Annual Report

Training and Communications Support Program and Seed Systems Development

Activity report
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CIAT
Centro Internacional de Agricultura Tropical

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TRAINING AND COMMUNICATIONS SUPPORT PROGRAM

AND

SEED SYSTEMS DEVELOPMENT

ANNUAL REPORT 1991

EXECUTIVE SUMMARY

Training pursues three institutional development objectives: (1) to strengthen national research capacity; (2) to strengthen national links between research and development; and (3) to develop subregional training systems. For the first, trainees are identified in close interaction with NARS, and selected strictly on the basis of research team strengthening objectives; personalized training programs are designed for each trainee. One hundred forty-seven professionals participated in such programs. To strengthen national research-development links, two lines of action are followed: direct training of extensionists; and training as part of seed systems development (see below). Training of extensionists is being reduced at the expense of developing subregional teams of trainers who will take over this responsibility. Consequently, only four in-country courses for extensionists were held in 1991, while the development of three subregional training teams successfully progressed, namely, for bean production in Central America, for rice production in the northern Andean countries, and for cassava production and utilization in the Southern Cone. The members of the Central American Trainers Team for bean production have already conducted eight courses for extensionists in the Dominican Republic, El Salvador, Haiti, Honduras, and Nicaragua (four courses). The group of Ecuadorian trainers for rice production will end the year with three courses delivered to extensionists (plus the first one from the whole series held in the previous year).

The Information Unit backstopped CIAT scientists with photocopies of 13,000 documents, 1,100 answers to reference questions, and nearly 1,000 literature searches. External users, on the other hand, purchased photocopies of about 12,000 documents, received answers to over 800 reference questions, and were served by more than 2,000 literature searches. These are increments, over last year, of 6% in the output of photocopies, 21% in reference questions answered, and a striking 116% in automated literature searches. The latter two improvements can be attributed to the Unit's technological modernization, and to the implementation of aggressive user awareness and training activities over the last two years.

The productivity of the Graphic Arts Unit, which had trebled from about 4,600 camera-ready pages in 1988 to approximately 13,900 in 1990, has increased by another 44% (to 20,000 camera-ready pages). Simultaneously, due to the advance in desk-top publishing, typesetting was reduced by 35%.

Major books were produced on Tissue Culture in Agriculture, Research for Crop Improvement in Common Beans, and Fungal Diseases in Tropical Pastures. Important working documents were published on Integrated Cassava Projects, the Contribution of Improved Pastures to Tropical Animal Production, and Pastures Research in Southeast Asia. And, of course, CIAT's new Strategic Plan is a watershed publication in the Center's life.

Of CIAT's extensive portfolio of publications, nearly 70,000 copies of periodicals were distributed; close to 5,000 publications and 6,000 study guides were sold; and more than 2,000 items were donated.

In 1992, the Training and Communications Support Program, the Seed Unit, and other activities will become the Institutional Development Support Program. In the transition towards the new arrangement, several seed systems development activities conducted by the Seed Unit, the Central American and Andean Bean Projects, the Training and Communications Support Program, and the Tropical Pastures Program have been linked.

Major progress was made in conceptualizing and implementing alternative small-scale seed supply systems for crops and other plant species of CIAT's interest which are not served by the established seed industry. To derive general principles for the successful establishment and management of such systems, real systems are being supported and monitored in six Latin American countries. The development of new systems is encouraged in several other countries. Seed-processing equipment appropriate to the scale of these systems has been developed or adapted, and deployed at nine sites or institutions in Central America, the Caribbean, and the Andean Region. The sites are a source of feedback on the equipment's suitability, and a focal point for further dissemination of the new technology.

A. TRAINING AND COMMUNICATIONS

I. TRAINING AND CONFERENCES

I.1. TRAINING[1]

CIAT-wide, Training pursues three institution development objectives

* Strengthen national research capacity;

* Strengthen national links between research and development;

* Develop subregional training systems.

With the Tropical Pastures Program, Training, jointly with other sectors in the TCSP, promotes the incorporation of the body of knowledge on tropical pastures generated by CIAT and RIEPT into the undergraduate curricula of Latin American and Caribbean universities.

In addition to the training activities related directly to institution development, postgraduate training opportunities are offered to young researchers from developed countries, to become acquainted with international tropical agricultural research; and undergraduate students from Colombia are given the opportunity to carry out research projects under the guidance of CIAT scientists, in fulfillment of a partial requisite to obtain their first university degree.

The report on 1991 activities and achievements in these five areas follows.

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[1]This report does not include information on in-country training of CIAT's Bean Research Projects and Networks in Africa, which report separately.

I.1.1. STRENGTHENING OF NATIONAL RESEARCH CAPACITY[2]

I.1.1.1. Beans

Forty NARS scientists were trained during 1991 in the Bean Program (Tables I.1.1., I.1.2., and I.1.3.). Fifteen took the general bean research and production course, followed by an individualized specialization (spending on average 4.7 months each at CIAT); 18 came directly for individualized training (these spent on average 1.6 months at CIAT); five worked for their M. Sc. research projects, and two did so for their Ph. D. projects. The trainees' specialization area by their country of origin, and the trainees' type of training by their country of origin are summarized in Tables I.1.2. and I.1.3.

TABLE I.1.1. BEAN RESEARCH TRAINING 1991

PROFESSIONALS TRAINED AT CIAT ACCORDING TO TYPE OF TRAINING AND SPECIALIZATION AREA

Specialization Area	TYPE OF TRAINING				TOTAL
	GROUP	INDIVIDUALIZED			
	Introductory Course + Individualized	No Thesis	Thesis MS	Thesis PhD	
Agronomy	8 (4.5)*	3 (2.3)	1		12
Breeding	4 (5.0)	4 (1.2)	2	1	11
Entomology	1 (4.6)	3 (3.3)	1		5
Microbiology	2 (4.9)	3 (1.2)	1		6
Pathology		4 (0.8)		1	5
Quality		1 (0.9)			1
TOTAL	15 (4.7)	18 (1.6)	5	2	40

* Months/Person

[2]While this report was being printed, four more research trainees were admitted: two for specialization in Bean Entomology; one for Ph.D. research in Rice Virology; and one for specialization in Tropical Pastures Production Systems

TABLE I.1.2. BEAN RESEARCH TRAINING 1991

PROFESSIONALS TRAINED AT CIAT ACCORDING TO SPECIALIZATION AREA AND COUNTRY OF ORIGIN

Country	SPECIALIZATION AREA						Total
	Agrono-my	Breed-ing	Entomolo-gy	Micro-biology	Patholo-gy	Quality Control	
ANGOLA	1						1
BOLIVIA	1						1
BRAZIL	1						1
COLOMBIA			1	2			3
COSTA RICA		1			2		3
ECUADOR			1		1		2
EL SALVADOR	1		1	1			3
ETHIOPIA				1			1
HONDURAS		1	1				2
MALAWI				1		1	2
MEXICO	2	4					6
MOZAMBIQUE		1					1
NICARAGUA	2	1	1				4
PANAMA	1						1
PEOP REP OF CHINA		1					1
PERU	2	1		1			4
UGANDA					1		1
VENEZUELA	1						1
ZAMBIA					1		1
ZIMBABWE		1					1
TOTAL	12	11	5	6	5	1	40

TABLE I.1.3. BEAN RESEARCH TRAINING *1991*

PROFESSIONALS TRAINED AT CIAT ACCORDING TO TYPE OF TRAINING AND COUNTRY OF ORIGIN

COUNTRY	TYPE OF TRAINING				TOTAL
	GROUP	INDIVIDUALIZED			
	Introductory Course + Individualized	No Thesis	Thesis MS	Thesis PhD	
ANGOLA		1			1
BOLIVIA		1			1
BRAZIL	1				1
COLOMBIA		2	1		3
COSTA RICA		2		1	3
ECUADOR		2			2
EL SALVADOR	2	1			3
ETHIOPIA		1			1
HONDURAS	1	1			2
MALAWI		2			2
MEXICO	5	1			6
MOZAMBIQUE	1				1
NICARAGUA	2		2		4
PANAMA	1				1
PEOP REP OF CHINA				1	1
PERU	1	1	2		4
UGANDA		1			1
VENEZUELA	1				1
ZAMBIA		1			1
ZIMBABWE		1			1
TOTAL	15	18	5	2	40

The general bean research and production course (followed in all cases by individualized specialization) was offered again this year, after having been replaced last year by an advanced course in bean breeding. This is part of the established strategy of gradually phasing out the production and introductory research training, as it is being taken over by the NARDS or by subregional training bodies (see I.1.3.).

I.1.1.2. Cassava

Twenty-two NARS researchers were trained in the Cassava Program (Tables I.1.4., I.1.5., and I.1.6.). Eighteen underwent individualized training programs (on average 1.2. months long), two worked for their M.Sc. research projects, and two for their Ph.D. projects (Table I.1.4.). The trainees' specialization area by their country of origin, and the trainees' type of training by their country of origin are summarized in Tables I.1.5. and I.1.6.

After having held basic courses on cassava research and integrated projects last year, no such course was offered in 1991, in accordance with the strategy of gradually phasing them out as NARDS or subregional training bodies assume the responsibility of meeting demand (see I.1.3.)

TABLE I.1.4. CASSAVA RESEARCH TRAINING 1991

PROFESSIONALS TRAINED AT CIAT ACCORDING TO TYPE OF TRAINING AND SPECIALIZATION AREA

Specialization Area	TYPE OF TRAINING			TOTAL
	INDIVIDUALIZED			
	No Thesis	Thesis MS	Thesis PhD	
Agronomy	1 (0.8)*	2		3
Biotechnology	1 (0.7)			1
Breeding	1 (1.0)		2	3
Pathology	6 (1.1)			6
Physiology	1 (2.3)			1
Utilization	8 (1.5)			8
TOTAL	18 (1.2)	2	2	22

* Months/Person

TABLE I.1.5. CASSAVA RESEARCH TRAINING 1991

PROFESSIONALS TRAINED AT CIAT ACCORDING TO SPECIALIZATION AREA AND COUNTRY OF ORIGIN

Country	SPECIALIZATION AREA						Total
	Agrono-my	Biotec-nology	Breeding	Patholo-gy	Physi-ology	Utili-zation	
ARGENTINA				1			1
BRAZIL	1	1		4			6
COLOMBIA			1	1			2
ECUADOR						6	6
INDIA						1	1
INDONESIA						1	1
PARAGUAY	1						1
PEOP REP OF CHINA					1		1
THAILAND	1		1				2
THE PHILIPPINES			1				1
TOTAL	3	1	3	6	1	8	22

TABLE I.1.6. CASSAVA RESEARCH TRAINING 1991

PROFESSIONALS TRAINED AT CIAT ACCORDING TO TYPE OF TRAINING AND COUNTRY OF ORIGIN

COUNTRY	TYPE OF TRAINING			TOTAL
	INDIVIDUALIZED			
	No thesis	Thesis MS	Thesis PhD	
ARGENTINA	1			1
BRAZIL	6			6
COLOMBIA	2			2
ECUADOR	6			6
INDIA	1			1
INDONESIA	1			1
PARAGUAY		1		1
PEOP REP OF CHINA	1			1
THAILAND		1	1	2
THE PHILIPPINES			1	1
TOTAL	18	2	2	22

I.1.1.3. Rice

Sixteen NARS researchers were trained in the Rice Program (Tables I.1.7., I.1.8., and I.1.9.). Fourteen followed individualized programs (on average 2.4. months long), and one each worked on their M.Sc. and Ph.D. research projects (Table I.1.7.). The trainees' specialization area by their country of origin, and the trainees' type of training by their country of origin are summarized in Tables I.1.8. and I.1.9.

The comment made on not having held a basic cassava research course, applies equally to not having held an equivalent rice course this year.

TABLE I.1.7. RICE RESEARCH TRAINING 1991

PROFESSIONALS TRAINED AT CIAT ACCORDING TO TYPE OF TRAINING AND SPECIALIZATION AREA

Specialization Area	TYPE OF TRAINING			TOTAL
	INDIVIDUALIZED			
	No thesis	Thesis MS	Thesis PhD	
Agronomy	3 (3.5)*			3
Breeding	2 (1.9)	1	1	4
Economics	2 (1.0)			2
Entomology	5 (1.8)			5
Pathology	2 (4.0)			2
TOTAL	14 (2.4)	1	1	16

* Months/Person

TABLE I.1.8. RICE RESEARCH TRAINING 1991

PROFESSIONALS TRAINED AT CIAT ACCORDING TO SPECIALIZATION AREA AND COUNTRY OF ORIGIN

Country	SPECIALIZATION AREA					Total
	Agronomy	Breeding	Economics	Entomology	Pathology	
BRAZIL			1	1		2
COLOMBIA		3				3
CUBA	1					1
ECUADOR			1	2		3
EL SALVADOR					1	1
MEXICO					1	1
PERU		1				1
VENEZUELA	2			2		4
TOTAL	3	4	2	5	2	16

TABLE I.1.9. RICE RESEARCH TRAINING 1991

PROFESSIONALS TRAINED AT CIAT ACCORDING TO TYPE OF TRAINING AND COUNTRY OF ORIGIN

COUNTRY	TYPE OF TRAINING			TOTAL
	INDIVIDUALIZED			
	No thesis	Thesis MS	Thesis PhD	
BRAZIL	2			2
COLOMBIA	2	1		3
CUBA	1			1
ECUADOR	3			3
EL SALVADOR	1			1
MEXICO	1			1
PERU			1	1
VENEZUELA	4			4
TOTAL	14	1	1	16

I.1.1.4. Tropical Pastures

Thirty NARS researchers were trained in the Tropical Pastures Program (Tables I.1.10., I.1.11., and I.1.12.). Four of them took only the general pastures research and production course; 19 took this course followed by an individualized training program (average 4.3. months per trainee); five came directly for individualized training (3.9 months duration on average); and one each worked on their M.Sc. and Ph.D. research projects (Table I.1.10.). The trainees' specialization area by their country of origin, and the trainees' type of training by their country of origin are summarized in Tables I.1.11. and I.1.12.

TABLE I.1.10. TROPICAL PASTURES RESEARCH TRAINING 1991

PROFESSIONALS TRAINED AT CIAT ACCORDING TO TYPE OF TRAINING AND SPECIALIZATION AREA

Specialization Area	TYPE OF TRAINING					TOTAL
	GROUP		INDIVIDUALIZED			
	Introductory Course	Introductory Course + Individualized	No Thesis	Thesis MS	Thesis PhD	
Agronomy		4 (3.9)*	1 (11.4)	1		6
Genetic Resources		1 (4.3)	1 (1.1)			2
Pasture Quality		4 (4.4)	1 (1.1)			5
Production	4					4
Production Systems		6 (4.1)				6
Seed Production		3 (3.7)	2 (2.1)			5
Soils		1 (6.6)			1	2
TOTAL	4	19 (4.3)	5 (3.9)	1	1	30

* Months/Person

TABLE I.1.11. TROPICAL PASTURES RESEARCH TRAINING 1991

PROFESSIONALS TRAINED AT CIAT ACCORDING TO SPECIALIZATION AREA AND COUNTRY OF ORIGIN

Country	SPECIALIZATION AREA							Total
	Agrono-my	Genetic Resources	Pasture Quality	Produc-tion	Production Systems	Seed Production	Soils	
BELIZE						1		1
BRAZIL		1						1
COLOMBIA	1		2		3		1	7
COSTA RICA	1			1		1		3
ECUADOR				2		1		3
EL SALVADOR						1		1
HONDURAS					2			2
MEXICO				1			1	2
NICARAGUA	2	1	1			1		5
PANAMA	1							1
PEOP REP OF CHINA	1							1
PERU			1					1
VENEZUELA			1		1			2
TOTAL	6	2	5	4	6	5	2	30

TABLE I.1.12. TROPICAL PASTURES RESEARCH TRAINING 1991

PROFESSIONALS TRAINED AT CIAT ACCORDING TO TYPE OF TRAINING AND COUNTRY OF ORIGIN

COUNTRY	TYPE OF TRAINING					TOTAL
	GROUP		INDIVIDUALIZED			
	Introductory Course	Introductory Course + Individualized	No thesis	Thesis MS	Thesis PhD	
BELIZE			1			1
BRAZIL			1			1
COLOMBIA		5		1	1	7
COSTA RICA	1	1	1			3
ECUADOR	2	1				3
EL SALVADOR		1				1
HONDURAS		2				2
MEXICO	1	1				2
NICARAGUA		5				5
PANAMA		1				1
PEOP REP OF CHINA			1			1
PERU		1				1
VENEZUELA		1	1			2
TOTAL	4	19	5	1	1	30

I.1.1.5. Research Support Units

Thirteen NARS scientists were trained in the Research Support Units (Tables I.1.13, I.1.14., and I.1.15.). Ten of them followed individualized training programs, while three worked on Ph.D. research projects (Table I.1.13.). The trainees' specialization area by their country of origin, and the trainees' type of training by their country of origin are summarized in Tables I.1.14. and I.1.15.

TABLE I.1.13. RESEARCH SUPPORT UNITS TRAINING 1991

PROFESSIONALS TRAINED AT CIAT A ACCORDING TO TYPE OF TRAINING

UNIT	TYPE OF TRAINING		TOTAL
	INDIVIDUALIZED		
	No Thesis	Thesis PhD	
Biotechnology	6 (1.6)*	3	9
Data Processing	1 (1.0)		1
Documentation	1 (3.2)		1
Genetic Resources	2 (2.7)		2
TOTAL	10 (2.1)	3	13

* Months/Person

TABLE I.1.14. RESEARCH SUPPORT UNITS TRAINING 1991

PROFESSIONALS TRAINED AT CIAT ACCORDING TO COUNTRY OF ORIGIN

Country	SPECIALIZATION AREA				Total
	Biotechnology	Data Processing	Documentation	Genetic Resources	
BOLIVIA			1		1
BRAZIL				1	1
COLOMBIA	7			1	8
ECUADOR	1				1
LEBANON	1				1
PANAMA		1			1
TOTAL	9	1	1	2	13

TABLE I.1.15. RESEARCH SUPPORT UNITS TRAINING 1991

PROFESSIONALS TRAINED AT CIAT ACCORDING TO TYPE OF TRAINING AND COUNTRY OF ORIGIN

COUNTRY	TYPE OF TRAINING		TOTAL
	INDIVIDUALIZED		
	No thesis	Thesis PhD	
BOLIVIA	1		1
BRAZIL	1		1
COLOMBIA	6	2	8
ECUADOR	1		1
LEBANON		1	1
PANAMA	1		1
TOTAL	10	3	13

I.1.1.6. Socio-Economics

Special mention deserves the First Course on the Role of Socio-Economists in Agricultural Research held from 16 September until 21 October.

The event was organized by the Economics Sections of CIAT's four commodity research programs, with the support of the Training and Conferences Unit, and the participation of resource persons from CENICAÑA, CIMMYT, CIP, FEDEARROZ, ICA and IDRC.

The objectives were to strengthen the NARS' capacity to do socio-economic research; to diagnose research needs, and to prioritize such needs; to do technology adoption studies; and to assess the impact of new technologies.

Candidates were identified and selected in close interaction with NARS leaders, with CIAT's headquarters' and outposted staff, and with the newly established Central American Network of socio-economics.

Participants (20) were from Mexico (one), Central America (one from each country, with the exception of El Salvador which was not represented), the Andean countries (four participants from Colombia, three from Ecuador, two from Peru, one from Bolivia, and one from Venezuela), Paraguay (one), and Brazil (two).

With this event, NARS decision making capacity for the assignment of resources among competing research needs has been strengthened. Actions to encourage NARS managers to make full use of their enhanced socio-economics human resources should follow.

I.1.1.7. Gender distribution among NARS research trainees

The gender distribution among NARS research trainees is presented in Tables I.1.16. and I.1.17.

TABLE I.1.16. GENDER OF RESEARCH TRAINEES FROM NARS, 1991

GENDER DISTRIBUTION BY RESEARCH PROGRAM AND RESEARCH SUPPORT UNITS

PROGRAM/UNITS	TRAINEES		
	Women	Men	Total
Beans	8	32	40
Cassava	4	20	24
Rice	6	12	18
Tropical Pastures	2	28	30
Research Suuport Units	8	7	15
Socioeconomics*	7	13	20
TOTAL	35	112	147

* Across-commodity training (see I.1.1.6.)

TABLE I.1.17. GENDER OF RESEARCH TRAINEES FROM NARS, 1991
GENDER DISTRIBUTION BY SPECIALIZATION AREA AND RESEARCH PROGRAM/SUPPORT UNITS

SPECIALIZATION AREA	BEANS		CASSAVA		RICE		TROPICAL PASTURES		SUPPORT UNITS		TOTAL	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
Agronomy	1	11	1	2	0	3	0	6			2	22
Biotechnology			1	0					5	5	6	5
Breeding	2	9	0	3	1	3					3	15
Data Processing									1	0	1	0
Documentation									0	1	0	1
Economics					2	1					9*	14**
Entomology	1	4	0	1	3	3					4	8
Genetic Resources							1	1	2	1	3	2
Microbiology	2	4									2	4
Pasture Production							0	4			0	4
Pasture Production Systems							0	6			0	6
Pasture Quality							1	4			1	4
Pastures Seed Prod.							0	5			0	5
Pathology	1	4	0	6	0	2					1	12
Physiology			0	1							0	1
Quality	1	0									1	0
Soils							0	2			0	2
Utilization			2	7							2	7
Total	8	32	4	20	6	12	2	28	8	7	35	112

* Includes 7 from socio-economics course
** Includes 13 from socio-economics course

I.1.2. STRENGTHENING OF NATIONAL LINKS BETWEEN RESEARCH AND DEVELOPMENT

Two lines of action were followed in the pursuit of this objective. On the one hand, training was given to extensionists in in-country courses. On the other hand, training was provided as part of seed systems development activities. The latter is reported in B.2.3. The former will be reported here.

First, it is convenient to remember that support to direct in-country training activities for extensionists is being reduced, and replaced with the establishment of subregional trainers teams which will take over the training of extensionists (I.1.3.).

Consistent with the strategy of reducing direct *training* of extensionists, participation in in-country courses for extensionists was very limited this year (four events altogether).

In collaboration with the Rice Program, two courses were held in Venezuela, one of the target countries of the Rice Program's institution development efforts on all fronts: research, extension, and training trainers (see also I.1.1.3. and I.1.3.2.).

Participants in both courses were from APROSCELLO (association of certified seed producers of the Eastern Plains), APROSCELLAC (association of certified seed producers of the Central Plains), FONAIAP (the national agricultural research institute), and FUNDECO (foundation for the development of the center-west region). Both events were under the coordination of the National Rice Council (Consejo Consultivo Nacional del Arroz), a strong interinstitutional mechanism of Venezuela's rice sector.

One course, on the economics of rice production, was held in Acarigua, Portuguesa, from 11 until 22 March for 22 participants. The other, on rice production technology, was held in Calabozo, Guarico, for 23 participants, from 28 October until 1 November.

The remaining two events were organized with the Cassava Program.

One was a course held in La Jota Exptl Station, Chimore, Chapare, Bolivia, from 19 until 23 August, to update 23 professionals on cassava production and utilization technologies.

The other one was a training workshop organized jointly with CIP (as part of the UNDP sponsored CIAT/CIP/IITA project for the development of human resources for root and tuber crops technology generation and transfer), to improve the capacity of Brazilian professionals to diagnose production problems in root and tuber crops. It was held in Fortaleza, Ceara, from 20 until 24 May, with 21 participants from Northeastern Brazil.

I.1.3. DEVELOPING SUBREGIONAL TRAINING CAPACITY

In 1989/90, methodology, for the development of teams of trainers, which will substitute for CIAT's commodity production (and utilization) training, was worked out with rice training prototype teams in Ecuador and the Dominican Republic. In 1991, the establishment of three subregional teams, one each for beans, rice, and cassava, went full force ahead.

I.1.3.1. Beans in Central America and the Caribbean

I.1.3.1.1. Institutional setting and selection of participants

A Central American and Caribbean team of trainers in bean production technology is being established under the auspices of the Central American Bean Network PROFRIJOL. Participants were selected by each country following criteria suggested by the coordinator and the executive committee of PROFRIJOL in interaction with CIAT's training staff. In essence, the criteria were proven experience in bean production technology; a favorable disposition of the candidates towards assuming training as part of their official duties; and support from the candidates' institutions to their integrating the regional team.

I.1.3.1.2. The team development process (Table I.1.18)

Training trainers workshop. The process was initiated with a workshop in Guatemala in October 1990, with 24 professionals from Mexico, the six Central American countries, Haiti and the Dominican Republic.

On the occasion, participants

* received training in adult education methodology;
* diagnosed and prioritized training needs in bean production technology of agricultural professionals in the region;
* integrated seven working groups, each of which began the production of an instructional unit on one of the seven top priority subjects;
* elected a leader for each working group, to follow-up on the production of the instructional units, and to liaise with CIAT's training staff.

Instructional Units. The seven units are on:

* BREEDING: improved bean varieties and their importance;

TABLE I.1.18. Development of a Central American and Caribbean team of trainers in bean production technology. Participants and events

PARTICIPANTS	EVENTS									
	Workshop Training Trainers. Guatemala, Guatemala. 15-27 Oct. 1990	General Bean Research and Production Course. CIAT. Feb-March 1991	Laboratory Training Trainers. Managua, Nicaragua. 8-13 April 1991	Bean Production Course. Estelí, Nicaragua. 15-19 April 1991	Bean Production Course. Cape Haitien, Haiti. 27-31 May 1991	Bean Production Course. Danlí, Honduras. 22 July- 1 August 1991	Post-Harvest Seed Production Course. Estelí, Nicaragua. 26-31 August 1991	Bean Production Course. Jinotepe, Nicaragua. 16-26 Sept. 1991	Bean Production Course. San Andrés, El Salvador. 7-17 Oct. 1991	Bean Production Course. San Juan de la Maguana, Dominican Republic. 28 Oct. 1 Nov. 1991
COSTA RICA	X	X						X		
Carlos Manuel Araya F.	X		X							X
Rodolfo Araya Villalobos	X		X			X			X	
Claudio Gamboa Hernández										
DOMINICAN REPUBLIC										
Abraham J. Abud Antun	X									X
EL SALVADOR										
Santos Pastora Bonilla A.	X		X			X			X	
Germán Raúl Henríquez	X	X	X					X	X	
José Enrique Mancía C.	X		X	X					X	
GUATEMALA										
Roni Osman Carrillo Aguilar	X		X	X			X		X	
Carlos Leonel Orellana S.	X		X			X				
Rafael Raúl Rodríguez	X		X				X		X	
Víctor Eberto Salguero Navas	X	X	X					X		
HAITI										
Emmanuel Hugues Prophete	X		X	X	X					
HONDURAS										
Federico Trece Ramos	X	X				X				
Ligia Zúñiga de Ramos	X					X				
MEXICO										
Enrique Noé Becerra León	X		X							X
NICARAGUA										
Freddy Sebastián Alemán Zeledón	X	X	X	X				X		
Julio César Molina Canteno	X		X	X				X		
Telémaco Talavera								X		
PANAMA										
Naira Alina Camacho	X	X	X					X		
Gladys Isabel González Dufan	X					X				
Julio Alberto Lara Martez	X		X	X						

* ENTOMOLOGY: Integrated pest management in beans;

* PATHOLOGY: Main bean diseases and their control;

* SEEDS: Non-conventional post-harvest bean seed production technologies;

* WEEDS: Integrated weed-management in the common bean;

* AGRONOMY: bean agronomy;

* SOILS: chemical soils analyses in bean production.

Each unit consists of a text arranged in an educational sequence, and two sets of visual aids: overhead transparencies and photographic slides.

Test of units in CIAT's general bean research and production course (GBRPC). Each of the group leaders tested the corresponding instructional unit under real-life training conditions in CIAT's GBRPC in February-March 1991. They were given feedback on their communications skills, and on the quality of the units. They adjusted the units' contents with CIAT's specialists, and improved the training aids with CIAT's training materials development staff.

Training trainers laboratory. In April, participants met in Managua, Nicaragua, where their adult education training was resumed. Their communications skills were improved by filming a dummy presentation of the instructional units, and by subsequently analyzing their communication patterns. The units were adjusted further.

Courses. As part of their training, all participants performed training duties in the in-country courses organized by PROFRIJOL in response to the network's member countries' demand (Table I.1.18). Twelve of them participated in one event, eight participated in two events, and one participated in three events. In all cases they used the instructional units, received feedback information on their performance, and were coached to improve their skills.

Team sustainability. Four participants dropped out; two of them after the first event and one later on; the fourth one took on a postgraduate scholarship and is expected to rejoin the team after completion of a M. Sc. program. One person was admitted to the team after a successful participation as instructor in one of the in-country courses.

Next step. A final one-month long training event for all participants is to take place in the first trimester of 1992 at CIAT.

I.1.3.2. Rice in the Northern Andean Region

I.1.3.2.1. Institutional background

The institution development objective is to establish a team of trainers in rice production technology for the Northern Andean countries (Colombia, Ecuador, and Venezuela). At variance with the Central American and Caribbean team of trainers in bean production technology, there is no regional mechanism such as PROFRIJOL that could sponsor a subregional team of trainers in rice. Consequently, for the time being, the team is developed country by country, with the expectation of eventually assembling the three national teams into a subregional one.

In Ecuador, work started in 1989, as part of the development of the methodology for training trainers. Participating institutions initially were all from the public sector: INIAP (the national agricultural research institute), PNA (the national rice program), and PROTECA (a research and development strengthening project funded by IDB). They were brought together in an Interinstitutional Committee responsible for coordinating the training trainers activities and the subsequent deployment of the team of trainers. This year, other institutional players have joined, and the committee has been transformed into a more action-oriented working group. The newcomers are CEDEGE (a development corporation of the Guayas river basin), agricultural inputs business representatives, and a farmers organization. Farmers participation, however, is weaker in Ecuador than in Colombia and Venezuela, basically reflecting the relative strengths of rice producers associations in the three countries.

In Colombia, participating institutions are ICA (the national agricultural research institute), FEDEARROZ (the national federation of rice growers), and the University of Tolima (in the rice growing heartland). The linkage mechanism is an Interinstitutional Committee with representatives of the three organizations and CIAT.

In Venezuela, the partners are FONAIAP (the national agricultural research institute), APROSCELLO (association of certified seed producers of the Eastern Plains), APROSCELLAC (association of certified seed producers of the Central Plains), and FUNDECO (foundation for the development of the center-west region). A strong interinstitutional mechanism, the National Rice Council (Consejo Consultivo Nacional del Arroz), is in place and coordinates the training trainers activities.

I.1.3.2.2. The team development process

In Ecuador and the Dominican Republic (1989/90), the team development and the interinstitutional support mechanism had the ups and downs common to many learning processes. With beans in Central America, events ran more smoothly and the development process was streamlined substantially as compared with the precursors. Probably as a consequence of the previous experience, kick off in Colombia and

Venezuela has also been smooth, and the process is proceeding along the lines that were consolidated with beans in Central America.

Ecuador. The team delivered its first course to 19 professionals, from 27 August to 7 September 1990, in Boliche. A second course was held for 12 participants, in Portoviejo, on 26 - 30 August 1991. Before that, however, some deficiencies in the management of demonstration-plots by the trainers, had become apparent. A workshop was therefore held, from 6 to 8 August 1991, to strengthen their demonstration-plot planning, monitoring, and evaluating skills. Next, the trainers team will hold two courses for extension agents, on 25 - 29 November, and 9 - 13 December 1991.

Six instructional units, developed by the Ecuadorian team with the support of CIAT's scientists and training materials development staff, have been completed. They deal with

* Rice growth and development;
* Soils and fertilization;
* Management for disease control;
* Management for phytophagous insects control;
* Management for weeds control; and
* Field development.

Colombia. The first workshop for training trainers was held from 17 to 28 June 1991.

Ten participants belong to ICA's national rice research program; nine to FEDEARROZ; and three to the postgraduate school of Tolima University. They integrated six working groups for developing instructional units on:

* Field development;
* Soils and fertilization;
* Management for disease control;
* Management for phytophagous insects control;
* Management for weeds control; and
* Irrigation.

Two members of each working group gathered at CIAT from 21 to 25 October 1991 to accelerate the improvement of the Units with the help of CIAT staff.

In early 1992, participants will meet again in a training trainers laboratory, and to deliver their first course.

In synergy with the present program, Tolima University (with support from FEDEARROZ) is launching a postgraduate program in rice production specialization. The first version starts in January 1992 and will last two semesters. The three members from Tolima University who participate in the interinstitutional trainers team are also part of the faculty that will teach in the specialization program.

Venezuela. Preparatory activities for initiating the Venezuelan chapter of training trainers in rice production technology are well advanced. Participants have been identified and the initial workshop is planned for March 1992.

I.1.3.3. Cassava in the Southern Cone

CIAT's cassava program has been fostering the development of a cassava research and development network for the Southern Cone (Paraguay, Southern Brazil, and Northeastern Argentina). As part of this initiative, contacts with scientists and institutional leaders from the three countries have been made during the present year, exploring whether there is a demand for establishing a subregional trainers team for cassava production and utilization technology. The response has been highly positive, potential participants have been identified, and a workshop to initiate the development of the team is scheduled for April 1992 in Corrientes, Argentina.

I.1.4. PROMOTE THE INCORPORATION OF THE BODY OF KNOWLEDGE ON TROPICAL PASTURES GENERATED BY CIAT AND RIEPT INTO THE REGION'S UNIVERSITIES' UNDERGRADUATE CURRICULA

Knowledge on tropical pastures for acid soils has grown remarkably over the last ten years, largely due to CIAT's Tropical Pastures Program and the International Network of Tropical Pastures Evaluation (RIEPT). This new body of knowledge, however, appears to have been incorporated rather little by Latin American Universities into their undergraduate curricula for the agricultural sciences. To obtain information that might help in defining a strategy to overcome this apparently limited use of current information in undergraduate teaching, a survey of tropical pastures undergraduate teaching was performed.

First, over 90 letters were sent to the governance of universities in Latin America and the Caribbean, to identify chairs involved in teaching on pastures. Based on the replies,

146 copies of a questionnaire were sent to 43 faculties in 14 countries. The questionnaire aimed at

* characterizing the population of lecturers, including parameters such as teaching experience; level of education; distribution of their time among teaching, research, and other responsibilities; RIEPT membership;

and at assessing

* the lecturer's acquaintance with, and use of, CIAT's publications and audiotutorials on tropical pastures;

* what bibliography they use for their teaching activities;

* what limitations they face for accessing scientific information;

* their demand for updating on pastures for acid soils; and

* their preferred updating strategies.

A report on the survey has been distributed in January 1991. Additional copies can be obtained from the TCSP's leader. Only the most relevant results will be summarized here.

The response rate was highly satisfactory. The questionnaire was answered by 46 chairs from 33 universities or faculties, this is from 77% of faculties surveyed. All but one of 14 countries replied.

More than 80% of the respondents had more than 10 years of professional experience, and nearly 40% had graduated 20 or more years ago. Their teaching experience was generally shorter: 41% had been teaching for not more than five years; however, 43% had been teaching for more than 10 years. Nearly 60% had postgraduate training (49% M.Sc. and 9% Ph.D level). In the distribution of their activities, teaching had priority over research; other activities, however, also demanded much of their attention.

Only 15% of the respondents were members of RIEPT. This may be related to the high priority given to non-research activities.

None of CIAT's publication is used frequently by more than 50% of the respondents. Within that ceiling, the journal "Pasturas Tropicales" is the most widely known and used publication. CIAT's other periodical publication, the quarterly abstract reviews, is also among the better known and more widely used products. Among the monographs and manuals, a compilation of scientific and common names of tropical forages is quite popular. RIEPT's manual on agronomic evaluation is well known and used; the recent

book on **Andropogon gayanus** is doing well; and the TPP's annual reports are well known, but not so frequently used.

Most significantly, the bibliography most widely used antedates the development of most of the body of knowledge on tropical pastures for acid soils. This confirms the initial perception that the modern body of knowledge has been little incorporated in the prevailing curricula. The signals on what approaches to follow to overcome this limitation are somewhat contradictory, however. On the one hand, the respondents indicated that for their updating they prefer periodicals. On the other hand, they showed a clear preference for monographs or text books as their main bibliography. With regard to subjects in which the respondents need updating, "production, management, and utilization of acid soils pastures" was given precedence over any other. This, in conjunction with the preference for books and monographs, could suggest that the highest payoff would probably come from producing a monograph on this subject.

For their updating, lecturers also indicated a preference for short intensive courses (less than a month long). A course for some 20 participants repeated once would meet this demand. Offering such a course **and** publishing a monograph, as suggested in the previous paragraph, could be a composite strategy with a high probability of success to achieve the central objective addressed in this section.

I.1.5. TRAINING NOT DIRECTLY RELATED TO INSTITUTION DEVELOPMENT

I.1.5.1. Research students from developed countries

CIAT offers post graduate training opportunities to researchers from developed countries to allow them to become acquainted with international tropical agricultural research.

During 1991 eight students worked on their Ph.D. research projects, and eight participated in student in practicum programs (Table I.1.19.).

I.1.5.2. Undergraduate Colombian students

As a special contribution to CIAT's host country, Colombian undergraduate agricultural students are admitted to do a research project at CIAT guided by Center's scientists, in fulfillment of a partial requisite to obtain their university degree (ingeniero agrónomo or equivalent).

Forty-six students completed their graduation theses in 1991.The areas of specialization by research program/unit are presented in Table I.1.20. Fifty-two percent of the students are women. The gender distribution by program/unit and by specialization area is shown in Tables I.1.21 and I.1.22.

TABLE I.1.19. RESEARCH TRAINEES FROM DEVELOPED COUNTRIES

RESEARCH PROGRAM/UNIT, COUNTRY OF ORIGIN, SPECIALIZATION AREA, TYPE OF TRAINING, DURATION, AND GENDER

Program/Unit	Country	Specialization Area	TRAINING		GENDER	
			Type	Duration	Woman	Man
Beans	Netherlands	Economics	Practicum	Oct. 91 - March 92	X	
Beans	Netherlands	Economics	Practicum	Oct. 91 - March 92	X	
Beans	U.S.A.	Microbiology	Ph.D.	Jun. 90 - Sept. 91	X	
Biotechnology	Canada	Biotechnology	Ph.D.	Nov. 89 - Dec. 91	X	
Biotechnology	Canada	Biotechnology	Ph.D.	March 90 - Jan. 92		X
Cassava	France	Utilization	Ph.D.	June - Dec. 91	X	
Cassava	Germany	Entomology	Ph.D.	April 89 - April 91		X
Cassava	Germany	Soils	Practicum	July - Dec. 91	X	
Cassava	Netherlands	Economics	Practicum	July - Dec. 91		X
Cassava	Switzerland	Physiology	Practicum	March - Aug. 91		X
Genetic Resources	Great Britain	Genetics	Practicum	July 91 - July 92	X	
Participatory Research	Netherlands	Soil Sciences	Practicum	March - July 91		X
Rice	Italy	Economics	Ph.D.	March 90 - March 91		X
Rice	U.S.A.	Entomology	Ph.D.	July - Oct. 91	X	
Tropical Pastures	Germany	Plant Nutrition	Ph.D.	Nov. 91 - May 93		X
Tropical Pastures	Switzerland	Pastures Quality	Practicum	March - Aug. 91		X

TABLE I.1.20. UNDERGRADUATE THESIS RESEARCH

THESES BY SPECIALIZATION AREA AND RESEARCH PROGRAM/UNIT

Specialization Area	Program/Unit					Total
	Beans	Cassava	Rice	Tropical Pastures	Research Support	
Agronomy		1		3		4
Biotechnology					6	6
Breeding	1	1	5			7
Entomology		2	2	1		5
Experimental Station Operation					2	2
Germplasm				1	2	3
Microbiology				2		2
Pasture Quality				1		1
Physiology				2	2	4
Plant Pathology		1	2	1		4
Post-harvest	2	2				4
Seeds				1		1
Systems				2		2
Virology					1	1
TOTAL	3	7	9	14	13	46

TABBLE I.1.21. GENDER OF UNDERGRADUATE STUDENTS BY PROGRAM/UNIT

Program/Unit	Women	Men	Total
Beans	1	2	3
Cassava	6	1	7
Rice	5	4	9
Tropical Pastures	6	8	14
Research Support	6	7	13
TOTAL	24	22	46

TABLE I.1.22. GENDER OF UNDERGRADUATE STUDENTS BY SPECIALIZATION AREA

Specialization Area	Women	Men	Total
Agronomy	1	3	4
Biotechnology	3	3	6
Breeding	3	4	7
Entomology	3	2	5
Experimental Station Operation		2	2
Germplasm	2	1	3
Microbiology		2	2
Pasture Quality	1		1
Physiology	4		4
Plant Pathology	2	2	4
Post-harvest	3	1	4
Seeds		1	1
Systems	2		2
Virology		1	1
TOTAL	24	22	46

I.2. CONFERENCES

I.2.1. EVENTS

Seventeen conferences were held, at headquarters or in-country, under the full responsibility of CIAT, or with major participation by the Center (Table I.2.1.). Conferences held by the Regional Bean Projects in Central America and the Caribbean, the Andean Region, and in Africa are not included in this account (they are reported by the various Projects).

The objectives ranged from internal awareness raising, through information exchange among participants, state-of-the-art technical reviews, catalytic action and training for NARDS strengthening (especially in the field of problem diagnosis and prioritization), to networking and interinstitutional action planning, monitoring, and evaluation.

Special mention deserves the Workshop on sustainable agriculture on the hillsides of Central America. It was held in IICA's headquarters in Coronado, San Jose, Costa Rica, organized by CIAT, IICA, CATIE, and CIMMYT from 13 until 16 August 1991. Objectives were to

* Take stock of institutions and organizations working on sustainable agriculture on the hillsides of Central America, and to characterize their systemic level(s) of intervention;
* Identify constraints and opportunities for interinstitutional collaboration in research and technology transfer on sustainable agriculture;
* Propose follow-up actions for devising and establishing interinstitutional collaborative mechanisms in sustainable agriculture.

The event is memorable in that it brought together key persons from public agricultural research institutions, from the private sector, and from NGOs, who successfully discussed the possibilities of jointly working on sustainable agriculture for the hillsides of Central America, and who agreed upon significant follow up actions. Also, it is a milestone marking the beginning of the implementation of CIAT's strategy of natural resources management research. A short report on the event has been published by CIAT in English, and the full proceedings in Spanish have been produced by IICA.

I.2.2. USE OF CIAT'S CONFERENCE FACILITIES

CIAT's conference facilities are a magnificent asset in constant use. In addition to hosting events such as those reported in the previous paragraph, they are in constant use for meetings of various CIAT components--scientists, training, visitors, administration, and personnel cooperatives (Table I.2.2). They are also used by CIAT's associate institutions; they are lent to Colombian institutions closely related to CIAT's activities and objectives;

TABLE I.2.1. CIAT CONFERENCES - 1991*

Title	No. of Participants and No. of Countries	Venue	Program	Type of activity**				Objectives	Dates
				W	C	M	S		
Internal seminar on biotechnology	20 1	CIAT, Colombia	Tropical Pastures				X	Awareness course for Tropical Pastures Program scientific staff	28-01-91 01-02-91
Meeting on diagnostic techniques for the rice sector in Colombia ICA-CIAT-FEDEARROZ	15 1	CIAT, Colombia	Rice			X		Promote diagnostic techniques for rice sector	14-02-91 15-02-91
Collaborative workshop CIP-CIAT-IITA and ICTA on processing, marketing and utilization of roots and tubers in Latin America	27 9	Villanueva, Guatemala	Cassava	X				Exchange of results and ideas related with processing and marketing of root tubers. Discuss and encourage cooperation	08-04-91 12-04-91
Central American workshop on the development of small seed enterprises PROFRIJOL-CIAT-DIGESA	29 5	Jutiapa, Guatemala	Seeds	X				Analyze progress on, and promote the development of small scale seed enterprises	22-04-91 26-04-91
Workshop on the improvement of NARS' diagnostic skills, CIP-CIAT-UNDP	25 9	Fortaleza, Ceará, Brazil	Cassava	X				Improve diagnostic capacity of Latin American researchers working on production of root and tubers	20-05-91 24-05-91
Internal workshop on gender analysis in agricultural research	32 1	CIAT, Colombia	CIAT	X				Generate ideas and hypotheses on the role of women in the Latin American agriculture with special emphasis on CIAT's research programs	13-06-91 14-06-91
Workshop on advances on cassava starch	68 8	CIAT, Colombia	Cassava	X				Evaluation and exchange of research; encourage integration of cassava starch enterprises; define new research goals; strengthen interinstitutional projects; establish an informal network to exchange information	17-06-91 21-06-91
Second Andean meeting on grain legumes - RELEZA II	100 10	CIAT, Colombia	Bean			X		Present and promote advances on grain legume research and exchange information among Andean Zone and CIAT scientists	24-06-91 29-06-91

Title	No. of Participants and No. of Countries	Venue	Program	Type of activity**				Objectives	Dates
				W	C	M	S		
II workshop on cassava integrated projects FUNDAGRO-CIAT	42 8	Portoviejo, Manabí, Ecuador	Cassava	X				Up date on advances of participant countries on cassava production, processing, utilization and marketing; discuss organization and performance of 2nd order farmer organizations and evaluate integrated projects	22-07-91 26-07-91
Seminar on cassava as an agricultural and food alternative	100 1	Maturin, Venezuela	Cassava				X	Establish commmunication between productive agricultural sector and researchers	01-08-91 02-08-91
Sustainable agriculture on the hillsides of Central America	91 15	Coronado, Costa Rica	CIAT IICA CATIE CIMMYT	X				Take stock of institutions and organizations working on sustainable agriculture on the hillsides of Central America and to characterize their systemic level (s) of intervention. Identify constraints and opportunities for interinstitutional collaboration in research and technology transfer on sustainable agriculture. Propose follow-up actions for devising and establishing interinstitutional collaborative mechanisms in sustainable agriculture.	13-08-91 16-08-91
Seminar: From research to farmers' fields: Case study on new cassava varieties	37 1	CIAT, Colombia	Cassava				X	Exchange experiences on participatory research, transfer and extension on new cassava varieties and to propose strategies	03-09-91 05-09-91
Meeting of the Advisory Committee of the International Tropical Pastures Evaluation Network - RIEPT	11 5	CIAT, Colombia	Tropical Pastures			X		Analyze the present state of RIEPT; implications of CIAT's new strategic plan; RIEPT activities for the period 1992-93	21-10-91 23-10-91
International Bean Trials Conference	82 20	CIAT, Colombia	Bean		X			Set priorities and design common strategies for improving bean production in different crop-growing situations	21-10-91 25-10-91
III Workshop for Evaluation and Selection of Rice Germplasm for Central America and Mexico	32 15	Culiacán, Sinaloa, Mexico	Rice	X				Observe and discuss the characteristics of germplasm under two distinct environments in Mexico	04-11-91 06-11-91

Title	No. of Participants and No. of Countries	Venue	Program	Type of activity**				Objectives	Dates
				W	C	M	S		
VIII International Conference on Rice for Latin America and the Caribbean	114 26	Villahermosa,Tabasco, Mexico	Rice		X			Analyze the future of the rice industry in Latin America and the Caribbean	11-11-91 15-11-91

* Does not include in-country conferences of regional bean projects

** W = Workshop
C = Conference
M = Meeting
S = Seminar

TABLE I.2.2. USE OF CONFERENCE ROOMS 1991.

NUMBER OF EVENTS AND HOURS OF USE BY TYPE OF USERS

User		No. of Events*	Hours
CIAT	Research	324	1249
	Training	236	1592
	Visitors	61	212
	Administration	285	844
	CRECIAT-PROCIAT	117	203
	Subtotal	1023	4100
Associate Institutions	INTSORMIL	24	168
	IPGRI	2	5
	CIMMYT	9	35
	IFDC	1	2
	Subtotal	36	210
External	Complimentary	46	360
	Non-Complimentary	129	1109
	Subtotal	175	1469
Total		1234	5779

* In events longer than one day, each day was registered as one event

and they are let to institutions of the local community. This amounts to 1234 meetings over nearly 6,000 hours; more than 80% of them by CIAT staff (Table I.2.2.).

Overall the use of conference rooms is essentially inversely correlated with their size (Table I.2.3). This is in keeping with the common sense notion that meetings of a few people are more common than large gatherings. Non-complimentary external use, however, follows a different pattern in that maximum use is made of intermediate size rooms.

II. INFORMATION AND DOCUMENTATION

The most notable change in 1991 was the very large increase (116%) in database literature searches. This follows an increase of the same magnitude in 1990. In total, there has been a 354% increase in literature searches over the past two years. This is a direct result of the availability of new technologies, such as compact discs, that allow flexible, cheap access to the literature. It also reflects an aggressive training and outreach effort on the part of the Information Unit in 1991.

Another observation of note in the 1991 statistics is the distribution of the Unit's services. Nearly two-thirds of the use is by external users. Key services such as photocopies, literature searches, and reference service are distributed almost equally between CIAT scientists, CIAT core collaborators, and other users. The Annual Report of the Information Unit for 1991 is presented in five parts: use of existing services, innovation in services, institutional development support, assessment of information centers function, and outreach.

II.1. SERVICES

The Information Unit provides technical and public services consisting of acquisition, processing, retrieval and dissemination of scientific research information related to CIAT's mission. Highlights on growth of the collection and services by user group in 1990 and 1991 are discussed below.

II.1.1. The Collection as Basis for Services (Table II.1.).

Indexing. The Unit increased indexing for the CINFOS database on cassava, beans, and tropical pastures by 18.3% over 1990. The increase was due primarily to the filling of a vacancy for a pastures documentalist.

TABLE I.2.3. USE OF CONFERENCE ROOMS

NUMBER OF EVENTS* BY TYPE OF USER AND CONFERENCE ROOM

User		Rooms (Capacity)							Total
		Auditorium (180)	Nariño (80)	Muisca (40)	Calima (40)	Tairona (30)	Tumaco (20)	Quimbaya (12)	
CIAT	Research	14	28	35	35	52	76	84	324
	Training	7	32	67	49	13	25	43	236
	Visitors	0	2	7	11	10	17	14	61
	Administration	5	29	25	16	76	84	50	285
	CRECIAT-PROCIAT	6	25	6	10	26	23	21	117
Associate Institutions	INTSORMIL	6	6	3	4	0	2	3	24
	IPGRI	0	0	0	0	1	1	0	2
	CIMMYT	0	2	0	0	0	7	0	9
	IFDC	0	0	0	0	0	0	1	1
External	Complimentary	0	9	9	10	13	4	1	46
	Non-Complimentary	13	11	26	42	20	6	11	129
TOTAL		51	144	178	177	211	245	228	1234

* In events longer than one day, each day was registered as one event.

TABLE II.1. TECHNICAL SERVICES

	1990	1991
Indexing/Abstracting		
Indexed for CINFOs database		
Cassava	719	601
Beans	906	1,027
Tropical pastures	583	985
Total	**2,208**	**2,613**
Cataloging		
Documents cataloged		
Journals	135	221
Books	699	1,424
Others	1,052	900
Total	**1,886**	**2,545**
Other cataloging activities		
Rice documents processed	733	1,338
Input to AGRIS (FAO) database	151	174
Retrospective conversion of cataloging records		7,883
Input to CATAL (automated catalog)	1,200	10,325
Acquisitions		
Acquisition by source		
Purchase		
Journals	643	613
Books	1,153	391
Photocopies	543	1,635
Others	2,584	8
Total	**4,923**	**2,647**
Exchange		
Journals	1,388	1,552
Books	297	1,402
Photocopies		1,813
Others	177	8
Total	**1,862**	**4,775**

Table II.1. Technical Services - Continued

	1990	1991
Acquisition of bibliographic materials-Summary		
Journals	2,031	2,165
Books	1,450	1,793
Photocopies	543	3,448
CD-ROM	6	9
Other	2,755	7
Total	**6,785**	**7,422**
Acquisitions expenditures		
Journals	$US 133,042	$US 157,334*
Books	14,000	29,829**
Photocopies purchased	1,488	1,130
CD-ROM	8,974	16,075
Total	**$US 157,504**	**$US 204,368**

* Includes US$ 12,305 obligated for journals ordered in 1990 but invoiced in 1991.
** Includes US$ 12,023 obligated for books ordered in 1990 but invoiced in 1991 and includes US$ 5,427 obligated for books ordered in 1991 but not paid todate.

Cataloging. Cataloging of books, journals, and other documents for the CIAT collection increased by 35% in 1991. This is related to a large increase in acquisitions, especially material acquired through exchange with other libraries, and to the implementation of an automated cataloging system which has increased productivity.

Other Cataloging Activities. The Unit increased the processing of Latin American rice literature by 82% over 1990. The input of bibliographic records for CIAT publications to FAO's shared database, AGRIS, also increased 15% in 1991. Over 10,325 records were input into CATAL, the automated catalog, an increase of 760%.

Acquisitions. Expenditures for journals increased despite cancellation of 119 journal titles. An inflation factor of 17.5% for scientific journals was the primary cause. Number of books purchased declined by 66%. The Unit supplemented its materials budget through participation in exchange programs with other libraries. Over 65% of all bibliographic materials added to the collection in 1991 were received through gift and exchange.

II.1.2. Publications

The list of publications produced by the Unit is presented in Table II.5.

II.1.3. Services to CIAT Scientists (Table II.2.).

Photocopying services for CIAT scientists in 1991 were comparable to 1990. Fifty-three percent of all documents copied were for CIAT staff. Reference questions answered and

TABLE II.2. PUBLIC SERVICES

	1990	1991
Document Delivery Activity		
Materials Loaned	6,586	4,991
Documents photocopied		
CIAT scientists	13,845	14,616
CIAT collaborators	4,346	5,906
Others*	6,017	5,236
Total	**24,208**	**25,758**
Reference Questions Answered		
CIAT scientists	816	1,108
CIAT collaborators	633	458
Others	150	375
Total	**1,599**	**1,941**
Automated Literature Searches		
Online	58	22
CINFOS database	785	852
CD-ROM	639	2,320
Total	**1,482**	**3,194**
Literature Searches by Requestor		
CIAT scientists	635	943
CIAT collaborators	482	1,166
Others	365	1,085
Total	**1,482**	**3,194**

Training and Orientation	1990		1991	
	Events	Persons	Events	Persons
Training	11	158	20	156
Exhibits	1	260	4	509
Visitor Orientation		229		326
Total		**647**		**991**

* Includes 3,806 for libraries and documentation centers in 1990 and 2,181 in 1991.

literature searches conducted for this group, however, increased by one-third and one-half respectively in 1991. Fifty-seven percent of all reference questions answered and 30% of all literature searches conducted were for CIAT staff.

There has been a sharp upward curve in the number of literature searches in the last two years which shows the popularity of bibliographic databases on compact disc (CD-ROM), available in the Unit. While there was a 9% increase in the total number of searches in the CINFOS commodity database, there was a 263% increase in the total number of searches in CD-ROM databases in 1991.

II.1.4. Services to CIAT Collaborators (Tables II.2., II.3., II.4.).

This category of users includes researchers, agri-professionals, CIAT trainees, and undergraduate and post-graduate students (thesis at CIAT), who have a close working relationship with CIAT. Documents photocopied for CIAT collaborators in 1991 increased dramatically by 47% over the previous year. Twenty-five percent of all documents copied were for CIAT collaborators. Literature searches for this group increased by more than 142% in 1991. Twenty-four percent of all reference questions answered and 37% of all literature searches conducted were for CIAT collaborators.

The striking increase in the demand for information services by CIAT collaborators can be attributed to the availability of databases on compact disc, continued training of national program scientists in information access, improved quality of reference service, and a greater, more effective outreach effort. Contacts made through training, exhibits, and orientation doubled in 1991.

The Unit developed two publications which disseminate scientific information on CIAT commodities found in the databases and are targeted to specific CIAT collaborators. The publication "Indice de Temas en Informes Anuales de los Programas de CIAT" is an index with abstracts to the contents of the annual reports of the Tropical Pastures Program 1978-1990. The "Quick Bibliography" series provides short, specialized searches on topics of keen regional interest, as identified by program scientists.

The Information Unit continues to play an important role as information intermediary for Colombia and the region. Colombia received a substantial portion of key services: 30% of all documents photocopied and 58% of all literature searches went to Colombia (not CIAT). Latin America and the Caribbean as a region, including Colombia, received 40% of the photocopies and 68% of the literature searches.

II.1.5. Services to Others (Tables II.2., II.3, II.4).

In general, the 1991 statistics show that other users receive from 19 to 34 per cent of the Information Unit's services. This category includes administrators, university lecturers,

TABLE II.3. GEOGRAPHIC DISTRIBUTION OF SELECTED SERVICES

Area	Documents Photocopied	Bibliographic Searches
Latin America and Caribbean (not Colombia)		
1990	1,155	342
1991	2,667	304
Colombia (not CIAT)		
1990	8,046	493
1991	7,640	1,857
CIAT		
1990	14,431	553
1991	14,616	943
Africa		
1990	490	52
1991	244	31
Asia		
1990	29	12
1991	208	18
Developed Countries		
1990	57	21
1991	382	40
Other Countries		
1990		9
1991	1	1
TOTAL		
1990	**24,208**	**1,482**
1991	**25,758**	**3,194**

TABLE II.4. GEOGRAPHIC DISTRIBUTION OF PUBLICATIONS

	Bibliographic Bulletin	Abstracts Journals	Pages of Contents	Quick Bibliog.	Special Bibliog.	Others*
Latin America (not Colombia)						
1990	62	534	193	130	154	400
1991	201	648	173	500	102	410
Colombia (not CIAT)						
1990	71	160	156			287
1991	74	178	107	50	32	282
CIAT						
1990	44	187	110		190	
1991	123	173	119	50	142	
Africa						
1990	5	213	90			100
1991	41	224	83	65	1	120
Asia						
1990		81	12			63
1991		122	16			10
Developed countries						
1990		294	3			100
1991		228	2			100
Other countries						
1990	1	5				50
1991	14	31		10	6	20
TOTAL						
1990	**183**	**1,474**	**564**	**130**	**344**	**1,000**
1991	**453**	**1,604**	**500**	**675**	**283**	**942**

* Includes promotional brochures on products and services, training manuals, and database user guides.

TABLE II.5. PUBLICATIONS OF THE INFORMATION UNIT

Quarterly abstracts:

Abstracts on Field Beans. CIAT Bean Information Center. 1991.
Resúmenes sobre Frijol. CIAT Centro de Información sobre Frijol. 1991.
Abstracts on Cassava. CIAT Cassava Information Center. 1991.
Resúmenes sobre Yuca. CIAT Centro de Información sobre Yuca. 1991.
Resúmenes sobre Pastos Tropicales. CIAT Centro de Información sobre Pastos Tropicales. 1991.

Quick Bibliography Series:

Ophiomyia spp. 1913-1990. 1990. 64 p. 148 Refs.
Virus del mosaico dorado de frijol América Central y el Caribe. 1991. 23 p. 41 Refs.
Bacteriosis en frijol América Central y el Caribe. 1991. 21 p. 51 Refs.
Antracnosis en frijol América Central y el Caribe. 1991. 33 p. 64 Refs
Apion Godmani en frijol América Central y el Caribe. 1991. 13 p. 28 Refs.
Establecimiento y manejo de praderas en América Central. 1991. 98 p. 172 Refs.
Arroz en América Central y el Caribe. 1991. 11 p. 72 Refs.
Biological nitrogen fixation. 1980-1989. 1991. 94 p. 194 Refs.
Fijación biológica de nitrógeno en frijol. 1980-1989. 1991. 104 p. 194 Refs.
Cultivo asociado yuca maíz. (In press).

Miscellaneous:

Pages of Contents
Monthly
Weekly

Bibliographic Bulletin (Quarterly)

Trabajos Publicados por Personal del CIAT en 1989 y 1990
Publications by CIAT Staff in 1989 and 1990. Cali, Colombia: Centro Internacional de Agricultura Tropical, 1991. 124 p.

Indice de Temas en Informes Anuales de los Programas de CIAT. Pastos Tropicales 1978-1990. Jorge López (comp.). Cali, Colombia: Centro Internacional de Agricultura Tropical, 1991. 96 p.

Diseminación Selectiva de Información (DSI) (Brochure)

undergraduate students and postgraduate students not conducting their theses at CIAT, librarians and documentalists, agro-industrialists, and agri-producers.

The use of photocopy services by this group diminished slightly in 1991 but still represents 22% of the total use of the service. This group requested 34% of all literature searches and increased their use of this service by 197% over 1990.

II.2. INNOVATION IN SERVICES

The Information Unit continued to modernize its processes in order to provide the most agile and cost effective services to its users. Innovations were made in the following areas:

CD-ROM. The Unit acquired four new database products on compact disc: Biological Abstracts, Food Sciences and Technology Abstracts, Microsoft Bookshelf, and CD-MARC Names. These join the existing agricultural CD's, AGRIS, AGRICOLA, CAB, TROPAG, and SESAME. Two additional multipurpose workstations were acquired bringing the total available to users to three workstations plus one terminal for accessing all internal and external databases.

Workshop on CD-ROM Searching. The Unit implemented a weekly, two-hour, mini-workshop for CIAT staff on the basics of searching compact disc databases. The workshop has been well-attended and the results can be seen in increased use of the databases.

Tutorial on CD Searching. A microcomputer-based tutorial on how to search bibliographic databases on compact disc is being developed by a visiting intern in training in the Information Unit. The purpose of the tutorial is to maximize the time of the reference staff and reduce the need to personally repeat basic instructions for every user.

Personal Database on Micro CDS/ISIS. The Unit developed a prototype database in Micro CDS/ISIS for use by CIAT staff to manage their personal reference databases. The database, which is streamlined but fully compatible with the Unit's CATAL database, can receive periodic updates on research areas of interest from the Information Unit and/or be used to manage personal reference collections maintained in offices. The product is being field tested at this time.

Selective Dissemination of Information (SDI). The Unit launched a new alert service directed to CIAT scientists and CIAT collaborators that allows the researcher to receive periodic updates of bibliographic references on specific research areas of interest derived from the databases available to the Unit.

Expansion of CATAL. The Unit conducted a retrospective conversion of more than 6,000 catalographic records for books in the general collection and entered these records in the automated catalog, CATAL. CATAL now includes nearly 13,000 records and the conversion from the card catalog is 80% complete.

Format Changes in Alert Services. The Unit changed the formats of both the "Boletin Bibliografico" and the abstract journals in order to realize economies in production. Changes were made in size, quality of paper, and frequency in the case of the "Boletin". The content of the "Boletin" was also expanded to include more information on new products, services, and training.

II.3. INSTITUTIONAL DEVELOPMENT SUPPORT

The Information Unit, in its role of reinforcing the internal agricultural research information links in the region, made progress in two areas in 1991.

Colombian Agricultural Information Network. The Unit actively participated in Phase 2 of the Colombian project "Red Conmutada de Transferencias Diferidas", financed by the Interamerican Development Bank and administered for Colciencias by PROCADI. The Unit installed an electronic mail connection and interface in order to implement resource sharing of research materials and databases with 14 other institutions in the Colombian agricultural sector. The Unit also hosted the final meeting of Phase 2 of the project and demonstrated technology applications available to the participants through the network.

Training in Information Access. In 1991, the Unit trained 53 national program scientists in how to manage and access agricultural research information. Most events were 1-2 day workshops. The Unit also hosted a trainee from Bolivia for a three-month internship on the basics of organizing a regional information system. Unit staff collaborated with FAO trainers in conducting a workshop for 18 Colombian librarians/documentalists on how to input bibliographic records into FAO's collaborative AGRIS database.

II.4. ASSESSMENT OF INFORMATION CENTERS FUNCTION

In November, the Unit began an intensive review of the specialized information centers section (CINFOS). This section is responsible for indexing and abstracting the literature on cassava, beans, and tropical pastures and producing the database from which several specialized research support products are derived. These products include: the abstract journals (3 numbers a year) on cassava, beans, and tropical pastures in English and Spanish; specialized bibliographies by sub-topic or geographic area; Quick Bibliographies on highly specialized topics of regional interest; indexes to other

publications (such as the index to the program annual reports or to the program research bulletins/newsletters); and Specialized Dissemination of Information (SDI) profile current awareness service.

The objective of the review is to determine the level of overlap between CINFOS and other databases in the agricultural sector such as CAB, AGRICOLA, and AGRIS in the coverage of the literature on cassava, beans, and tropical pastures. It is also the objective to examine the complementarity between the four databases and to determine the truly unique and important literature that is not currently being indexed by either CAB, AGRIS, or AGRICOLA. A third objective of the review is to propose cost effective options to the abstract journals for ensuring access by CIAT scientists and collaborators to the scientific information that they need at an affordable price.

The methodology consists of a user survey and a detailed bibliometrical analysis of citations on the three commodities encountered in the four databases in 1990. In addition, the quality parameters of the citations will be analyzed through an examination of the types of publications. Preliminary results show that there is a high frequency of unique materials in CIAT's CINFOS database, especially in the area of non-refereed international and national journals, multiauthored books, proceedings, reports and non-U.S. theses. Data on quality of these unique materials is not yet available.

II.5. OUTREACH

The Information Unit participated in two outreach events in 1991, both involving displays and/or demonstrations of publications, products and services at annual congresses.

PCCMCA. The Unit hosted an exhibit booth at the PCCMCA Congress in Panama City. The purpose of the booth was to market CIAT publications and Information Unit products and services to a key group of collaborators. More than 200 contacts were made and 300 copies of specialized bibliographies on topics of interest to congress participants were distributed.

Congreso Nacional de Ingenieros Agronomos. The Information Unit co-hosted an exhibit booth with the Publications Unit at the annual meeting of the Colombian Agronomist's Association in Cali. The primary objective for participating in this meeting was to reinforce the role of CIAT as co-sponsor of the event, by offering a visual presence. CIAT publications were sold from the booth and demonstrations of agricultural databases on compact disc were offered to congress participants.

C. **Visitor Orientation.** The Unit provided orientation to services and new technology demonstrations to 326 persons in 1991, nearly double that of 1990.

III. PUBLICATIONS AND GRAPHIC ARTS

III.1. PRODUCTION

This year's production was marked by the development of CIAT's strategy for the 1990s. The new strategic plan in two volumes (the strategy plus a methodological appendix) was produced in a draft version, and in two final versions in English and Spanish respectively. Complementary publications were the Program Plans and Resource Requirements 1992-1996, and the Funding Requests for 1992. Further, a brochure on CIAT's Novel Research Approach to Sustainable Agriculture, the Report on a Workshop on Sustainable Agriculture on the Hillsides of Central America, and the bilingual (Spanish-English) presentation of the CATIE-CIAT-IICA Agreement on Management of Renewable Natural Resources for the Sustainable Agricultural Development of the American Tropics, showed CIAT already moving along the path drawn in the Strategic Plan.

In support of a TAC workshop to discuss the Committee's analysis of CGIAR priorities with Latin American and Caribbean NARS, a Spanish version of TAC's CGIAR Priorities document was prepared with the aid of ENGSPAN, the machine translation software developed by PAHO that is in full use at CIAT.

The proceedings of an internal workshop on gender analysis in draft and final versions are an important document, both on account of its content and as a signal of CIAT's commitment to addressing the subject.

Major technical monographs are

* Cultivo de tejidos en la Agricultura: Fundamentos y Aplicaciones;
* World List of Fungal Diseases of Tropical Pasture Species (co-published with CABI);
* Common Beans: Research for Crop Improvement (co-published with CABI).

Other important technical publications are

* Integrated Cassava Projects (Working Document in Spanish and English versions);
* Pasture Research in Southeast Asia: Current Status, Problems, and Resources Available (Working Document);

* Contribucion de las Pasturas Mejoradas a la Produccion Animal Tropical (Working Document).

Manuals and training materials include

* Farmer Evaluation of Technology: Methodology for Open-Ended Evaluation. Instructional Unit No.1. IPRA; and

* A Simplified Crossing Method for Rice Breeding.

To this must be added the commodity program newsletters; the journal Pasturas Tropicales; CIAT International; CIAT Report; re-impressions of earlier publications; and flyers advertising the latest products.

The full list of materials produced in the Publication Unit is presented in Table III.1. Publications produced by the Information-Documentation Unit are presented in Table II.5.

The output of the Graphic Arts Unit is presented in Table III.2. Particularly significant is the production of camera-ready pages (typeset and direct image), which underpins publications: it had trebled from 1988 to 1990, and this year it increased another 44% over last year. The production of typeset pages (in house) was reduced by 35% du to change over to desk-top publishing. Both changes are evidence of the ongoing improvement of efficiency achieved with decreasing numbers of human resources.

TABLE III.1. MATERIALS PRODUCED IN CIAT'S PUBLICATION UNIT. 1991

RICE

- A Simplified Crossing Method for Rice Breeding: A Manual, 32 p., 1000 copies.
- A Simplified Crossing Method for Rice Breeding: A Manual (promotional flyer), 2000 copies.
- Arroz en las Américas, Vol. 12, Nos. 1 and 2, 1800 copies each.
- Rice Program Annual Report 1987-1989, 404 p., 150 copies.

BEANS

- Sistema Estándar para la Evaluación de Germoplasma de Frijol,(Reprint), 56 p., 580 copies.
- Standard System for the Evaluation of Bean Germplasm, (Reprint), 53 p., 400 copies.

Table III.1. Continued

TROPICAL PASTURES

- Centrosema: Biology, agronomy, and utilization (promotional flyer), 1500 copies.
- Contribución de las Pasturas Mejoradas a la Producción Animal Tropical (Documento de trabajo No. 80), 68 p., 500 copies.
- Establecimiento y Renovación de Pasturas, (In print).
- Evaluación de Pasturas con Animales, (Reprint), 290 p., 500 copies.
- Indice de Temas en Informes Anuales de los Programas de CIAT. Pastos Tropicales 1978-1990, 98 p., 200 copies.
- Pasturas tropicales, Vol. 12, No.3, 1990, 1800 copies.
- Pasturas Tropicales, Vol. 13, Nos. 1 and 2, 1991, 1600 and 1500 copies.
- Pasture Research in Southeast Asia: Current Status, Problems, and Resources Available (Working document No. 81), 71 p., 200 copies.
- Programa de Pastos Tropicales. Informe Anual 1990 (Documento de trabajo), 283 p., 250 copies.
- Suscripción/renovación Pasturas Tropicales (promotional flyer), 2000 copies.
- Tropical Pastures Program Annual Report 1991, 100 p., 120 copies.

CASSAVA

- CASSAVA newsletter: Author and Subject Indexes 1977-1989 (Working document No. 82), 24 p., 540 copies.
- CASSAVA newsletter, Vol. 15, No. 1, and 2, 1400 copies each.
- Integrated Cassava Projects (Working document No. 78), 241 p., 200 copies.
- Mejoramiento Genético de la Yuca en América Latina, 426 p., 700 copies.
- Mejoramiento Genético de la yuca en América Latina (promotional flyer), 5900 copies.
- Proyectos Integrados de Yuca (Documento de trabajo No. 79), 262 p., 300 copies.
- YUCA boletín informativo: Indices de Autores y Materias 1977-1989 (Documento de trabajo No. 83), 26 p., 460 copies.
- YUCA boletín informativo, Vol. 15, Nos. 1 and 2, 1300 copies each.

SEED

- Programas de Semillas: Guía de Planeación y Manejo, (Reprint), 358 p., 500 copies.

Table III.1. Continued

OTHER

- A Common Path / Una Ruta en Común (J.L. Nickel recognition booklet), 56 p., 500 copies.
- Agreement among CATIE, CIAT, IICA / Acuerdo entre CATIE, CIAT, IICA, 12 p., 150 copies.
- ARCOS Nos. 1, 2, 3, 4, and 5 (internal bulletin), 1800 copies each.
- ARCOS Noticias (weekly internal flyer), 6 issues, 500 copies each.
- Cercas más económicas. Componentes y construcción (brochure), 12 p., 1000 copies.
- CIAT in the 1990s and Beyond: A Strategic Plan (draft), 86 p., 500 copies.
- CIAT in the 1990s and Beyond: A Strategic Plan. Supplement (draft), 86 p., 500 copies.
- CIAT in the 1990s and Beyond: A Strategic Plan (final), 125 p., 500 copies.
- CIAT in the 1990s and Beyond: Supplement (final), 125 p., 500 copies.
- CIAT Internacional, Vol. 10, No. 1, 8 p., 4500 copies.
- CIAT International, Vol. 10, No. 1, 8 p., 4200 copies.
- CIAT Report/Informe CIAT 1991, 162 p., 5000 copies.
- Cultivo de Tejidos en la Agricultura: Fundamentos y Aplicaciones, 976 p., 1000 copies.
- Cultivo de tejidos en la agricultura: Fundamentos y aplicaciones (promotional flyer), 5800 copies.
- El CIAT hacia el Año 2000. Un Plan Estratégico, 92 p., 600 copies.
- El CIAT hacią el Año 2000. Un Plan Estratégico. Suplemento, 92 p., 600 copies.
- Evaluating Technology with Farmers (promotional flyer), 6200 copies.
- Farmer Evaluations of Technology: Methodology for Open-Ended Evaluation. Instructional Unit No. 1 (IPRA), 92 p., 1000 copies.
- Funding Request for 1992, 50 p., 500 copies.
- Gender Analysis in Agricultural Research (preliminary version), 102 p., 50 copies.
- Gender Analysis in Agricultural Research (final version), 104 p., 100 copies.
- Genetic Resources Unit Annual Report 1991, (In print).
- Keep up-to-date! (promotional flyer), 600 copies.
- Manténgase al día! (promotional flyer), 1000 copies.
- Program Plans and Resource Requirements 1992-1996 (draft), 164 p., 500 copies.
- Report on Workshop on Sustainable Agriculture on the Hillsides of Central America, 44 p., 300 copies.
- Revisión de las Prioridades del GCIAI, 193 p., 25 copies.
- Trabajos Publicados por Personal del CIAT en 1989 y 1990 / Publications by CIAT Staff in 1989 and 1990, 124 p., 800 copies.
- Video: The IPRA Method. A Study Guide, 6 p., 100 copies.

Table III.1. Continued

2. Copublications

World List of Fungal Diseases of Tropical Pasture Species, 162 p., CAB International, UK

Common Beans: Research for Crop Improvement, 980 p., CAB International, UK

TABLE III.2. GRAPHIC ARTS UNIT PRODUCTION FIGURES FOR 1988-1991

Output	1988	1989	1990	1991
Print Shop				
No. of impressions	3'937,587	4'569,831	4'452,169	4'667,145
Photocopies	2'740,949	3'130,076	2'996,197	3'170,042
Typeset pages (in house)	2,362	4,665	6,150	4,000
Typeset pages (outside)	- o -	230	960	- o -
Camera-ready pages (typeset & direct image)	4,595	8,163	13,845	20,000
Camera ready (film) pages	2,362	4,665	7,110	6,500
Photography				
Slides	58,217	66,851	51,733	56,236
B/W copies and color (cibachrome)	4,928	4,749	5,800	5,300
Photographic studio sessions	167	285	230	291

III.2. DISTRIBUTION

The figures on distribution of CIAT's publications are presented in Tables III.3., III.4, and III.5. Nearly 70,000 copies of periodicals were distributed; close to 5,000 publications and 6,000 study guides were sold; and somewhat over 2,000 items were donated.

TABLE III.3. SUBSCRIPTIONS TO CIAT PERIODICAL PUBLICATIONS AND NUMBER OF COPIES DISTRIBUTED. 1991

- SUBSCRIPTIONS -

Periodical	Institutional	Individual	Copies distributed
Newsletters			
Arroz en las Américas	450	603	1726
Yuca boletín informativo	384	788	1267
Cassava Newsletter	510	691	1226
CIAT Internacional	1806	2349	8523
CIAT International	2721	1189	3932
Boletín Bibliográfico	269	186	1765
Total:			18439
Magazine			
Pasturas Tropicales	476	670	2515
Abstract journals			
Resúmenes sobre Frijol	218	123	967
Abstracts on Field Beans	202	114	928
Resúmenes sobre Yuca	196	63	756
Abstracts on Cassava	188	52	691
Resúmenes sobre Pastos Tropicales	303	154	134
Total:			4706
Annual reports			
Bean Program Annual Report	235	373	0
Informe Anual Programa de Pastos Tropicales	104	76	172
Total:			172

Periodical	Institutional	Individual	Copies distributed
Pages of Contents (Monthly issue)			
Area			
Agropecuaria General	155	88	4242
Fisiología Vegetal	135	77	3987
Protección de Plantas	144	83	4532
Suelos y Nutrición de Plantas	140	75	3961
Pastos, Nutrición y Producción Animal	132	50	3486
Economía Agrícola y Desarrollo Rural	145	29	3557
Total:			23765
Pages of Contents (Weekly issue)	0	104	4255
Internal newsletters			
ARCOS (5 issues)	0	1800	9000
ARCOS Noticias (14 issues)	0	500	7000
Total publications distributed on subscription:			9852

TABLE III.4. SALES OF CIAT'S NON-PERIODICAL PUBLICATIONS. 1991

Item	Copies sold	Income US$
Publications		
At CIAT:		
CIAT programs	1527	13678.50
Colombia	642	5518.30
Latin America and Caribbean	903	966.00
Africa	296	2782.00
Asia	4	28.20
Oceania	2	104.00
Developed countries	150	1246.70
Through distributors:		
Colombia	892	1186.20
Asia	141	1065.78
Developed countries	196	452.60
Total publications sold:	4753	
Total income in US$:		36723.20
Audiotutorial and Videotutorial Units		
At CIAT:		
CIAT programs	18	1580.00
Colombia	24	1946.70
Latin America and Caribbean	84	7691.00
Africa	14	1390.00
Asia	1	100.00
Oceania	1	100.00
Developed countries	17	1440.00
Through distributors:		
Colombia	30	1727.60
Developed countries	13	643.00
Total units sold:	202	
Total income in US$:		16618.30

Item	Copies sold	Income US$
Study Guides		
At CIAT:		
CIAT programs	1325	1567.70
Colombia	513	537.20
Latin America and Caribbean	624	765.00
Africa	1201	1201.50
Developed countries	14	42.00
Through distributors:		
Colombia	2062	1002.00
Total Study Guides sold:	5739	
Total income in US$:		5115.40

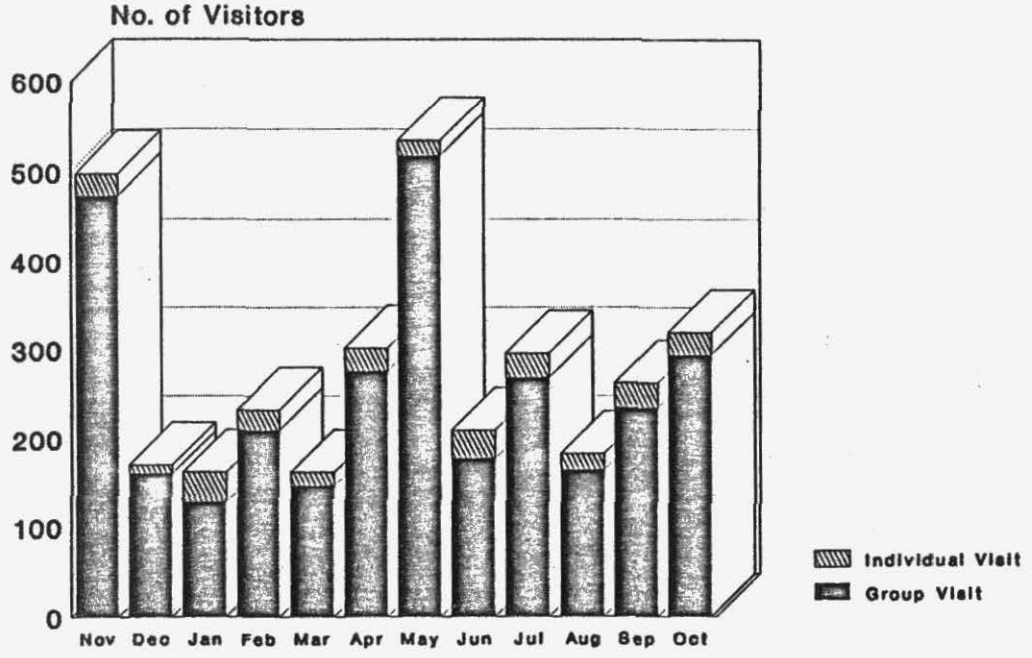
TABLE III.5. DONATIONS MADE OF CIAT PUBLICATIONS. 1991

	Copies Publications	Audiotutorial Units	Study Guides
Developing countries	1472	35	576
Developed countries	40	0	0

IV. VISITORS OFFICE

Over 3,000 persons visited CIAT between November 1990 and October 1991 (Figure IV.1.). Most of them were received as part of CIAT's public affairs activities (Table IV.1), and most were from Colombia (Table IV.2). Some of the more notable visits are listed in Table IV.3.

FIGURE IV.1. CIAT VISITORS
Nov/90 - Oct/91



Total 3,337

TABLE IV.1. VISITORS, NOVEMBER 1990 - OCT0BER 1991

NUMBER OF VISITORS ACCORDING TO SUPPORT FUNCTIONS

SUPPORT OF:	VISITORS	
	No.	%
Public Affairs	3,243	97.18
Research Programs	43	1.29
Personnel Office	44	1.32
Technical Advice	7	0.21
TOTAL: 3.337		

TABLE IV.2. PUBLIC AFFAIRS SUPPORT. GEOGRAPHIC ORIGIN OF VISITORS

NOVEMBER 1990 - OCTOBER 1991, No. OF VISITORS

COUNTRY	GROUP VISITS	INDIVIDUAL VISITS	TOTAL
Colombia	2,851	114	2,965
Local Community	1,400	50	1,450
Other Communities	1,451	64	1,515
Latin America and Caribbean Islands	60	35	95
USA and Canada	25	18	43
Europe	51	28	79
Asia	2	6	8
Australia & Oceania	-	2	2
Africa	-	1	1
Others	39	-	39
TOTAL: 3.243			

TABLE IV.3. VISITS HIGHLIGHTS

DATE	EVENT
	EMBASSIES
Oct 10	Group of Indian Parliament Members
Nov 29	Mr. T. Tsukada, Ambassador of Japan
Jan 21	Mr. Keith Morris, Ambassador of Great Bretain
Mar 30	Mr. Wang Yusheng, Ambassador of the Peoples Republic of China
Sep 13	Mr. Dean Brown, Ambassador of Canada
Sep 26	Mr. Peter Niederberger, Ambassador of Switzerland, with a group of 14 Swiss citizens
	CGIAR
Oct 14-17	Dr. Charan Chantalakana, CIAT Liaison Scientist, TAC
Nov 18-23	Dr. G. Gryseels, Senior Agricultural Research Officer, TAC Secretariat
Jun 29-31	Mr. Heinrich Von Loesch, Communication Advisor, CGIAR
Sep 9-13	Drs. H. Feldstein, and S. Russo, Gender Issues Working Group, CGIAR.
	DONORS AND RELATED INSTITUTIONS
Oct 5	Group of representatives of the U.S. Government Interagency on the Andean Initiative.
Oct 27-30	Dr. M. Toyoda, Research Coordinator, Research Council Secretariat, Ministry of Agriculture, and Fishery, Japan
Apr 4	World Bank Mission, Drs. J. Cock, E. Ruderferd and Nohelia Mejia.
Apr 17-20	Group of representatives of World Bank, Africa Branch
Sep 19-23	Drs. R. Herdt, and R. Puentes, Rockefeller Foundation
	OTHERS
Nov 11-17	Dr. J. J. Paretas, Science and Technology Director, Instituto de Investigacion de Pastos y Forrajes, Ministry of Agriculture, Cuba.
Apr 4-6	Dr. D. Parish, Director, Agrochemicals Division, IFDC.
Apr 8	Ministers of Agriculture of the Andean Pact countries.
Apr 28	Dr. Chada Krishan, Deputy Director General, Indian Council for Agricultural Research, India
Apr 30	Group of U.S.A. Agricultural Journalists
Jun 19	Dr. Jaime Carvajal, President, Fundacion Carvajal, and associates.
Aug 1-5	Dr. J. M. Salazar, Vice-Minister of Agriculture, El Salvador.
Aug 26-29	Mrs. Shirley Tarawaly, AFRNET

B. SEED SYSTEMS DEVELOPMENT

In 1992, CIAT's Seed Unit will formally become part of the Institutional Development Support Program. In the transition towards the new arrangement, progress has been made on the conceptualization of small-scale seed systems development, and on its implementation; also, seed-related activities in several sectors of the Center (Seed Unit, Central American and Andean Bean Projects, TCSP, TPP) have been articulated among them.

1. CONCEPTUAL FRAMEWORK

It was realized that there are market-specific seed systems. On the one hand, large, homogeneous, and stable grain markets--such as those for hybrid maize, sorghum, or sunflower--are matched by large enterprises, which process seeds using large scale equipment and infrastructure. On the other hand, small or atomized, and unstable markets, such as those of beans or open-pollinated maize, are not attractive for large enterprises. Small-scale organizational arrangements are thought to provide a solution to how to meet the needs of these markets. Seed processing equipments, necessarily, have to be proportional in size to the small-scale organizational arrangements. Consequently, CIAT's seed systems development strategy focuses on the development of alternative small-scale systems, particularly for beans and cassava, but also for rice and open-pollinated maize seed supply. Complementarily, appropriate technologies are developed or adapted to backstop the new systems.

To derive general principles for the successful establishment and management of such systems, the Unit monitors some systems that are already in place, and studies others that are emerging in Central America and the Caribbean, and in the Andean Region. The monitoring scheme is presently being adjusted as follows: The organizational arrangement of the seed multiplication phase, of post-harvest processing, and of seed distribution are recorded, i.e. whether these functions are performed by individual (not-organized) farmers, by farmers organizations (of what kind) or by other entities (of what kind). The institutional support to the various schemes is similarly recorded: what institutions are involved, what roles do they play, whether they act independently of each other or coordinatedly, and in the case of being coordinated, what is the coordination mechanism. Technologies used, and production parameters of the systems are also recorded.

Operationally, CIAT contributes to the development of alternative small-scale seed systems by sensitizing potential candidates for the establishment of new systems (catalytic action); by providing training and technical advice; and by being partner in specific interinstitutional seed systems development projects.

2. SEED SYSTEMS DEVELOPMENT ACTIVITIES

2.1. Central American Workshop on development of small seed enterprises

This workshop, organized with the Central American Regional Bean Project, PROFRIJOL, brought together professionals from Guatemala (7), El Salvador (4), Nicaragua (5), and Panama (4), involved in giving support to existing small-scale seed systems, or interested in developing new ones. Four professionals from Honduras unfortunately were unable to join due to an institutional crisis. Resource persons (12) were from the public (1) and private sectors (3) in Central America and Colombia; from PROFRIJOL (3); and from CIAT (5).

Participants analyzed six cases from Guatemala, Honduras, Panama, and Colombia (successes, difficulties, and issues to be addressed), and they prepared action plans either for the improvement of the systems in which they are involved, or for developing new systems (one for El Salvador, and two for Nicaragua).

2.2. Interinstitutional support

The Central American Regional Bean Project's network PROFRIJOL is organized by regional projects, each of which is leadered by one country and co-leadered by a second one. Artisanal seed production--which presently would probably better be called alternative small-scale seed supply systems--is one such project. Panama is the leading country and Honduras the co-leader. To evaluate project progress, PROFRIJOL and the TCSP coordinated one workshop in each of the two project sites (Danli, Honduras, 18-20 February, 1991; Volcan, Panama, 5 - 8 March 1991) with professionals from the various institutions that support both endeavors.

Interinstitutional workshops have become an ongoing planning, monitoring, and evaluating mechanism in seed supply systems for forages based on CIAT-germplasm for acid soils. In the early stages of development of such systems, CIAT plays a central role in setting the mechanism into motion. Costa Rica is at this initial stage, and the TPP's Seed Section with the collaboration of the TCSP organized a 2nd workshop in Atenas, Costa Rica (29 April - 3 May 1991) with 15 participants from eight institutions. Further information on this model can be found in the TPP's report for this year's in-depth review (Chapter 26, 26-13 to 26-15).

2.3. Human resources development

2.3.1. Training course on technology for small-scale seed enterprises. CIAT, 27 May - 21 June 1991.

This course was mainly for professionals involved in Ecuador's large Agricultural Technology Development Program PROTECA (23 participants from 15 provinces). Five other participants (two each from Mexico and Nicaragua, and one from Colombia) also benefitted from this event. It is expected that participants will contribute significantly to the difusion of the small-scale seed supply approach. The Ecuadorian participants have formally proposed to their authorities the creation of four small seed enterprises in Guaranda (maize and beans), Ibarra (beans), Portoviejo (cassava and maize), and Guayas (rice). The Colombian participant works with Fundación Carvajal, a major NGO with great experience in the organization of urban micro-enterprises, that has recently expanded its interests to include small farmers, and especially small-scale seed production. The Nicaraguan participants will strengthen bean seed production in Esteli and Jalapa, two sites in which artisanal seed production is likely to cristalize into two small seed enterprises complementary to a large centralized seed industry (which until recently was state-owned but appears to be in the process of privatization). The Mexican participants are public sector bean researchers who will be involved in seed multiplication.

2.3.2. Training course on artisanal seed production. Esteli, Nicaragua. Phase I, pre-harvest, 10 - 15 February; Phase II, post-harvest, 26 - 31 August 1991

This course (25 participants in the first, and 29 in the second phase) was organized with PROFRIJOL, MAG (CNIGB), and a local FAO project, to support artisanal bean seed production in Esteli, which is becoming a major bean seed producing area for Nicaragua.

2.3.3. Training workshop on small seed enterprises as an alternative for rice seed supply. CIAT, 16 - 27 September 1991

The event was organized by the Caribbean International Rice Network (CRIN), the Seed Unit, the Rice Program, and the TCSP. Participants were key professionals involved in national rice seed supply, two each from Belice, Guyana, Haiti, Suriname, and Trinidad & Tobago. Content was seed technology with emphasis on small-scale seed production.

2.3.4. Individualized training at CIAT

Bolivia

* One professional from the National Seed Council. Five weeks training in small-scale bean seed systems and appropriate technology. In support of a new small-scale seed enterprise in Mairana, Santa Cruz.

* One professional from the Association of Small Bean Farmers in Santa Cruz. One month training in small-scale bean seed systems and appropriate technology. In support of a new small-scale seed enterprise in Comarapa, Santa Cruz.

* One professional from the Association of Small Bean Farmers in Santa Cruz. Two months training in bean agronomy. In support of bean production technical advice to Association members, and to the new small-scale seed enterprise in Comarapa, Santa Cruz.

Colombia

* The newly appointed head of ICA's Seed Production Department. Two weeks training in small-scale bean and cassava seed systems and appropriate technology. To support the establishment of small seed enterprises in Cajamarca, Tolima (beans), and Armenia (beans and cassava).

Dominican Republic

* One professional from the National Center of Agricultural Technology (CENATA). Two weeks training in making small-scale seed processing equipment. In support of CENATA-CRIN rice development activities.

Peru

* One professional from the Regional Development Committee, Arequipa. Five weeks training in small-scale bean and rice seed systems and appropriate technology. To support the establishment of a small-scale seed supply system.

* One professional from a Departmental Seeds Committee. Five weeks training in small-scale rice seed systems and appropriate technology. To support the establishment of rice seed supply in Jaen, Cajamarca; Bagua Chica, Amazonas; and Rioja, San Martin (forest agroecologies).

2.4. Deployment of small-scale seed processing equipment

Small-scale seed processing equipment developed or adapted by the Seed Unit has been deployed at nine sites or institutions in Central America and the Caribbean, and the Andean Region (Table B.1.). Feedback on its suitability is thus obtained. Simultaneously, the deployment sites become focal points for further dissemination of the new technology.

TABLE B.1. DEPLOYMENT OF APPROPRIATE SEED PROCESSING EQUIPMENT FOR SMALL-SCALE SEED SUPPLY SYSTEMS.

			Equipment						
Country	Organization	Site	1	2	3	4	5	6	7
Guatemala	Cooperativa de Santa Gertrudis	Jutiapa	X		X	X	X	X	
Panama	Cooperativa de Caisán	Chiriquí	X		X			X	
Haiti	Organization for the Rehabilitation of the Environment (ORE)			X			X	X	
Colombia	COAGROSANGIL	Santander				X			
	Semillas Pescador	Cauca		X				X	
	SENA	Quindío	X		X			X	
	ASOQUINDIA	Quindío							X
	COPROARAUCA	Arauca							X
Peru	Indigenous communities	Cuzco	X		X				

1. Threshing table
2. Friction thresher
3. Precleaner
4. Portable dryer
5. Seed grader
6. Autofeeding screen-table
7. Portable disk-saw for cutting stakes

3. RESEARCH IN SEED PRODUCTION TECHNOLOGY

Activities focused on the generation of post-harvest processing methods and equipment appropriate for alternative seed-supply systems.

3.1. Beans

A previously developed friction thresher was further improved to change from batch to continuous feeding. Output increased from 200 to 300 kg hr^{-1}, and operation was made easier.

A portable wooden drier with heated air-flow was developed to operate with 1 ton batches. Its water removal capacity is 0.5-1.0 hr^{-1} On-farm moisture assessment is essential in seed production. A method using the finger nail mark is being developed. Preliminary results show that the size of the mark decreases as seed moisture falls, disappearing totally at 12%. This is a threshold level above which the seed is subject to deterioration and below which safe storage is possible.

A previously developed pre-cleaner was improved to work also as precision seed grader, by improving the feed control and air-flow mechanisms. In addition to cleaning (rejection of contaminants), the machine now also selects high density seeds from low density seeds which frequently are of low quality. The equipment has a 1 ton hr^{-1} capacity. To complement it, an automatically fed screen table was developed to expedite quality upgrading by manual sorting. Although developed for beans, the new equipments can be easily adapted for maize.

3.2. Cassava

To speed up stake preparation, a disk-saw was developed to cut 3-5 branches at a time. Thus, one person can prepare 17,000 stakes per day, compared to 5,000 using the traditional "machete".

In collaboration with Biotechnology, the Seed Unit has initiated an exploratory research on low cost in vitro mass propagation. Using a commercial laminar flow cabinet and rooting media, but low cost jars and a growth room made of bamboo, 100% establishment with zero contamination has been obtained. Further research is necessary, but the preliminary results indicate high pay off.