

DEPARTMENT OF STATE  
AGENCY FOR INTERNATIONAL DEVELOPMENT  
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Mr. John Nickel, Director General  
International Center of Tropical Agriculture (CIAT)  
Cali, Colombia

DEC 31 1975  
ORF

Subject: AID Grant No. AID/ta-G-1269  
PIO/T No. 3168627

Dear Mr. Nickel:

931-11-195-1111

Pursuant to the authority contained in the Foreign Assistance Act of 1961, as amended, the Agency for International Development (hereinafter referred to as "A.I.D." or "Grantor") hereby grants to the International Center for Tropical Agriculture (hereinafter referred to as "CIAT" and/or "the Grantee") the sum of one million seven hundred thousand dollars (\$1,700,000) in support of your program to be conducted in Calendar Year 1976. The objective of this program is to accelerate agricultural and economic development and to increase agricultural production and productivity to improve the diets and welfare of the people of the lowland tropics with special emphasis on Latin America.

The funds being contributed under this grant, along with contributions from other specified donors, will enable CIAT to direct concentrated effort toward agricultural and economic development of countries of the lowland tropics, with development expressed in improvements in real income and equitable distribution of this income within the society.

This grant is effective as of the date of this letter and shall continue in effect through December 31, 1976. Funds granted hereunder shall apply to specified costs incurred during the period January 1 through December 31, 1976. Funds provided by this grant are to be used exclusively in support of CIAT's core budget which is set forth as part of the total Calendar Year 1976 operating budget, attached hereto and made

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CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL  
(CIAT)

Program Description

January 1, 1976 through December 31, 1976

A. Program Objectives

The mission of Centro Internacional de Agricultura Tropical (CIAT) is to accelerate agricultural and economic development and to increase agricultural production and productivity to improve the diets and welfare of the people of the lowland tropics, with special emphasis on Latin America. CIAT works in concert with governments, educational and research institutions, and private enterprise.

CIAT seeks maximum results in minimum periods of time. Its operations are characterized by multi-disciplinary approaches, concentrated thrusts, cooperative efforts with national and private entities, and numerous efforts to demonstrate and multiply results.

While CIAT attacks the problems of crop and animal production necessary to increase the quality and quantity of food available, it also is concerned with economic development and reduced production costs leading to improved buying power so that urban residents may purchase and thus benefit from the increased production of food.

In its operations, CIAT seeks (a) to be catalytic in the agricultural and economic development of the tropics; (b) to establish and demonstrate a pace-setting level of program excellence; (c) to collaborate and cooperate with national institutions throughout the lowland tropics on research, educational, and extension programs and to facilitate the development of cooperating networks among these institutions; (d) to maintain mutually complementary programs and relationships with other international centers and regional organizations, and (e) to establish and maintain cooperative linkages with agricultural research and training institutions in the developed countries.

CIAT's primary areas of research are beef cattle, cassava and field beans. It also has modest rice and maize programs, strongly linked with IRRI and CIMMYT, respectively. Finally it has a program of limited scope on swine, primarily concerned with training and collaboration with national programs in the areas of management and nutrition.

CIAT concentrates on the agricultural problems of the tropical lowland areas below 3,000 feet elevation and with particular emphasis, initially, on the lowland tropics of Latin America. The general activities of CIAT are designed:

1. To develop and demonstrate new technology to increase the productivity of specific crops and animals selected for their importance in the American tropics.
2. To develop information and practices for use in bringing into economical production specific lowland areas not presently developed or fully utilized.
3. To develop and demonstrate effective techniques and strategies for the rapid spread and adoption of improved varieties and agricultural practices.
4. To help national institutions to develop staffs and programs, so that these may handle more effectively present and future research and educational tasks.
5. To provide an information center to process and exchange data and references relevant to the agricultural and economic development of the lowland tropics.
6. To provide a facility to collect, preserve, supply, and exchange plant and animal germplasm.
7. To provide opportunities for the further training and development of professionals and non-professionals in agriculture at CIAT and elsewhere with specific emphasis upon raising the level of expertise of the indigenous human resources within the context of existing institutions.

## B. Location of Program Activities

Because of the diverse nature of the lowland tropics, CIAT plans from the beginning recognized the inability of undertaking problems significant to the lowland tropics at a single location. The process of choosing a headquarters site also included consideration of means of doing research in other environments, each of which would be representative of an extensive area of the lowland tropics.

The Board of Trustees subsequently authorized CIAT management to place core research and training activities at such locations in Colombia as would best satisfy the needs. Through cooperative arrangements with the Instituto Colombiano Agropecuario (ICA), the Colombian Institute of Agriculture, CIAT has established research activities in two lowland tropical environments quite different than those of the headquarters site. One of these is at the Carimagua Research Station of ICA in the eastern plains in an area of extremely infertile, extremely acid soils typical in varying degrees of some 700,000,000 hectares in Latin America. The other at the Turipana Research Station of ICA, is representative of many coastal plain areas in Latin America.

In addition, CIAT and ICA collaborate on several projects at the Palmira Research Station of ICA immediately adjacent to the CIAT headquarters farm.

At these locations, ICA and CIAT collaborate directly on certain experiments and projects of CIAT.

More recently, some commodity programs of CIAT, particularly cassava, field beans, rice and maize, have placed some experiments in farmers' fields to test new varieties and practices under a range of environmental conditions. This also provides opportunity to identify problems specific to certain environments.

Characteristics of the three principal sites of CIAT activities in Colombia are as follows:

Palmira (Headquarters) -- 3°30' North, 76° West; average temperature, 24°C; 1,006 meters elevation; annual rainfall

1,124 mm., with two dry, two wet seasons; soils of the Cauca Valley are among the most fertile in the tropics, the major problems being high pH associated with poor drainage, and micronutrient deficiencies.

Carimagua -- 4°30' North, 71°31' West; average temperature 27°C; 50 meters elevation; annual rainfall 1,900 mm., with heavy rains from April to December, and a definite dry period from mid-December to the end of March; soils are sedimentary oxisols, highly acid (pH 4.2 to 4.3), high in exchangeable aluminum.

Turipana -- 8° North, 76° West; average temperature 27°C., 12 meters elevation; annual rainfall 1,233 mm, with definite wet and dry seasons — heaviest rains in the period May to November, a distinct dry period from December into March; soils on the station are potentially productive given adequate drainage and supplemental irrigation in the long dry season. This station serves a diverse coastal plains area of some 132,000 square kilometers. The soils in the gently rolling plains lack fertility and are acid; soils of the alluvial river valleys are fertile, but drainage problems, salt, and micronutrient deficiencies often limit production. Temperatures in the area range from 27° to 35°C, and rainfall from 400 to 1,500 mm.

### C. Specific Activities

#### 1. Beef Production Systems

The overall program objective contributes to the agricultural and economic development of the lowland tropics through the development of beef cattle based farming systems using grasslands that are not presently suitable for crop production, and using feedstuffs that are not destined for consumption by humans or non-ruminants.

The specific program focus is on the extensive latosol grassland areas (approximately 250,000,000 hectares) in the Llanos of Venezuela and Colombia, Campo Cerrado of Brazil, Beni of Bolivia, as well as similar lands elsewhere. These soils are generally infertile, and many have limited potential for commercial crop production.

CIAT'S principal field program is located at the Carimagua station of the Instituto Colombiano Agropæuario in the heart of the Eastern Plains of Colombia frequently referred to in

this document as the Llanos Orientales.

Marked increases in cattle productivity have been obtained through the use of improved grass and legume-grass pastures at Carimagua. In the rainy season, weight gains on molasses grass (*Melinis minutiflora*), a pioneer improved grass, have been four to five times greater than on native grass. However, even higher weight gains of 200 kg/ha/yr have been obtained on stylo (*Stylosanthes guyanensis*) - grass based pastures, as compared to 20 kilograms on native grass. Stylo, a tropical forage legume, is much higher in protein than grasses, is drought resistant, and with soil Rhizobia can symbiotically fix atmospheric nitrogen in the soil. During the dry season, cattle on stylo-based pastures gained weight (310 to 370 gm/head/day) whereas cattle on native and improved grasses lost weight (202 to 610 gm/head/day).

Supplementation often increases productivity and profit in latosol grass-land areas. Complete mineral supplementation has increased calving percentages of cows grazing native grass by 50-75 per cent (from 58-69 to as high as 103 per cent). All native and improved grasses grown in these latosols, as well as Stylo, are deficient in phosphorous. Protein supplementation during the dry season enabled steers grazing molasses grass pastures to gain weight (10 kilograms) while non-supplemented steers lost weight (55 kilograms).

Early weaning of calves at 2 1/2 months enabled cows grazing native and molasses grass pastures (on a marginal plane of nutrition) to rebreed. All early weaned calves are healthy and nearly as heavy as nursing calves.

Health status also limits productivity. Survey teams have encountered the breeding diseases brucellosis, leptospirosis and infectious bovine rhinotracheitis in the Llanos Orientales. Incidence of the hemoparasite diseases anaplasmosis and babesiosis has been variable, with anaplasmosis being generally endemic and babesiosis being spotty. In the North Coast, with higher cattle densities, both hemoparasite diseases appear to be highly endemic. Wild animal populations are being checked to determine potential health hazards to man or cattle.

The economists have concentrated on determining the economics of beef production systems in latosol grassland areas. Model simulation studies indicate good returns to low cost inputs that can be applied in the short term such as mineral supplementation. These studies also indicate that the establishment of improved pastures, a higher cost input, is economically viable, even though temporary negative cash flows are to be expected. Other activities have included a regional workshop on economic aspects of the livestock sector in Latin America, and a bench-mark study of the livestock sector in collaboration with national institutions in Peru and Ecuador.

A prototype of a family farm unit has been established to provide data and experience on how to make available technology work for small farmers in areas such as the Llanos Orientales. It included a component to produce food for farm family and feedstuffs for minor species, and a beef cattle component as the principal commercial part of the enterprise.

Work at CIAT, Palmira, as related to the development of highly intensified systems for small farm units in fertile soil areas indicates that live weight gains of (2500 kg/ha/yr) can be produced with fertilized and irrigated elephant grass.

A seminar sponsored by CIAT on potentials for increasing beef production in the American tropics was attended by 261 beef production specialists from Latin America and other parts of the world.

CIAT contemplates limited expansion of its operations at Carimagua. Projects to be initiated or to be expanded in 1975-76 include a) increased attention to seed production of the Stylo legume, b) use of the Stylo legume and non-protein nitrogen supplements to correct protein deficiencies of dry season grasses, c) plant nutrition studies as related to pastures and food crops, d) soil microbiology studies with tropical forage legumes, e) second herd systems project to determine fertility and growth rate of beef cattle in life cycle production systems using native, improved grass and grass-Stylo legume pastures, f) mineral nutrition of cattle, g) animal health investigations relating to the role of ticks as reservoirs and vectors of disease and h) survey of family farms in the Carimagua area by the economic:

group, with subsequent pilot testing of technology packages with farmers.

In turipana, activities in pasture establishment and weed control will be reduced, animal health investigations will continue, and an investigation on milk-beef production in beef cattle herds, initiated in 1975, will be continued into 1976.

Expanded work programmed at the CIAT Center will be principally as related to the Carimagua program, i.e. seed production, plant nutrition, soils microbiology, early weaning of calves and tick investigations.

## 2. Swine Production Systems

The future impact of the swine program will depend to a major degree upon the number of trained research and extension workers available to develop and transfer new technology to the farmer for application for more efficient and increased production. If Technology advances are to be converted into production increases, each country or region will need scientists with a background and understanding of production-oriented research. The small number of well trained swine production and research scientists available in Latin America for accomplishing this task requires that major emphasis be given to the training of teams of swine specialists to meet this need. Whereas previously primary emphasis has been given to the development of new technology and secondary emphasis to the transfer of this technology, in 1975 and 1976 the emphasis will be revised. The number of swine production and research trainees will be significantly increased to more rapidly meet the needs of national teaching, research, extension and development institutions working with swine. It is proposed that this be accomplished by the establishment of a new Swine Production Training Course to train swine specialists. The increased training capability will be provided by substantial support from the Training Program and by internal shifts in senior staff time allocations.

The 100 million head of swine in Latin America play a role in the agricultural economy of both small and large farms and provide animal protein for humans. The outlook for improving swine production and thus total availability of pork is based on the knowledge that swine production efficiency is low (extraction rate less than 50 per cent compared with an efficient rate of 160-170 per cent) and that it can be improved significantly through proper and adequate use of available feeds, genetic improvement of existing breeding stock and prevention and control of disease and parasites. Significant improvements and increases in swine production are possible through increased efficiency and without an increase in the present swine population and to some extent the present level of feedstuffs being utilized.

With the development of effective swine production systems based on by-products and available feed resources, during 1975-1976 a major shift in program emphasis will be made. It is recognized that the transfer and application of new technology development at CIAT and at other institutions will require the training of large teams of swine production and research specialists capable of demonstrating and teaching these new production systems to farmers and of solving local production problems. Major priority will be given to the selection and training of swine production and research teams for countries or regions where the technological and economic feasibility of swine production has been established and where regional and national institutions have given priority and support for development.

The research program will continue to concentrate on the solution of production problems that are shown to limit economic swine production in the regions with production potential that are selected and supported by national institutions. The research program, along with local field studies, will serve as training grounds for swine production and research trainees. In addition the program will continue to seek to develop new and innovative production systems that will improve efficiency and economy of production. A prime example of the latter will be the local testing of the cassava fermentor and the evaluation of the fermentation product as a protein source for swine feeding.

Efficiency in technology transfer will require that regions of present and future swine production potential be identified and that priorities for providing training and technical assistance for national programs involved in the development of this potential, be established.

### 3. Cassava Production Systems

The cassava program has continued work aimed at producing the technology for increasing cassava production and utilization with limited inputs. The ideal plant type for CIAT conditions is now nearly defined and work will concentrate on the adaptability of the ideotype. Control methods for bacteria blight have been developed and proved successful under field conditions whilst some resistance to all major disease has been found. Similarly varieties resistant to most of the major insects have been encountered. Fortunately, in the case of thrips, resistance is found in potentially high yielding types. The hornworm attacks all varieties and can be devastating, however, biological control measures are being developed. Work in pathology and entomology will continue to develop screening methods, screen new hybrids and where resistance cannot be found develop other control measures.

The methodology of breeding has now been determined and more than 30,000 seedlings are being produced each year. These crosses aim to produce high yielding, disease and insect resistant varieties of high quality that can be harvested easily. Up to 500 promising lines will be placed in replicated yield trials in CIAT and observational yield trials on the acid soils of the tropics and poor sandy soils. From these a small number of elite varieties will be tested under farmers' conditions in fourteen locations in Colombia. The best of these lines will enter an international testing program.

A recent workshop has formed the basis of the international testing network. Representatives from Brazil, Peru, Ecuador, Venezuela, Guatemala, Mexico, India, Indonesia, Malaysia, Thailand and the Philippines defined the modus operandi of the network for genetic exchange and testing. Discussions have

also been held with IITA scientists and officials on means of strengthening cooperation between CIAT and IITA on Cassava research.

The agronomy section is heavily involved in the germ-plasm testing and cultural practices are not receiving the attention they warrant. Beginning in 1976 more emphasis will be placed on providing information in the cultural needs of the new varieties. In conjunction with the agronomy section the soils group is developing fertilizer practices and methods of alleviating minor element disorders in the vast areas of alluvial soils where much cassava is presently grown. Yields of over 20t /ha have been obtained in these very infertile soils.

While the entire Cassava Production Systems team will be concerned with the development of new technology which will be viable under real farming conditions, and useful on farms of various sizes, the Economists working together with the Outreach Production Agronomists (see below) will be particularly active in ensuring that new technology being developed is done so with the knowledge of how well it will fit into the larger mix of farming practice, and seeing to it that this technology is validated at the farm level under various ecological and socio-economic conditions.

Weeds have been shown to depress yield severely, however, control methods either using labour or chemicals have been developed. In the future the entomologist will be responsible for developing integrated crop production technology.

Many of the decisions for resource allocation are based on an agro-economic survey of cassava production being made in Colombia. When completed the economics group will evaluate new technology, study its impact and help define policies which should be followed by national agencies to assist in stabilizing markets.

One of the methods of preventing marked fluctuations in price is to reduce the perishability of a product; a method of storing cassava in boxes was developed in a joint CIAT/TPI project. Further cooperation with TPI is planned to formulate simple on-farm drying systems. These activities are special project funded.

As the program develops, cooperation between national agencies increases the available information on cassava. The documentation service continues to provide resumes of work on cassava. At the same time the program is developing more intensive training programs to provide people to reinforce national agencies. Last year 20 Brazilians were trained in cassava research methodology.

The development to date is better than had been expected and we believe that the first varieties produced by CIAT will be on a number of farms in various countries within five years, thus contributing to overall cassava production.

Discussions are underway with IDRC on major support for outreach activities of the Cassava Program. In addition to special project-funding for a broad range of training activities in cassava, it is expected that two Outreach Production agronomists will work with national programs in the organization of coordinated trials to evaluate and disseminate promising new varieties and other technology developed at CIAT under local conditions.

#### 4. Bean Production Systems

Dry beans are an important component of the human diet in Latin America, nearly 35% of the world production occurring in this region. Yield levels are low (550-1200 kg/hect), especially among hillside farmers with low credit or technological inputs. The major objective of the CIAT bean program is to increase this yield both for the "campesino" farmer and for those areas of Colombia, Peru, Chile, Brazil, etc. where some technological inputs are available.

Short term yield increases are expected from practices minimizing yield variation. Thus an initial emphasis has been the development and distribution of disease free seed and the recommendations needed for disease and pest control. Using disease free seed, farmers in one area of Guatemala tripled seed yields. ICTA (in collaboration with CIAT) has more than 500 tons of seed now available for distribution. Varietal materials from other countries are also being cleared. Pesticide recommendations for various regions are almost complete and will be deemphasized in future studies.

The long term improvement in yield will come from varietal improvement and the incorporation of resistance factors into promising materials. The initial step, the evaluation of germplasm material, is progressing rapidly. Varieties resistant to web-blight, common mosaic virus, rust, bacterial blight and anthracnose and empoasca, have been identified and breeding for both horizontal resistance and for combination of different disease resistances within a single variety are underway. Agronomically promising varieties have also been identified and studied in replicated yield trials over several locations. Yields averaging 3 tons/hect were obtained in Popayan and Ecuador, while individual plot yields topped 4 tons. Climbing beans particularly showed promise with several varieties topping 5 tons/hect and with a maximum yield under high intensity planting of 5.8 tons/hect. Breeding among high yielding varieties is proceeding.

The program hopes to make promising materials available to national programs as soon as possible, and is cataloguing its germplasm data, and maintaining a data information retrieval system. Rust resistance nurseries and international yield trials, to be initiated in 1975-76, will promote germplasm transfer.

The task of developing and validating technology which can make a major impact at the farm level, with special concern for small or low income farmers, will be the responsibility of each member of the Bean Production Systems team. However, the Agronomist, the Outreach Production Agronomist and the Economist will have special responsibility to work together with national programs to ensure full integration of these efforts and concerns, from the laboratory to the farmers' fields.

In response to the TAC request, the program has initiated some of the activities required by a collaborative bean research network. Specific activities have included:

- a) A workshop to review the bean program and the relevance of its research in relation to Latin American problems was held in October 1974. A technical committee in which the majority of members are Latin American scientists has been elected to advise and review the program. Additional information on research needs and

priorities will come from agroeconomic surveys currently underway in Colombia but to be extended in 1975-76 to two other countries.

- b) A rust resistance Workshop considered rust symptomatology, and devised standard methods for screening material for rust resistance; 108 varieties are included in the original rust nursery.
- c) A documentation service has been initiated with cards forwarded to 200 scientists in 29 countries. More than 1000 articles have been abstracted to date.
- d) Collaborative experiments are underway in four countries and are to study CIAT developed technology for relevance to particular ecological conditions.
- e) A program document has been prepared and will be distributed to national programs as a guide to the functions and services CIAT can offer. Close contact between CIAT and national programs especially in the training area, will need to be an essential part of the research network activities.

The CIAT rice breeder and agronomist, cooperating closely with the Colombian ICA rice program, have successfully modified and developed new technology for traditional tropical American conditions. Large quantities of seed of four new dwarf varieties have been released internationally, including IR8 and IR22 from Asia and CICA 4 and CICA 6 developed in Palmira.

Massive training of personnel of national programs from essentially all countries in the hemisphere has given the

necessary linkages to farmers. Farmer acceptance of the new technology and resultant increases in production have been spectacular. Data from Colombia indicate: 98 percent adoption of new varieties in the irrigated sector, an increase of 2.4 tons per hectare to 5.4 T/ha, a marked area increase in the irrigated sector with a corresponding decrease in upland area, and an approximate doubling of national production since the program began. Substantial gains have occurred in Peru, Ecuador, Venezuela, Cuba, Mexico and portions of Central America. This technological change has resulted in higher output, changes in pattern of rice trade, and regional shifts in production. A study is currently underway to examine the economic impacts of these changes, with special attention to Colombia where the changes have been among the most dramatic. It is envisaged that by identifying the distribution of the benefits between classes of consumers and producers, and the impact on the rice exporting potential of the region, some general guidelines should emerge for the future direction of rice research to ensure that full advantage of the new materials continues to be achieved.

Special project funds are being sought to place outreach production specialists in Central America and in the southern cone of South America to evaluate, adapt and promote utilization of rice technology developed at IRRRI and CIAT in these regions of high potential for utilization of this technology for increased rice production.

The countries that have widely adopted the new technology will soon experience difficulty in achieving additional increases in productivity because: a) the area of adoption already is large and b) average yields are extremely high.

Modest gains might be expected through the release of blast resistant varieties and through improvement in weed control. These are paramount program objectives at present.

Massive increases in productivity are possible in the traditional rice areas of the countries which have not adopted the new technology. It is considered that stagnancy in

productivity in these countries is not due to inadequate technology. Rather, the solution appears to lie in training, demonstration, and stimulation of local rice workers. To this end a second agronomist has been projected for 1977 in effect to bring semi-tropical Latin America to level of productivity now experienced in northern South America through Mexico.

Perhaps the most attractive opportunity for increased rice production in the Americas is the exploitation of the enormous idle land and water resources in the humid tropics. Modified Asian technology developed at CIAT is the key to opening these areas to rice culture. This new technology, requires further modification but has been proved on large scale commercial plantings. To polish the new modified Asian system and to prepare for country production programs tied to CIAT and IRRI, the CIAT Agricultural engineer was assigned full time to the rice team in 1975.

#### 6. Maize Production Systems

The joint CIMMYT-CIAT activities aimed to increasing maize yields in the Andean region and northern Brazil will be conducted in accord with the following principles:

- a. That maximum emphasis is placed upon strengthening national programs and their staffs; that research to benefit the Andean region should be conducted as far as possible, on a collaborative basis, within national programs, and that local scientists be asked to share in the planning and execution of regional services.
- b. That services provided by CIMMYT-CIAT should pool the strong points of the two centers -- particularly CIAT's regional emphasis and CIMMYT's global leadership on maize.
- c. That CIMMYT and CIAT use these joint Andean services as a demonstration of intercenter relations, in order to establish a pattern of cooperation for wider application to other crops, and other areas.

The activities of this program will be as follows:

- a. A CIMMYT-CIAT team of two maize scientists will be stationed at the CIAT headquarters, and devote full-time to services which will strengthen national maize programs of the Andean region, including:
  - consulting with national programs regarding their production problems and their research and extension programs for the maize crop.
  - Helping plan and carry out training programs with the staffs of national maize programs, including the promotion of a workshop among maize workers of the region, annually or every two years.
  - Coordinating development of uniform nursery trials and analyzing the data if necessary.
  - Promoting the participation of Andean scientists in the above activities, including arrangements for mutual consultation among national programs' personnel.
  - Producing a regular information document summarizing maize research in the region, emphasizing the collaboration between the CIMMYT-CIAT team and national programs.
- b. A CIMMYT-CIAT maize breeder will be stationed in one of the four Andean countries which produce highland floury maize, to devote full-time to breeding and outreach work on floury maize.
- c. Training in maize production research will be divided among CIMMYT, CIAT, and national programs in order to take full advantage of all available resources, including:

- Researchers in maize will receive in-service training at CIMMYT in order to benefit from the multi-disciplined research program for both lowland and highland crops.
- Both CIMMYT and CIAT will participate in the training of production agronomists, with emphasis on training within national programs.

## 7. Small farm Systems

Since the earliest stages of CIAT's program development, there has been a recognition of the need to ensure that technology developed at CIAT be useful to and adopted by the small or low-income farmers. It was acknowledged that many crops in tropical developing countries, especially in the subsistence agricultural sector, are not grown in monoculture and that animals often form part of the enterprise mix. Further, it was recognized that there are often great differences between what can be accomplished under the controlled conditions of experiment stations and what is possible under real farming conditions. For these reasons, a continuing attempt has been made to incorporate some mechanism for validating the CIAT technology under real farming conditions and to stimulate inter-program cooperation.

Several structures have been attempted to deal with this complex set of issues and concerns, the most recent of which has been CIAT's Small Farm Systems Program. When it appeared that this experiment was not likely to achieve success in this important field, the Executive Committee of CIAT's Board of Trustees asked the Director General to thoroughly review this program and make specific recommendations regarding the future organizations of these types of activities. In order to accomplish this task, the Director General called a two-day workshop at which a number of distinguished specialists in this field from outside of CIAT, and a selected group of scientists from within CIAT, were asked to carefully consider the objectives, end-products, clients, activities and organizational relationships of CIAT's activities related to the concerns for which the Small Farm Systems Program had been established. A four man task force was named to participate in the Workshop and, following the

Workshop, to draft a set of recommendations for the Director General to utilize in making his final recommendations to CIAT's Board of Trustees. With some slight modifications, the recommendations of the Task Force were incorporated into the Director General's recommendations, which were thoroughly discussed and approved by the Program Committee and, subsequently, by the full Board of Trustees. In summary, these recommendations were as follows:

- a. That evaluation of new technologies and studies of their adoption should be an integral part of the activities of CIAT's main commodity programs.
- b. That this research should be carried out by biologists and economists working within the Commodity teams, and not by staff from a separate systems program unit.
- c. That each of the major commodity programs should have assigned to them, on a full time basis, a Production Economist and an Outreach Production Specialist, whose terms of reference would be defined to cover the activities proposed in recommendations 1 and 2 above. The economists' role should be primarily at the micro-economic level and their activities should be primarily concerned with the adoption and evaluation of new technology. The outreach production specialists' role should be to provide the technical input to these activities as well as delivery of CIAT's technologies to national agencies.
- d. That an Agricultural Production Systems Coordination Group be established, made up of the Associate Directors General for Research and International Cooperation along with the Economists and Outreach Production Specialists mentioned above, and the center's Biometricians to maintain an overview of the activities and results of the various commodity programs, with particular reference to the validation and adoption of technology developed in these units. The group will advise the program leaders of possible modifications in their activities and the nature of the technology generated

to ensure that the concerns described below are dealt with as effectively as possible within the commodity programs. The Group will also identify additional activities along these lines which should be conducted by the Special Studies Unit, as well as coordinate inter-program collaboration on research pertaining to mixed-cropping and mixed-farming.

- e. That a Special Studies Unit be established under the Associate Director General for Research to conduct studies of an exploratory nature, or of a broad inter-program nature, which cannot be well dealt with within the Commodity Programs. These will include inter-cropping, mixed-farming, and socio economic studies.

These recommendations will result in the discontinuation of the Small Farm Systems Program as a separate unit. In doing so it must be emphasized in the strongest terms that CIAT will continue to strive to:

- a. Be responsive to welfare issues as well as production goals.
- b. Be concerned with farming as an integrated system.
- c. Be concerned with rapid adoption of improved technology in a manner which will reduce, or at least not exacerbate, income inequalities.
- d. Insure that new technology developed at CIAT is directly useful in, or can be adapted to, various ecological zones within our area of responsibility.
- e. Insure that new technology will be viable under the conditions of real farms of various sizes.
- f. Maintain a special concern for small or low income farmers.

We believe these concerns can best be dealt with by vertical integration of the Commodity Programs rather than to continue the attempt at horizontal integration through a separate systems program. This will insure that the job of developing and validating technology for the small farmer and concern for improving the welfare for the poor, users and consumers alike, will be the job, not of a special team, but of every member of staff.

### 8. Training and Conferences

Facilities and available staff time impose definite restrictions on the overall operations in Training and Conferences. The present capacity for housing trainees at CIAT is 80, while the conference housing maximum is 64. While larger conference groups can be handled by booking rooms in Cali, available air-conditioned facilities limit groups to a maximum of 200.

Scientists in the commodity programs must budget their time between research, training, conference participation, and travel and consultation in other countries. As more trainees complete programs at CIAT, the need increases to provide followup support in the countries. Successful establishment and continuance of in-country training efforts depends on CIAT's abilities to supply temporary instructors and increased amounts of training materials. Growing emphasis on socio-economic issues involving CIAT commodities emphasizes the need for greater inputs from this area into the training programs.

Finally, a pace-setter for training and conference activities in the future is the developing of outreach programs, and every effort is being made to maintain flexibility so as to be able to respond in this area effectively and promptly.

#### Training for Research and Production

Training activities at CIAT provide learning experiences for professionals, some to conduct production-oriented research in their own organizations, while larger numbers become crop or animal production specialists, helping to translate and communicate new agricultural technology.

Of immediate concern is the preparation of individuals to accelerate research on and the application of new technology in their own countries. These trainees help CIAT to develop effective links for the exchange of knowledge about agricultural

problems and their solution and eventually, to build and strengthen effective networks for research and communication among scientists.

The longer-term goals are to increase the numbers of research workers, educators, and extension specialists with competency to identify and solve production problems and the ability to communicate these solutions to farmers and others. CIAT's continuing training role is to provide counsel and assistance where appropriate, to train cadres of individuals to staff existing and new training operations within countries, to offer opportunities for specialized or refresher training for selected individuals, and to help the various institutions develop more adequate resources of teaching and reference materials.

During 1974, 160 persons from 22 countries were enrolled, including 43 as postgraduate interns in research, 62 as production specialists, 19 as master's degree students, 15 working on doctoral dissertations, and 21 special, short-term trainees.

Performance of CIAT trainees after return to their own countries and work organizations and growing awareness of CIAT throughout the world has influenced significantly the growth of the training program, the kinds of persons applying for training, and availability of support for trainees. Of the 160 persons enrolled in 1974, only 62 were supported by CIAT funds directly. Other principal sources of support were the Interamerican Development Bank, 25, and national interests of various countries, 36. More than 1,600 persons from many countries participated in some 25 international and national conferences, symposia, workshops and short courses.

Plans provide for training of the following categories of persons in 1976:

Post-Doctoral Fellows. CIAT established this category in 1975 with the objective of providing high level, advanced research experience in tropical agriculture for young scientists interested in careers in the tropics. Such a program as other centers already have demonstrated, becomes the principal source of experienced staff for outreach projects or to undertake major research programs in countries. CIAT expects

to identify other sources of funds so as to increase the numbers in this category, but for 1976 is budgeting \$74,000 which is expected to cover 3 1/2 man years of such training.

Post-Graduate Interns. These are young scientists, chiefly from Latin America and the Caribbean, who have completed undergraduate degrees in agronomy, animal science, or veterinary medicine. They receive on-the-job training in production system studies while serving as full-time research interns. Thirty-two man years of these interns are funded in the budget for 1976, at an average of \$4,000 each.

Production Specialists. CIAT presently is involved in the eighth and ninth courses designed to prepare agricultural production specialists for developing countries. Each year CIAT offers one course in livestock production, the other in crop production, depending upon demand and available funding. Costs of these courses have been supported, in the past, on a special project basis by the Interamerican Development Bank and other organizations.

The objective of these courses is to produce specialists with the scientific, technical, economic, farming and communication competencies necessary to diagnose production problems of a livestock enterprise, or a crop farm, prepared to work in the field as individuals or, more importantly, to establish and conduct training programs in their own countries.

While special project funding is contemplated for the bulk of the production specialist training in 1976, funds to cover up to 4 man years of such training (\$ 18,000) are included to cover enrollment of individuals who cannot be covered under the special project funding terms.

Research Scholars and Fellows. Allocations for these people will in future be used only for: a) continuation of scholars and fellows already enrolled; b) some scholarships for scholars and fellows to cover the research portion of their M.Sc. or Ph.D studies at CIAT; and c) in certain cases, scholarships for the course work portion of a scholar or fellow who will do his research at CIAT.

Other Trainees. CIAT maintains a flexible policy to provide unique training opportunities for young professionals from many lands. For example, through an agreement with Wageningen University in the Netherlands, fourth year animal science students come to CIAT for up to a year on-the-job experience in the management of animals and pastures under tropical conditions. A similar program has been initiated with Wageningen for students interested in rural sociological problems in the tropics.

Through informal arrangements with various universities, other graduate students may spend extended periods of time with CIAT working under the supervision of CIAT senior staff and on problems of direct interest to CIAT. CIAT limits its financial involvement to helping, where necessary, with the direct research expense.

#### Conferences and Symposia

CIAT facilities for conferences and symposia include an organizational staff, meeting rooms, equipment, housing, and feeding. Activities contemplated for 1976 and beyond include policy seminars for national leaders, scientific symposia and technical workshops for research workers, short courses for production specialists, and such other events as may be appropriate for representatives of various entities in the total agricultural development system.

The core budget includes funds to cover the staffing and operations of a small conference management and support staff. The staffing pattern for 1976 includes two professional simultaneous interpreters who between conferences translate manuscripts for conference papers, publications, and other materials.

In 1973, the Board indicated the desirability of putting more stability and predictability into the financial structure for conferences and symposia by providing core funds to support a limited number of scheduled events considered by the commodity program teams as instrumental to achieving the success of the respective commodity programs.

The amount included for core support in 1976 is \$161,000 plus the salaries of the staff. This covers the conference needs of CIAT's five commodity programs and, in addition, provides up to \$60,000 to finance the equivalent of three commodity or disciplinary short courses of 30 days each.

**D. Program Reports**

1. The following reports shall be prepared and submitted to A.I.D. as stated below:

a. One hundred (100) copies of the Comprehensive Annual Report on over all program and fiscal matters for the entire calendar year for which the grant was made;

b. Five (5) copies of the report prepared in connection with the annual International Centers Week. (This report will describe proposed program and funding requirements for the ensuing calendar year.)

c. Five (5) copies of such other reports may be prepared or requested from time to time on various other program activities.

2. Copies of the above stated reports <sup>at the numbers indicated</sup> shall be submitted to the Technical Specialist:

Dr. Guy B. Baird  
Associated Director Research  
Technical Assistance Bureau  
Office of Agriculture  
Agency for International Development  
Washington, D.C. 20523

Additionally, one copy of each report shall be submitted to the Grant Officer whose name appears on the grant.

3. The TA/AGR program specialist should be consulted on questions of a general program nature. He is

Mr. John W. Wiles  
Program Analyst  
Technical Assistance Bureau  
Office of Agriculture  
Agency for International Development  
Washington, D.C. 20523

4. Questions concerning the administration of the grant by its terms shall be addressed to the Grant Officer.

**Centro Internacional de Agricultura Tropical (CIAT)  
@ Net Financial Requirements  
CY 1976**

**By Expense Category**

**Amount**

Direct Research	\$3,189,000
Training and Conferences	751,000
Research Support Groups	599,000
Administration	778,000
General Expenses and Contingencies	1,064,000
Library and Information Services	513,000

	\$6,894,000
Sub Total	
Capital Expenditure	992,000

	7,886,000
Total	
Less income	350,000

\$7,536,000 required

**Sources of Funds**

United States (AID) - 22.6%	1,700,000
Belgium, Australia, Canada, Ford Foundation, Germany, IDB, IDRC, Kellogg Foundation, Rockefeller Foundation, Saudi Arabia, Switzerland, UNEP.	5,590,000*
Other	246,000

7,536,000

•@ Based on estimates available in October 75 and on consultations between AID and CGLAR in November 75.

\* Specific donations for those listed not confirmed at the time this budget was prepared (Nov. 75). It is estimated that 5.5 million is the minimum amount that will be approved by the respective governments/organizations.

TERMS AND CONDITIONS.

ARTICLE I. DEFINITIONS

These definitions are applicable throughout this Grant.

- a. "Grantor" shall mean the Agency for International Development, an agency of the Government of the United States of America.
- b. "Grantee" shall mean the organization or institution to which the Grant is made.
- c. "Grant Officer" shall mean the person executing this Grant on behalf of the United States Government and any other government employee who is properly designated Grant Officer; and the term includes, except as otherwise provided in this Grant the authorized representative of a Grant Officer acting within the limits of his authority.
- d. "Project Specialist" shall mean the person in the A.I.D. Scientific/Technical Office who has primary program responsibility for the Grant.
- e. "Local currency" shall mean the currency of the country in which activities under this Grant take place.
- f. "A.I.D." shall mean the Agency for International Development.
- g. "Administrator" shall mean the Administrator or Deputy Administrator of the Agency for International Development.
- h. "Government" shall mean the Government of the United States.
- i. "Mission" shall mean the United States A.I.D. Mission to, principal A.I.D. office or designated A.I.D. representative in, the country in which a program is being carried out.

ARTICLE II - ALLOWABLE COSTS

The Grantee shall be reimbursed for direct costs incurred in implementing the program supported by the Grant during its specified Calendar Year/CORE/Operating Budget provided such costs are incurred in accordance with the terms and conditions of said grant, including the attached budget, and are determined to be allowable, allocable and reasonable in accordance with the principles set forth in sub-part 1-15.3 of the Federal Procurement Regulations as in effect as of the period of this Grant.

ARTICLE III - ACCOUNTING, RECORDS AND AUDIT

The Grantee shall submit to the Grant Officer an annual financial statement certified by an independent public accountant. Financial records covering all phases of the Grantee's program, including documentation to support entries on the account records and to substantiate expenditures shall be maintained in accordance with accounting principles generally accepted in the U.S. and consistently applied, and shall be available for examination by personnel authorized by A.I.D. All such financial records shall be maintained for at least three years after final disbursement of funds under this Grant. The A.I.D. Auditor General and the Comptroller General or their duly authorized representatives reserve the right to conduct an audit of the Grantee's books and records to determine whether the Grantee organization has expended its funds in accordance with the terms and conditions of this Grant.

The Grantee agrees to make available any further information requested by A.I.D. with respect to any questions arising as a result of the audit.

ARTICLE IV - UNEXPENDED FUNDS AND REFUNDS

A. Funds granted hereunder but not disbursed to the grantee prior to the expiration of the period for which the grant is made or its termination shall revert to A.I.D. Any funds disbursed to but not expended by the Grantee or for which the Grantee has not incurred a legally binding obligation within the purpose of the grant and prior to expiration of the grant period or its termination shall be refunded to A.I.D.

B. If, at any time during the life of grant, it is determined by the Grant Officer that funds provided under the grant have been expended for purposes not in accordance with the terms of the grant, the Grantee shall refund such amounts to A.I.D.

C. Expenditures which may be disallowed at the time of final audit of the grant will be refunded to A.I.D.

D. If use of Grant funds results in accrual of interest to the Grantee or to any entity to which the grant funds are made available for carrying out the purposes of this grant, the Grantee shall refund to A.I.D. an amount equivalent to the amount of interest accrued.

ARTICLE V - TRAVEL AND TRANSPORTATION EXPENSES

Unless otherwise approved in writing by the Grant Officer, the reasonableness of expenses attributable to this grant for travel, related allowances, and shipping will be determined in accordance with the

Standard Government Travel Regulations in effect at the time the costs are incurred.

The Grantee agrees, when such costs are attributable to this grant, to use less-than-first-class transportation unless such use will result in unreasonable delay or increased costs. When travel by other than less-than-first class accommodations becomes necessary, the Grantee shall certify to the facts involved in the voucher or other documents retained as part of his grant records to support his claim for reimbursement and for post audit.

ARTICLE VI - LIMITATION ON TRANSPORTATION

A. All international air shipment of goods, attributable to this Grant, shall be made, to the maximum extent practicable, on U.S. flag carriers. When other than U. S. flag carrier is utilized, the Grantee shall certify to the facts involved in the voucher or other documents retained as part of his Grant records to support his claim for reimbursement and for post audit.

B. International Ocean Transportation. All international ocean transportation of persons and goods which is to be reimbursed in U.S. dollars under this grant shall be by U. S. flag vessels to the extent that they are available. With respect to the transportation of goods, where U. S. flag vessels are not available, or their use would result in a significant delay, the Grantee may obtain a release, in advance, from this requirement from the Resources Transportation Division, Agency for International Development, Washington, D. C. 20523,

giving the basis for the request.

ARTICLE VII - SALARIES AND WAGES

All salaries, wages, fees, stipends and allowances paid from funds provided by this grant shall be in accordance with the Grantee's usual policy and practice. Any deviations from Grantee's policy shall be documented and such documentation shall be retained as part of the grant records for audit by A.I.D. and/or the Comptroller General of the United States.

ARTICLE VIII - PROCUREMENT OF VEHICLES, EQUIPMENT, MATERIALS, SUPPLIES AND SERVICES

A. Except as may be specifically approved or directed in advance by the Grant Officer, or as may be provided in paragraph D, below, all equipment, vehicles, supplies and materials, the costs of which are to be attributed to this Grant and which will be financed with United States dollars, shall be purchased in and shipped from the United States and all services shall be obtained from U.S. sources. In addition, for any U. S. purchase transaction in excess of \$2,500, the Grantee shall notify the seller that the item(s) must be of U. S. source and production and comply with the componentry limitations and other requirements applicable to suppliers under A.I.D. Regulation 1, and that the supplier must execute and furnish Form AID-282 "Suppliers Certificate and Agreement with the Agency for International Development."

B. The Grantee shall obtain competition to the maximum extent practicable for any procurement the cost of which is not to be attributed to this Grant. Procurement by the Grantee without consideration of more than one source must be certified to and supported by adequate justification as part of the permanent grant records. In no event will any procurement be on a cost-plus-a-percentage of cost basis.

C. Procurements in-country, i.e., the country in which the Grantee's facility is physically located, which are less than \$2,500.00 and are for materials (regularly available and normally sold on the local market) which are to be consumed or expended in the performance of this grant, are exempt from the conditions set forth in Paragraph A. hereinabove, provided that the origin of such materials and supplies and the component parts thereof is a free world country as described in A.I.D. geographic Code 935."

D. Notwithstanding the provisions of paragraph A. above, an amount of up to \$           -0-           of grant funds provided hereunder may be used to defray expenditures for in-country costs of local source and origin for items such as local staff, local labor, and non-expendable supplies, materials, equipment, etc. For the purpose of interpreting this clause all bona fide employees of the grantee both local direct hire and the international staff are exempt from the above restriction on the use of grant funds.

ARTICLE IX - TITLE TO AND USE OF PROPERTY

Title to property such as vehicles, equipment, library acquisitions and other similar items purchased with grant funds vests in the Grantee institution. All such property must be used during the grant period for activities furthering the purpose of program for which it was purchased and may not be disposed of, provided it has useful life, without the prior written consent of the grant officer.

ARTICLE X - CAPITAL EXPENDITURES

A. Grant funds may not be used for new construction, alteration improvements to buildings, fixtures, or facilities without the prior approval of the Grant Officer.

ARTICLE XI - CONVERSION OF UNITED STATES DOLLARS TO LOCAL CURRENCY

Whenever practicable Grantee agrees to convert United States dollars to local currency through the United States Disbursing Officer, American Embassy. When circumstances, certified to by the Grantee, do not permit compliance with this procedure, the Grantee may convert U. S. dollars to local currency through any local bank or accredited financial institution.

ARTICLE XII - TERMINATION

This Grant may be terminated, at any time, in whole or in part, upon written notice from the Grant Officer to the Grantee. Upon

the Grantee's receipt of notice of such termination, it shall take immediate action to minimize all additional obligations financed by this Grant and shall cancel such unliquidated obligations whenever possible. No further reimbursement shall be made after the effective date of such termination, repay to the Grantor all unexpended portions of funds theretofore paid by the Grantor to the Grantee which are not otherwise obligated by a legally binding transaction within the purposes of this Grant. Should the funds paid by the Grantor prior to termination of this Grant be insufficient to cover the Grantee's obligations pursuant to the aforementioned legally binding transactions, the Grantee may submit to the Grantor within ninety (90) calendar days after the effective date of such termination, a written claim covering such obligations and, subject to the limitations contained in this Grant, the Grantor shall determine the amount or amounts to be paid by the Grantor to the Grantee under such claim.

ARTICLE XIII - OFFICIALS NOT TO BENEFIT

No member or delegate to the Congress or resident Commissioner shall be admitted to any share or part of the grant or to any benefit that may arise therefrom.

ARTICLE XIV - COVENANT AGAINST CONTINGENT FEES

The Grantee warrants that no person or selling agency has been employed or retained to solicit or secure this grant upon an agreement

or understanding for a commission, percentage, brokerage, or contingent fee except bona fide employees or a bona fide established commercial or selling agencies maintained by the Grantee for the purpose of securing business. For breach or violation of this warranty, A.I.D. shall have the right to cancel this grant without liability or, in its discretion, to deduct from the grant amount, or otherwise receive the full amount, of each commission, percentage, brokerage, or contingent fee.

#### ARTICLE XV - CONFLICT OF INTEREST

Other than in the performance of duty as specified by the Grantee in accordance with this grant, an employee or consultant assigned by the Grantee, whose expenses may be reimbursable hereunder shall not engage, directly or indirectly, either in his own name or in the name or through the agency of another person, in any business, profession, or occupation in any country to which he is assigned; nor shall he make loans to or investments in any business, profession or occupation in any country to which he is assigned.

#### ARTICLE XVI - SUBORDINATE AGREEMENTS

The placement of subordinate agreements, grants, or contracts (the costs thereunder which are attributable to this grant) with other organizations, firms or institutions is subject to the prior written consent of the Grant Officer. In no event shall any such subordinate agreement, grant, or contract be on a cost-plus-a-percentage-of-cost basis. Subordinate contractors (including suppliers) shall be

selected on a competitive basis to the maximum practicable extent consistent with the obligations and requirements of this grant.

ARTICLE XVII - PATENTS

Grantee agrees to notify the Grant Officer, in writing, of any invention or discovery conceived or first actually reduced to practice in the course of or under this grant. The Grant Officer will determine the patent rights to be afforded the Grantee in accordance with the Presidential Memorandum and Statement of Government Patent Policy (36 FR 16887).

ARTICLE XVIII - AMENDMENT

The Grant Agreement may be amended by formal modifications to the basic grant document or by means of an exchange of letters between the A.I.D. Grant Officer and an appropriate official of the Grantee.

ARTICLE XIX - GRANT AGREEMENT

The letter to the Grantee signed by the Grant Officer, and all attachments identified therein, which have been reviewed and agreed to by the Grantee, constitute the Grant Agreement.

ARTICLE XX - PUBLICATIONS

A. As agreed upon by A.I.D. and the Grantee, appropriate acknowledgement of A.I.D.'s support must be made in connection with the publication of any material based on activities conducted under the grant. The acknowledgement should also state that the information and conclusions in the paper do not necessarily reflect the position of A.I.D. or the U.S. Government.

B. TA/AGR will be informed of all publications and dissertations developed through Grantee's research program, and Grantee will provide at least two (2) copies of such publications as requested by TA/AGR.

C. The Grantee is permitted to secure copyright to any publication produced or composed under this Grant. Provided, the Grantee agrees to and does hereby grant to the Government a royalty-free, non-exclusive and irrevocable license throughout the world to use, duplicate, disclose, or dispose of such publications in any manner and for any purpose and to permit others to do so.

D. Nothing contained in this clause shall imply a license to the Government under any patent or be construed as affecting the scope of any license or other right otherwise granted to the Government under any patent.

ARTICLE XXI- NOTICES

Any notice given by any of the parties hereunder, shall be sufficient only if in writing and delivered in person or sent by telegraph, cable, registered or regular mail as follows:

TO A.I.D. : Grant Officer  
Office of Contract Management  
Central Operations Division  
Agency for International Development  
Washington, D. C. 20523

TO GRANTEE: At Grantee's address shown in this Grant, or to such other address as either or such parties shall designate by notice given as herein required.. Notices hereunder, shall be effective when delivered in accordance with this clause or on the effective date of the notice, whichever is later.

BEST AVAILABLE COPY

FEDERAL RESERVE LETTER OF CREDIT

FOR ADVANCE PAYMENT (APR. 1975)

(a) AID shall open a Federal Reserve Letter of Credit in favor of the Grantee in the amount of \$ 1,700,000 (for amending existing grants, add the word "remaining" here) available for obligation under this grant against which the grantee may present payment vouchers. The amount drawn by the grantee during any calendar (month or quarter) of this grant shall not exceed \$ 125,000 without the prior written authorization of the grant officer. The amount of the payment voucher shall not be in an amount less than \$10,000 nor more than \$1,000,000 but within the specific dollar ceiling on (monthly or quarterly) withdrawals.

(b) In no event shall the accumulated total of all such payment vouchers exceed the amount of the Federal Reserve Letter of Credit.

(c) If at any time, the grant officer determines the grantee has presented payment vouchers in excess of the amount or amounts allowable in (a) and (b) above, the grant officer may: (1) cause the Federal Reserve Letter of Credit to be suspended or revoked; or (2) direct the grantee to withhold submission of payment vouchers until such time as, in the judgment of the grant officer, an appropriate level of actual, necessary and allowable expenditures has occurred or will occur under this grant, and/or (3) request the grantee to repay to AID the amount of such excess. Upon receipt of the grant officer's request for repayment of excess advance payments, the grantee shall promptly comply with such request.

(d) Procedure for Grantee.

(1) After arranging with a commercial bank of its choice for operation under this arrangement and obtaining the name and address of the Federal Reserve Bank or branch serving the commercial bank, the Grantee shall deliver three originals of Standard Form 1194, "Authorized Signature Card for Payment Vouchers on Letters of Credit" signed by those official(s) authorized to sign payment vouchers against the Federal Reserve Letter of Credit and by an official of the Institution who has authorized them to sign..

(2) Upon execution of the grant the grantee shall receive one certified copy of the Federal Reserve Letter of Credit.

(3) The grantee shall confirm with his commercial bank that the Federal Reserve Letter of Credit has been opened and is available if funds are needed.

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(4) To receive payment, the Grantee shall:

(i) Periodically, although normally not during the last five days of the month, prepare payment vouchers (Form TUS 5401) in an original and three copies.

(ii) Have the original and two copies of the voucher signed by the authorized official(s) whose signature(s) appear on the Standard Form 1194.

(iii) Present the original, duplicate, and triplicate copy of the Form TUS 5401 to his commercial bank.

(e) Retain the quadruplicate copy of the voucher.

(5) Each drawdown should be initiated at approximately the same time that checks are issued by the organization in payment of program liabilities including those for allowable indirect costs, and in an amount approximately equal to the Federal share of such payments. Therefore, there is no necessity for the recipient organization to maintain balances of Federal cash other than the small balance necessary to provide for an element of bank float.

(6) A report of expenditures is prepared and submitted to the Office of Financial Management, within thirty days of disbursement. This report, submitted on Standard Form 1034, "Public Voucher for Purchases and Services Other Than Personal", and supported by certifications, listing of withdrawals, and documentation as required, itemizes expenditures made, identifying funds expended by line item of the approved budget and/or category supporting the agreement.

(7) The report of expenditures on Standard Form 1034 is reviewed against the grant provisions, and any disbursement improper under the grant is disallowed. The grantee is notified of the reason for the disallowance and is directed to adjust the next periodic report of expenditures to reflect the disallowance and to reduce its next payment voucher against the Federal Reserve Letter of Credit by the amount of the disallowance.

(8) Simultaneously with the submission of the report of expenditures, the grantee submits to the Controller a status report on the Federal Reserve Letter of Credit as of the close of the period covered by the report of expenditures. The report is prepared in the following format:

Status of Funding Report

Federal Reserve Letter of Credit (FRLC)

No. \_\_\_\_\_

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Period from \_\_\_\_\_ through \_\_\_\_\_

**A. Letter of Credit Position**

- 1. Current amount of FRLC (including amendments) through reporting period \$ \_\_\_\_\_
- 2. Payment Vouchers on Letter of Credit presented (Form TUS 5401):
  - a. Credited prior to reporting period \$ \_\_\_\_\_
  - b. Credited during reporting period via TUS 5401 Voucher Nos. \_\_\_\_\_ through \_\_\_\_\_ inclusive \$ \_\_\_\_\_
  - c. Presented but not credited during report via TUS 5401's numbered \_\_\_\_\_ through \_\_\_\_\_ inclusive \$ \_\_\_\_\_
- 3. Total of all Payment Vouchers against FRLC credited or presented \$ \_\_\_\_\_
- 4. Balance of FRLC not drawn or requested this reporting period \$ \_\_\_\_\_

**B. Cash Position**

- 1. Cash on hand at beginning of period \$ \_\_\_\_\_
- 2. Plus: cash drawn during period \$ \_\_\_\_\_
- 3. Plus: refunds, rebates or other amounts received, to the extent allocable to disbursements charged against this FRLC \$ \_\_\_\_\_
- 4. Total cash available (sum of 1, 2, and 3) \$ \_\_\_\_\_
- 5. Less: disbursements during period \$ \_\_\_\_\_
- 6. Balance of cash on hand at close of reporting period \$ \_\_\_\_\_
- 7. Estimated number of days requirements covered by balance on hand (Item 6 above)  
Days: \_\_\_\_\_
- 8. Advances to subcontractors; \$ \_\_\_\_\_ (included in B. 6 above)

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**(f) Refund of Excess Funds**

(1) If all costs have been settled under the grant and the grantee fails to comply with the grant officer's request for repayment of excess Federal Reserve Letter of Credit funds, the Government shall have the right, on other grants held with the Grantee to withhold payment of Federal Reserve Letter of Credit or other advances and/or withhold reimbursements due the Grantee in the amount of the excess being held by the Grantee.

(2) If the Grantee is still holding excess Federal Reserve Letter of Credit funds on a grant under which the work has been completed or terminated but all costs have not been settled, the Grantee agrees to:

(i) Provide within 30 days after requested to do so by the Grant officer, a breakdown of the dollar amounts which have not been settled between the Government and the Grantee (The Grant officer will assume no costs are in dispute if the Grantee fails to reply within 30 days.);

(ii) Upon written request of the grant officer, return to the Government the sum of dollars, if any, which represents the difference between (1) the Grantee's maximum position on claimed costs which have not been reimbursed and (2) the total amount of unexpended funds which have been advanced under the grant; and

(iii) If the Grantee fails to comply with the grant officer's request for repayment of excess Federal Reserve Letter of Credit funds, the Government shall have the right, on other grants held with the Grantee, to withhold payment of Federal Reserve Letter of Credit or other advances and/or withhold reimbursements due the Grantee in the amount of the excess being held by the Grantee.

**BEST AVAILABLE COPY**