moko de plátano en focos afectados (Finca La Manigua)

Table 3.4.1. List of students supervised in 2005, cont'd

Name	Supervisor	University	Title
BSc Thesis			
Marcelo Vargas (Feb. 2005 – Feb. 2006)	Elizabeth Alvarez (CIAT) Henry Toro (Universidad de Caldas)	Universidad de Caldas, Colombia	Evaluación de prácticas ecológicas de manejo de suelo en focos afectados por Moko (<i>Ralstonia solanacearum</i>) en un cultivo de plátano (Finca La Guaira) en el departamento del Quindío
Omar Zuluaga (Feb. 2005 – Feb. 2006)	Elizabeth Alvarez (CIAT) Henry Toro (Universidad de Caldas)	Universidad de Caldas, Colombia	Evaluación de prácticas ecológicas de manejo de suelo en focos afectados por Moko (<i>Ralstonia solanacearum</i>) en un cultivo de plátano (Finca Cataluña) en el departamento del Quindío
María Fernanda Miller	Cesar Cardona (CIAT) James Montoya (Univ. del Valle)	Universidad del Valle, Cali, Colombia	Sub-lethal effects of a resistant <i>Brachiaria</i> hybrid on the demography of the spittlebug <i>Zulia carbonaria</i> (Lallemand) (Homoptera: Cercopidae)
Sandra Jimena Valencia	Cesar Cardona (CIAT) Magnolia Cano (Univ. Nacional Palmira, Colombia)	Universidad Nacional Palmira, Colombia	Sub-lethal effects of antibiotics on the demography of <i>Zabrotes subfasciatus</i> and <i>Acanthoscelides obtectus</i> , storage pests of beans.
David Pulgarin	Fernando Correa (CIAT) Gustavo Adolfo Garcia Henao (Univ. de Antioquia, Medellín, Colombia)	Univ. de Antioquia, Medellín, Colombia	Caracterización de genes de resistencia a <i>Pyricularia grisea</i> (Sacc.) en variedades de Arroz de America Latina y del Caribe
MSc Thesis			
Name	Supervisor	University	Title
María Elena Cuellar Jiménez (Feb. 2004 – March 2006)	Francisco Morales (CIAT) James Montoya (Universidad del Valle)	Universidad del Valle, Colombia	El arrugamiento foliar del frijol: Transmisión por la mosca blanca (Gennadius) (Homoptera: Aleyrodidae), búsqueda de fuentes de resistencia en <i>Phaseolus vulgaris</i> L. y epidemiología
Miriam Karlsson (Dec. 2004 – Aug. 2005)	Anthony Bellotti, Claudia Holguín (CIAT) James Montoya (Univ. de Sven Axel Svensson (Swedish Univ. of Agric. Science)	Swedish University of Agricultural Science	Control de mosca blanca (<i>Aleurotrachelus socialis</i> Bondar) con insecticidas orgánicos en yuca (<i>Manihot esculenta</i> Crantz)
Sophia Komba (Jun. 2003 – Dec. 2005)	Susan Kaaria, Eli Minja (CIAT) Felician Mutasa (Open University of Tanzania)	Open University of Tanzania and New Hampshire University (USA)	Social economic benefits of IPDM technologies to bean farming communities in Hai district, northern Tanzania

Table 3.4.1. List of students supervised in 2005, cont'd

MSc Thesis			
Name	Supervisor	University	Title
Juan Fernando Mejía (Oct. 2005 – Oct. 2007)	Elizabeth Alvarez (CIAT) Martín Fregene (CIAT) Jaime E. Muñoz (Universidad Nacional)	Universidad Nacional, Colombia	Identificación de genes análogos de resistencia asociados con superalargamiento en la familia ACR de yuca
Maria Antonia Henríquez (Jan.2003 – Aug.2005)	George Mahuku (CIAT) Hernando Ramirez (Universidad Nacional de Colombia, Palmira)	Universidad Nacional de Colombia, Palmira	ESTs para entender la interacción entre genotipos del frijol común (<i>Phaseolus vulgaris</i>) y <i>Phaeoisariopsis griseola</i> , el agente causal de la mancha angular
Walter Ocimati (Sep. 2004 – Dec. 2005)	Robin Buruchara (CIAT) Geoffrey Tusiime (Makerere University)	Makerere University, Uganda	Effects of different management practices against root rots on major crops in the bean-based cropping system of south-western Uganda
Augustine Musoni	Robin Buruchara (CIAT)	University of Nairobi	Inheritance of fusarium wilt (<i>F. oxysporum</i> f.sp. <i>phaseoli</i>) and selection for multiple disease resistant and marketable climbing bean varieties
Carlos Alberto Ortega-Ojeda (Jan. 2004 – Dec. 2005)	Andreas Gaigl (CIAT) César Falconi (Escuela Politécnica del Ejército)	Escuela Politécnica del Ejército; Centro de Posgrado (Ubicado en Sangolquí-Distrito Metropolitano de Quito)	Estudios metodológicos para evaluar el impacto económico de escarabajos Melolonthidae (Insecta: Coleoptera) en cultivos tropicales
Leopoldo Serrano	Francisco Morales (CIAT)	Universidad de El Salvador	Caracterización de biotipos de la mosca blanca
Ana Karina Martinez	Francisco Morales (CIAT) F. Alirio Vallejo (Univ. Nacional Palmira)	Universidad Nacional Palmira, Colombia	Caracterización del <i>begomovirus</i> y evaluación de líneas como fuente para la producción del tomate con resistencia a <i>begomovirus</i> en el Valle del Cauca
Maritza Cuervo	Lee Calvert (CIAT) Edgar Ivan Estrada (Univ. Nacional Palmira)	Universidad Nacional Palmira, Colombia	Caracterización molecular de algunos aislamientos del virus del cuero de sapo de la yuca recolectados en diferentes zonas de Colombia
Fernando Lopez	Cesar Cardona (CIAT) James Montoya (Univ. del Valle)	Universidad del Valle, Cali, Colombia	Tolerance to adult feeding damage as a component of resistance to <i>Aeneolamia varia</i> in <i>Brachiaria</i> spp.

Table 3.4.1. List of students supervised in 2005, cont'd

Name	Supervisor	University	Title
Ulises Castro	Cesar Cardona (CIAT) Jorge Vera graciano (Universidad of Chapingo, Mexico) Ramón Garza García (INIFAP)	Universidad of Chapingo, Mexico	Mechanisms of resistance to <i>Aeneolamia</i> <i>Albofasciata</i> and <i>Prosapia</i> <i>simulans</i> in <i>Brachiaria</i> spp.
Alejandro Pabón	Cesar Cardona (CIAT) Evaldo Ferreira Vilela (Departamento de Biología Animal/UFV)	Universidad of Viçosa, Brazil	Mechanisms of resistance to <i>Deois incompleta</i> , <i>D. Schah</i> and <i>Notozulia entreriana</i> in <i>Brachiaria</i> spp.
Paola Sotelo	Cesar Cardona (CIAT) Ariel Gutierrez (Univ. Nacional Palmira, Colombia)	Universidad Nacional Palmira, Colombia	Inheritance of crumpled leaf virus in snap beans
Ph. D. Thesis			
Name	Supervisor	University	Title
Clare Mukankusi (Sep. 2003 – Aug. 2007)	Robin Buruchara (CIAT) Rob Melis (University of KwaZulu-Natal)	University of Kwazulu- Natal, Pietermaritzburg, RSA	Breeding beans (<i>Phaseolus</i> <i>vulgaris</i> L.) for resistance to Fusarium root rot (<i>Fusarium</i> <i>solani</i> f.sp. <i>phaseoli</i>) and large seed size in Uganda
Virginia Gichuru (Sept. 2005 – Aug. 2006)	Robin Buruchara (CIAT) Patrick Okori (Makerere University)	Makerere University, Uganda	Symptomatology and characterization of <i>Pythium</i> spp. of major crops in a bean based cropping system in south-western Uganda
Reuben Otsyula	Robin Buruchara (CIAT)	Makerere University, Uganda	Study of inheritance and development of root rot (<i>Pythium</i>) resistant varieties using marker assisted selection in common beans
Arturo Carabalí (April 2005- April 2008)	Anthony Bellotti (CIAT) James Montoya Lerma (Universidad del Valle)	Universidad del Valle, Colombia	Caracterización de la Resistencia a la Mosca Blanca <i>Aleurotrachelus socialis</i> Bondar en Especies Silvestres de <i>Manihot</i> y Marcadores Moleculares Asociados
Enrique Bravo	Francisco Morales (CIAT)	Universidad del Valle, Cali, Colombia	Secuencia Nuclotídica y estructura del genoma del virus del mosaico común del frijol cepa NL4
Helena Reichel	Francisco Morales (CIAT)	University of Gembloux, Belgium	Caracterización del virus filamentoso del platano en Colombia, Filipinas y Africa
Gloria Santana	Francisco Morales (CIAT)	Universidad Nacional Palmira, Colombia	Resistance to bean common mosaic virus

Activity 3.5. Training and consultancy services offered during 2005

Contributors: Members of PE-1

Event	Date	Organizer/ Place	Participants	Received by
Diagnostic and identification of bacterial and fungal pathogens	Sep 26- Oct. 7	CIAT-Cassava Pathology/ Palmira	2	Isola Robleto y Ana María Blanco, MAGFOR, Nicaragua
Training in nematodes, entomopathogenic fungi and bacteria	Jul. 18.- Nov. 2	CIAT – cassava entom. / Palmira	1	Sandra Victoria Mena
Conservation and handling of entomopathogenic fungi	Jul.13- Oct 30	CIAT - cassava entom./ Palmira	1	Ifigenia Hurtado
Raising and handling of “chinche” and “galleria”	Jul. 18-28	CIAT- cassava entom. / Palmira	1	Eliécer Vivas, Technician LST S.A., Bogotá
Risk evaluation of genetically modified organisms (GMOs): Bt cotton case in the Valle del Cauca, Colombia.	Jun. 27	ICA/Tulua	25	Agricultural and extensión specialists
Pathological, entomological problems, integrated crop management, and knowledge on nitrifying bacteria	May 20	CIAT- cassava entom / Palmira	30	Students in VIII Semester of Economic Entomology and forage protection, Agronomy program, Fac. Ciencias Agropecuarias, Universidad de Caldas, Colombia
Training in storage and conservation of entomopathogenic fungi	Apr. 28	CIAT/Palmira	14	Students, Universidad de Córdoba, Colombia
International course of modern production, processing and utilization systems of cassava in Latin America and the Caribbean, integrated management of whitefly, horn worm and utilization of <i>baculovirus</i> . Biological control of burrower bug with nematodes	Apr. 18-27	CIAT- Clayuca/ Palmira	34	Professionals and technicians from Latin America and the Caribbean
First workshop on “Basic Taxonomy and Overview of Collembola”	Apr.1 11-15	CIAT-Cornell University project/Palmira	11	Students from Universidad del Valle, Colombia
Biological control, soil quality indicators, molecular markers of beans	Apr. 6	CIAT	25	Students from Universidad Nariño, Colombia
Training in procedures for risk evaluation of genetically modified organisms (GMOs)	Mar. 18- Apr. 8	CoaCol/Palmira	1	Luisa Fernanda Bermúdez, Universidad Nacional de Colombia

Activity 3.5. Training and consultancy, (cont'd)

Event	Date	Organizer/ Place	Participants	Received by
Advances in diagnosis and integrated management of bacterial wilt of banana and plantain	Mar.10–11, 2005	CIAT, Palmira		Martha Cecilia Castaño, Ana Lucía Bejarano, Angela María Arango, Marco Fabián Flórez, and Jefferson Rubiano, professionals and technicians from ICA–Section Quindío
First update on sustainable production of maize	Feb. 24	ICA, Corpoica, Industrias del Maiz, Casa Toro, Del Campo/ Palmira	200	Students, extensión and agricultural specialists
Training in overview of cassava crop management	Feb. 8-10	CIAT- cassava entom, Palmira	1	José M. Lugo Pérez, Caribbean Best, Costa Rica
Biodiversity of collembolas in silvo pastoral and agricultural production systems in the tropical dry forest	Feb. 7-11	CIAT/Palmira	1	Claudia Lisana Guzmán del Río, Universidad del Tolima, Colombia
Advances in research for managing bacterial wilt of plantain	Oct. 26	ICA-Tulua	19	Technical personnel from ICA Tulua, Colombia
Advances in research on managing bacterial wilt in Musaceae	Sep. 29	ICA- Palmira	18	Technical personnel from ICA Palmira
Workshop on integrated management of cassava pests and diseases with emphasis on biological control and production costs	Sep. 9		23	23 participants from Yopal, Colombia
Managing cassava diseases	Aug. 18, 19	CIAT, Palmira		Ana Elizabeth Diaz, CORPOICA; Juan Jose Font and Jorge Fuentes, Guatemala
Seminar on “Advances in the Search for Alternatives in Managing Bacterial Wilt of Musaceae	Aug 18	Sevilla, Valle del Cauca	30	Farmers and technicians
Advances in the search for alternatives in managing bacterial wilt of plantain: national seminar on plantain pests and diseases	Jul 18-19		300	Farmers, technicians, and students from Armenia, Colombia
Workshop on the management of cassava diseases, using clean strategies	Jul. 5	CIAT, Palmira	11	Farmers form Piendamó, Cauca

Activity 3.5. Training and consultancy, (cont'd)

Event	Date	Organizer/ Place	Participants	Received by
Managing bacterial wilt of plantain in Quindio, Colombia	Jul 1-31	CIAT, Palmira	2	Marcelo Vargas and Omar Zuluaga, Universidad de Caldas, Colombia
Development of strategies for managing bacterial wilt of plantain	15 Jul–15 Dec, 2005	CIAT, Palmira	1	Juan Pablo Castle, Universidad de Caldas, Colombia
Application of biofungicides in grape disease control: evaluation of the inhibitory minimum concentration of several products on <i>Ralstonia solanacearum</i>	May 23– Jul. 21, 2005	CIAT, Palmira	1	Mathilde Ouevrard, Institut National d'Horticulture, France
Training on the agronomic management of snap and dry beans and integrated disease management.	Nov. 17-19	Bogota	65	Technicians
Course on cassava bacterial blight	5 May	CIAT/U. Nacional de Palmira	2	Johny Arlet Pineda Calle and Claudia Patricia Gonzales Students, U. Nacional de Palmira, Colombia
PCR methods to detect <i>Ralstonia solanacearum</i> in soil samples collected from a commercial plot of plantain in the Ariari Region	Apr 30.- May 13	CIAT, Palmira	1	Sandra Milena Rodríguez CORPOICA Villavicencio
Identifying isolates of <i>Ralstonia solanacearum</i> through specific PCR, using primers	Apr. 8- May 5	CIAT, Palmira	1	Sandra Milena Rodríguez CORPOICA Villavicencio
Symptoms and management of cassava frogskin disease	Mar. 28	CIAT	43	Farmers from Armenia
Detecting phytoplasmas associated with frogskin disease of cassava	Nov 2004- Nov 2005	CIAT, Palmira	2	Adriana Arenas and Diana López, students, Universidad del Valle, Colombia
Innovation Histories of the Adoption of Bean Varieties		CIAT, Kampala, Uganda	16	
Strengthening Capacity for Participatory Monitoring and Evaluation for the National Bean Programmes in ECABREN Partner Countries, Nairobi, Kenya	Mar14 - 18	CIAT	35	
Biofortification Project Planning meeting	Mar19	Nairobi, Kenya	13	
Planning of bean research	Mar 30-31	Cameroon	15	
Participatory Plant Breeding Monitoring Tour	Apr1-12	CIAT/ Ethiopia	12	

Activity 3.5. Training and consultancy, (cont'd)

Event	Date	Organizer/ Place	Participants	Received by
Ninth Annual Meeting of the PABRA Steering Committee	16 - 18 May	Arusha, Tanzania	17	
Ouru Masawa farmer field day	18 May	Kenya	107	Farmers
Ethiopia Bean Seed Impacts Partner Meeting	20 - 21 April			
Workshop on Strengthening Common Bean Seed System in Eastern Ethiopia	May 30	Jima, Ethiopia	15	
Breeder's course on making crosses	8-11 June	Uganda	20	
Breeder's Course and Field Visits	June 7 - 18,	Uganda/ Rwanda/ Kenya	17	
Training of enumerators at Oyugis for IPDM uptake surveys in Kisii site	25 -26 August	Kenya	16	
Reviewing PABRA Regional Strategy for IPDM & INM in Beans	Oct 31- Nov 3	Kampala, Uganda	33	
Marker Assisted Selection in Plant Breeding: Principles and practices	3 - 7 October	Kawanda, Uganda	13	
To facilitate a farmer exchange visit and conduct IPM farmer group participatory training workshop at Tarime for VicRes Project participants	22-26 Nov	Tarime, Tanzania and Kisii, Kenya	25	
Tarime farmers' learning visit to Ouru Masawa	24 Nov	Tanzania	26	Farmers
Training of Tarime farmers on bean IPDM and participatory group research approach	25 Nov	Tanzania	27	Farmers
How to measure parasitism in whiteflies	Feb. – Mar.	CIAT	120	Farmers
Biology and ecology of whiteflies	23 Feb.	CIAT	30	Technical assistants and farmers
Training in sampling methods	22 April	CIAT	8	Students, Univ. Nacional /Palmira
Biology and ecology of whiteflies	4 May	CIAT	20	MSc. students, Univ. Nacional / Medellín
Biology and ecology of whiteflies	19 May	CIAT	35	Students, Univ. de Caldas- Manizales
Sampling insects, biology of whiteflies	June	CIAT	65	Students, Univ. Nacional /Palmira
Biology and ecology of whiteflies	Sept.	CIAT	2	Students, Univ. de Caldas- Manizales

Activity 3.5. Training and consultancy, (cont'd)

Event	Date	Organizer/ Place	Participants	Received by
Management of whiteflies	12 October	CIAT	19	Students, Univ. Nacional /Palmira
Management of whiteflies	10 –22 Oct.	CIAT	1	Vladimir Lino Collaborator from PROINPA
Sampling insects, biology of whiteflies	8 Nov.	CIAT	27	Students, Univ. Nacional /Palmira
Viral Diseases of High Value Crops	23-25 Nov.	CIAT	20	Personnel from Semillas Arroyave

Activitiy 3.6. Conferences, Workshops, Meetings Attended by one or more staff of PE-1 project

Staff Member	Date	Place	Event
Segenet Kelemu	4-6 April	Nairobi, Kenya	Sub-Saharan (SSA) regional design meeting for the International Assessment of Agricultural Science and Technology for Development (IAASTD)
	21-24 February	Aleppo, Syria	System-wide Program-IPM (SP-IPM) committee meeting, ICARDA
	30 July-4 August	Austin, U.S.A	American Phytopathological Society meeting
	6-10 July	Ravello, Italy	Internacional consortium on agricultural biotechnology research (ICABR) conferences
	25-29 September	El Batan, Mexico	First level leadership development program (FLDP), CIMMYT
Elizabeth Alvarez	10-13 May	Angers, France.	5th ISTA–SHC Seed Health Symposium
	14-17 May	Lyon, france	Ecole National Veterinaire de Lyon.
	28 August – Sept 2	Manizales, Colombia	II Seminar on Production, Commercialization e Industrialization of Plantain
	4-9 October	Bogotá, Colombia	XXVI ASCOLFI Congress
	11-13 May	Palmira, Colombia	IX Congress of the Colombian Association of Plant Breeding and Crop Rots, CORPOICA
	26 August	Palmira, Colombia	Workshop on the “State of the Art in the Agricultural Prediction Models”, Corporación BIOTEC, SAG, CENICAÑA, CIAT
29 July	Palmira Colombia	Workshop on “Participatory selection of soursop planting material: an analysis of advantages and implications,” Corporación BIOTEC, CIAT, PROFRUTALES Ltda, COLCIENCIAS	
Andreas Gaigl	11-18 April	Manaus, Brazil	TSBF Annual Meeting
	25-29 June	Quito, Ecuador	Meeting with Wilson Vasquez (INIAP) and Trevor Jackson (AgResearch, NZ), set up of proposal for NZAID

Activitiy 3.6. Conferences, Workshops, (cont'd)

Staff Member	Date	Place	Event
	27 July	Ibague, Colombia	SOCOLEN Annual Congress
	7-8 December	Quito, Ecuador	Defense of MSc thesis by Carlos Alberto Ortega, MSc Student
Cesar Cardona	13-18 November	Brazil	Review of work on host plant resistance to spittlebug (University of Viçosa)
	26 February- 2 March	London, UK	Planning meeting of the Whitefly Project at DFID Headquarters
	20-24 October	Bolivia	Planning meeting of Whitefly Project activities in Bolivia. With Proinpa, the national collaborator.
	March, August	Chota, Ecuador	Visit whitefly management trials
Eli Minja	March 14-18	Nairobi, Kenya	CIAT PABRA PM&E workshop
	31 May – 4 June	Uganda	Africa Staff meeting and BOT review
	26-30 June	Nairobi, Kenya	ASARECA Concept Note proposal with Kenya national scientists
	July 13-15	Nairobi and Kirinyaga, Kenya	To participate in Farm Inputs Promotion Africa (FIPS, an NGO) small package inputs methodology field day and meet with DFID-CPP Deputy Manager and other CPP Project Leaders based in Kenya and Tanzania
	October 16-21	Kisii, Kenya and Tarime, Tanzania	Vicres Project annual monitoring exercise
	Oct 30-Nov 04	Mukono, Uganda	CIAT PABRA INM&IPM framework workshop
	Nov 22-26	Tarime, Tanzania and Kisii, Kenya	To facilitate a farmer exchange visit and conduct IPM farmer group participatory training workshop at Tarime for VicRes Project participants
Robin Buruchara	12-15 January	Accra	SSA_CP Challenge Program meeting
	15-19 January	Kigali, Rwanda	Interviews for ATDT/ERI position
	23-28 January	Nairobi, Kenya	Attend the RF workshop of RF grantees
	27 Feb-4 March	Cameroon	Planning of Bean Research
	7-8 March	Butare, Rwanda	Seasonal planning meeting
	14-18 March	Nairobi, Kenya	PABRA PME workshop
	4- 6 April	Nairobi, Kenya	SSA Design Team Meeting
	24- 30 April	Kigali, Rwanda	SSA-CP Kivu Pilot Site Stakeholders meeting
	15-19 May	Arusha, Tanzania	PABRA SC Meeting
	1 - 4 June	Kampala, Uganda	Africa Staff Meeting and CIAT BOT Meeting
	6- 10 June	Entebbe, Uganda	FARA General Assembly

Activity 3.6. Conferences, Workshops, (cont'd)

Staff Member	Date	Place	Event
	22-24 June	Butare, Rwanda	Participate in the CGS proposal development for the GLR team
	28-30 June	Nairobi, Kenya	KEPHIS for a meeting to develop a proposal outline on "Good Seed Initiative"
	July 24 to 28	Washington, USA	Discuss the REU proposal at Harvest Plus IFPRI
	July 29- 6 August	Austin, USA	American Pytopathological Society meeting
	29 August -1 Sept	Entebbe, Uganda	SSACP, Lake Kivu Management Committee Preparatory meeting
	13 – 15 Sept	Nairobi, Kenya	ILRI, Harmonization of Medium Term Plans of CG in ECA.
	19 – 20 Sept	Gisenyi, Rwanda.	SSA-CP Lake Kivu Management Committee meeting
	21 – 23 Sept	Bukavu,, DRC	Planning meeting of the DGDC legume project.
	26 – 30 Sept	Kampala, Uganda	Bean REU proposal writing
	10 -13 October	Nairobi, Kenya	SSA-CP Concept Note Workshop
	25 – 28 October	Kabale, Rwanda, Goma	Accompany the EU Review mission of the SSACP
	31 Oct – 4 Nov	Kampala, Uganda	IPDM and INM Workshop
	6 – 13 Nov	Cameroon	Visit be program activities
	22 – 27 Nov, 2005	Kigali, Rwanda	Kigali, SSACP - Lake Kivu Log Frame Dev meeting
	1 Dec	Kampala, Uganda	SSACP, Lake Kivu, Management Committee Meeting.
George Mahuku	24-27 January	Nairobi, Kenya	Participate in the 2 nd general meeting of the Rockefeller Foundation-supported program Biotechnology, Breeding and Seed systems for African Crops.
	1-5 May	Panama City, Panama	Attend the PCCMCA meeting
	29 May - 20 June	Kampala, Uganda	Attend the board meeting in Uganda, followed by field visits to Uganda, Rwanda, DRC and Kenya
	29 July - 4 August	Austin, U.S.A.	Attend the APS annual meeting
	23 September - 1 October	Kunming, China	Visiting Yunnan Academy of Agricultural Sciences in the Yunnan province of the People's Republic of China
	28 November - 10 December	Harare, Zimbabwe	Proposal development for the SADC pilot site of the SSA-CP
	17-19 November	Bogotá, Colombia	Workshop to train technicians (65) on the agronomic management of snap and dry beans and integrated disease management.
Anthony Bellotti	27 February- 2 March	London, U.K.	Tropical Whitefly project DFID
	6 - 10 June	Gainesville, USA	Seminar/Tropical Entomology Course on Cassava Pests; Discuss cooperation on invasive

Activitiy 3.6. Conferences, Workshops, (cont´d)

Staff Member	Date	Place	Event
	10 - 16 September	Davos, Switzerland	species, UF, Homestead, FL. International Symposium Biologica Control
	26 October - 6 November	Campo Grande and Cruz das Almas, Brazil/ Fort Lauderdale, USA	CNPMF/EMBRAPA on Generation Challenge Program, Bahia Branca. Attend Entomology Society of America 2005 Congress; poster presentation.
	7-8 December	Quito, Ecuador	MSc Thesis defense, Carlos Alberto Ortega, Universidad Polytecnico
Francisco Morales	3 - 8 April	Lima, Peru	IX International Plant Virus Epidemiology Symposium
	19-22 April	Cordoba, Argentina	XIII Phytopathology Congress and the 3 rd Workshop of the Phytopathology Association
Fernando Correa	4-6 April	Costa Rica	FLAR meeting
	18-24 April	Argentina	ALF meeting and FONTAGRO project
	12-19 June	USA	RiceCap meeting (Rhizoctonia) and workshop on MAS
	22-26 August	Panama	Observation of rice diseases. Project development
	16-28 November	Philippines	Rice Genomics Symposium and IRRI
	7-9 December	Venezuela	Redbio Conference

Activity 3.7. List of visitors to the various research activities of PE-1 project

CIAT – Palmira, Colombia

Name	Institution	Date
Dr. Jairo Osorio	CORPOICA, Colombia	26 January, 20 September
Dr. Lisette Staal	Internacional Program, University of Florida, USA	27 January
Mr.. José M. Lugo Pérez	Caribbean Best, Costa Rica	February 8-10
Dr. Milton Salazar	Subgerente Dupont	February 15
Mr. Fabio Clavijo	Ministry of Agriculture and Rural development	February 18
Mr. Gustavo Leon Villa	Biotropical S. A., Colombia	March 01
Dr. Masayoshi Saito	Liaison Officer of CGIAR Secretariat, outposted from JIRCAS	March 8 - 10
Ms. Kayo Fujita	Research coordinator, International Research Division, MAFF Research Council Secretariat of Japan	March 8 - 10
Mr. Hiroya Okamoto	Second Secretary, Embassy of Japan in Bogotá	March 8 - 10
Dr. Tatsuro Katsuyama	Director of International Research Division, MAFF Research Council Secretariat of Japan	March 8 - 10

Activity 3.7. List of visitors, (cont'd)

Name	Institution	Date
Dr. Yusaku Uga	Rice Genetist	March 8-12
Dr. Aaron Zazueta	Senior Specialist in Monitoring & Evaluating Global Environment	
Ing. Martha C. Castaño, Ana L. Bejarano, Angela M. Arango, Marco F. Flórez and Jeferson Rubiano	ICA – Seccional Quindio, Colombia	March 10-11
43 Farmers from Armenia, Colombia		March 28
Mr. Germán Arteaga M.	Universidad de Nariño, Pasto, Colombia	April 4
Ms. Chrissie Rey	University of the Witwatersrand, Johannesburg, South África	April 5 – 6
Prof. Mauricio Salazar Yepes and 14 students	Universidad Nacional of Colombia, Palmira, Colombia	April 7
Ms. Lilian Martinez and 26 students	Colegio Bolivar, Cali, Colombia	April 7
Prof. Henry Toro Lopez and 4 students	Universidad de Caldas, Colombia	April 20
Prof. James Montoya and 8 students	Universidad del Valle, Colombia	April 22
Drs. Santiago Perry, Andres Laignelet	CORPOICA	April 22
Mr. Johny A. Pineda and Ms. Claudia P. González	Universidad Nacional de Colombia, Palmira	May 5
11 Students	Universidad del Valle, Colombia	May 11
Dr. Lucia Vaccaro	Facultad de Agronomía, Universidad Central de Venezuela	May 16 - 20
Dr. Fanny Restrepo	CENIFLORES, Colombia	May 18
Prof. Henry Toro Lopez and 30 students	Universidad de Caldas, Colombia	May 19
Dr. Humberto Rios	Coordinator, Fitomejoramiento Participativo, Nacional Institute of Agricultural Sciences, Cuba	May 19-26
Dr. Silverio González	Coordinator, Cadenas Productivas de Plátano, FEDEPLATANO, Colombia	May 23
Prof. Luis Jairo Silva and 25 students	Universidad Dist. Francisco de Caldas	May 25
Prof. Hernando Delgado and 28 Students	Universidad Pedagogica y Tecnologica Tunja, Colombia	May 26
Prof. Rocio Suarez	Universidad del Quindío, Armenia Colombia	June 1
Ms. Alejandra Duarte P.	Universidad de Santander, Microbiología Industrial, Bucaramanga, Colombia	June 3
Mr. Carlos Felipe Espinal, Jorge M. Diaz	Consultants – CIRAD-IICA, Colombia	June 15

Activity 3.7. List of visitors, (cont'd)

Name	Institution	Date
Drs. Luis F. Forero, Jose Manuel Suso	CEO and Board Member –Induarroz, Colombia	June 23
11 Farmers	La María, Piendamó, Colombia	July 5
Dr. Shoshi Kikuchi	Head of Laboratory of Gene Expression of NIAS, Japan	July 18
Dr. Orlando Peixoto de Moraes	EMBRAPA Arroz, Brazil	August 11 - 12
Dr. José de Almeida Pereira	EMBRAPA Meio-Norte, Brasil	August 11 - 12
Mr. Juan J. Font and Mr. Jorge Fuentes	Representaciones Comerciales, S.A., Guatemala	August 14 - 19
Dr. Gerard F. Barry	Coordinator Goldenrice Network-IRRI, The Philippines	August 16
Dr. Jonathan Crouch	Genetic Resources Program, CIMMYT, México	August 16
Dr. Eduardo J. Graterol	Research Manager, Fundación para la Investigación Agrícola DANAC, Venezuela	August 17
Drs. Juan J. Font and Jorge Fuentes	Representaciones Comerciales S.A., Guatemala	August 18
6 Students	Universidad San Buenaventura, Cali, Colombia	August 18
Ms. Ana Elizabeth Díaz	Programa MIP, CORPOICA, Palmira	August 19
Dr. Phillipe Prior	CIRAD, France	September 6
Dr. Luis F. Rios	J.P. Gestión Financiera Banco Mundial de Bogotá, Colombia	September 16
Ms. Angela Maria Castaño	Universidad de Caldas	September 22
Ms. Catalina Quintero V.	Universidad de Caldas	September 22
Prof. Henry Toro Lopez	Universidad de Caldas	September 22
Prof. Gerardo Martinez	Universidad de Caldas	September 22
Prof. Luis F. Aristizabal	Universidad de Caldas	September 22
18 Technicians	ICA, Palmira	September 29
Mr. Luis Paulino Herrera and Mr. Mario Jimenez H.	Hortifruti, Costa Rica	September 30
Mr. Luis Paullino Herrera B.	HORTIFRUTI, Costa Rica	October 3 - 8
Mr. Mario Jiménez Hernández	HORTIFRUTI, Costa Rica	October 3 - 8
Dr. Ronald R. Walcott	Associate Professor, Plant Pathology, University of Georgia, USA	October 5 - 8
Dr. Eduardo Villota	President ACOSEMILLAS, Minister Advisor and Board Member of CORPOICA, Colombia	October 13
Dr. Arturo Vega	Executive Director CORPOICA, Colombia	October 19
Dr. Kazuhiro Suenaga	International Research Coordinator, JIRCAS, Japan	November 3 - 5
Dr. Shuichi Oshio	Director, Animal Production and grassland Division, JIRCAS, Japan	November 3 - 5

Activity 3.7. List of visitors, (cont'd)

Name	Institution	Date
Dr. Hiroshi Kudo	JIRCAS Representative for South America, Japan	November 3 - 5
Dr. David A. Miron	President, TDM Consultants, USA	November 7
Dr. Nobuyoshi Maeno	Former Member of CIAT – Board Trustees	November 7
Dr. Merion Margaret Liebenberg	Plant Pathologist ARC-Grain Crops Institute, Potchefstroom, South Africa	November 10-16
Dr. Felix Fellmann	Director Asociado, SDC –COSUDE – Central America	November 20-27
Dr. Pedro E. Ferreira Rossi	Director General, CATIE – Costa Rica	November 21-23
Dr. John Beer	Director of Agriculture and Agroforestry, CATIE, Costa Rica	November 21-23
Ms. Isabel Bortagaray	UNU/INTECH, Holland	November 29
Mr. Maryke Labouschange	University of Freestate, Blomfontein	November 30
Dr. Silvia Restrepo	Universidad de los Andes, Colombia	December 5
Dr. Adriana Bernal	Universidad de los Andes, Colombia	December 6
Mr. Robert Kalyebara	Banana Research Program, Uganda	December 8
Dr. Jenny Gaona	SAC, Colombia	December 12
Dr. Mike Meadows	Plant Pest Survey Coordinator- Florida Dpt of Agriculture	December 22

CIAT – Africa

Name	Institution	Date
Ms. Kwesiga Vivian	Trainer, KADFA-ISAMI	March 17
Mr. Ntacyabiyukuye Evaristus	Farmer from Rwanda	April 18
Mr. Andrew Guita	CARE, Uganda	April 18
		August 5
Dr. Jim Myers	CRSP and Sokoine University of Agric.	April 28
Dr. Phil Miklas	CRSP and Sokoine University of Agric.	April 28
Dr. Susan Nchimbi	CRSP and Sokoine University of Agric.	April 28
Ethiopia NARS	EARO	April 30
Mr. Julius Masanyu	AFRICARE	March - May
Mr. Samwel Ahabwe	NAADS Service Provider	May 21
Mr. Mike Davison	WREN Media	May 25
Mr. Nyiti	FIPS, SARI	August 26
Mr. Mugerwa	Kibo Seed	August 26
Mr. Mushobozi	FLORESTA	August 26
Ms. Edith Banzi	CPP, Armyworm Project, Minjingu Mining Co.	August 26
Prof. Zadoc Ugutu	VicPac, VicRes and Kenya National University	August 18-19
Prof. Kenneth Mavuti	VicPac, VicRes and Kenya National University	August 18-19

Activity 3.7. List of visitors, (cont'd)

Name	Institution	Date
Prof. Mabel Imbuga	VicPac, VicRes and Kenya National University	August 18-19
Mr. Julius Ecuru	VicPac, VicRes and Kenya National University	August 18-19
Dr. Rose Kingamkono	VicPac, VicRes and Kenya National University	August 18-19
Farmers from Kabale	Kabale District	November 1
Mr. Daniel Fotio	IRAD, Cameroon	November 4
Mr. Paul Koono	IRAD, Cameroon	November 4
Mr. Martin Ngueguim	IRAD, Cameroon	November 4
Tarime Farmers in Tanzania	Tarime District	November 23-24

3.8. List of awards to staff in Project PE-1

1) **A. Carabalí, A.C. Bellotti and J. Montoya-Lerma.** "Honorable Mention" (third place) for the "Hernán Alcaráz Viecco Prize". *Comparing the adaptability of biotype B of Bemisia tabaci (Homoptera: Aleyrodiade) to commercial cassava (Manihot esculenta Crantz) Mcol 2063 and to wild M. carthaginensis.* XXXII Congress of the Colombian Society of Entomology (SOCOLEN), July 2005.

2) **E. Álvarez., M. Fregene and X. Hurtado.** Honorable mention "Rafael Obregón National Prize of Phytopathology" *"Detección de Marcadores Microsatélites Asociados con la Resistencia al Añublo Bacterial de la Yuca en Colombia"*. July 2005.

3) **E. L. Melo., C.A. Ortega., A. Susurluk., A. Gaigl, R. Ehlers and A.C. Bellotti.** "Honorable Mention" (third place) "Luis Hernando Pino Santiago Prize", *Search for native populations of entomopathogenic nematodes in regions of Colombia and Panama.* XXXII Congress of the Colombian Society of Entomology (SOCOLEN), July 2005.

4) **J.M. Bueno., C. Cardona and P.Chacón de Ulloa.** "Hernán Alcaráz Viecco National Prize of Entomology". *Phenology, spatial distribution and development of sampling methods for Trialeurodes vaporariorum (Westwood) (Homoptera: Aleyrodidae) on snap beans and beans (Phaseolus vulgaris L.).* XXXII Congress of the Colombian Society of Entomology (SOCOLEN), July 2005.

5) **P. A. Sotelo., C. Cardona., G. Sotelo and J. Montoya-Lerma.** "Francisco Luis Gallego Prize" (Second place). Undergraduate thesis presented to the biology academic program, Faculty of Sciences, Universidad del Valle, in the area of forage entomology. *Resistance of Brachiaria spp. to the spittlebug: sub-lethal effects of resistant cultivars on adult Aeneolamia varia (F.) (Homoptera: Cercopidae).* XXXII Congress of the Colombian Society of Entomology (SOCOLEN), July 2005.

6) **Francisco Morales** received the "Distinguished Latin American Plant Pathologist Award" at the XIII Phytopathology Congress in Cordoba, Argentina.

Activity 3.9. Funded special projects developed and executed with partners.

Project Title	Donor	Participating Institutions	Contact Scientist		Total Project budget US\$
			CIAT	Participating Institution	
Agricultura de Precisión y la Construcción de Modelos de Campo Cultivo para Especies de Frutas Tropicales (2005 – 2007)	COLCIENCIAS Agencia Colombiana de Cooperación Internacional (ACCI) MADR Colombia	Corporación BIOTEC	Elizabeth Alvarez	Myriam Sánchez	15,280
Assessing the Impact of Biotechnology on Diversity: Effect of Transgenic Maize on Non-Target Soil Organisms. (2002 – 2005)	United States Agency for International Development (USAID)	Cornell University	Anthony Bellotti Jairo Rodríguez	Daniel Peck	99,360.00
Association of Phytoplasma with Cassava Frog Skin Disease (2003 – 2005)	Ministerio de Agricultura y Desarrollo Rural de Colombia (MADR), Colombia	Agrovelez, Jamundí, Colombia Univalle, Colombia	Elizabeth Alvarez	Henry Hamman Diego López	38,720
Desarrollo e Implementación de una Red Nacional para la Certificación Fitosanitaria de Cítricos Competente en el Mercado Mundial (2005 – 2007)	Ministry of Agriculture and Rural Development (MADR), Colombia	CORPOICA, ICA, Profrutales Ltda.	Lee Calvert	Jorge Gómez Jorge E. Angel	261,114
Desarrollo y Transferencia de Medidas del Manejo del Moko (<i>Ralstonia solanacearum</i>), en Cultivos de Plátano del Municipio de Armenia (2005)	Alcaldía de Armenia, Colombia	ICA	Elizabeth Alvarez	Cristina Aristizábal	6,000.00

Activity 3.9. Funded projects, (cont'd)

Project Title	Donor	Participating Institutions	Contact Scientist		Total Project budget US\$
			CIAT	Participating Institution	
Detecting and Handling Microorganisms (2004 – 2005)	Ministry of Agriculture and Rural Development (MADR), Colombia		Lee Calvert		8,005.00
Dinámica de Fuentes de Inóculo y Análisis de la Estructura de las Poblaciones de los Agentes Causales de Antracnosis en Especies de Frutales Promisorios (2005 – 2007)	COLCIENCIAS, Colombia	CORPOICA	Segenet Kelemu	Jairo Osorio	219,046.00
Evaluación de Aislamientos Colombianos del Virus de la Tristeza de los Cítricos (2003 – 2005)	COLCIENCIAS, Colombia	CORPOICA	Lee Calvert	Jorge Gómez	32,258.00
Evaluación de la Protección Cruzada como Estrategia de Control del Virus de la Tristeza de los Cítricos (2005 – 2007)	COLCIENCIAS, Colombia	CORPOICA	Lee Calvert	Jorge Gómez	35,500.00
Evaluation of the Effectiveness of Biorationals Used in the Management of Bruchid Pests on Beans (<i>Phaseolus vulgaris</i>) by Small-Scale Farmers in the Lake Victoria Basin (2004 – 2007)	SIDA SAREC, Sweden	NARS Universities and research programs in Kenya and Tanzania	Eliaineny M. Minja	Mabel Imbuga Paul Tarus Absolom Munyasi John Ogecha Phanice Namungu Hashim Barongo Goodluck Kimaro	30,000.00

Activity 3.9. Funded projects, (cont'd)

Project Title	Donor	Participating Institutions	Contact Scientist		Total Project budget US\$
			CIAT	Participating Institution	
Increasing Cassava Productivity through Integrated Pest Management (2005 – 2007)	Inter-American Institute for Cooperation on Agriculture (IICA), Colombia	Live Systems Technology (LST), S.A., Bogotá, Colombia	Andreas Gaigl	Esperanza Morales	83,246.00
Integrated Control of Subterranean Pests in South America (2002 – 2005)	BMZ, Germany	University Hannover University Kiel BBA CORPOICA Univ. del Valle Univ. Nacional de Bogotá Univ. de Caldas	Andreas Gaigl	Christian Borgemeister Ralf-Udo Ehlers Gisbert Zimmermann Martha Londoño Miguel Serrano Alberto Soto Luis F. Vallejo	714,961.00
Lulo con Valor Agregado: Nuevas Alternativas para el pequeño Agricultor (2006 – 2008).	Ministry of Agriculture and Rural Development (MADR), Colombia	CORPOICA La Selva, Universidad de Antioquia	Alonso Gonzalez, Zaida Lentini, Elizabeth Alvarez	Mario Lobo	240,513
Manejo Integrado de Enfermedades del Cultivo de Yuca (2005 – 2007)	Ministerio de Agricultura y Desarrollo Rural de Colombia (MADR) and Inter-American Institute for Cooperation on Agriculture (IICA), Colombia	Live Systems Technology (LST) S.A., Colombia	Elizabeth Alvarez	Esperanza Morales Jaime Jaramillo	275,099

Activity 3.9. Funded projects, (cont'd)

Project Title	Donor	Participating Institutions	Contact Scientist		Total Project budget US\$
			CIAT	Participating Institution	
Manejo Integrado de la Enfermedad del Moko en Plátano (2005)	CGIAR Award	ICA, CORPOICA	Elizabeth Alvarez	Silverio Gonzalez	10,000.00
Manejo Integrado de la Mosca Blanca en el Trópico – Fase III (2005 – 2008)	Department for International Development (DFID), UK	IITA AVRDC CIP CABI NRI	Francisco Morales	James Legg Peter Hanson Isabel Carballal	2,613,071.00
Mejoramiento del manejo nutricional para el control preventivo del mildew vellosa del rosal <i>Peronospora sparsa</i> (2006 – 2007)	COLCIENCIAS, Colombia	CENIFLORES ASOCOLFLORES	Elizabeth Alvarez	Rebeca Lee	104,000.00
Pest and Disease Resistance, Drought Tolerance and Increased Shelf Life Genes from Wild Relatives of Cassava and the Development of Low-cost Technologies to Pyramid them into Elite Progenitors (2005 – 2007)	The Generation Challenge Programme, CGIAR	EMBRAPA-CNPMPF, Brazil Namulonge Agricultural and Animal Production Research Institute (NAARI) Crop Research Institute (CRI) National Root Crop Research Institute (NRCRI)	Elizabeth Alvarez, Alfredo Alves Anthony Bellotti Hernan Ceballos Martin Fregene	Anton Bua Titus Alicai Elizabeth Okai Chiedozi Egesi	894,906.00

Activity 3.9. Funded projects, (cont'd)

Project Title	Donor	Participating Institutions	Contact Scientist		Total Project budget US\$
			CIAT	Participating Institution	
Promotion of Integrated Pest Management Strategies for Major Insect Pests of Phaseolus Beans in Hillsides Systems in Eastern and Southern Africa (2005 – 2006)	DFID, United Kingdom	NARS in Uganda, Kenya, Tanzania and Malawi	Eliaineny M. Minja Robin Buruchara Kwasi Ampofo	Michael Ugen Fina Opio John Ogecha Felister Makini Catherine Madata David Kabungo Patrick Mviha Barbara Chibambo	113,118.00
Protocol for Monitoring and Developing Resistance to the Bollgard Technology in Colombia (2004 – 2005)	COACOL, Colombia		Anthony Bellotti		30,960.00
Reducción del uso y desarrollo de resistencia a plaguicidas en el cultivo de arroz y frijol en Colombia, Venezuela y Ecuador (2005 – 2008)	FONTAGRO	INIA, Venezuela FEDEARROZ, Colombia INIAP, Ecuador	Fernando Correa César Cardona	Reinaldo Cardona Miguel Diago Sandra Garcés	224,000 total approved funds 508,000 (with counterpart funding)
Understanding the Mechanism of Plant Resistance to Whiteflies (2004 – 2008)	United States Department of Agriculture (USDA)	USDA	Anthony Bellotti	Stephen Lapointe	61,146.00
Estudios de epidemiología y control no convencional de la antracnosis del mango (2006-2009)	COLCIENCIAS	CORPOICA	Segenet Kelemu	Jairo Osorio	70,250

Activity 3.10. List of project proposals and concept notes developed with partners

Donor/Title	Lead Researcher/ Principal Contact	Total Project budget US\$
Austria Integrated Soil Fertility, Pest, and Disease Management in the Tropics of America	A. Gaigl	10,000
Austria Improving fruit and vegetable product quality from smallholder system: Optimizing soil-crop-pest management for economically viable, socially acceptable and ecologically sustainable production	A. González T. Oberthur M. Lundy S. Kelemu I. Rao	599,232
Bayer – Dow Dupont - Desarrollo de resistencia a fungicidas en los patógenos del arroz, <i>Pyricularia grisea</i> y <i>Rhizoctonia solani</i>	F. Correa	30,000
Bayer Cropscience Enhancement of biological control agents through the combination with imidacloprid	A. Gaigl	85,725
Belgium Improving rural livelihoods in Rwanda: Promoting integrated crop, disease, and pest management (ICDPM) strategies for intensification and diversification of agricultural systems.	G.Mahuku R.Buruchara S. Kelemu L. Calvert	5,992,330
BMZ White grubs – soil pests or recycler of soil organic matter. Studies on feeding behaviour of white grubs associated with tuber crops	A. Gaigl	30,000
BMZ Host plant resistance to white grubs attacks	A. Gaigl	30,000
CFC Doubly green beans: Income generation and improved livelihoods for smallholder farmers through an environmentally clean product for local and international markets.	C. Cardona G. Mahuku S. Beebe	2,000,000
CIDA – CIRAD Mejoramiento de la Calidad de Vida de Agricultores bajo Riesgo: Tecnologías y Políticas para Rehabilitar Tierras Degradadas en Cultivos y Pastos en Nicaragua.	C. Lascano I. Rao S. Kelemu J. Peters J.I. Sanz	8,491,127
CIRAD Innovative technologies to reduce diseases in plantain and banana	E. Alvarez	677,000
Colombia – Cuba Desarrollo de prácticas de manejo de pudrición de raíz de yuca mediante la detección molecular de Phytophthora en zonas semi-áridas en Cuba y Colombia.	E. Alvarez	10,927
CYTED Tecnologías innovativas para reducir agroquímicos en plátano y banano	E. Alvarez	248,406
CYTED Implementación de un Sistema Fitosanitario Regional para Centroamérica y el Caribe	L. Calvert	123,000
FONTAGRO Alianzas estratégicas para producción sostenible de yuca en los Andes (with regional partners).	E. Alvarez	300,000
FONTAGRO Tecnologías innovativas para reducir agroquímicos en plátano y banano (with various regional partners).	E. Alvarez	300,000
Ford Foundation Enhance life quality of rural families through the use of sustainable technologies for cassava and plantain.	A Gaigl	308,988

Activity 3.10. List of project proposals, (cont'd)

Donor/Title	Lead Researcher/ Principal Contact	Total Project budget US\$
IFAD Development of strategies for integrated soil fertility, pest and disease management on cassava in Colombia, Ecuador, Venezuela and Cuba	A. Gaigl	1,502,208
IPM CRSP Integrated soil pest management for environmentally sound agriculture in South America	A. Gaigl	15,000
Kellogg's Enhance life quality of rural families through training communities in the use of sustainable technologies	A. Gaigl	433,500
MADR Alternativas verdes para el control de enfermedades y plagas en productos de alto valor: Extractos de fique (<i>Furcraea cabuya</i>) y swinglia (<i>Swinglia glutinosa</i>) como fuentes de sustancias bioplaguicidas naturales. Entidades que presentan la propuesta: CIAT y Universidad del Valle	G. Mahuku C. Cardona	78,671
MADR Alternativas verdes para el manejo sostenible de plagas y enfermedades en cultivos hortícolas de alto valor en Colombia (with CORPOICA, CIPASLA SANOPLANT and CIAT-soils group).	C. Cardona S. Kelemu G. Mahuku	305,944
MADR Estudios de epidemiología y control no convencional de la antracnosis del mango. (CORPOICA and CIAT; CORPOICA is the submitting institution, Approved January 2006)	J. Osorio S. Kelemu	70,250
MADR Mejoramiento de la productividad, la calidad y la inocuidad del cultivo de lulo a través del desarrollo y la implementación de programas de manejo integrado del cultivo y el cumplimiento de buenas prácticas agrícolas internacionales. (Live Science Systems is the submitting institution)	A. Gaigl	218,531
MADR Mejoramiento de la productividad, la calidad y la inocuidad del cultivo de mora a través del desarrollo y la implementación de programas de manejo integrado del cultivo y el cumplimiento de buenas prácticas agrícolas internacionales. (Live Science Systems is the submitting institution)	A. Gaigl	218,531
MADR Mejoramiento de la productividad, la calidad y la inocuidad del cultivo de papa criolla a través del desarrollo y la implementación de programas de manejo integrado del cultivo y el cumplimiento de buenas prácticas agrícolas internacionales. (Live Science Systems is the submitting institution)	A. Gaigl	218,531
MADR Reducción del uso de plaguicidas para aumentar la competitividad de frutas para exportación (with CORPOICA, CIPASLA, Ecoflora, Profrutales and CIAT-soils group).	C. Cardona S. Kelemu	349,650
MADR - IICA Lulo con Valor Agregado: Nuevas Alternativas para el Pequeño Agricultor.	A. González Z. Lentini E. Alvarez	240,513

Activity 3.10. List of project proposals, (cont'd)

Donor/Title	Lead Researcher/ Principal Contact	Total Project budget US\$
MADR – IICA Colección, caracterización y multiplicación clonal de selecciones criollas de aguacate con énfasis en la identificación de patrones con tolerancia a <i>Phytophthora</i> spp. (Corporación Colombiana de Investigación Agropecuaria-Corpoica, Vivero Profrutales Ltda., Centro Internacional de Agricultura Tropical - CIAT)	E. Alvarez	1,015,012
NZAID Enhance life quality of rural families through the use of sustainable technologies	A. Gaigl	300,000
Palmar del Oriente - Palmas de Casanare - Palmeras Santana - COLCIENCIAS Confirmación de fitoplasma, como agente causante de la marchitez letal en palma de aceite.	E. Alvarez	72,288
Rockefeller Integrated soil fertility, pest and disease management in South America.	A. Gaigl	1,500,000
USAID Desarrollo de un biofungicida para el manejo de enfermedades de cultivos establecidos en fincas productoras de plátano en Colombia.	E. Alvarez	250,000
USAID Opportunities for the Biologically-base Management of Subterranean Insect Pests (with Cornell)	A. Gaigl	14,000
Not yet submitted to donors		
Biological indicators: Assessing and Monitoring Soil Health using Belowground Indices as Biological indicators. Duration: 5 years	G. Mahuku S. Kelemu	1,500,000
Highlighting available scientific data to address concerns related to modern biotechnology in the East African context.	S. Kelemu L. Calvert	500,000
SSA-CP Improving the resilience of crop/livestock farming system to enhance food security and income generation in SADC countries	G. Mahuku and Others	1,198,465
MCKNIGHT FOUNDATION Promotion of integrated pest and soil management strategies for <i>Phaseolus</i> beans in smallholder farming systems in Malawi, Mozambique and Tanzania	Eli Minja	300,000
EU-ASARECA Scaling-out integrated soil and pest management bean based technologies with farmers, Competitive Funding	Eli Minja	351,350
Proposals at initial concept stage		
Biological Pesticides: Exploiting the natural microbial and plant biodiversity wealth for combating diseases and pests for sustainable livelihoods in the tropics. Duration: 5 years	S.Kelemu, C. Cardona	15,000,000
Biocidal proteins from native African plants and microbes for control of plant diseases and pests of major economic importance. (Duration and budget to be defined)	S. Kelemu	
Endophytic fungi and bacteria in the tropics (Africa and Latin America): food safety and crop improvement applications. (Duration and budget to be defined)	S. Kelemu	
Soil biota (System wide Program-IPM)	PE-1 scientists and CGIAR	10,000,000

Activity 3. 11. List of Publications

Refereed journal articles

- Abello, J. F., Kelemu, S. 2005. Hongos endofitos: Ventajas adaptativas que habitan al interior de las plantas. *Revista Corpoica Ciencia y Tecnología Agropecuaria* (in press).
- Álvarez, E., Ospina, C. A., Mejía, J. F., Llano, G. A. 2005. Morphological, pathogenic, and genetic characterization of the causal agent of anthracnose (*Colletotrichum gloeosporioides*) in soursop (*Annona muricata*) in Valle del Cauca. *Fitopatol Colomb* 28:1–8.
- Alvarez, E., Llano, G. A., Loke, J. B., Mejía, J. F. 2005. Applying biotechnology tools to improve control diseases of some tropical crops. *Fitopatol. Colombiana* 28(2): 93-97.
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3.12. List of Partners/ Collaborators

Australia

Cooperative Research Center for Tropical Plant Protection
University of Queensland

Brazil

Alfredo Alves, EMBRAPA-CNPMF
Instituto Agronómico de Campinas (IAC)

Belgium

Jean-Pierre Busogoro, Agricultural University of Gembloux

Canada

Andre Levesque, Agriculture and Agri-Food, Ottawa

Colombia

Adriana Arenas, Universidad del Valle
Agrobiológicos SAFE , Laboratory “Natural Control”, Medellín
Alberto Soto, Universidad de Caldas
Ana Luisa Díaz, ICA
Aníbal Tapiero, CORPOICA
BIOCARIBE S.A., Medellín
Bolívar Muñoz, CORFOICIAL
Carlos Aníbal Montoya, ICA
CENICAFE, Chinchiná
Cenicaña
CIAL “La María”, Piendamó, Cauca
CIAL “San Bosco”, Mondomo, Cauca,
Consejo Regional Indígena del Vaupés (CRIVA)
CORPOICA, Nataima, C.I. La Libertad, "La Libertad", Villavicencio, Palmira
Corporación para el Desarrollo Sostenible del Norte y Oriente Amazónico (CDA), Vaupés
Cristina Aristizabal, ICA
Diana López, Universidad del Valle
Diego López, Universidad del Valle
Edgar Burbano, ICA
Esperanza Morales, Life Systems Technology (LST) S.A.
Ester Jaramillo, farmer from Quindío
Eusebio Ortega, Development Pole–Córdoba and Sucre
Germán Hoyos, Syngenta
Gloria Esparanza Santana, CORPOICA, Rionegro, Antioquia
Grajales S.A.
Henry Hamman, Agrovez, Jamundí, Valle
Henry Toro, Universidad de Caldas
Hover Naranjo, farmer from Quindío
Instituto Colombiano Agropecuario (ICA), Quindío and Valle
Instituto Tecnológico de Roldanillo
Jaime Jaramillo, Life Systems Technology (LST) S.A.
Jairo Castaño, Universidad de Caldas
Jairo Osorio, CORPOICA, Bogota
James Montoya, Universidad del Valle
Jorge E. Angel, Profrutales Ltda.

Jorge García, Barpen International S.A.
Jorge Gómez, CORPOICA, ICA
Luis Enrique Cheverry, farmer from Quindío
Luis F. Vallejo, Universidad de Caldas
Luz Adriana Meza, Universidad del Quindío
Marcelo Vargas, Universidad de Caldas
Mario Lobo, CORPOICA La Selva
Marleny Salazar, Univesidad del Quindio
Martha Londoño, CORPOICA, Rionegro
Mayor's Office of Aguazul, Casanare
Mayor's Office of Armenia, Quindío
Miguel Diago, FEDEARROZ
Miguel Serrano, Universidad Nacional de Colombia- Bogotá
Myriam Sánchez, Corporación BIOTEC
Octavio Vargas, Mitsui de Colombia, S.A.
Omar Zuluaga, Universidad de Caldas
Palmar del Oriente
Palmas de Casanare
Petrotesting Colombia S.A., Puerto López, Meta.
Rebeca Lee, CENIFLORES, ASOCOLFLORES
S González, FEDEPLATANO
Secretaría de Agricultura del Vaupés, Mitú
Silverio González, CORPOICA
UMATAs (Mitú, Santander de Quilichao, Buenos Aires, Caicedonia, La Tebaida, and Montenegro)
Unidades Municipales de Asistencia Técnica Agropecuaria UMATAs
UNIPALMA
Universidad Católica de Manizales
Universidad de la Amazonía
Universidad de los Andes, Bogotá
Universidad de los Llanos
Universidad de Sucre
Victor Hugo Treviño, Universidad del Quindío
Victor Montaña, Cassava Development Pole, Casanare,

China

Zhide Geng, Yunnan Academy of Agricultural Sciences, YAAS

Costa Rica

Carlos Manuel Araya, National University, Heredia.

Cuba

Instituto de Investigaciones de Viandas Tropicales (INIVIT)

Instituto de Investigaciones del Arroz (IIA)

Denmark

The Royal Veterinary and Agricultural University (KVL)

Ecuador

Sandra Garcés, Instituto Nacional Autónomo de Investigaciones Agropecuarias. INIAP

Escuela Politécnica del Ejército (ESPE)

France

Institut National de Recherche Agronomique (INRA) - Institut National des Sciences Appliquées (INSA), Laboratoire de Biologie Appliquée, Villeurbanne

Institute of Research for Development (IRD)

Germany

Christian Borgemeister, Institut für Pflanzenkrankheiten und Pflanzenschutz, Fachbereich Gartenbau, Universität Hannover
Ralf-Udo Ehlers, Agrar- und Ernährungswissenschaftliche Fakultät, Universität Kiel
Gisbert Zimmerman, BBA, Federal Biological Research Centre for Agriculture and Forestry (BBA)

Ghana

Elizabeth Okai, Crop Research Institute, CRI

Kenya

Community Mobilisation Against Desertification in Western Kenya
Local Chiefs and religious leaders
Ministry of Agriculture
Ministry of Education
Ministry of Health
Paul Calatayud, IRD/ International Centre of Insect Physiology and Ecology ICIPE
Reuben Otsyula, KARI
SIMLOW
UCCIP
University of Nairobi

Malawi

Chitedze Agric. Res. Station
Concern Universal
Dedza District Extension Office
Local leaders
Ministry of Agriculture and Irrigation
PLAN International

Niger

Chiedozi Egesi, Nacional Root Crop Research Institute, NRCRI

Nigeria

James Legg, IITA
National Root Crop Research Institute (NRCRI)

Peru

International Potato Center (CIP)

Rwanda

Gerardine Mukeshimana, UNR
Institut des Sciences Agronomiques du Rwanda (ISAR)

South Africa

Merion Liebenberg, ARC
R. Melis, University of Kwa-Zulu-Natal
W. de Milliano, University of Kwa-Zulu-Natal

Switzerland

Federal Institute of Technology Development (ETH)

Taiwán

Peter Hanson, Asian Vegetable Research and Development Center, AVRDC

Tanzania

ADRA- Adventist Development and Relief Agency
AHI- African Highlands Ecoregional Programme
Anglican Church of Tanzania, Mara Diocese
Catherine Madata, Agricultural Research Institute
ELCT- Evangelical Lutheran Church of Tanzania
Farm Africa
FIPS Farm Inputs Promotion Africa
HEM- Himo Environmental Management
Local government and religious leaders
Ministry of Agric.-Armyworm project
Minjingu Mines & Fertilizer Ltd.
SARI Bean research programme
World Vision

Uganda

A. Namayanja, National Agricultural Research Organization, NARO
AAMP- Area-Based Agricultural Modernisation programme
Africare
AHI – African Highlands Ecoregional Programme
Antón Bua, Namulonge Agricultural and Animal Production Research Institute, NAARI
Ecotrust
Fina Opio, NARO
Geoffrey Tusiime, Makerere University
ISAMI (CARE/KADFA)
Kigesi Diocese
Local Government and religious leaders
M.A. Ugen, NARO
Michael Ugen, NARO
NAADS- Uganda National Agricultural Advisory services
NEMA – National Environment Management Authority
P. Okori, Makerere University
PMA- Plan for the Modernisation of Agriculture
Titus Alicia, NAARI

United Kingdom

Commonwealth Agricultural Bureaux International (CABI)
Horticulture Research International (HRI)
Isabel Carballal, NRI
N. Spence, UK Government Department for Environment Food and Rural Affairs.
Scottish Crop Research Institute (SCRI)

United States

Chris Schardl, University of Kentucky
Daniel Peck, Cornell University
Iowa State University
John E. Losey, Cornell University
Kansas State University
Leslie L. Allee, Cornell University
Michigan State University
Ron Walcott, University of Georgia
Stephen Lapointe, United States Department of Agriculture (USDA)
Texas A&M University
University of California Davis
University of Florida

Venezuela

Reinaldo Cardona, Instituto Nacional de Investigación Agrícola INIA

Zimbabwe

Walter Manyangarirwa, Africa University