

**CIAT'S TRAINING:
ITS PAST, AND ITS PRESENT AND FRAME OF REFERENCE***

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1. INTRODUCTION

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The general goal of CIAT's TRAINING AND COMMUNICATIONS SUPPORT PROGRAM is to strengthen and support the technology generation and transfer capacities of the NATIONAL AGRICULTURAL RESEARCH AND DEVELOPMENT SYSTEMS (NARDS), in relation to the commodities of the Center's mandate.

Three major activities are carried out for this purpose, i.e., training is provided to certain members of these systems; technical information and training materials are prepared and supplied to specific institutions and individuals within them; and communications and cooperation amongst component organizations, as well as their interfacing with CIAT, are fostered.

Four operational Units take part in offering the services and generating the products aimed at achieving the Programs's objectives: 1) Training and Conferences, 2) Information, 3) Publication, and 4) Graphic Arts.

This paper addresses training-, but not conferences-, activities of only the Training and Conferences Unit. The training objectives and activities of the past will be described. The changes, over time, in the objectives and philosophy will be outlined; and the present activities, and the frame of reference for them will, finally, be presented.

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2. EVOLUTION 1969 -1987.

2.1. AN AUTONOMOUS TRAINING AND COMMUNICATIONS PROGRAM (1969-76)

In 1969 training activities were started at CIAT under the responsibility of the TRAINING AND COMMUNICATIONS PROGRAM which addressed "...institutions and individuals whose roles in the various countries are highly relevant to the development process." Individuals were trained to "... effectively function in their own institutions and thus enable those organizations to contribute significantly to the development process".

The training offered initially consisted of two twelve-month courses called respectively Livestock Production Specialists Training Program, and Crop Production Specialists Training Program. The former dealt with beef cattle and swine production; the latter addressed the production of rice, maize, sorghum, Phaseolus beans, soybeans and cassava.

Other categories, in addition to the Production Specialists courses, were progressively incorporated, over the next years, into the array of training opportunities offered by the Program. Individualized in-service training for disciplinary research or for production of a specific commodity were thus introduced, as well as thesis research for the M. Sc. degree, post M. Sc. research programs, and research conducive to obtaining a Ph.D.

Methodologically emphasis was put on learning by doing, and the development of communications skills was stressed in the courses. The whole Program was, initially, self-contained, i.e., not linked to the Center's research programs; and the institutions to benefit from its activities were defined rather imprecisely by the sole, very general, reference to their connection with the development process. Gradually, however, articulation with the research programs was developed; and professionals of the national agricultural research institutes, and scientists involved in the research networks developed by the Center, became the Program's main clients. Also, some parts of the Program evolved towards independent life, like the Library and Information Services which separated from the original body in 1974, leaving the remainder converted into the Training and Conferences Program.

2.2 THE ARTICULATION OF TRAINING AND CONFERENCES WITH THE RESEARCH PROGRAMS (1977-87)

This evolutionary process culminated in a fundamental rearrangement in 1977 along the guidelines set by three principles:

"a. Training and Conferences is not an independent program but a set of "activities" that are intrical [sic] part of each commodity program.

[It is convenient to mention here -for the sake of clarity further down- that the Center's research programs also had evolved over the years, until they eventually focused onto single commodities, under a multidisciplinary research arrangement. As a result, four commodity programs emerged: Beans, Cassava, Rice, and Tropical Pastures. They were supported by a series of Research Support Units (e.g. Data Services Unit, Communications and Information Support Unit, etc.); and a special independent Unit must be added to this list: the Seed Unit.]

b. Training and Conferences Activities are conducted in support of collaborative and independent commodity research in the countries.

c. Training and Conferences Activities are based on the Center's research function and are part of CIAT's international cooperation."

To reflect the new approach, the name Training and Conferences Program was changed to Training and Conferences Activities (TCA).

The objectives for the TCA were redefined by the Program Committee of CIAT's Board of Directors in 1981 as:

"...to help prepare scientists with leadership capabilities for collaborative research in the areas of CIAT's commodity mandate, thereby strengthening networks of professionals who can exchange, test, validate, and generate improved germplasm."

The most important features of this epoch of Training may be summarized as 1) the intimate relationship with the Center's commodity research programs, and 2) the emphasis on disciplinary training of researchers from the NARS to work on the commodities in CIAT's mandate.

2.2.1. Training categories.

Central to this training was a commodity-specific package made up of 1) an intensive course (i.c.), introductory to the production and research related to the corresponding commodity, and 2) a period of individualized training (i.t.) in a discipline or subject-matter area, under the direct supervision of one of CIAT's scientists.

The introductory courses addressed the basic subjects for the commodity production (morphology, physiology, nutrition), production problem diagnosis and problem-solving (agronomy, pathology, entomology), the production context (economics, systems, FSR) and the scientific improvement of the crop and its production (genetic resources management, breeding), statistics and experimental design, etc..

In the tradition of the Training and Communications Program, learning by doing was stressed in these courses; and it was constantly sought in them to strike a harmonious balance between theory and practice.

During the subsequent individualized specialization phase, the trainees were introduced to the skills and knowledge of a research discipline or field by in-service training, in close integration to a Commodity Research Program Section and under the supervision of a senior scientist.

Any one of the two components of the package could be the only training taken by some candidates: the individualized specialization by those who didn't need the introductory course, and the introductory course by those who only required the more general commodity-related information supplied by it. Individualized in-service training was available not only after the intensive courses but at any time throughout the year.

The duration of the intensive courses varied between commodity programs (Table 1) from slightly over one month, for Cassava, to little more than two months for Tropical Pastures.

The duration of the whole package (i.c.+ i.t.) varied from 3.4 months, for Cassava, to 5.5 months for Tropical Pastures (Table 1).

The persons that only took individualized training (i.t.) spent on average a month and a half in the Rice Program, or about two and a half months in the other Programs (Table 1).

The variation around these averages (Table 1) was smallest for the intensive courses, and largest for trainees that came exclusively for individualized training.

Table 1. Duration of Intensive Introductory courses (i.c.), i.c. plus individualized training (i.t.) and i.t. only in the various commodity-specific training programs (in months and coefficient of variation).

Training category	-----Commodity program -----							
	--- Rice ---		--- Cassava ---		--- Beans ---		--- Tropical Pastures ---	
	X	C.V.	X	C.V.	X	C.V.	X	C.V.
i.c.	1.5	13.7	1.1	13.9	1.3	11.2	2.1	15.5
i.c. & i.t.	4.6	21.8	3.4	42.0	4.2	33.6	5.5	28.8
i.t.	1.5	94.1	2.4	135.9	2.4	47.9	2.5	73.2

Obviously, amongst the latter some stayed at CIAT for much less than the average of the category, while others did so for much longer. For the package "i.c.+ i.t." the variation of the duration around the average was intermediate between i.c. and i.t. only.

In addition to the central training package, training was also provided by means of M.Sc.- and Ph.D.-thesis research done at CIAT under the supervision of Commodity Program Scientists.

Finally, special courses or group-events (s.g.e.) were held for various reasons with relation to the Rice, Cassava and Tropical Pastures Programs. Their average duration was one month or slightly less.

The distribution of trainees amongst the various training categories is presented, for the years 1980-87, in Table 2.

Table 2. Number of persons trained at CIAT from 1980 through 1987 and percentage of them in the various training categories.

Commodity program	Persons trained	Training category (%)						
		Intensive courses (i.c.)	i.c. & individualized training (i.t.)	i.t.	(i.c. & i.t.) & i.t.	M.Sc.	Ph.D.	Special group events
Rice	251	23.5	36.7	17.1	53.8	1.6	0.8	20.3
Cassava	372	28.0	15.8	30.7	46.5	2.4	3.2	19.9
Beans	429	19.1	29.8	42.7	72.5	5.1	3.3	0.0
T. Pastures	357	9.5	40.4	27.7	68.1	5.3	2.8	14.3
Total	1409	20.2	30.1	31.1	61.2	3.8	2.7	12.5

On average, one fifth of over 1400 trainees participated only in the intensive courses; 6.5% of the trainees carried out thesis research (3.8% at M.Sc. and 2.7% at Ph.D. level), 12.5% participated in special courses, and the majority (nearly two thirds) participated either in the "i.c.+i.t." package or undertook individualized in-service training. Major departures from this general trend were a tendency in Beans and Tropical Pastures to concentrate on the "i.c.+i.t." package plus higher degree thesis (over 75% of the trainees in both programs); and a relative emphasis on special courses and participation in the intensive courses only in Rice and Cassava (43.8 and 47.9% of the trainees respectively).

2.2.2. Fields of specialization.

The relative frequencies of trainees in the different specialization fields of research can be found in Tables 3 and 4.

Table 3. Relative numbers of trainees in the various specialization fields in the Rice, Cassava, and Bean Programs (base numbers: persons in categories "l.c. & l.t.", "l.t.", M.Sc. and Ph.D. from 1980 through 1987 = 100)

Specialization field Commodity program		
	Rice	Cassava	Beans
Breeding	36.9	13.2	23.3
Genetic Resources		14.7	2.3
Pathology	9.2	8.6	15.9
Entomology	5.0	12.7	6.5
Agronomy	36.9	14.2	17.3
Soils		5.6	4.0
Physiology		5.1	2.6
Economics		5.1	3.7
OFR			19.9
Proc./Utilization		10.2	
Others	12.0	10.6	4.5

In the Rice Program, most of the trainees specialized in Breeding or in Agronomy, or in disciplines for "germplasm-evaluation", such as Pathology and Entomology. This is consistent with a small program that initially focused strongly on germplasm development, and thereafter devoted much of its efforts to improving the crop production techniques with the purpose of lowering production costs.

The Cassava and the Bean Programs had a broader disciplinary training profile than the Rice Program. But in both, in close resemblance to the Rice Program, nearly half of the trainees also specialized in the disciplines more typically related to germplasm improvement. The relatively

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higher frequency of specialization in entomology in Cassava is a reflection of the strong interest in IPM in that Program, in addition to the germplasm evaluating function of this discipline.

In the two Programs, an important proportion of trainees also specialized in the crop's agronomy. Peculiarities of the two disciplinary training profiles, which were consistent with the characteristics of each of the Research Programs, were a large number of trainees specialized in OFR in Beans, and in Processing/Utilization in Cassava.

In keeping with the complexity of the Tropical Pastures Program (TPP) -where the commodity is an input to beef and/or dairy production rather than an end product in itself, and where different genera or species of grasses and legumes must be grown in associations of long persistence and acceptable productivity-, the disciplinary training profile of the TPP was the broadest of the four Commodity Programs, and was also qualitatively different from the other three. It was characterized by the germplasm-evaluation disciplines, by the training of RIEPT (International Network for Evaluation of Tropical Pastures) partners, and by the disciplines required for the understanding of the soil/plant relationships in the infertile soils of the Program's mandate.

Table 4. Relative numbers of trainees in the various specialization fields in the Tropical Pastures Program (base number: persons in categories "i.c. & i.t.", "i.t.", M.Sc. and Ph.D. from 1980 through 1987 = 100)

Specialization field	Percentage of trainees
Genetic Resources	5.4
Agronomy/Regional Trials	20.7
Soils/Nutrition	11.6
Pathology	2.5
Entomology	2.9
Soils/Microbiology	6.5
Physiology	2.9
Management, Utiliz., Quality	15.6
Development	5.1
Production	3.6
Seeds	6.5
Systems	6.5
Economics	5.8
Others	4.4

2.2.3. Geographic origin of trainees.

The geographic origin of the trainees reflected the relative importance of CIAT's commodities amongst countries, although other factors -like variation in the degree of development of the NARSS, in agricultural policy, in the interest in human resources development, etc.-, probably modified the basic, underlying, pattern.

With regard to Rice, amongst the South American countries predominated trainees from Brazil, Colombia, Peru and Ecuador (Table 5), and a few trainees came from each of the other countries.

Table 5. Country-origin of persons that received training of various kinds in the Rice Program from 1980 through 1987 (number of trainees).

 Type of training*			
	s.g.e.	i.c.	(i.c. & i.t.) & i.t.	M.Sc. Ph.D.
Mexico		3	7	
Belize			1	
Guatemala		3	9	
El Salvador		1	3	
Honduras		2	7	1
Nicaragua			4	
Costa Rica			3	1
Panama		2	14	
Cuba			11	
Dominican Republic		1	6	
Haiti		1	1	
Trinidad & Tobago				1
Guyana			1	
Venezuela			4	
Colombia		11	16	1
Ecuador		3	12	
Peru		7	14	
Brazil	51	24	9	1
Paraguay			2	
Bolivia		1	1	
Chile			3	
Uruguay			1	
Argentina			2	
Developed Countries			4	1

*s.g.e. = special group events; i.c. = intensive courses;
i.t. = individualized training.

From Central America trainees came mainly from Guatemala, Honduras and Panama; from the Caribbean, trainees were principally Cubans and Dominicans; and finally, a small number of trainees also came from developed countries.

South American trainees in the Cassava Program were mainly from Brazil and Colombia, followed by Paraguay, Ecuador and Peru (Table 6).

Table 6. Country-origin of persons that received training of various kinds in the Cassava Program from 1980 through 1987 (number of trainees).

	----- Type of training* -----				
	s.g.e.	i.c.	(i.c. & i.t.) & i.t.	M.Sc.	Ph.D.
Mexico	2		17	1	
Belize					
Guatemala	1				
El Salvador					
Honduras			2	1	
Nicaragua	3		2		
Costa Rica	1		2		
Panama	1	1	6		
Cuba			18		1
Dominican Republic	4	1	5	1	
Haiti			3		
Bahamas	1				
Barbados			1		
Jamaica			2		
Guyana					
Venezuela		1	3		
Colombia	23	20	28	3	
Ecuador	4	2	6		
Peru		3	8		
Brazil	28	25	26		1
Paraguay	3	1	13		
Bolivia			4		
Chile					
Uruguay					
Argentina			1		
Philippines	1	15	4		
India	1				
Indonesia		12			
Malaysia		4	1		
P.R. of China		1	2		
Sri Lanka		6			
Thailand		12	7	2	
Kenya			1		
South Africa			2		
Sierra Leone	1				
Uganda			1		
Zimbabwe			1		
Developed Countries			7	1	10

*s.g.e. = special group events; i.c. = intensive courses;
i.t. = individualized training.

Only from Panama came substantial numbers of Central Americans. Trainees of Caribbean origin were principally from Cuba and the Dominican Republic. An important number of trainees came from Mexico. Asian trainees were mainly from Thailand, the Philippines and Indonesia, followed by Sri Lanka and Malaysia, and a few from the Peoples Republic of China and India. A small number of trainees came from 5 African countries, and a significant number came from developed countries, particularly for higher degree thesis research.

In the Bean Program (Table 7) a large number of professionals from Mexico were amongst the trainees.

In South America the major training effort was devoted to Colombians, Peruvians and Brazilians; but important numbers of trainees also came from Argentina, Ecuador, Bolivia, Chile and Paraguay. Particular emphasis was given to the training of professionals from Central America, with the exception of Panama where bean production is of little importance. As in Rice and Cassava, Caribbean trainees came mainly from Cuba and the Dominican Republic. African trainees -numerically important only in this program, as a reflection of its African thrust- were principally from Central and East Africa. Developed countries also contributed some Bean trainees, particularly amongst those that worked at CIAT for their Ph.D. degrees; and, finally, a very small number of professionals also came from Asia.

Table 7. Country-origin of persons that received training of various kinds in the Bean Program from 1980 through 1987 (number of trainees).

 Type of training*			
	i.c.	(i.c. & i.t.) & i.t.	M.Sc.	Ph.D.
Mexico	19	28		1
Belize				
Guatemala	2	22	3	
El Salvador		13	2	
Honduras	1	12	1	
Nicaragua	2	15	1	1
Costa Rica	4	21	2	
Panama		2		
Cuba		12	1	
Dominican Republic	3	15		
Mali		5		
Trinidad & Tobago				
Guyana				
Venezuela	1			
Colombia	27	30	3	
Ecuador	2	10		
Peru	4	30	2	1
Brazil	14	17	2	
Paraguay		8		
Bolivia	2	6	1	
Chile	1	6	2	
Uruguay				
Argentina		15	1	
Philippines		1		
Sri Lanka				1
Turkey		2		
Burundi		1		
Egypt		1		
Ethiopia		2		
Kenya		2		1
Rwanda		3		
Tanzania		7		
Uganda		7		
Zaire		5		
Zambia		1		
Developed Countries		12	1	9

*i.c. = intensive courses; i.t. = individualized training.

In the Tropical Pastures Program (Table 8), South American trainees came in largest numbers from Colombia, Brazil and Peru, followed by Bolivia, Ecuador and Venezuela. An important number of trainees came from Mexico. Amongst the Central American countries Panama and Nicaragua contributed most of the trainees; whereas from The Caribbean a particularly important quantity of trainees came from Cuba. Some trainees also came from developed countries, especially amongst the Ph.D. candidates.

Table 8. Country-origin of persons that received training of various kinds in the Tropical Pastures Program from 1980 through 1987 (number of trainees).

	----- Type of training* -----				
	s.g.e.	i.c.	(i.c. & i.t.) & i.t.	M.Sc.	Ph.D.
Mexico	4	5	17		
Belize			2		
Guatemala	2		3		
El Salvador					
Honduras	3		6		
Nicaragua	1	1	11	1	1
Costa Rica	3	2	3		
Panama	3		20		
Cuba	2		31		
Dominican Republic			9		
Haiti			1		
Antigua			1		
Barbados			1		
Guyana				1	
Venezuela	3		8	1	1
Colombia	8	15	25	9	2
Ecuador	1	3	9	1	
Peru	7	2	27	3	
Brazil	5	3	36	2	
Paraguay	1		4		
Bolivia	6	1	15	1	
Chile			2		
Uruguay					
Argentina	2	2	2		
Africa and Asia			4		
Developed Countries			6		6

*s.g.e. = special group events; i.c. = intensive courses;
i.t. = individualized training.

2.2.4. Yearly variations in the number of trainees.

The intensity of the training effort at CIAT varied over the years. Measured by the yearly number of trainees (Table 9) during the 1980-87 period, the training effort was very strong in 1980, fell on average to about 70% of the initial level for the next five years (except in 1984 in which large numbers of trainees in Beans and Tropical Pastures nearly pushed the average back to 1980 levels), and reached peak levels in 1986-1987.

Table 9. Relative numbers of trainees in the years 1980-87 (base year 1980 = 100)

Year	----- Commodity program -----				Total
	Rice	Cassava	Beans	Tropical Pastures	
1980	100.0	100.0	100.0	100.0	100.0
1981	76.7	62.5	77.3	69.6	70.5
1982	60.0	57.8	67.9	82.6	66.8
1983	100.0	45.3	83.0	67.4	69.4
1984	56.7	71.9	115.1	117.4	92.2
1985	70.0	60.9	92.4	71.7	73.6
1986	200.0	87.5	130.0	137.0	128.5
1987	166.7	78.1	120.8	110.9	111.3

2.3. IN-COUNTRY TRAINING

2.3.1. Aims and general features.

An important change began to emerge gradually in the late seventies, when CIAT started to support short in-country courses organized by national institutions. These events -usually 1-2 weeks long- addressed extensionists, technical advisers, credit supervisors, input purveyors, etc.; in short: persons (mostly professionals) involved in agricultural technology transfer. The objective of these events was, principally, to inform the audience on the characteristics of improved varieties of CIAT's commodities being released, and on the agronomic practices to be used with them. The participation of CIAT staff varied, from organizing the event and providing most of the instructors, down to support by only a minimum number of subject-matter specialists.

In the 80's the in-country courses increased in numbers, particularly so in the second 4-year period of the decade (Tables 10, 11 and 12), and their contents were modified and/or diversified.

The Rice-courses focused on the production of irrigated rice, with emphasis on lowering the production costs of the crop.

Events supported by the Cassava Program diversified from crop production courses, to cassava processing and utilization courses, and also to training in IPM.

The interests of the Bean Program diversified from supporting only crop production courses, to include OFR-courses. Under this modality each event actually extended over a period of 7 to 18 months. At the beginning of this span, again after one third to one half of it had elapsed, and at the end of the whole period, one- to two-weeks long courses were held ("phases" I, II and III).

The first phase was devoted to introducing the participants to the basic concepts of OFR, and on how to go about to systematically evaluate the situation of bean production in their respective areas of action. Upon

returning to their places of origin, they had to gather information -according to what they had been taught- and to prepare a situation report. This was the subject of discussion in the second phase: problems had to be prioritized, and action plans to tackle them (including relevant experiments) had to be drawn. Back in their home base, the participants had to implement those plans, to return to the last phase with their results. These, then, were analyzed and discussed, and follow-up actions were projected.

Between phases, some supervision and support, provided either by CIAT staff or by local leaders, was found to be essential. Training of the latter for this task proved to be of paramount importance.

The Tropical Pastures Program joined the in-country training activities in 1986, as by then proven technology had become available from the Program's effort to put to use plant species that had not been exploited previously.

2.3.2. Geographic distribution of in-country courses.

With regard to the Geographic distribution of the support to in-country courses, the Rice Program focused on

Table 10. Rice in-country courses supported from 1980 through 1987. Number of courses and (number of participants).

Country	Year								Total
	1980	1981	1982	1983	1984	1985	1986	1987	
Mexico								1(26)	1(26)
Colombia							1(21)	1(25)	2(46)
Ecuador								1(25)	1(25)
Peru	1(20)				3(66)				4(86)
Brazil							1(15)	2(75)	3(90)
Honduras		1(27)	1(41)		1(16)				3(84)
Nicaragua			1(64)			1(20)			2(84)
Costa Rica							1(24)		1(24)
Panama	1(12)	1(19)				1(21)			3(52)
Nepal				1(15)					1(15)
Total	2(32)	2(46)	2(105)	1(15)	4(82)	2(41)	3(60)	5(151)	21(532)

Peru and Central America during the early 80's (Table 10). Thereafter it shifted its attention towards Brazil and Ecuador.

The distribution of Cassava in-country courses (Table 11) resembled very closely the profile of the geographic origin of professionals trained at CIAT (Table 6): Colombia, Brazil, Ecuador, Peru and Paraguay were the countries assisted in South America; three courses were supported in Mexico; in Central America, again, only Panama received assistance; and in The Caribbean the training efforts were devoted principally to Cuba.

Table 11. Cassava in-country courses supported from 1980 through 1987. Number of courses and (number of participants).

Country	Year								Total
	1980	1981	1982	1983	1984	1985	1986	1987	
Mexico	1(19)					1(31)	1(22)		3(72)
Colombia		1(30)	1(17)	4(131)		3(95)			9(273)
Ecuador							1(73)	1(28)	2(101)
Peru								2(69)	2(69)
Paraguay							1(32)	1(32)	2(64)
Brazil			1(26)		1(33)	1(19)	2(56)	1(21)	6(155)
Panama						2(22)			2(22)
Cuba				1(41)	1(33)	1(26)	1(23)	2(25)	6(148)
Dominican R.	1(25)								1(25)
Haiti			1(24)						1(24)
Total	2(44)	1(30)	3(67)	5(172)	2(66)	8(193)	6(206)	7(175)	34(953)

Courses supported by the Bean Program in the early 80's (Table 12) concentrated on Central America, Cuba, Brazil and Peru. The emphasis on Central America and Peru was accentuated still further during 1985-87 by means of the new OFR-courses in phases. Paraguay, Argentina and Chile received some assistance, and support to Cuba was given continuously.

The support to in-country training given by the Tropical Pastures Program began focusing on two of the Program's priority countries: Peru and Panama.

2.4. SEED TECHNOLOGY TRAINING

CIAT is unique amongst the IARCs in that it has a Seed Unit devoted to developing and strengthening the seed sector in the region. Training has been a major thrust for this purpose which, from 1980 through 1987, reached over 400 professionals in Latin America and the Caribbean, and a few from Asia and Africa (Table 13).

Short intensive courses, of about a months duration, focused on providing the knowledge and skills required for developing and implementing any of the links of the seed production and distribution chain (genetic and basic seed production; quality control and seed certification; multiplication; distribution and marketing), or of the organization of the whole seed industry at the country level. Individualized in-service training was also provided, either as a course complement for some participants, or as an independent activity. Finally, courses tailored to respond to particularly urgent needs were organized in several countries (Table 13).

Table 13. Persons trained in Seed Technology at CIAI or in in-country courses supported by the Seed Unit from 1980 through 1987.

 At the Seed Unit			In-country courses on (No. participants)
	Course participants	In-service trainees	M.Sc.	
Mexico	34	1		Rice Genetic Purity (30)
Belize	2			
Guatemala	19	3	1	*
El Salvador	5	5		Seed Cond. Plant Mgmt. (24)
Honduras	11	1		
Nicaragua	9	1		Varietal Description (30)
Costa Rica	18	3		Seed Quality Anal. (27)
Panama	15	6		Organizations Devel. (25)
Antigua	1			
Barbados	1			
Cuba	8	1		Seed Technology (25)
Dominican Rep.	25	2		Rice Varietal Desc. (25)
Haiti	5			
Jamaica	4			
St. Lucia	1			
T. Tobago	6			
Suriname	2			
Guyana	3			
Venezuela	12			Organizations Devel. (32)
Colombia	64	4		**
Ecuador	20	1		Organizations Devel. (29)
Peru	27	4		
Bolivia	35	4		
Paraguay	1		1	
Brazil	57	1		Basic/Genetic Seeds (22)
Chile	6	1		
Argentina	16	4		
Uruguay	5			
Africa	10			
Asia	5			
* 4 courses:	Bean Varietal Description		(18)	
	Organizations Development		(29)	
	2 Artisanal Bean Seed Production		(30) (31)	
** 8 courses:	2 Seed Conditioning		(22) (18)	
	Rice Varietal Description		(10)	
	Seed Certif. & Quality Control		(21)	
	Cassava Seed Material Mgmt.		(17)	
	Bean Seed Production		(17)	
	Tropical Pastures Seed Analysis		(25)	
	Seed Processing		(30)	

2.5. MANPOWER DEDICATED TO TRAINING

2.5.1. Training personnel and its responsibilities.

The personnel structure of the TCA was quite simple. At the head was an internationally recruited Training and Conferences coordinator. To him responded 1) nine training associates: two for each commodity program, and one for the seed unit; 2) a registrar; 3) an orientation officer; and, outside the scope of this presentation, a conferences administrator. This team was assisted by 10 clerical staff.

The coordinator reported to the Director of International Cooperation. His main responsibilities were:

- With officials of the relevant national institutions, to assess the NARS' needs of scientific manpower development.
- The development, implementation, and application of effective training methods.
- With the commodity research program leaders, to set priorities by countries and institutions, with regard to the strengthening of their research capacity through training.
- To program and supervise the implementation of the training activities.
- To set the standards and criteria for identification and selection of training candidates.
- With senior staff of the commodity research programs, to identify and select training candidates.
- The logistics of the training activities and the administration of the corresponding funds.

The associates' responsibilities were:

- The planning, programming, and conducting of group training events.
- To assist instructors in matters of training methodology.
- The logistics of classroom teaching, and of laboratory and field practices.
- To assist national institutions in the coordination and implementation of in-country courses.

The registrar was responsible for:

- Informing relevant officials in the NARS on training opportunities at CIAT.
- To assist in the candidate selection process.
- The communication with training candidates, and the logistics of getting the accepted ones to CIAT.
- Coordination of individualized training programs with the corresponding scientific supervisors.
- Keeping record of persons trained at CIAT.

The orientation officer's responsibilities were:

- To introduce trainees to the Center and to familiarize them with facilities and procedures.
- Counselling and giving assistance to those with personal problems that might affect their -well-being and performance.
- The administration of health services for the trainees.
- Organizing sports and social events to entertain them.
- Looking after their general well-being and comfort to foster a friendly atmosphere amongst them and with the Center's staff.

2.5.2. Participation of research staff in training activities.

Training was incorporated as a normal part of the activities of all scientific staff at CIAT. About half of the international staff, and approximately 80% of the locally recruited scientists, dedicated up to 150 hours to this activity in 1986. And almost one fifth of the international staff were involved in training, and training-related activities, for over 400 hours during the same year.

About two thirds of the total staff-time contributed to training, was dedicated to the attention and supervision of individual trainees; the rest was distributed quite evenly amongst the intensive introductory courses, special group events, in-country training, and the preparation of training materials.

3. THE TRAINING AND COMMUNICATIONS SUPPORT PROGRAM

In 1988 the Training and Conferences Activities were merged with the Communications and Information Support Unit, to integrate a new TRAINING AND COMMUNICATIONS SUPPORT PROGRAM (TCSP).

The purpose of the merger was to integrate, under a single leadership, the closely related functions of 1) training, 2) supplying information, and 3) interconnecting people and organizations, to better serve the needs of A) enhancing and supporting the technology generation and transfer capacities of the NARDS, in relation to the commodities of the Center's mandate, and B) strengthening the interface amongst them and CIAT.

The status of this program is equivalent to that of the Center's four commodity research programs. Its creation does not imply, however, a return to the self-contained Training and Communications Program of the late 60's and early 70's. Rather, the TCSP is a partner of the commodity research programs in a joint effort to strengthen and supporting the NARDS. It is responsible for the development of the strategies to achieve the general institution-enhancement goal, and for planning and programming the corresponding actions, in close coordination with the research programs. The implementation of the activities is equally closely coordinated with them, and depends vitally on their making available the contribution of the subject-matter experts.

3.1. CLIENTS OF THE TCSP'S TRAINING FUNCTION

The interest of the TCSP focuses on the whole NARDS. Operationally, however, it is components of these systems that are addressed for developing the capacity of their human resources through training.

Three major components (systems or subsystems) can be meaningfully distinguished in this respect: The agricultural research system (ARS), the agricultural training and education system (ATES), and the agricultural development

system -or, more strictly, technology transfer system- (ADS).

The first of them has in the past been the almost exclusive client for training. Moreover, the publicly funded National Agricultural Research Institutes were practically synonymous with agricultural research system, and therefore the main recipients of CIAT's training. More recently, however, a variety of institutions -public and private- have entered the institutional scenario to become involved in agricultural research. A complex system of research institutions and organizations is thus emerging, and calls for the attention of the TCSP to meet some of its training needs related to the work on the Center's commodities.

The Agricultural Training and Education System is another, rather newly recognized, client for CIAT's training. Reference here is to both, the educational function of the universities in relation to the production of first-degree graduates, and to the need of enhancing the indigenous capacity to train and educate agricultural professionals for doing research, and for the transfer of technology. The latter dimension of the ATES, i.e. post-graduate training is, in general, particularly weak and, therefore, constitutes a major limitation to the effectiveness of the NARDS as a whole.

The third significant client sector is the Agricultural Development System. The recognition of it as such, lead to the change from using the acronym NARS, when referring to our national partners, to NARDS. A major change indeed with respect to the implications! This subject will be discussed further under 3.2.

3.2. SERVICES OFFERED AND SELECTION OF CANDIDATES

The services offered to the clients are based on the subject matter expertise of CIAT's scientific staff. In other words, strict adherence is kept to the principle of teaching only subjects thoroughly known to the instructors.

3.2.1. Assistance to the agricultural research systems.

3.2.1.1. Fields of training.

For the ARS the principal general fields on which training is offered are:

- Methods of research management, and of research support disciplines.
- Research methodology.
- Principles and technology of commodity production.
- Seed technology.

3.2.1.2. Selection of candidates.

Candidates to benefit from these services are selected with a view on the needs of the organization to which they belong. This is a difficult and delicate matter. Wrong decisions, i.e. acceptance of "poor" candidates or rejection of "good" ones, work against the efficiency and the effectiveness of the TCSP. Also, great care is required not to offend national officers by the rejection of any of their candidates.

To enhance the national research function its weaknesses must, obviously, be known. The national research leaders, naturally, ought to be in the best position to establish where strengthening is required; who should be trained, in what subject-field, at what level. But amongst countries, and amongst commodity programs, CIAT must establish its own priorities. Also, care must be taken to avoid spurious interests to interfere in the presentation of candidates and in their selection. A substantial knowledge of the national programs and of their human resources is, therefore, necessary to plan and program the training activities for the enhancement of the NARS' research capacity. Close coordination with the national leaders is essential, but additional sources of information on the state of development of their programs must also be tapped.

Candidates must always be proposed by the national institutions, notwithstanding that CIAT's staff (headquarter's or outposted scientists, and members of the

TCSP) usually play a very active role in their detection. Every application for training at the Center must have the written support of a high ranking national officer; a clear description of the candidate's present responsibilities is to be included in it (together with the corresponding life history), and the plans for his/her future activities must be given.

Individuals amongst a group of candidates are selected following a complex set of criteria which are not formally weighted. Essentially it is sought to estimate: 1) the effect to be achieved by the training on each candidate's subsequent job performance, 2) the impact to be expected through the enhancement of his/her team, and 3) the probability of success. This is a multidimensional problem involving: the importance of the respective commodity in the candidate's country; the kind of problems to be solved; the extent to which the individual's insufficient training constitutes a constraint to the effectiveness or efficiency of his/her program; the degree of change that the candidate is expected to experience; the probability of remaining in the program after being trained; and the chances of continuity of the research program in which he/she is -or will be- involved.

Decisions are made around a discussion table with the participation of: the corresponding commodity research leader, the TCSP leader and registrar, and the commodity-specific training associates. The information input from CIAT's research staff (both from headquarters and outposted) and from the TCSP's members is crucial at this point, and maximum use of this resource is made.

In conclusion, the TCSP, rather than being reactive in the selection of training candidates, takes a highly proactive role in this process, in keeping with its strategies for client institution strengthening, developed in coordination with the commodity research programs.

3.2.2. Assistance to the agricultural training and education system.

3.2.2.1. Fields of training.

The general fields on which training can be offered to the ATES are:

- Commodity production problem diagnosis (including OFR).
- Commodity production principles and techniques.
- Commodity processing and utilization techniques.
- Seed technology.
- Research methodology.
- Training methods.

3.2.2.2. Selection of candidates.

At present the Universities (public and private) are the main component of the ATES in Latin America. Their major effort is devoted to undergraduate education leading to the Agronomic Engineer degree, which takes 5-6 years to be obtained.

Training is by disciplines, with little focus on commodity production, or on diagnosing and solving production problems; and it is heavily biased towards theoretical rather than practical tuition. The numbers of agricultural faculties have increased substantially over the last decades; the development of their standards, however, has not always kept pace with this numerical growth. Very frequently lecturers are only part-time staff members; their numbers are, therefore, very large; and their academic standards are, not rarely, somewhat precarious.

Very little training of such university lecturers has been done by CIAT so far. And it is not easy to envisage a strategy for it that might result in an important effect on the production of the center's commodities. This is due to the fact that the numbers to be trained greatly exceed the TCSP's capacity to deal with them; and in the unlikely event that they could be reached, the effect of their training on the commodity production impact that is being sought, would foreseeably be highly dilute. Nevertheless, efforts are underway to interact with university lecturers from a select group of agricultural faculties, to find out whether an effective model for their training, with a purpose of achieving an impact on commodity production, can be developed.

The targeted production of communication and training materials for -and with- the universities is, of course, an important means to improving the present situation, but the subject is beyond the scope of this presentation.

Post-graduate education at the agricultural faculties is weak in the region with regard to CIAT's commodities. It addresses research (but not necessarily technology generation), and almost completely disregards the transfer of technology. Training of researchers involved in these university post-graduate programs falls more within the domain of enhancing the ARS rather than the ATES.

It may be important to recognize, here, that the university postgraduate programs usually do not follow a strategy of human resources development with -or for- the ARS or ADS. Rather, they pursue their own academic lines of research (often oriented more by the [sub-optimal] array of resources available to them, then by a prioritization based on problem-solving objectives; or by bureaucratic requirements of numbers of research projects, papers and thesis to be complied with), and offer higher-degree opportunities to whomever complies with the academic prerequisites and has access to the necessary funding.

This feature, and the fact, on the other hand, that the non-university components of the ATES are very little developed at the post-graduate level, constitute a severe weakness of the whole NARDS with regard to the possibilities of these to provide an effective and efficient indigenous capacity for the development of the human resources of the ARS and the ADS.

3.2.3. Assistance to the agricultural development system.

3.2.3.1. Fields of training.

The major fields in which training is offered to professionals in the ADS are:

- Commodity production problem diagnosis (including OFR).
- Commodity production principles and techniques.
- Commodity processing and utilization techniques.
- Seed technology.

3.2.3.2. Training of primary clients vs. training of trainers.

With regard to CIAT's training it is not only important who its clients are and what can be offered to them. The capacity to train vis a vis the numbers of clients that need to be trained is equally important. Thus, the number of candidates to be trained, within a certain period of time, must not exceed the training capacity, if the necessary development of human resources is to be reached. Also the principles of comparative advantage and complementarity, which guide the Center's relations with the NARDS, must be complied with.

These requisites are fulfilled to a large extent, at present, with regard to the training of researchers who work on CIAT's commodities in Latin America. Their number is not too large to be assisted by the Center; and the concentration of research facilities and scientific expertise at CIAT -at the service of the four commodities addressed by the Center- is a unique resource, which can meet essentially all training needs of a developing research team. (Whether CIAT should go on indefinitely devoting these resources to today's kind of training, or whether the ATES should take on this responsibility is another matter, which will not be pursued further in the context of the present discussion).

In the case of training professionals in the ADS, the situation is quite different. The number of candidates to be trained is enormous, even in small countries, and exceeds by far the training capacity of the TCSP. The Center's comparative advantage for training, on the other hand, resides in its high degree of commodity related subject matter and problem solving expertise. This can meet some very important needs of the ADS members, but still leaves many others to be addressed by other sources of training.

In conclusion, with regard to enhancing the capacities of ADS members, the TCSP only can offer partial training to a select group of them. They, in their turn, should pass this expertise onto others to be applied, and/or passed to still others, to achieve a multiplier effect of the training initially provided by CIAT staff.

This can be referred to as training trainers. There is a fundamental prerequisite, however, for the process to be effective: the trainers have to be such. This may seem a truism, but it has occurred, rather frequently, that members of research or extension organizations were trained at an

IARC, with the hope that they would train others. The primary responsibilities of these professionals were, however, either to do research or to give technical advice to farmers, and not to train! Upon returning to their mother institutions they reassumed these functions and did not train others. In other words, the wrong audience had been addressed, by training members of the ADS or ARS as trainers, instead of training members of the ATES. The ineffectiveness, or even nonexistence, in many cases of the necessary ATES institutions, organizations, or components, may explain this mistake but does not change the facts.

3.2.3.3. Selection of candidates.

Selection of individual candidates for training at CIAT follows the same principles as described for the ARS.

Support to in-country courses organized by member institutions of the ADS is part of the TCSP's effort to enhance the capacities of the NARDS, as has already been mentioned in 2.3. The selection of the participants for these events concerns exclusively the national institutions.

For the TCSP the relevant decision with regard to in-country courses is which events to support, and occasionally what courses to catalyze. Such decisions are made, once again, in close coordination with the commodity research programs. The main criteria are 1) those followed by the commodity programs in prioritizing amongst countries (contribution of the program's commodity to the diet of the poor in the various countries; its production by poor farmers; the countries' ecological potential for the production of the commodity; etc.); 2) probability of direct impact upon production on the part of the participants; and 3) probability of the participants transmitting the new knowledge and skills to others (multiplier effect).

3.3. PROGRAM ORGANIZATION

3.3.1. MANPOWER AND RESPONSIBILITIES

As mentioned in the INTRODUCTION, the TCSP is made up of four Units: 1) Training and Conferences, 2) Information, 3) Publication, and 4) Graphic Arts. These respond to an internationally recruited leader -who, in its turn, reports to one of the Center's two Deputy Directors General -and who is responsible for:

- Developing and implementing, in close coordination with the Commodity Research Program Leaders, strategies for A) enhancing and supporting the technology generation and transfer capacities of the NARDS, in relation to the commodities of the Center's mandate, and B) strengthening and maintaining the interface amongst them and CIAT; by means of: 1) training certain members of these systems; 2) preparing and supplying technical information and training materials to specific institutions and members within the NARDS; and 3) interconnecting people and organizations within and across NARDS, and with CIAT.
- Budgeting the TCSP's resources and activities, with the assistance of the Unit heads; and administering the corresponding funds.
- Setting, with the Commodity Research Program Leaders, priorities amongst countries and institutions, for the reception of the products and services of the TCSP.
- Analyzing, with the National Program Leaders, the needs of their programs and the support that the TCSP may offer to them.
- Developing the yearly working programs, with the assistance of the Program's Unit Heads, and in coordination with the Research Program Leaders.
- The promotion of the knowledge about the TCSP's products, services, achievements, and potential amongst its clientele and amongst the donor community.

The positions of heads of the Information, Publication, and Graphic Arts Units are already filled; their description, however, is not relevant here.

The position of head of the Training and Conferences Unit, on the other hand, has been requested in CIAT's latest quinquennial Planning and Budgeting document approved by TAC.

The responsibilities of this position will be (and are covered in the meantime by the program leader):

- The development, implementation, and application of effective and efficient training methods.
- To assist the program leader in the development of the yearly working program; and to supervise the implementation of the training activities.
- The logistics of the training activities.

One aspect that receives particular attention in the activities of this Unit, and which is a major responsibility of the Unit head, is the attitudinal development of the training participants.

The basic attitude that ought to prevail amongst professionals in the NARDS is a problem-solving one. This, in turn, must be tied to an espoused mission, and to well defined objectives. An attitude of urgency must be linked to the problem-solving outlook; and the criterion of efficiency in the use of resources must guide all activities.

The objective of developing and strengthening these attitudes in the NARDS permeates CIAT's training. The pedagogic know-how of the head of the Training and Conferences Unit, and of the associate staff, are fully facing this challenge, which is not only to obtain the internalization of new attitudes. It is to achieve it against the background of an, essentially, scholastic education in which most of the training candidates have been brought up; and through which, attitudinal obstacles to independent scientific thought have become deeply rooted in many of them.

The need for this particular attention has been recognized only recently in its full extension. Before, great care was taken in increasing the training participants' knowledge (information), and in providing them with the technical skills for the tasks that they were responsible for, but the attitudinal dimension was not tackled explicitly. Now it has become the complement, in its own right, to the former principal pedagogic targets.

The training associates, registrar, and orientation officer positions have remained the same as in the former TCA; and their responsibilities have not changed either (see 2.4.1.).

3.3.2. COMPUTER ASSISTANCE

The TCSP's manpower is enhanced substantially by computer assistance. With regard to the Training and Conferences Unit this assistance comprehends the following:

- Production of documents;
- Directories;
- Logistics related to participants;
- Historical files of participants and events;
- Evaluation of participants and events;
- Follow-up of participants;
- Production of visual aids.

The hardware involved is CIAT's mainframe computer (IBM 4361 mod.5, 2.5 Gb disk capacity, 12 Mb RAM, 4 tape units), two PCs connected to the mainframe (1 IBM PC XT and 1 IBM PC/PS 2 mod.30; each with 20 Mb disk and 640 Kb RAM), a plotter (HP 7475 A, 6 pins), two printers (Epson 100 and Epson EX 1000), a typewriter linked to the PC/PS 2, a word processor, a thermal copier, and a photocopier.

The production of documents refers to correspondence, reports, papers, etc.. The software specifically used for this purpose is programs for wordprocessing, graphics, and spreadsheets; but interfacing with the other functions is also resorted to whenever necessary.

Special directories, for instance, for the distribution of training announcements, are kept -either as small databases, on purpose-specific software, or as simple lists on word-processing software- in addition to the larger databases (see below).

The logistics related to participants are very similar for training and for conferences. In the case of training, they start with the reception of the corresponding applications. These are acknowledged and enter a provisional computer file until decision is made in the sense of acceptance or rejection. In the case of rejection, the corresponding communication is prompted (document production). In the case of acceptance the process of incorporation of the participant is initiated. The appointment is issued, travel arrangements are made (tickets, reservations, visas), the administrative process is prompted (payment of stipend, collection of funds, etc.), food and board are reserved, and so forth. The relevant information is computerized (database) for monitoring and for immediate response when troubleshooting becomes necessary.

Upon arrival of the trainee, a new chain of logistic events begins to be managed with computer assistance. This involves mainly the payment of stipends and other allowances, and the medical insurance and any health assistance that may be required during the trainees sojourn.

The historical files are databases (on SAS), two each for Training and for Conferences. One database is on the participants (with the relevant descriptors for each of them), and the other is for events (with information on objectives and content). Interaction amongst databases is possible. These files are used for preparing reports, for retrospective analyses (like those presented in Tables 1 to 13), and for follow-up contacts with alumni.

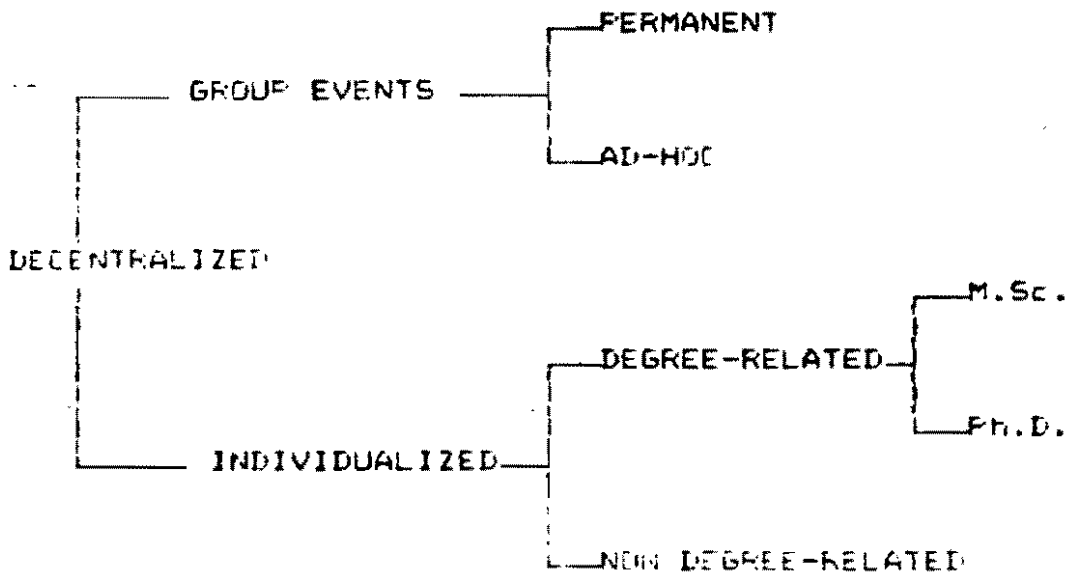
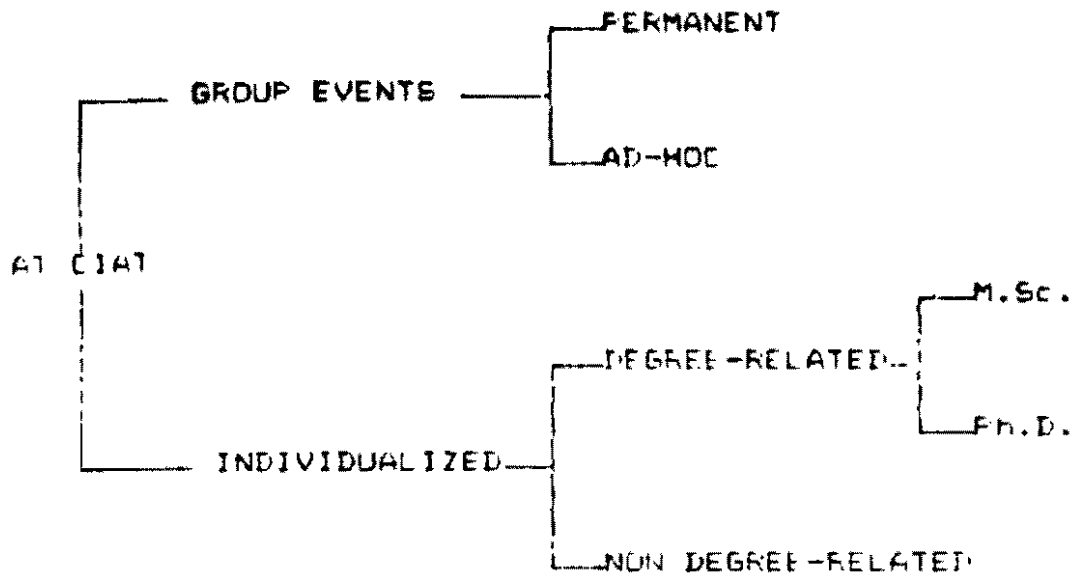
Other types of analyses that have been initiated are, for instance, what proportion of the authors contributing to major scientific events in the region (like the meetings of the PCCMCA, of ALPA, etc.) are CIAT alumni; or how active are ex-trainees in bibliographic production, according to the documents collected in the Specialized Information Centers of the TCSP's Information Unit.

Computer assistance for the processing of training evaluation data is just being started. By standardizing the evaluations of repetitive events it is expected that the monitoring of their execution will be improved, on one hand by timely analysis of large numbers of data, and on the other by contrasting the results of ongoing events against historical data that will accumulate over time.

Color transparencies for overhead projection of graphics and tables created by computer, are produced directly through the plotter, or are obtained by transforming black and white print-outs by means of the thermal copier. Less sophisticated aids are produced by computer printing and common photocopying.

3.3.3. TRAINING CATEGORIES

The TCSP's training activities are carried out either at CIAT (headquarters and dependent experiment stations) or at decentralized locations (in other institutions which can be located in Colombia or in other countries and continents). Similar categories of activities may take place in any of the two situations as shown in the following scheme:



A participant can take part in a group event or be the subject of individualized training. Group events can be permanent or ad hoc. The former are offered repeatedly at regular intervals; they are not immutable, but major changes to them are made at fairly long intervals (minor adjustments are, of course, made on an ongoing basis). The latter meet specific one-time needs of particular members of the NARDS.

If repetition of ad hoc events becomes necessary, they may develop eventually into permanent ones. Conversely, permanent events may be phased out, once their purpose has been accomplished or the demand for them has been met.

Typical examples of permanent events at CIAT are the intensive, introductory, commodity-specific research and production courses, which form part of the "i.c.+ i.t." package described under 2.2.1., and which continue being offered.

Recent cases of ad hoc events at CIAT were: a one-month training workshop on pasture evaluation under grazing, for members of the International Network for Tropical Pastures Evaluation (RIEPT); a course on rice seed production, for professionals from various state institutions involved in this theme in Santa Catarina, Brazil, where inadequate seed production was a severe limiting factor for adoption of improved varieties; and a training workshop for cassava specialists from federal and state, and research and extension, organizations from Northeastern Brazil, which lead to the proposal of an integrated cassava project for that region.

The individualized training at CIAT, in any of its versions (degree-related or not degree-related), continues being offered as described in 2.2.1.. The not degree-related training, however, has become more diverse. From the "traditional" in-service training, aimed mainly at novel researchers, it has been expanded, on one hand to include members from the other client systems described in 3.1., and on the other, to offer short term skills-training in some cases, and advanced training, for highly experienced scientists, in others.

The various training categories can be regarded as building blocks for more complex individual training programs. The traditional "i.c.+i.t." package is such a case. But other combinations have been used recently. For instance, some trainees have taken part in an ad hoc event immediately after having participated in a permanent event; others have participated in two permanent events in a row; and others still received individualized training before permanent or ad hoc group events.

Decentralized ad hoc group events are typically represented by the in-country courses described in 2.3.. Permanent decentralized events have not been developed so far. They may, however, become part of CIAT's training portfolio in Africa. In Latin America, on the other hand, permanent involvement in repetitive decentralized training

events appears to be unlikely, because it would probably clash with the principle of complementarity between CIAT and the national institutions.

Decentralized individualized training (both degree- and not degree-related) pivots around CIAT's outposted international staff. Basically these scientists train individual professionals according to the same guidelines and standards that govern the individualized training at CIAT.

3.3.4. EVALUATION

The evaluation of training is fundamental for getting feedback on the quality of the services being offered, and on the achievement of the objectives being pursued.

Several levels of evaluation can, therefore, be distinguished: 1) the quality control of the teaching methods; 2) the quality control of the learning process; 3) the achievement of the learning objectives; 4) the consistency between the subjects being taught and the needs of the participants (relevancy, novelty and extent of the subjects vis a vis the needs); 5) the subsequent effect of the training on the participants' job performance; 6) the subsequent effect on the participants' team performance.

The first three levels of evaluation are routinely tackled in CIAT's training by means of methods which are comparable to those described by Carmen Siri in her "Evaluation Manual for CIP Courses"; the 4th level is also routinely addressed by means of questionnaires.

The last two, by contrast, are not being addressed systematically. It is intended to look into this in greater detail in order to develop criteria, and ways and means, for obtaining such vital information.

3.3.5. FOLLOW-UP

CIAT alumni are included in the Center's mailing lists; many of them are members of the formal networks in which the commodity programs are involved; and others maintain, more or less frequent, informal contact with their colleagues from the Center.

To get an estimate of the degree of the latter, a list of alumni of the corresponding commodity program was forwarded in 1987 to each international staff member, with the request to inform on which of them they maintained contact with, and whether they did so regularly or sporadically. For this presentation, any alumnus that kept regularly in contact with at least one scientist in the corresponding program, was considered as being in continuous contact with the Center.

About 87% of alumni that had done their M.Sc. or Ph.D. thesis-research at CIAT remained in contact with their Center colleagues. Of the alumni from other training categories, the proportion that maintained contact varied amongst programs, type of training, and time elapsed after having left the Center (Table 14).

Table 14. Percentage of ex-trainees who maintain regular contact with scientists in CIAT's commodity programs; in brackets number of trainees.

Years in which training took place	----- Training category -----					
	i.c.	i.c. & i.t.	i.t.	i.c.	i.c. & i.t.	i.t.
	----- Rice Program -----			----- Cassava Program -----		
1980-82	44.0 (25)	75.0 (36)	87.5 (8)	33.3 (63)	63.0 (27)	36.6 (41)
1981-83	30.8 (26)	81.8 (33)	100.0 (7)	43.2 (37)	61.1 (18)	26.7 (30)
1982-84	33.3 (21)	90.0 (30)	100.0 (8)	48.8 (41)	67.9 (28)	43.5 (23)
1983-85	33.3 (21)	96.6 (29)	100.0 (13)	76.0 (50)	72.2 (18)	51.7 (29)
1984-86	83.3 (12)	97.0 (33)	94.1 (17)	88.3 (60)	79.2 (24)	65.5 (32)
	----- Bean Program -----			----- T. Pastures Program -----		
1980-82	55.3 (38)	53.2 (47)	67.9 (28)	50.0 (14)	54.8 (42)	59.5 (37)
1981-83	52.0 (25)	61.1 (36)	63.0 (27)	45.5 (11)	60.0 (45)	64.3 (28)
1982-84	62.5 (24)	73.2 (41)	79.5 (44)	42.3 (26)	64.2 (53)	70.0 (20)
1983-85	56.0 (25)	82.9 (41)	85.7 (56)	50.0 (28)	74.5 (51)	75.0 (20)
1984-86	65.4 (26)	86.7 (45)	89.5 (86)	59.3 (27)	89.8 (49)	83.3 (30)

Professionals that only had taken an intensive introductory course lost contact with the Center more frequently than those that had received other kinds of training. Alumni from the packages "i.c.+i.t." remained in contact to about the same degree as those that had been through in-service training only (except in cassava, where the in-service-only trainees had a low subsequent contact rate). Professionals trained in the early 80's remained in contact to a lesser extent than those trained more recently. Fifteen to 20% of alumni from the bean and cassava programs who didn't maintain regular contact with the Center's international staff, still kept contact with the training associates during their country visits; for the rice alumni the corresponding figure was about 40%. By and large, the contact rate of alumni with the Center is, thus, quite satisfactory.

3.4. TRAINING MATERIALS

In addition to teaching aids for the various training activities, CIAT has produced two major types of training materials: training manuals and audiotutorials.

The original audience for them was the Center's trainees; the manuals were conceived as major texts for the intensive, introductory, commodity-specific courses; and the audiotutorials were intended to save staff-time by substituting for instructors in routine teaching.

Commodity-specific manuals for rice, cassava, and beans research and production were developed from the collection of hand-outs that, with regard to their relevancy and pedagogic value, had withstood the test of several editions of the intensive introductory courses. Other manuals, on more circumscribed subjects related to these crops (and also to not crop-specific matters like biological nitrogen fixation), were developed later on. And in the case of training in tropical pastures research, methodological manuals for the collection and evaluation of germplasm took the place of the crop research and production manuals.

Although produced for the use of CIAT's trainees, the manuals soon reached a much wider audience, so that other researchers, university lecturers, extensionists, agronomy students, and even select farmers, also satisfied some of their information needs by means of their utilization.

Audiotutorials, i.e. sets composed of a printed study guide, a photographic-slide collection, and a synchronized sound-text on tape, are the other main type of training material produced, so far, by CIAT. Over 120 titles have been produced, mainly in Spanish, but also in English and, more recently, in French. As was the case with the manuals, these materials have reached great popularity, far beyond their originally intended use; to the extent that more than 7,000 copies have been distributed, over 11 years, amongst research organizations, universities, and agricultural development institutions of all kind. Video equipment is, however, becoming more widely available in the developing countries than slide projectors. Some of the audiotutorials have, therefore, been successfully converted to video in the most recent past, thus marking the beginning of a wider use of this communication medium for the TCSP' training purposes.

3.5. TRAINEES WELL-BEING

Food, housing, health, and entertainment of the trainees are cared for while they are at CIAT. The program has priority use of 35, high quality, double apartments, for the lodging of trainees in the Center's housing area; and meals are provided for them in CIAT's restaurant for clerical and scientific staff.

Fully comprehensive health insurance covers hospitalization and surgery that might be required by training participants; and 50% of their expenses on medical consultations and prescriptions are reimbursed to them.

Entertainment is provided, on the premises, in the way of sports (with first class facilities for swimming, tennis, soccer, table-tennis, squash); social games; communal television and video; access, in the evenings, to a snack-bar by the swimming pool; and -most recently- television in each room, with two commercial channels, and two others linked to an internal video circuit: one of the latter offers general-entertainment films, and the other features cultural and educational programs. Some optional tuition will be made available by this means in the near future.

Touristic excursions, guided by the orientation officer, are made over long week-ends with the training participants. Such opportunities are abundant in Colombia because all public holidays (about 15 per annum) are shifted, every year, so as to be placed on Mondays. Thus, the trainees can become acquainted with the country, and with its people and culture.

4. NOT INSTITUTIONALLY TARGETED TRAINING.

Some candidates are accepted for training at CIAT without responding to the TCSP's NARDS-enhancement objectives. Amongst them are:

- Post-doctoral fellows from developed countries; or from developing ones, but who are not formal members of the NARDS (i.e. who are not attached to an organization within them).
- Undergraduates: from Latin American to work on a graduation-thesis project; and from developed countries, as students in practicum.
- Graduates from developed countries -or from developing ones, but who are not formal members of the NARDS-, who work on post-graduate thesis projects.

They are accepted, despite their not corresponding to the Program's objectives, on account of other reasons.

Post-doctorals are, essentially a resource for the research programs; consequently their positions are distributed by CIAT's management, in accordance with the commodity program's research needs.

The other categories compete for the resources required by the Training Unit for its specific purposes, particularly for instructor- or supervisor-time. Therefore, their acceptance is controlled by the TCSP; and decisions on their admittance are made on an *ad hoc* basis, case by case.

No TCSP funds whatsoever are allocated to these trainees.