Program Plans and Funding Requirements 1990-1993

Funding Request for 1990

CIAT Centro Internacional de Agricultura Tropical

CONTENTS

I. INTRODUCTION

In 1988, CIAT presented its five-year plan entitled "CIAT Program Plans and Funding Requirements 1989-1993." With its approval by the CGIAR, CIAT started the five-year period under consideration with a program and budget as described in that plan (with some downward adjustments in resource availability that will be described in Section IV below).

The budget request for 1990 as presented here is the same as the one projected in the five-year plan for 1989-1993 and approved by the CGIAR.

A brief description of CIAT at the time the budget request for 1990 is put forward is presented (Section II), followed by the outcome of the 1988 financial year (Section III) and the formal budget request (Section IV).

II. CIAT TODAY

Mandate and Objectives

CIAT works mainly with national agricultural research institutions (NARIs) to develop improved agricultural technology which will increase the quality and quantity of specific basic food commodities in the tropics, primarily in Latin America and the Caribbean. Within the CGIAR system CIAT has global responsibilities for common beans and cassava; principal responsibility for tropical pastures, with specific responsibility for the acid, infertile soils of the American tropics; and regional responsibility for rice in the American tropics.

One of the primary purposes of the Center is to assist NARIs in the development of plant varieties that produce relatively high yields with minimal use of fertilizers and agricultural chemicals. Research emphasizes plant improvement in order to obtain a stable genetic resistance to major tropical pests and diseases, tolerance to adverse climate and soil conditions, and the development of technology to increase the sustainable production and utilization of the crops within its mandate.

The Board of Trustees

CIAT is governed by an independent Board of Trustees. The 1989-1990 membership of the Board follows:

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Organizational Structure

CIAT is comprised of three divisions. Research Division I consists of the Bean and Cassava Programs and the Biotechnology, Virology, and Genetic Resources support units. Also included are Station Operations and Research Services (with the exception of Data Services). Research

Division II consists of the Rice and Tropical Pastures Programs, the Training and Communications Support Program, the Seed Unit, the Agroecological Studies Unit, and Data Services. Finance and Administration is the third division, responsible for general services and financial administration.

Research Sites

CIAT headquarters is a 521-hectare experiment station near Cali in the Valle del Cauca. There are four principal substations within the country where further work is carried out. Santander de Quilichao is a 184-hectare station located 60 km south of Cali, which is characterized by acid, infertile soils. Popayán is a 72-hectare station 150 km south of Cali and of intermediate altitude. Santa Rosa is a 31-hectare station made available for CIAT's use by the Rice Growers Federation (FEDEARROZ) and is located near Villavicencio in the piedmont of the eastern slope of the Andes. The largest station is Carimagua, a 22,000-hectare research site located in the heart of the Colombian Llanos and co-managed by CIAT with the Colombian national program, the Instituto Colombiano Agropecuario (ICA). Cooperative agreements are maintained with various national and regional institutions to help carry out regional and international testing activities, in some cases with CIAT staff outposted there for research and support of commodity networks.

Organizational Developments

The final days of 1988 saw the culmination of the process of converting CIAT from a not-for-profit Colombian institution to an international organization with headquarters in Colombia. The reader may recall that on 28 May 1986 an agreement was signed between the International Bank for Reconstruction and Development and the United Nations Development Programme on the establishment of CIAT as an international organization. This was followed by the signing of a headquarters agreement between the new CIAT and the Government of Colombia on 5 May 1987; this agreement was formally approved by the Congress of the Republic of Colombia by means of Law 29 passed on 18 March 1988. The process of transferring all assets and liabilities of the "old" CIAT to the new, international CIAT was completed by the end of 1988, and the "old" CIAT was duly dissolved.

Trends

The trend toward an increased presence of CIAT scientists in the respective regions where CIAT commodity programs have direct responsibilities is continuing. Whereas in 1985, 59 senior scientists were stationed in Colombia and 14 were outposted, in 1989, the Colombia-based scientific staff numbered 63, while the number of outposted staff had grown to 20. In 1989, CIAT scientists were stationed in the Caribbean (rice), Central America (beans and tropical pastures), the Andean region (beans), Brazil/Southern Cone (beans), the Brazilian Cerrados region (tropical pastures), the Amazon region (tropical pastures), Africa/IITA (cassava), the Great Lakes Region of Africa (beans), eastern Africa (beans), southern Africa (beans), and Asia (cassava).

The trend toward decentralization has been accompanied by a growing momentum in regional commodity research/development networks. These networks are composed of, and managed by, the participating national programs. In the typical case, each network has a steering committee providing overall coordination and guiding CIAT in its support efforts in the development of technology and human resources.

Achievements

For a description of the general status of the various CIAT programs, the reader is kindly referred to CIAT's "Program Plans and Funding Requirements 1989-1993" and CIAT's "Strategic Plan for the 1990s" (the latter to be published in the course of 1989). Results of CIAT's work in 1988 and 1989 are also published in the CIAT Reports of the respective years. Selected specific results from the 1988-1989 reporting period follow.

Bean Program

- Improved varieties were released and widely adopted in various regions. For example, in the major bean-producing regions of coastal Mexico, 40% of the farmers were using improved varieties. In Nicaragua, these varieties were sown on over 15,000 hectares. CIAT germplasm has also been widely released in Brazil, Burundi, Ethiopia, Rwanda, and Zaire.

- Breeding for increased nitrogen fixation has been a major area of study for the Program. Consistent yield increases due to *Rhizobium* inoculation have been observed in on-farm trials in Central America, Peru, and Africa. Earliness in nodulation is a character which heretofore had not been screened for. A screening method was thus developed for its evaluation and a large number of genotypes tested. Several small-seeded genotypes have shown consistently better early nodulation than the best previously identified genotypes.

- The main line of research on drought adaptation mechanisms concerned drought avoidance through greater root growth or efficiency of water uptake. Studies undertaken in the last year have shown that root genotype is responsible for conferring adaptation to drought stress.

- Charcoal rot (*Macrophomina phaseolina*) is a serious soil-borne pathogen in the dry, high-temperature regions of Latin America and Africa. Under both field and greenhouse screening of a large number of accessions, 22 were identified as resistant and 15 as intermediate. There was also a high correlation between resistant accessions and drought tolerance, suggesting useful possibilities for screening as both problems tend to occur together.

- Selection for resistance to bean pod weevil (*Apion godmani*) in bush and climbing lines was carried out in Central America in 1987-1988. Several lines with good agronomic characteristics, adaptation, and seed color have been selected and are undergoing further testing.

- The Virology Research Unit (VRU) evaluated a total of 1688 accessions for bean common mosaic virus (BCMV) during 1988. Out of more than 300 wild *Phaseolus vulgaris* accessions tested, three were resistant to BCMV, indicating the presence of the dominant *I* gene. Some 190 accessions exhibited superior adaptation or resistance traits to bean geminiviruses. Seven basic sources of bean golden mosaic virus (BGMV) tolerance/resistance were identified and are sources of additional variability for BGMV tolerance, a much-needed development in light of the fact that 95% of all BGMV-tolerant/resistant genotypes are currently derived from a single black-seeded genotype.

- The VRU examined the mechanical inoculation of beans with BGMV in comparison with natural field infection in Guatemala. It concluded that although field evaluations are the preferred method for routine screening of segregating populations, mechanical inoculation with BGMV in glasshouse conditions provides richer information on genotype response and is useful for the selection of parents. A number of previously unknown plant responses related to BGMV resistance were identified. Knowledge of these can be used to improve resistance levels and broaden the genetic base of resistant germplasm, thereby reducing the chance of a breakdown in resistance.

- The Biotechnology Research Unit (BRU) has aided the Program in the transfer of traits through interspecific crosses (*P. vulgaris* x *P. acutifolius*) and has recovered a number of putative hybrid plants through embryo culture. The Unit has also successfully regenerated plants from callus cultures of several wild relatives of *P. vulgaris* and cell suspension cultures of *P. acutifolius*.

Cassava Program

- The impact of the integrated cassava projects in Colombia and Ecuador is becoming evident as significant numbers of farmers are benefiting from the increased price stability resulting

from the use of cassava as an animal feed. As a result, both cassava production and rural employment have increased. The expanded production which has resulted from stable prices has also led to more stable and lower consumer prices. The benefits to consumers in Barranquilla, the largest city of Colombia's north coast, are estimated to be a savings of US$3-4 million per year.

- Strengthened national breeding programs in Asia are releasing improved varieties in Thailand, Indonesia, the Philippines, Malaysia, and China. One new variety offers the possibility of cropping previously unexploited peat soils where yields of 14 t/ha of dry roots have been harvested after only six months.

- Recent work on drought tolerance indicates that the crop is a C3-C4 intermediate in its photosynthetic pathway, opening the possibility of creating new, higher yielding lines in the future. Field results have shown a strong relationship between leaf photosynthetic rate and yield.

- The cassava hornworm (*Erinnyis ello*) is one of the most serious pests of cassava grown in the tropics, at times resulting in complete defoliation which leads to reduced root yield. Some field populations of hornworm larvae were found to be infested with a granulosis virus causing considerable larval mortality. A simple concentrate derived from the diseased larvae can be applied to the crop as a liquid and has been shown to offer nearly complete control. This method has been developed, field-tested, and farmer-adopted in several areas.

- Chronic cyanide toxicity is a severe problem in times of drought in areas where cassava is virtually the only available food after other crops fail. Under such conditions, cyanide levels are normally higher than usual. Through a careful screening of the germplasm collection, lines that maintain low cyanide levels even under drought conditions have been found.

- The task of combining high yield potential with good eating quality had been elusive. Currently, however, on-farm trials with farmers active in the selection process have resulted in varieties which meet both qualifications.

- An advanced cassava research network was established to undertake research in selected areas where at present there is a major constraint to improving production, processing, or utilization.

- The in vitro cassava germplasm bank has been augmented to over 4000 entries, representing 90% of the global collection. Nearly 200 elite clones were distributed to 17 different countries, while 76 clones were received. Collections submitted to CIAT have been cleaned, pathogen-tested, and returned to their country of origin. A database system for management of the in vitro collection has been developed as a pilot project with the International Board for Plant Genetic Resources (IBPGR).

- The BRU has initiated efforts to develop cryogenic techniques for the long-term conservation of germplasm in liquid nitrogen. Over 90% success has been attained in plant growth following retrieval.

- Isozyme electrophoresis has been used by the BRU in the characterization of over 1400 clones in the germplasm bank as part of a systematic effort to identify duplicates in the collection.

- The VRU carried out disease surveys and developed indexing procedures for frogskin disease (FSD), cassava common mosaic virus (CCMV), and cassava X virus (CsXV) in Colombia and Paraguay. FSD and CsXV were found to be common in Colombia, while CCMV was most common in Paraguay. The Unit is continuing to evaluate clones showing resistance to CsXV and FSD.

Rice Program

- Two new varieties have been developed by the Colombian national program (ICA) for the Llanos of Colombia and represent the first commercially released lines to have come from

the Santa Rosa station, a disease "hot spot". The lines show excellent blast and "hoja blanca" virus (HBV) resistance, a necessary feature for the introduction of integrated pest management (IPM) techniques in areas where both virus and vector are present.

- The stability of lines selected for blast resistance at Santa Rosa has been monitored. Results indicate that after six seasons of continuous rice planted under high disease pressure, lines are still stable.

- Cold-tolerant, high-yielding lines with good grain quality that are derived from anther culture have been advanced to the final evaluation stages in Chile. In addition to having cold tolerance at the seedling stage, the lines were found to be as tolerant as the local tolerant checks during low temperatures at flowering. These lines also show great promise for Cuba.

- A new crossing method has been developed which can make the process itself easier. This method reduces labor requirements by up to 66%, takes up only 20% of the space, and gives 20%-30% greater seed yields over conventional methods. Tillers are excised in the field and maintained in flasks in the greenhouse.

- A collaborative effort is under way with national programs in Ecuador and Venezuela to develop a national rice research strategy, as was done recently in Colombia. CIAT's role in this is to help support and orient the activities, such as sector diagnosis, priority area identification, and development of a work plan. The Program also provides support in the areas of training and consultation.

- Together with the Colombian national Rice Growers Federation (FEDEARROZ), a national census for the rice sector in Colombia has been conducted. The information obtained is being used to help guide research activities of both CIAT and the growers federation. It was noted that small rice farmers make up a much larger group than was thought before the census.

- A detailed distribution map for rice in Latin America has been developed with the assistance of the Agroecological Studies Unit (AESU). Again, small farms were shown to constitute a larger than expected segment of the rice-growing community.

- The Program conducted a survey of virtually all national rice research programs in the region. The focus was on human resources available to the programs and their activities. Results showed experienced and well-trained staff, with orientation skewed strongly toward breeding and agronomy, while lacking in plant protection, training, extension, and socioeconomic studies.

- The new, acid-tolerant lines, responsive to inputs and showing excellent grain quality, have been field-tested by national programs in Colombia, Brazil, Bolivia, Panama, and Guatemala, with very promising results. In areas where there is significant upland rice produced on acid soils, the CIAT savanna lines performed extremely well, with yields of the best lines averaging 30% better than the local checks. In contrast to the local lines, the new lines resisted lodging, indicating that the crop may be able to take full advantage of any residual fertility left by a preceding crop.

- The Rice Program and Tropical Pastures Program have initiated a collaborative project to develop a rice-pasture rotation system for the acid-soil savannas of Latin America. The project's aims are to develop a sustainable production system for poor soils based on the premise that a productive rice crop will permit the establishment of an improved grass-legume pasture by defraying the establishment costs of the pasture.

- The BRU successfully transferred the process of rice anther culture to the Rice Program. It has then concentrated on improving the efficiency of the technique, especially with regard to the frequency of doubled haploid plant regenerations.

- After an early characterization of the extensive cattle production systems of the Colombian, Brazilian, and Venezuelan savannas, further studies have been conducted in collaboration with national and regional institutions to examine areas with more intensive production systems. These are the dual-purpose (beef-milk) systems in the central provinces of Panama; Caquetá, Colombia; Napo, Ecuador; and Pucallpa, Peru. This knowledge enables the Program to target its own and the NARIs' research efforts.

- Further expansion of the Program's germplasm base has been achieved. Today, the collection comprises more than 23,000 entries of grasses and legumes. In conjunction with RIEPT—the International Tropical Pastures Evaluation Network—several key species have been identified for their adaptation and potential in major ecosystems. These are the grasses *Andropogon gayanus, Brachiaria brizantha, B. dictyoneura, B. humidicola*, and *Panicum maximum*; and the legumes *Arachis pintoi, Centrosema acutifolium, C. brasilianum, C. macrocarpum, C. pubescens, Desmodium ovalifolium, Stylosanthes capitata*, and *S. guianensis*.

- Full decentralization of the Program's screening effort has been achieved with the establishment of four major screening sites representing contrasting ecosystems and farming systems: Carimagua for the Llanos; Brasília for the Cerrados; Pucallpa for the Amazon; and Costa Rica for Central America.

- A clear advantage has been demonstrated in the performance of animals grazing grass-legume pastures compared with those grazing pastures of the same grass without legumes or grazing native savanna grassland.

  The productivity of *A. gayanus* sown with *S. capitata* was about 50% greater in animal liveweight gains per head and 18% greater in gains per hectare than gains of the grass alone. The new *B. dictyoneura* + *C. acutifolium* mixture shows similar results. The productivity of the associations is twice that of the savanna grasslands in terms of liveweight gain per head and 15-fold in terms of gain per hectare. On-farm trials have shown the excellent performance of these materials to supplement native grassland under farmer management. The higher nitrogen status of such mixtures maintains higher levels of biological activities in the soil, contributing to more sustainable soil management.

- For the degraded lands of the rain forests, new grass-legume pastures that effectively fix N and capture and recycle the limited soil nutrients are being identified. Results from NARIs' grazing trials show increases in yearly weight gain per hectare of 70%-450% over degraded *Paspalum notatum*.

- Adoption of the released materials is under way. *A. gayanus* is being used commercially in the Brazilian Cerrados, where more than half a million hectares have been planted. Over 50,000 hectares have also been planted in both Colombia and Venezuela. Smaller areas have been planted in Panama, Costa Rica, Mexico, and Peru. The legume *S. capitata* is presently being grown on about 5,000 hectares in Colombia, mostly in association with *A. gayanus*. The main constraint for further adoption is seed availability. However, NARIs are working toward the expansion of seed availability of the new cultivars.

- When the Program originally focused its activities on research in pasture development for poor acid soils, the NARIs in the subhumid and humid lowlands of tropical America were weak. The development of the RIEPT was the strategy of the Tropical Pastures Program to face the strong regional demand from the NARIs for the development in situ of relevant low-input technologies. Today, the RIEPT includes participants from 20 countries and more than 300 researchers. Through this effort, more than 730 preselected germplasm entries have been evaluated for adaptation, and selections are being assembled into pastures tested on-farm under grazing and seed multiplication.

III. OUTCOME OF THE 1988 FINANCIAL YEAR

The approved budget for 1988 core activities was US$24,989,000 (see "Program Plans and Funding Requirements 1989-1993"). Actual income from donors amounted to US$24,416,000, and other income was US$935,000, thus bringing total available funds to US$25,351,000. As is evident, in 1988 CIAT's approved budget was fully funded, thus allowing the Center to carry out the approved work plan completely. The slight surplus of 1.5 percent, together with selected, forced under-expenditures, were used to build up the working capital fund to the CGIAR-recommended level of the equivalent of the cost of operating the Center for 30 days.

Special project activities were executed at the level of US$4,463,000.

Table 1 provides full detail on 1988 expenditures (including special projects).

IV. 1990 BUDGET REQUEST*

Essential Program

The 1989 budget proposed in the five-year plan (1989-1993) for essential activities amounted to $29,611,000. In early 1989, CIAT responded to a CGIAR Secretariat request to make a reduction in the funding requirement by introducing a general downward adjustment in the amount of $632,000 and by postponing an upward adjustment of $239,000 in the working capital, resulting in a 1989 budget base of $28,740,000.

As proposed in the approved five-year plan, the following variations in 1990 are contemplated:

Table 1 presents this budget request by programs/units. Table 2 shows the budget request by category of expenses. Finally, Table 3 shows the complete staffing pattern of the "essential" program in 1990.

The 1990 request shows a total of 87 positions for the essential program, or, one position above the level presented in the approved five-year plan. This addition is due to a technical adjustment that CIAT proposes to make as follows: the controller position which during the 1983-1989 period was classified as a high-level locally recruited staff position is to be reclassified as a senior staff position to allow CIAT to recruit

Contemplated 1990 budget variations.

1989 Budget Base		$28,740,000
Additions:		
1) Cassava Breeder	$254,000	
2) Cassava Utilization Specialist	$254,000	
3) Head, Training/Conferences	$147,000	
4) Net Increase in Contract Research	$ 42,000	
5) Additional Capital Resources	$189,000	
6) Additional Working Capital	$ 66,000	
Reductions:		
1) Reduction in Caribbean Rice Effort	($106,000)	$846,000
Plus upward adjustment in working capital as postponed in 1989 (see text above)		$239,000
Plus provision for price increases (5% of $29,825,000)		$1,491,000
	Total 1990 Budget Request	$31,316,000

* **The budget request for 1990 as presented here was reviewed by TAC at the TAC-49 meeting in Rome on 19-24 June, and approved to go forward to the CGIAR.**

internationally for this critical financial administration position. This reclassification of the controller's position does not imply any upward adjustment in the budget request.

Based on the information given in Table 1, the Figure 1 below shows the relative allocation of resources to the Center's various programs/units.

The Figure 2 below is based on Table 2 and shows the relative allocation of resources to expense categories.

Based on information provided in Table 3, a comparison of the staffing patterns in research versus non-research areas is presented here in Figure 3.

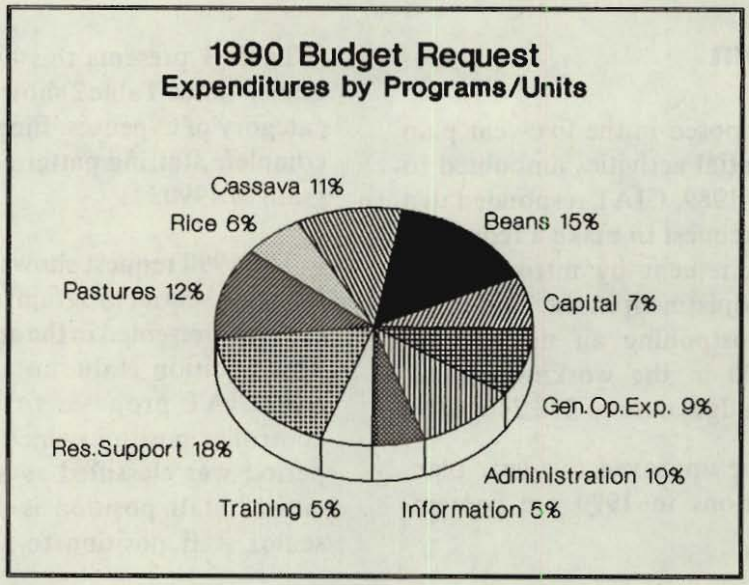

Figure 1.

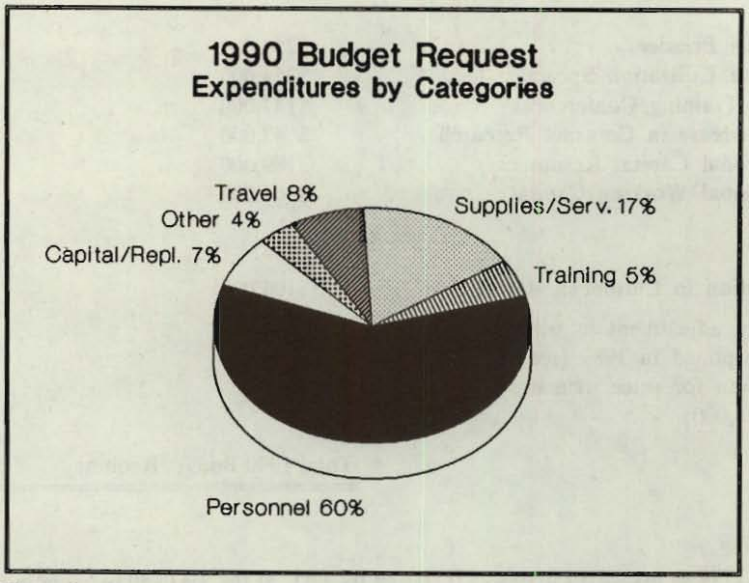

Figure 2.

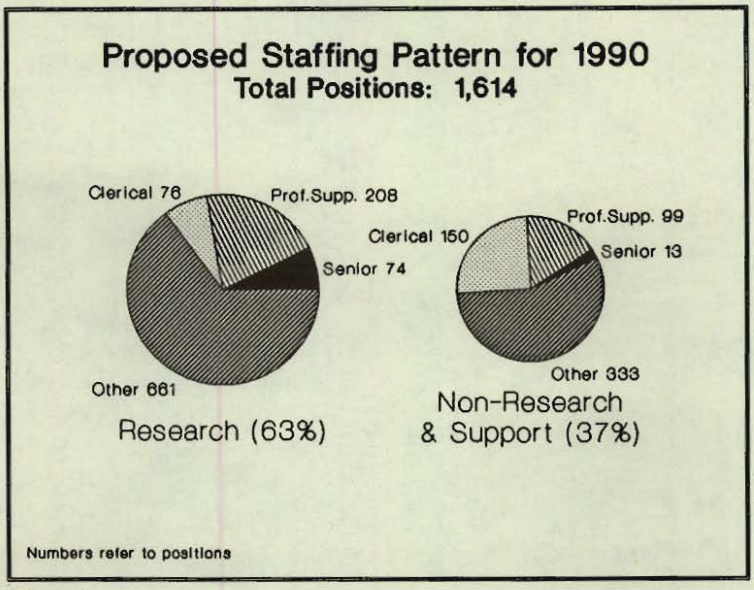

Figure 3.

Desirable Program

The proposed "desirable" program for budget year 1990 is as presented in the five-year plan. Below is a summary of the activities involved, and the status of their financing as of June 1989 (amounts are expressed in 1990 dollars ['000]).

Components of the "Desirable" Program	Financed	Without Financing
1) 5 Beans/Africa positions	1,358	—
2) 1 Beans/Andean zone position	148	—
3) 2 Beans/Middle East positions	—	441
4) 3 Cassava/Integrated Project positions	—	219
5) 1 Rice/Central America position	—	220
6) 1 Rice/Southern Cone position	—	220
7) 1 Pastures/Africa-ILCA position	—	220
8) 1 Farmer participatory research position	—	184
9) Capital and replacement capital	—	827

TABLES

TABLE 1

1990 BUDGET REQUEST: BUDGET BY PROGRAMS/UNITS
(includes comparison with 1988 outcome and 1989 working budget)
Amounts for Core and Special Projects (1988); and Essential and Desirable Activities (1989 & 1990)
(Amounts are in thousands of constant 1989 U.S. dollars, unless otherwise stated)

	1988			1989 Budget		1990 Budget Request	
	CORE PROGRAM		SPEC.PROJ.	ESSENTIAL	DESIRABLE	ESSENTIAL	DESIRABLE
	Budget '88 US$	Actual '88 US$	Actual '88 US$				
COMMODITY RESEARCH PROGRAMS							
BEANS	3,222	3,598	2,487	4,435	1,905	4,435	1,854
CASSAVA	2,144	2,011	305	2,646	209	3,154	209
RICE	1,279	1,319	464	1,912	420	1,807	420
TROPICAL PASTURES	3,454	3,690	182	3,643	-	3,643	210
Total Research Programs	10,099	10,618	3,438	12,636	2,534	13,039	2,693
RESEARCH SUPPORT							
VISITING SCIENTISTS & PDFs	671	553	-	676	-	676	-
GENETIC RESOURCES	404	396	155	419	-	419	-
BIOTECHNOLOGY RESEARCH	235	291	12	406	-	406	-
VIROLOGY RESEARCH	278	287	19	364	-	364	-
RESEARCH SERVICES	320	326	-	319	-	319	-
STATION OPERATIONS	784	866	-	862	-	862	-
CARIMAGUA STATION	616	658	-	634	-	634	-
DATA SERVICES	523	501	-	527	-	527	-
AGROECOLOGICAL STUDIES	178	176	-	330	-	330	-
SEEDS	551	531	-	562	-	562	-
RESEARCH CONTRACTS	-	-	-	100	-	142	-
FARMER PARTICIP. RESEARCH	-	-	205	-	175	-	175
Total Research Support	4,560	4,585	391	5,199	175	5,241	175
TRAINING AND COMMUNICATION							
TRAINING AND CONFERENCES	1,405	1,375	96	1,397	-	1,593	-
COMMUNICATION & INFORMATION	1,478	1,322	184	1,559	-	1,559	-
Total Training & Communication	2,883	2,697	280	2,956	0	3,152	0
MANAGEMENT AND ADMINISTRATION							
BOARD OF TRUSTEES	176	203	-	226	-	185	-
OFFICE OF DIRECTOR GENERAL	518	602	-	518	-	544	-
OFFICES OF DIRECTORS	640	676	-	679	-	679	-
ADMINISTRATIVE SUPPORT	1,508	1,453	-	1,585	-	1,585	-
PROJECTS OFFICE (*)	-	-	-		-		-
Total Mgt. and Administration	2,842	2,934	0	3,008	0	2,993	0
GENERAL OPERATING EXPENSES							
GENERAL SERVICES	-	-	-	1,069	-	1,069	-
PHYSICAL PLANT	1,144	1,360	-	625	-	625	-
MOTOR POOL	522	616	-	423	-	423	-
GENERAL EXPENSES	816	238	-	578	-	592	-
Total General Operation	2,482	2,214	0	2,695	0	2,709	0

TABLE 2

1990 BUDGET REQUEST: BUDGET BY CATEGORIES OF EXPENSES
(includes comparison with 1988 outcome and 1989 working budget)
Amounts for Core and Special Projects (1988); and Essential and Desirable Activities (1989 & 1990)
(Amounts are in constant 1989 U.S. dollars [thousands] unless otherwise stated)

	1988			1989 Budget		1990 Budget Request	
	CORE PROGRAM		SPEC.PROJ.	ESSENTIAL	DESIRABLE	ESSENTIAL	DESIRABLE
	Budget '88 US$	Actual '88 US$	Actual '88 US$				
EXPENSES BY CATEGORIES							
Personnel	15,190	14,905	1,601	17,010	1,453	17,432	1,604
Training	1,557	1,383	395	1,508	235	1,552	235
Supplies and Services	3,951	4,646	713	4,651	403	4,820	421
Travel	1,684	1,587	704	2,265	190	2,228	210
Other	484	527	696	1,060	372	1,102	343
Equipment Replacement	663	728	136	960	263	960	263
Capital	1,077	982	218	939	525	1,128	525
Contingency	246	-	-	347	91	298	92
Addition to Working Capital	137	593	-	-	300	305	14
Provision for Price Changes	-	-	-	-	-	1,491	185
TOTAL EXPENSES	24,989	25,351	4,463	28,740	3,832	31,316	3,892
SOURCES OF FUNDS							
From CGIAR	24,340	24,416	-	28,040	-	30,616	-
Special Project Financing	-	-	4,463	-	3,832	-	3,892
Self-generated Income	649	935	-	700	-	700	-
TOTAL INCOME	24,989	25,351	4,463	28,740	3,832	31,316	3,892

TABLE 3

STAFFING PATTERN
Approved Positions for 1989 and Proposed Essential Positions for 1990

	SENIOR STAFF		SUPPORT STAFF: SCIENTIFIC & SUPERVISORY		SUPPORT STAFF: CLERICAL		SUPPORT STAFF: OTHER SUPPORT		TOTAL POSITIONS	
	1989	1990	1989	1990	1989	1990	1989	1990	1989	1990
COMMODITY RESEARCH PROGRAMS										
Beans	23	23	53	53	16	16	144	144	236	236
Cassava	12	14	24	30	11	12	97	107	144	163
Rice	8	8	25	25	8	8	80	80	121	121
Tropical Pastures	18	18	43	43	13	13	160	160	234	234
Subtotal Research Programs	61	63	145	151	48	49	481	491	735	754
RESEARCH SUPPORT										
Genetic Resources	1	1	5	5	2	2	29	29	37	37
Biotechnology Research	2	2	8	8	1	1	10	10	21	21
Virology Research	2	2	6	6	1	1	7	7	16	16
Research Services	0	0	6	6	1	1	20	20	27	27
Station Operations	1	1	5	5	4	4	85	85	95	95
Carimagua Station	0	0	4	4	5	5	3	3	12	12
Data Services	1	1	10	10	9	9	1	1	21	21
Agroecological Studies	2	2	5	5	1	1	6	6	14	14
Seeds	2	2	8	8	3	3	9	9	22	22
Subtotal Research Support	11	11	57	57	27	27	170	170	265	265
Total Research	72	74	202	208	75	76	651	661	1,000	1,019
TRAINING & COMMUNICATION										
Training & Conferences	1	2	12	13	6	7	5	5	24	27
Communication & Information	3	3	29	29	19	19	36	36	87	87
Total Training & Communic.	4	5	41	42	25	26	41	41	111	114
ADMINISTRATION										
Office of Director General	2	2	4	4	3	3	1	1	10	10
Directors	3	3	4	4	7	7	1	1	15	15
Administrative Support	3	3	29	29	69	69	6	6	107	107
Total Administration	8	8	37	37	79	79	8	8	132	132
GENERAL OPERATING EXPENSES										
General Services	0	0	1	1	11	11	110	110	122	122
Physical Plant	0	0	3	3	5	5	65	65	73	73
Motor Pool	0	0	1	1	2	2	26	26	29	29
General Expenses	0	0	1	1	4	4	1	1	6	6
Total General Operations	0	0	6	6	22	22	202	202	230	230
SELF-SUPPORTING & INCOME-GENERATING ACTIVITIES	0	0	14	14	23	23	82	82	119	119
T O T A L	84	87	300	307	224	226	984	994	1,592	1,614