

MIDTERM REPORT

**1980-1981
TWO-YEAR BUDGET**

16 June, 1980



CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL

CIAT MIDTERM REPORT 1980-81

I. PROGRAM DEVELOPMENTS^{1/}

In 1980, all CIAT efforts continued in pursuit of the Center's basic objective which is:

To generate and deliver, in collaboration with national institutions, improved technology which will contribute to increased production, productivity and quality of specific food commodities in the tropics--principally countries of Latin America and the Caribbean--thereby enabling producers and consumers, especially those with limited resources, to increase their purchasing power and improve their nutrition.

The year 1980 saw a further development of CIAT's basic commodity programs--i.e., dry beans, cassava, rice, and tropical pastures--in a direction which promises to best utilize the Center's comparative advantage in international research and training. More specifically, CIAT has succeeded in making important advances in:

- developing increasing amounts of superior germplasm to the point where it can be further tested by collaborating national programs and subsequently be named as varieties, and distributed to producers. All four of CIAT's commodity programs either have already entered, or are now entering, the phase where the efforts of their respective interdisciplinary breeding/ selection programs are bearing fruits in terms of superior germplasm available for distribution and, ultimately, increased production.

^{1/}*In this section are summarized, as far as available, program developments in 1980. For an in-depth description of 1979 CIAT program developments the reader is referred to the publication CIAT REPORT 1980 (Series 02E1-79).*

- the definition, in agroclimatic terms, of the production areas where the CIAT mandated commodities are important. These efforts constitute an important step in guiding the Center in better establishing research priorities and in the development of germplasm material and management practices suited to broadly defined yet unique production conditions.
- expanding and consolidating the Center's germplasm collections. CIAT now holds 27,000 *Phaseolus* accessions; 2400 cassava cultivars; and 6000 accessions of tropical pastures germplasm. The documentation/evaluation work of these entries is rapidly advancing, and ever increasing numbers of samples are being made available to germplasm improvement programs both at CIAT and in collaborating national institutions.
- expanding and fortifying the research networks in beans, cassava, tropical pastures, and rice which link international and national research efforts so as to form a critical mass for development. To this end, CIAT has continued to expand and refine its efforts in research training, collaborative international testing, organization and conduct of international network workshops, selected information dissemination, and extensive travel by Center scientists to national counterparts for consultation and assistance purposes.

Beans

Germplasm improvement has continued to provide the focus of the Bean Program's activities. The parents used in the crossing programs have been both germplasm bank accessions as well as the continually increasing number of already improved lines. The Program's scheme for the evaluation of advanced generation of breeding lines has been further refined. Promising materials emerging from the breeding projects enter a three-level screening process as follows: (1) "Bean Team Nursery" (uniform screening for resistance to high-priority diseases and insects); (2) "Preliminary Trial" (uniform trials for the evaluation of promising materials emerging from the Bean Team Nursery for both disease and pest resistance as well as for yield, adaptation, and nitrogen fixation); and (3) International Bean Yield and Adaptation Nursery (replicated nursery shipped worldwide).

There has been marked progress in obtaining improved lines. All lines passing into advanced generation testing are now resistant to Bean Common Mosaic Virus (BCMV), which today is the most important bean production problem in Latin America. In addition, a high percentage of these lines also has resistance to rust and/or anthracnose. The best lines tested in the Preliminary Yield Trials in 1979 yielded 3381 and 3655 kg/ha at Palmira (1000 masl; 23.7°C mean temperature) and Popayan (1850 masl; 17.9°C mean temperature), respectively, outyielding the best international check varieties by as much as 1000 kg/ha.

CIAT breeding lines are beginning to have a measurable impact at the national level. For example, two selections made by former CIAT trainees in Honduras from CIAT lines, were named *Acacia 4* and *Acacia 6* in Honduras and are now being advanced for varietal release in that country. At the

same time, three lines which are resistant to Bean Golden Mosaic Virus (BGMV) and which resulted from the collaborative efforts between CIAT and the Instituto de Ciencia y Tecnología Agrícola (ICTA) in Guatemala, have been released as new varieties in Guatemala under the names *ICTA Jutulapan*, *ICTA Quetzal*, and *ICTA Tamazulapa*. Recent farm level trials showed that under heavy BGMV pressure, these lines, without insecticide treatments to control the whitefly vector of the disease, can outyield the local varieties with a seed insecticide treatment and four sprays by approximately one-third. The tolerant varieties yielded even more when the insecticide applications were made. Thus, these new lines which not only are resistant to BGMV, but also to BCMV and rust, demonstrated their potential to reduce risk for the farmer who does not have access to insecticides at the same time that they provide an even greater potential for the farmer who can apply protective chemicals.

Progress was also evident in climbing bean research where the introduction of hill plot techniques and early generation yield testing has greatly influenced the number of materials that can be handled. For the first time, several national programs have selected climbing materials—both germplasm selections as well as CIAT hybrids—out of the International Bean Yield and Adaptation Nursery (IBYAN) and have entered these in their respective regional testing programs.

Consistent with its aim of developing low input technologies for beans, the Program continued to emphasize the evaluation of materials for tolerance to low soil phosphorus, and for nitrogen fixation ability. Low phosphorus tolerant lines have been identified; crosses including these materials have been made, and a collaborative research program on this topic was initiated with the national bean program of Brazil where low soil phosphorus is a major limiting factor to bean production. In the area of nitrogen fixation, the first International Bean Inoculation Trial (IBIT), composed of 10 strains of *P. phaseoli* selected at CIAT, has been distributed to collaborating scientists in six countries. Initial results show yield improvement following inoculation in some locations, at the same time that they demonstrate the importance of competition from native soil rhizobia.

Until the recent past, the Bean Program has maintained collaborative ties mostly with Latin American programs only. As the Latin American network now is established and operational, the Bean Program has initiated the process of extending its collaborative efforts to the second largest bean production region in the tropics: Eastern Africa. CIAT has co-sponsored a planning workshop held at Malawi in March 1980 where concrete plans were drawn up regarding a regional, collaborative research network. The CIAT Bean Program is expected to play a major role in the formation of this network.

Cassava

In 1980, the sixth consecutive regional trial testing cycle of CIAT selections and hybrids is being carried out. With this year's result, CIAT will have completed over 50 international yield trials in Latin America and in Asia. During the year, CIAT selections and hybrids were also represented in more than 120 national yield trials planted in 10 countries of the Americas and three countries in Asia.

The Cassava Program has identified six distinct production ecosystems which are defined mainly by climatic regimes. These ecosystems are: (1) lowland tropics with long dry season; (2) lowland tropics with moderate to high rainfall; (3) lowland tropics with no pronounced dry season;

(4) medium-altitude tropics; (5) cool highland areas; and (6) sub-tropical areas. (A more detailed description of these ecosystems is provided in the CIAT publication entitled "CIAT Report 1980".) Following the observation that there is a strong cultivar/ecosystem interaction, various operational aspects of the cassava breeding program have been adapted in accordance with this classification system. All selection activities are now ecosystem-specific. The advantages of this approach have already been demonstrated by considerable progress achieved in the zonal selection for high yielding ability, and resistance to cassava bacterial blight (CBB) and superelongation disease. The selection strategy now being pursued by the Program has been changed from an emphasis on single traits to selection according to total plant performance in a given ecosystem. Stable yield performance is being emphasized, and evaluation in multiple yield trials has been extended to cover a time span of three years.

The first ecosystems production cycle harvested showed a distinct ecosystem interaction for all characters evaluated. These characters included root yield, stake production, starch content, HCN, and physical root deterioration.

Work on post-harvest root deterioration showed that phenolic compounds in deteriorated root induce physiological deterioration when applied to fresh root tissue. It is probable that the factor, which translocates from the aerial part of the plant, is an auxin which interacts with root phenolics to subsequently initiate and control the process of root deterioration. There are indications that stress-induced checks on growth tend to induce tolerance to physiological deterioration, a phenomenon that can be artificially brought about by pruning.

Research on cassava's response to mycorrhizal association has shown that, in non-mycorrhizal soils, inoculation can result in three to four fold increases in dry matter production at intermediate phosphorus levels. This confirms earlier findings showing that cassava is highly dependent on mycorrhiza for phosphorus uptake. In a related development, as part of the varietal screening activities, 250 selections and hybrids have now been tested for low phosphorus and high aluminum tolerance.

A granulosis virus of the cassava hornworm has been identified with the assistance of Boyce Thompson Institute at Cornell University. Preliminary work with this virus during heavy hornworm attacks in the field resulted in nearly 100 percent mortality of the hornworm. Other entomological studies in the Program have shown that thrips resistance is inherited additively. Therefore, levels of resistance can be increased by crossing varieties possessing resistant genes. Considerable progress has also been made in the development of mite-resistant cultivars. Forty-three cassava clones have been classified as resistant to the green mite, *Mononychellus tanajoa*. It was found that this resistance is due to two mechanisms: non-preference and antibiotic mechanisms. The identified mite-resistant material has now entered the germplasm improvement program for the development of mite-resistant hybrids.

As a follow-up to a training course in meristem tissue culture techniques recently offered by CIAT to a group of Asian cassava workers, several advanced lines of cassava have now been shipped to Thailand and the Phillipines. In order to build up large amounts of materials from a

few imported meristem cultures, a rapid multiplication technique based on single leaf-bud cuttings has been developed. The propagation potential of this method is significantly higher than with any other known technique.

The Program's farm level trials have been extended to include analyses by the food quality laboratory in order to take into account desired quality parameters in the cassava market. The Program also has initiated studies on markets for cassava in Latin America with a focus on the demand for cassava as an animal feed. A least-cost feed formulation model has been developed and applied to Colombian market conditions. Preliminary results suggest that a production technology for cassava that could deliver about 15 t/ha without significantly increasing production costs, would lead to a cassava price making this product competitive with sorghum in animal feed rations in Colombia.

Tropical Pastures

On the basis of an extensive survey project on its target area (i.e., the acid, infertile soils of the tropics of Latin America), the Tropical Pastures Program has been able to divide it into five well-defined ecosystems. This development will allow the Program to design low-cost pasture technology and associated animal management schemes for more specific environments within the overall region. The basis for the division are the variations in Total Wet Season Potential Evapotranspiration (TWPE), a parameter that has provided the rational quantification for (a) explaining existing vegetation coverage based on available energy for plant growth during the growing season, and (b) anticipating major expected differences in pasture growth and performance. The following ecosystems were identified: (1) Tropical savanna, well-drained (TWPE 910-1060 mm), hyperthermic (mean temperature during wet season more than 23.5°C), including the Llanos of Colombia, Venezuela, Guyana, Surinam, and savannas of Roraima and Macapá in Brazil. (2) Tropical savanna, well-drained (TWPE 910-1060 mm), thermic (mean temperature during the wet season less than 23.5°C), including the Cerrados of Brazil. (3) Tropical savanna, poorly drained, including the Beni in Bolivia, Pantanal of Brazil, Casanare of Colombia and the Apure region in Venezuela. (4) Tropical semi-evergreen, seasonal forest (TWPE 1061-1300 mm). (5) Tropical rainforest (TWPE more than 1300 mm).

Preliminary results of regional trials have shown overall distinct performance of germplasm in the different ecosystems. Therefore, the system of a single list of promising germplasm has been changed to germplasm lists by categories for each ecosystem. Lists for the first two ecosystems have been assembled based on research conducted at Carimagua (in the Eastern Plains of Colombia) and at Brasilia (located in the Cerrado of Brazil), respectively. Inasmuch as CIAT has no major research involvement in any of the other three principal ecosystems as of yet, no comparable lists have been assembled for these ecosystems. Nevertheless, in order to evaluate germplasm on a preliminary basis for adaptation to these ecosystems, a special network of regional trials has been designed and implemented. Under this system, more than 100 accessions of a series of species are evaluated for adaptation to edaphic and climatic conditions at eight different sites in Colombia, Brazil, Peru, and Venezuela. Parallel to these efforts, in an effort to reinforce the evaluation work conducted in Carimagua and Brasilia for ecosystem I and ecosystem II, respectively, a special network of regional trials is being organized.

By mid-1980, CIAT had available the results of animal performance of various types of promising pasture systems as conducted over a 16-month period that included two dry seasons and one wet season. The overall experiment from which these results were obtained is of a long-term nature; it is being carried out at the CIAT/Instituto Colombiano Agropecuario (ICA) station in Carimagua.

The results are summarized in the table below.

PASTURE PRODUCTIVITY AT CARIMAGUA				
Pasture	g/animal/day		total gain/year	
	Dry season	Wet season	kg/animal	kg/hectare
Grasses alone:				
Best-managed savanna ^{1/}	- 167	449	90	22
<i>Melinis minutiflora</i> ^{1/}	- 445	508	97	43
<i>Brachiaria decumbens</i> ^{1/}	- 50	506	118	147
<i>Andropogon gayanus</i>	- 99 ^{2/}	460	115	380
Grass/legume mixtures:				
<i>Andropogon gayanus/ Stylosanthes capitata</i>	337 ^{2/}	679	210	387 ^{3/}
<i>Andropogon gayanus/ Zornia latifolia</i>	163 ^{2/}	776	218	419 ^{3/}
<i>Andropogon gayanus/ Pueraria phaseoloides</i>	263 ^{2/}	681	204	381 ^{3/}

^{1/} Results shown are based on long-term experiments of a duration of three or more years.

^{2/} Average of two dry seasons.

^{3/} Stocking rates: 1 steer/ha during dry seasons; 2 steers/ha during wet season.

Although some problems within certain species remain to be solved, overall results clearly show the need for and advantages to be gained from developing persistent, legume-based pastures for CIAT's target areas.

The experiment on which the above results are based, is continuing. The latest trials under way have now entered the second wet season. Most pastures under observation have shown excellent regrowth after the first rains in Carimagua despite the fact that the last dry season was very extended. *Andropogon gayanus* continues to show an outstanding ability for regrowth and is doing better in this respect than other grasses currently available. Several new accessions of *Centrosema brasilianum* and *C. macrocarpum* were observed in excellent condition at the end of the dry season, at the same time that several accessions of *Stylosanthes capitata* and *Desmodium ovalifolium* 350 continue to indicate good persistence under grazing and excellent regrowth with the first rains.

After the very promising results obtained with *A. gayanus* had again been confirmed, several collaborating national institutions have taken the necessary initial steps for releasing it in their respective countries. EMBRAPA of Brazil, FONAIAP of Venezuela, and ICA of Colombia have started large-scale foundation seed increases of *A. gayanus* toward eventually releasing this cultivar for the Cerrado and the Llanos ecosystems in the respective countries.

Rice

Stable resistance to rice blast disease (*Piricularia oryzae*) has continued to dominate the breeding objectives of the Rice Program as this disease constrains rice production throughout Latin America. Pyramiding of major genes, incorporation of slow blasting characteristics (i.e., horizontal resistance), multilines, and accumulation of minor genes for resistance through crosses among susceptible varieties, constitute the major approaches to stable resistance.

Four potential candidates for national program varietal naming were identified from among 11 pyramided lines which had been tested at various locations in Latin America. In addition to their resistance to rice blast, these four candidates are also characterized by tolerance to the plant hopper (*Sogatodes oryzae*) and to leaf scald (*Rhynchosporium oryzae*), and good grain quality.

Five backcross lines of BG 90-2 which combine blast resistance, improved grain quality, and excellent lodging resistance, and with a yield potential which is equal or superior to CICA 8, have been identified and are being further evaluated under high stress conditions.

In response to requests for early maturing varieties received from various countries, over 50 advanced lines which mature in 110 days and combine excellent plant type, lodging and blast resistance with good grain quality, were identified and are being further evaluated.

In 1980, a nursery for acid soils problems has been added to the already existing nurseries in the International Rice Testing Program (IRTP) for Latin America. This year, a total of 287 sets of the now 14 nurseries are being sent to collaborators in Latin America. Both advanced lines developed at CIAT as well as germplasm materials distributed through IRTP continue to be selected

heavily for local testing in various collaborating national programs. A number of these materials was actually named as new varieties and has been released to farmers in the respective countries.

Training

In the first half of 1980, the following courses were conducted by the Center: (1) **Bean Production Research** (this course was organized and conducted for 24 bean researchers during a five-week period); (2) **Rice Production Research** (26 professionals from Latin American national organizations participated in this intensive 5-week course); (3) **Tropical Pastures Research** (a total of 27 professionals in tropical pastures research were attending this 6-week course); (4) **Cassava Production Research** (this intensive course was attended by 21 cassava workers from Latin American national institutions); and (5) **Seed Technology** (this 7-week course was a joint project of the CIAT Seed Unit and Mississippi State University. A total of 26 seed technologists from 11 Latin American and Caribbean countries attended the course.) An additional two courses (one on research for bean production and one on basic seed production) are scheduled for the second semester of 1980.

In June of 1980, CIAT also organized and conducted a course on research for cassava production in Leyte, Philippines, for cassava workers from Asia. Participating in this course were 20 cassava researchers from the Philippines, Sri Lanka, Thailand, Malaysia, and Indonesia.

A majority of CIAT's intensive courses are organized such that they provide a multidisciplinary training base for subsequent discipline-based individual internships for the course participants. These internships which start immediately after the group experience may last for three to six months beyond the intensive course. Over the past three years, CIAT has trained some 450 collaborators from national institutions in intensive short courses—compared to only 104 short course participants in the previous eight years. Whereas two thirds of the training participants in 1977-1979 were short course participants, it is expected that in 1980 this proportion will have been reversed through the current emphasis on longer-term internships.

CIAT has continued in its efforts to assist in-country training endeavors as a means to support the start-up phase of in-country training programs to thereby contribute to the effective linking of national research programs and extension operations. In the recent past, the Center assisted in-country training efforts in Honduras (beans); Colombia (rice, cassava, and beans); Cuba (beans); and Peru (rice).

II. GENERAL DEVELOPMENTS

CIAT continues to receive excellent cooperation from institutions in its host country, Colombia. Recent developments include:

1. The purchase by a local foundation (Fundación para la Educación Superior) and lease to CIAT for symbolic rent (1 peso per year) of 70 ha of land selected as being ideally suited for bean research at medium altitudes (1750 masl).

This new experimental site will make possible screening of bean materials for diseases and other problems which occur at lower temperatures. The mean temperatures at CIAT headquarters (24°C) and the new site near Popayan (18°C) bracket the conditions under which more than 80% of beans are grown in Latin America.

2. The extension of the agreement with the Instituto Colombiano Agropecuario (ICA) for rent-free use of the 522 ha on which CIAT headquarters is located to the year 2000.
3. The completion of the physical facilities of the ICA station in the Colombian Llanos. The majority of the funds for this capital construction were provided by ICA (mostly from an IDB loan) and some were provided from CIAT's budget. This 20,000 ha station is jointly managed by ICA and CIAT. The provision of these facilities and land and the funding of 50% of the operational costs of this station is one of the many ways in which ICA is collaborating with CIAT.

The Seed Unit is now fully staffed and construction of the new capital facilities for seed processing and training is underway. This Unit is financed by a Swiss-funded Special Project.

A new communications building is being constructed through funds provided by the Kresge Foundation, a non-CGIAR donor.

Development of a Long-Term Plan, "CIAT in the Eighties" is occupying much of the time and thought of CIAT management and staff. A special committee has been working for nearly a year on this important project. An Executive Summary was presented for comment to CIAT's Board in May, 1980. A complete draft will be ready before the end of 1980 so that further comments by national programs and the Board can be received before preparation of the final version.

III. BUDGET AND FINANCES

A. 1979 Finances

Our financial statements for the year ending 31st December 1979 have been distributed to interested donors. They show that operating expenses were according to budget. The capital budget is fully committed but, because of delays in acquiring equipment and in construction work, there was a concomitant delay of actual expenditures of US \$803,000. The revised versions of Tables I and II attached reflect actual figures for 1979.

B. 1980-81 Budget and Finances

CIAT 1980/81 budget request included US \$15,463,000 for 1980 and US \$17,488,000 for 1981. At the suggestion of TAC and the CG Secretariat the total for 1980 was reduced by US \$715,000 so that a total of only US \$14,998,000 was recommended for funding. Reductions were made to the Rice Program to postpone implementation of work on upland rice until TAC and the CG have made their recommendation on the whole upland rice question. In addition about US \$200,000 were eliminated from International Cooperation to make the increase from 1979 proportional to the increase in research. The capital request was reduced by 25% of the equipment budget, as in all centers, and by the extra capital included for the upland rice expansion.

The 1980 part of the two year budget has been adjusted to reflect these changes. In addition, minor shifts among programs have been made to reflect changed circumstances since the budget was prepared over a year ago. All of the above changes are reflected in Table I attached.

Inflation

CIAT's budget request included what were then thought to be reasonable and modest amounts for inflation. Consequently US \$1,292,000 or 9.5% was included for inflation in 1980. Unfortunately, inflation, which is the largest part of the increase in the budget from one year to the next, is the most difficult item to predict so far in advance.

As is well known, worldwide inflation over the last year since our budget was prepared has been unusually high. In the U.S. and Colombia, the two countries in which CIAT incurs the vast majority of its expenditures, inflation has been far higher than the average. Also, devaluation of the Colombian peso, which in the past helped to reduce the effect of high local inflation, was relatively low in 1979.

In view of the above CIAT has made a request to the CG Secretariat for an extra US \$406,000 in 1980 to cover the estimated extra costs because of inflation. The Secretariat has indicated that they can foresee very little hope of providing these extra funds.

While CIAT understands and recognises the difficulties of finding the extra amount requested, we had expected and hoped that the system for funding as established by the CG would be responsive to such a request according to published guidelines.

The 1981 portion of the two year budget has been adjusted by US \$502,000 for the extra amount needed in that year because of the unusual inflation between 1979 and 1980.

It should be noted that the total for 1981 has only been increased for known and definite changes since the budget was prepared. However our recent experience with our request for extra funding in 1980 has led us to recalculate the provision for price changes for 1981 based on revised projections. Although it is still too early to have reliable figures for 1981, it is probable that, when we do, it will be too late to make adjustments to our funding. We have therefore indicated to the CG Secretariat that we project an extra US \$540,000 for price changes in 1981 over and above the US \$502,000 already added. The revised calculations give an average net inflation rate from 1980 to 1981 of 15.8⁰/o which is, we believe, still a very reasonable figure.

1981 Budget

As noted the amount for inflation has been adjusted. In addition, the budget for the Rice Program has been adjusted downwards assuming that the expansion for upland rice work will be approved but, because of the delayed start-up, costs in 1981 will be lower by US \$95,000. The capital budget has been increased by US \$85,000 for the equipment for upland rice previously budgeted in, but eliminated from, the 1980 budget.

The 1980-81 budget included two positions for work on the humid tropics starting in 1981 but subject to Board approval. At its May 1980 meetings CIAT's Board approved management's recommendation that only one of these positions be started in 1981 with the second position postponed until 1983. This change gives a reduction of US \$38,000 in the operating budget and US \$15,000 in the capital budget for 1981.

Other than the three adjustments noted above, CIAT has made no further modifications to the 1981 portion of the 1980-1981 budget. However, the US \$18,176,000 gross budget request for 1981 is US \$1,376,000 more than the guideline total of US \$16,800,000 given by the CG Secretariat for 1981. CIAT was asked by the CG Secretariat to reduce our 1981 request to the guideline figure. CIAT's management has prepared a list of "standby economy modules" to achieve the reduction should it be necessary but has declined at this stage to reduce the budget which was approved both by CIAT's Board and the CG last year and has again been approved by the Board in May this year. CIAT believes that this approach is correct and is consistent with the two-year budget process which we have been careful to follow in the past.

CIAT management has had extensive communication with the CG Secretariat regarding the methodology used in arriving at the guideline figures and the amount calculated for CIAT in 1981. We feel that although the methodology used has the appearance of fairness it has in fact resulted in a division of available resources based on the particular shares of each center at a particular point in time without any reference to requirements for the tasks to be performed or the stage of development of each Center. In CIAT's case we believe the guideline figure to be inappropriate for the following reasons:

- 1) The 1980 budget used for a base in calculating the 1981 budget should include the extra US \$406,000 for inflation which CIAT has requested.
- 2) The full year cost of activities approved for 1980 is greater than the guideline figure; this means that certain activities cannot be started as planned in 1980 or they will have to be curtailed in 1981.
- 3) The establishment of a base which does not yet include certain downstream activities already incorporated into core budgets of other, more mature centers, would limit future development of complete sets of vertically integrated activities for each commodity program.
- 4) CIAT has shown restraint in the past by not adding upland rice work in the middle of a two-year budget (1978-1979), in conservative estimates for inflation and modest support staff levels and should not therefore be penalized now because the 1980 budget base is lower than otherwise would have been the case.

C. Projection for 1982-1983

CIAT's 1980-1981 Program and Budget document included projections of staffing and costs for the subsequent budget period 1982-1983. CIAT is now preparing a long term plan for the eighties which departs somewhat from previous projections. A draft of the long term plan document will be available to the CG & TAC at the end of 1980 with explanations and justifications for projected staffing. The CIAT Board will review the final version of the plan at its meeting in May 1981 in conjunction with the 1982-1983 budget proposals. Included here, therefore, are only brief details of the revised projections.

Beans

An additional pathologist is proposed in 1982 to handle bacterial and fungal diseases. The previously proposed regional services positions for Central America and Caribbean and Eastern Africa starting in 1982 have been delayed until when the anticipated special project funding for these positions terminates. The previously proposed second regional services position for Eastern Africa has been dropped. In addition the group of regional services staff has been redefined and divided into liaison scientists and regional services personnel.

Cassava

A full time coordinator is proposed starting in 1983. The previously proposed second regional services position for Asia has been dropped and the positions for the Andean Zone and Central America and the Caribbean delayed until 1983 and 1985 respectively. The group of regional services staff has been redefined and divided into liaison scientists and regional services personnel. A regional services scientist for the Southern Cone is proposed starting in 1982.

Tropical Pastures

It is proposed to delay one of the humid tropics positions previously budgeted to start in 1981 until 1983 when, if additional resources are not available, one existing research position would be dropped in favor of this second humid tropics position. This implies a modification to the 1981 portion of the 1981-1982 Budget. The previously proposed regional services position for S.E. Asia is dropped.

Ecosystems Research Unit

This new unit is proposed, starting in 1982 with two senior staff with a third added in 1983, to survey and monitor the target area of each of CIAT's commodities for climate, soil and agricultural systems and thereby direct the technology generation activities where the greatest benefit can be obtained. The unit would include an agricultural climatologist, a land system survey and analysis specialist and a land economist to be added in 1983.

		ACTUAL EXPENSES			
		1978		1979	
		M-Y	\$ 000	M-Y	\$ 000
<u>CROPS RESEARCH</u>					
Office of the Director	0.8	166	1.1	216	
Beans	9.4	1102	9.7	1354	
Cassava	7.9	939	9.0	1263	
Rice	2.0	204	2.9	367	
Genetic Resources	2.7	221	3.0	287	
Laboratory Services		145		178	
Stations Operations	1.0	444	1.0	594	
SUB-TOTAL	23.8	3221	26.7	4259	
<u>LAND RESOURCES RESEARCH</u>					
Office of the Director	0.8	149	1.1	191	
Tropical Pastures	15.6	1754	15.3	2255	
Carimagua		264		465	
Data Services	1.0	225	0.6	324	
Ecosystems Research					
SUB-TOTAL	17.4	2392	17.0	3235	
Swine	2.0	179	2.0	209	
TOTAL RESEARCH	43.2	5792	45.7	7703	
Of which Regional and Liaison Services					
<u>INTERNATIONAL COOPERATION</u>					
Office of the Director	1.0	108	1.0	135	
Training and Conferences	1.5	679	1.3	819	
Communication Support	2.5	427	2.5	577	
Documentation Services	1.0	318	1.0	403	
TOTAL INT'L. COOP.	6.0	1532	5.8	1934	
<u>ADMINISTRATION</u>					
Board of Trustees		40		47	
Director General	1.0	138	1.0	163	
Controller	1.0	343	1.0	356	
Executive Officer	1.0	445	1.0	492	
TOTAL ADMINISTRATION	3.0	966	3.0	1058	
<u>GENERAL OPERATING EXPENSES</u>					
Physical Plant		750		845	
Motor Pool		433		503	
General Expenses		504		576	
TOTAL GENERAL OPERATING		1687		1924	
<u>OTHER</u>					
Contingency					
Provision for Price Changes					
TOTAL CORE	52.2	9977	54.5	12619	
TOTAL SPECIAL PROJECTS		1306		1782	
<u>CATEGORIES OF EXPENSES</u>					
Personal Services		7230		9012	
Supplies		1012		1311	
Services		835		929	
Travel		693		1004	
Equipment		72		242	
Other		135		121	
Contingency					
SUB-TOTAL		9977		12619	
Provision for Price Changes					
TOTAL CORE		9977		12619	

SUMMARY OF SOURCES AND APPLICATION OF FUNDS

	ACTUAL			BUDGET						REVISED PROJECTIONS		
	1978	1979	Total	1980		1981		Total		1982	1983	Total
				Original	Revised	Original	Revised	Original	Revised			
SOURCES OF FUNDS												
Core Operations												
Unrestricted												
Australia	182	179	361		209							
Belgium	157	197	354		225							
Canada (CIDA)	982	984	1966		970							
European Economic Community		1102	1102		1400							
Ford Foundation	200	150	350		100							
Germany (Federal Republic)	1096	1183	2279		1280							
Interamerican Dev. Bank	2400	2630	5030		2900							
International Development Assoc. (World Bank)	202	379	581		-							
IFAD					770							
Japan	200	400	600		800							
Netherlands	200	300	500		250							
Norway	207	201	408		210							
Rockefeller Foundation	300	300	600		300							
Switzerland	228	300	528		402							
United Kingdom	353	445	798		480							
United States (AID)	2600	3300	5900		3650							
Unidentified sources				14436	18	16613	16981	31049		20131	23192	43323
Balance from previous period		82										
Income applied in year	432	474	906	400	400	400	400	800		400	400	800
SUB-TOTAL	9739	12626	22283	14836	14364	17013	17381	31849	31745	20531	23592	44123
Restricted												
Kellogg Foundation	320		320									
TOTAL CORE OPERATING FUNDS	10059	12626	22603	14836	14364	17013	17381	31849	31745	20531	23592	44123
Capital												
Interamerican Development Bank	235		235									
International Development Assoc. (World Bank)	620	938	1558		500							
Unidentified sources				877	134	675	795	1352		692	741	1433
Balance from previous period	1689	763	1689		803							
Balance of working funds	700	800	700	950	950	1200	1180	950		1430	1690	1430
Other	31	2	33									
TOTAL CAPITAL FUNDS	3275	2503	4215	1827	2387	1875	1975	2502	3182	2122	2431	2863
Special Projects												
Belgium	52	(74)	(22)									
CIMMYT (CIDA)	126	49	175									
Ford Foundation		5	5									
German Agency for Technical Cooperation	71	51	122									
German Foundation for Int'l. Development		42	42									
Interamerican Development Bank	34	39	73									
IBPGR	25	5	30									
International Development Research Centre	229	196	425									
International Fertilizer Development Center	41	121	162									
International Rice Research Institute	99	162	261									
Rockefeller Foundation	(13)	31	18									
Switzerland	437	718	1355									
United Kingdom	(18)		(18)									
U.N. Development Programme	721		721									
United States (AID)	104	130	234									
Other	(1)	(15)	(16)									
Unidentified sources				1900	1870	2750	2750	4650	4620	1500	1500	3000
Balance from previous period	351	1152	351	800	830	700	700	800	830	700	700	700
TOTAL SPECIAL PROJECTS	2458	2612	3918	2700	2700	3450	3450	5450	5450	2200	2200	3700
TOTAL FUNDS	15792	17741	30736	19363	19451	22338	22806	39801	40440	24853	28223	50686
APPLICATION OF FUNDS												
Core Operations	9977	12619	22596	14836	14364	17013	17381	31849	31745	20531	23592	44123
Capital a/	1712	750	2462	627	1207 b/	475	545	1102	1752	432	491	923
Special Projects	1306	1782	3088	2000	2000	2750	2750	4750	4750	1500	1500	3000
Unexpended Balances												
Unrestricted Core	82	7	7									
Capital	763	803	803									
Working Funds	800	950	950	1200	1180	1400	1430	1400	1430	1690	1940	1940
Special Projects	1152	830	830	700	700	700	700	700	700	700	700	700
SUB-TOTAL	2797	2590	2590	1900	1880	2100	2130	2100	2130	2390	2640	2640
TOTAL APPLICATIONS	15792	17741	30736	19363	19451	22338	22806	39801	40377	24853	28223	50686
Memo:												
1. Total Core Operating Funds Required	10059	12619	22678	14836	14364	17013	17381	31849	31745	20531	23592	44123
Less Unexpended balance previous period	-	(82)	(82)									
Less Earned Income Applied current year	(432)	(474)	(906)	(400)	(400)	(400)	(400)	(800)	(800)	(400)	(400)	(800)
Net Core Operating Funds Required	9627	12063	21690	14436	13964	16613	16981	31049	30945	20131	23192	43323
2. Total Capital Funds Required	3244	2501	4182	1827	2387	1875	1975	2502	3182	2122	2431	2863
Less Unexpended balance previous period	(1689)	(763)	(1689)		(803)				(803)			
Less Balance of Working Funds	(700)	(800)	(700)	(950)	(950)	(1200)	(1180)	(950)	(950)	(1430)	(1690)	(1430)
Net Capital Funds Required	855	938	1793	877	634	675	795	1552	1429	692	741	1433
3. Total Funds Required from Donors	10482	13001	23483	15313	14598	17288	17776	32601	32374	20822	23933	44756
4. Total Earned Income	432	474	906	400	400	400	400	800	800	400	400	800
Applied to Core Operations	(432)	(474)	(906)	(400)	(400)	(400)	(400)	(800)	(800)	(400)	(400)	(800)
Applied to Capital	-	-	-	-	-	-	-	-	-	-	-	-
Balance carried forward	-	-	-	-	-	-	-	-	-	-	-	-

a/ Figures do not include CIAT's aircraft purchase.
b/ This figure is made up of the reduced capital budget - \$404,000 plus \$803,000 brought forward from 1979.

ADDENDUM

Attached hereto is a revised *Table 1*. This Table has been recalculated to show how the total expenditures for 1981 recommended by the Secretariat (\$17.75 million) would be utilized. This is a management document and will be used as the basis for management proposals to CIAT's Board of Trustees for the approval of a revised Budget for 1981 when the actual amount of funds for that year is known. A list of the program items which have been deleted to arrive at this modified version of *Table 1* is given below, in order of priority for reincorporation into the budget if additional funds become available.

- 1) **Additional Support Staff for 1981.** The hiring of new support staff in the various CIAT programs is a first-level priority item for reinstatement, and amounts to the figure shown in the summary table below.
- 2) **Training and Conferences Activities.** This involves the reinstatement of core-funded training courses and the restoration of CIAT-sponsored training to the originally budgeted 900 man-months (funding at the CGIAR recommended level would imply that only 360 man-months of training can be financed out of core), plus the reinstatement of all originally planned conference events (workshops which are essential to maintaining network activities are included in the budget recommended for CIAT by the Secretariat). The amount shown for the reinstatement of training and conference activities includes costs of stipends and travel of training participants, and travel and other costs of conferences. Costs of essential training infrastructure are not included as this would be retained in the residual budget to evaluate past and future training activities, as well as to conduct such courses and conferences as can be financed through special projects and individual scholarships.
- 3) **New 1981 Positions: Upland Rice.** Two of the originally budgeted three positions for upland rice work would have to be postponed under the funding level as recommended by the Secretariat. Should additional funds become available for 1981, the restoration of these two upland rice positions (one half man-year each, including corresponding support staff, travel, supplies, and equipment) would be assigned third-order priority.
- 4) **Capital Items.** As there is a clear need for the new glasshouse as originally planned for 1981, this facility would be constructed as a fourth-level priority item.
- 5) **New 1981 Position: Tropical Pastures Position in the Humid Tropics.** The start-up of one senior staff position intended for the screening/evaluation of pasture germplasm in the humid tropics of Latin America would be implemented as previously planned. The amount shown includes one half man-year including support staff, travel, supplies, and equipment.

- 6) **Academic Scholarships.** In response to requests from collaborating national programs for CIAT assistance in the strengthening of their commodity programs through scholarships for advanced training (MS level), CIAT had included in its budget for 1980 and 1981 funds for this purpose. At the request of the CGIAR to reduce the budgeted amount in international cooperation activities for 1980, the start-up of these scholarships had been postponed to 1981. If funds are available at the level requested by CIAT, this scholarship program would be implemented as previously planned.

SUMMARY OF DELETED PROGRAM ITEMS	
Activities to be restored if additional funds are available (ranked according to priorities)	Estimated Costs
1. Additional Support Staff for Various CIAT Programs	36,000
2. Training and Conferences Activities	316,000
3. New 1981 Positions: - Upland Rice (two positions)	255,000
4. Capital Items (glasshouse)	70,000
5. New 1981 Position: - Tropical Pastures (one position)	66,000
6. Academic Scholarships	223,000
TOTAL	966,000

The modified *Table 1* also shows revised projections for 1982-1984. These are highly tentative and will require further management and Board deliberation on program content, as well as consultation with the CGIAR Secretariat on estimates for price changes. The projections have been revised on the assumption that 1981 will be a "no growth" year, after which planned growth will be resumed, but without the accelerated growth required to restore the development rhythm within the previously budgeted time frame. Since the previous projections were made on the basis of the draft long-term planning document, there is no reason to change the basic assumptions. What has been done, therefore, is to use 1982 to restore activities to the level previously planned for 1981 and to project new activities planned for 1982 and 1983 to one year later, respectively.

CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL

SUMMARY OF MAN-YEARS AND COSTS BY PROGRAM AND ACTI

REVISED TABLE - C.G. RECOMMENDATIONS

	ACTUAL EXPENSES						BUDGET							
	1978		1979		TOTAL		1980		1981		TOTAL		1982	
	M-Y	\$ 000	M-Y	\$ 000	M-Y	\$ 000	Revised M-Y	Revised \$ 000	Revised 1/ M-Y	Revised 1/ \$ 000	Revised 1/ M-Y	Revised 1/ \$ 000	Revised 1/ M-Y	Revised 1/ \$ 000
CROPS RESEARCH														
Office of the Director	0.8	166	1.1	216	1.9	382	1.0	265	1.0	289	2.0	554	1.0	295
Beans	9.4	1102	9.7	1354	19.1	2456	10.7	1548	12.0	1684	22.7	3232	12.0	1750
Cassava	7.9	939	9.0	1263	16.9	2202	10.0	1462	10.0	1544	20.0	3006	10.0	1595
Rice	2.0	204	2.9	367	4.9	571	3.0	449	3.5	565	6.5	1014	5.0	803
Genetic Resources	2.7	221	3.0	287	5.7	508	2.0	268	2.0	299	4.0	567	2.0	313
Laboratory Services		145		178		323	1.0	305	1.0	321	2.0	626	1.0	332
Stations Operations	1.0	444	1.0	594	2.0	1038	1.0	592	1.0	648	2.0	1240	1.0	666
SUB-TOTAL	23.8	3221	26.7	4259	50.5	7480	28.7	4889	30.5	5350	59.2	10239	32.0	5754
LAND RESOURCES RESEARCH														
Office of the Director	0.8	149	1.1	191	1.9	340	1.0	226	1.0	241	2.0	467	1.0	247
Tropical Pastures	15.6	1754	15.3	2255	30.9	4009	18.5	2511	20.0	2609	38.5	5120	20.5	2739
Carimagua		264		465		729		438		472		910		481
Data Services	1.0	225	0.6	324	1.6	549	1.0	423	1.0	435	2.0	858	1.0	437
Ecosystems Research														
SUB-TOTAL	17.4	2392	17.0	3235	34.4	5627	20.5	3598	22.0	3757	42.5	7355	22.5	3904
Swine	2.0	179	2.0	209	4.0	388	-	-	-	-	-	-	-	-
TOTAL RESEARCH Of which Regional and Liaison Services	43.2	5792	45.7	7703	88.9	13495	49.2	8487	52.5	9107	101.7	17594	54.5	9658
INTERNATIONAL COOPERATION														
Office of the Director	1.0	108	1.0	135	2.0	243	0.6	108	1.0	161	1.6	269	1.0	169
Training and Conferences	1.5	679	1.3	819	2.8	1498	1.0	902	1.0	805	2.0	1707	1.0	1290
Communication Support	2.5	427	2.5	577	5.0	1004	2.4	765	3.0	844	5.4	1609	3.0	893
Documentation Services	1.0	318	1.0	403	2.0	721	1.0	472	1.0	486	2.0	958	1.0	492
TOTAL INT'L. COOP.	6.0	1532	5.8	1934	11.8	3466	5.0	2247	6.0	2296	11.0	4543	6.0	2844
ADMINISTRATION														
Board of Trustees		40		47		87		44		46		90		48
Director General	1.0	138	1.0	163	2.0	301	1.0	178	2.0	230	3.0	408	2.0	231
Controller	1.0	343	1.0	356	2.0	699	1.0	387	1.0	406	2.0	793	1.0	414
Executive Officer	1.0	445	1.0	492	2.0	937	1.0	558	1.0	591	2.0	1149	1.0	593
TOTAL ADMINISTRATION	3.0	966	3.0	1058	6.0	2024	3.0	1167	4.0	1273	7.0	2440	4.0	1286
GENERAL OPERATING EXPENSES														
Physical Plant		750		845		1595		915		974		1889		995
Motor Pool		433		503		936		572		619		1191		658
General Expenses		504		576		1080		729		801		1530		909
TOTAL GENERAL OPERATING	1687		1924		3611		2216		2394		4610		2562	
OTHER														
Contingency								247		149		396		163
Provision for Price Changes										1892		1892		4840
TOTAL CORE	52.2	9977	54.5	12619	106.7	22596	57.2	14364	62.5	17111	119.2	31479	64.5	21353
TOTAL SPECIAL PROJECTS	1306		1782		3088		2000		2750		4750		1500	
CATEGORIES OF EXPENSES														
Personal Services		7230		9012		16242		10349		10988		21337		11754
Supplies		1012		1311		2323		1440		1511		2951		1623
Services		835		929		1764		1116		1192		2308		1295
Travel		693		1004		1697		755		820		1575		941
Equipment		72		242		314		306		400		706		556
Other		135		121		256		151		159		310		181
Contingency								247		149		396		163
SUB-TOTAL	9977		12619		22596		14364		15219		29583		16513	
Provision for Price Changes										1892		1892		4840
TOTAL CORE	9977		12619		22596		14364		17111		31475		21353	