

I. PROJECT IDENTIFICATION

1. PROJECT TITLE  
**SOIL FERTILITY**

APPENDIX ATTACHED  
 YES  NO

2. PROJECT NO. (M.O. 1025-1)  
**596-11-140-063**

3. RECIPIENT (specify)  
 COUNTRY \_\_\_\_\_  
 REGIONAL **ROCAP/CA**  INTERREGIONAL \_\_\_\_\_

4. LIFE OF PROJECT  
 BEGINS FY **1975**  
 ENDS FY **1977**

5. SUBMISSION  
 ORIGINAL \_\_\_\_\_ DATE \_\_\_\_\_  
 REV. NO. \_\_\_\_\_ DATE \_\_\_\_\_  
 CONTR. PASA NO. \_\_\_\_\_

II. FUNDING (\$000) AND MAN MONTHS (MM) REQUIREMENTS

A. FUNDING BY FISCAL YEAR	B. TOTAL \$	C. PERSONNEL		D. PARTICIPANTS		E. COMMODITIES \$	F. OTHER COSTS \$	G. PASA/CONTR.		H. LOCAL EXCHANGE CURRENCY RATE \$ US (U.S. OWNED)		
		(1) \$	(2) MM	(1) \$	(2) MM			(1) \$	(2) MM	(1) U.S. GRANT LOAN	(2) COOP COUNTRY (A) JOINT (B) BUDGET	
1. PRIOR THRU ACTUAL FY												
2. OPRI FY 1975	297.4	241.5	90			9.3	46.6	241.5	90			300
3. BUDGET FY 1976	317.0	256.0	103			6.7	44.3	256.0	103			300
4. BUDGET +1 FY 1977	267.0	213.0	76			0.7	43.3	213.0	76			300
5. BUDGET +2 FY												
6. BUDGET +3 FY												
7. ALL SUBO. FY												
8. GRAND TOTAL	881.4	710.5	269			16.7	134.2	710.5	269			900

9. OTHER DONOR CONTRIBUTIONS

NAME OF DONOR	DESCRIPTION OF GOODS/SERVICES	AMOUNT

III. ORIGINATING OFFICE CLEARANCE

1. DRAFTER  
**D. R. Fiester; RRDO**

TITLE **CABuchanan: ADO**  
**Jeyre: Prog.**

DATE **1/10/75**

2. CLEARANCE OFFICER  
**Irving G. Tragen**

TITLE **Director ROCAP**

DATE **1/10/75**

IV. PROJECT AUTHORIZATION

1. CONDITIONS OF APPROVAL

Prior to initiating disbursements for any country activity, an implementation plan satisfactory to ROCAP, detailing personnel and budget to be provided by the National institutions in support of the project, must be prepared and reflected in a formal commitment on the part of the respective national institutions. The ProAg and contract may be signed prior to the satisfaction of the above condition, and activities may be initiated as each country program satisfies the condition. Costs related to non-country-specific activities may be incurred upon signing of the ProAg and contract.

2. CLEARANCES

BUR/OFF.	SIGNATURE	DATE	BUR/OFF.	SIGNATURE	DATE
LA/DP	L. Harrison		LA/MRSD	D. Lion	
LA/OPNS	C. Uyehara		LA/CEN	D. Lazar	
LA/GC	I. Levy		LA/DR	M. Nagata/B. Sidman/J. Breen	1/25/75

3. APPROVAL AAS OR OFFICE DIRECTORS  
 SIGNATURE **Herman Kleine** DATE **1/10/75**  
 TITLE **Deputy U.S. Coordinator**

4. APPROVAL A/AID (See M.O. 1025-1 (1 C))  
 SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_  
 ADMINISTRATOR, AGENCY FOR INTERNATIONAL DEVELOPMENT

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NON CAPITAL PROJECT PAPER FORSOIL FERTILITYI. PROJECT SUMMARY

The purpose of this project is to create, through a coordinated Central American soil fertility research program, a system capable of producing fertilizer-use alternatives which are suitable for the cropping systems of the small farmer.

The purpose will be attained by building on the base established in Central America by previous AID- funded North Carolina State University (NCSU) activities in International Soil Testing and International Soil Fertility Evaluation and Improvement. These activities have strengthened the Central American countries' capacities in laboratory soil chemical analyses, greenhouse trials to measure plant response to inorganic sources of plant nutrients and methodologies for data correlation. The new ROCAP-sponsored project will continue to support these activities where necessary, but emphasis will be placed on the identification of the most economic, ecologically sound and productive plant nutrient inputs into the Isthmian soils farmed by the rural poor. ROCAP will provide a total of \$700,000 for this project to be obligated over a three-year period.

To insure the continuity and regional institutionalization of the program after ROCAP funds are disbursed, CATIE will be groomed during the life of the project to become the soil fertility program implementing agent in the region. CATIE is the logical choice because it is expected to be named as the regional research coordinating agency by the Ministers of Agriculture of the five Central American governments for the new socio-economic community evolving in the region. CATIE has expertise in various fields of soil science but has not been significantly involved in providing technical assistance in applied soil fertility research in Central America.

To remedy the technical assistance deficiency, ROCAP will develop an annual action plan with CATIE in which (1) the Central American technical experience developed by NCSU in soil fertility will be transferred to CATIE technicians and (2) during the three-year period of this project, CATIE will, in cooperation with NCSU, become systematically and programmatically involved in providing technical assistance to all of the five Central American soil fertility programs. CATIE, collaborating with NCSU, will provide training and technical support to existing programs in the five Central America- countries to: (a) improve research design and analytical procedures; (b) develop an expanded program in applied field research on small farms; (c) evolve improved data collection and resultant interpretation of field response trials; (d) provide improved organic and inorganic fertilizer, soil amendment and cover crop recommendations based on laboratory analysis and field response correlations for basic food crops and inter-cropping and (e) develop essential soil fertility data required by the regional and national agricultural information and data system useful for the formulation of tec-paks. At the completion of this ROCAP soil fertility project, CATIE will have developed the essential linkage with national programs and will be expected to provide the primary extra-national technical support and coordination in soils management/crop production research to the five Central American countries.

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Long and short-term technical advisory assistance will be provided to upgrade the skills of cooperating countries' personnel in the following areas:

- (1) Designing and implementing Ministry of Agriculture soil fertility programs including necessary upgrading of functioning physical plants (laboratories and greenhouses).
- (2) Designing and managing fertilizer response trials on fields of small farmers and correlating the response to fertilizers with chemical analysis of the soil.
- (3) Analyzing data relating crop response in field fertilizer trials to the economics of fertilizer use, and the presentation of this data to the agricultural information system in such a way that it can be used to meet the needs of national planners, the fertilizer industry, the change agents and the farm community.
- (4) Identifying soils and geographic areas where conditions are sufficiently similar to allow extrapolation of fertilizer use recommendations within and among the Central American countries.
- (5) Initiating experimentation with organic and ground-cover sources of plant nutrients and with mulches including the evaluation of the agro-economic productivity of their use.

## II. SETTING

The role of ROCAP in the development of agricultural programs in Central America, as defined in its DAP, is "directed at developing the regional technological capacity needed to support more effective and accelerated country efforts." Soil fertility evaluation, which is aimed at optimizing returns to farmers from their land, is a component part of this technological capacity. However, the potential for the increased productivity of nearly all agricultural areas of Central America is untapped due to lack of research knowledge regarding what systems of fertilizer use when integrated with improved varieties, cropping systems, pest control measures, etc., can result in production levels in the tropics that equal or surpass those of the temperate countries.

Most of the basic food consumed in Central America is produced on small farms. This traditional source of food has not been able to satisfy domestic needs. The problem of domestic production has been further complicated by rising fertilizer prices in Central America which have increased by 300 percent or more during the last two years. Despite these price increases supply cannot meet demand. Uncertainty as to the continued availability of food from the U.S. and Canada which is required to meet Central American national shortfalls resulted in a meeting of the Central American Ministers of Agriculture on October 25-26, 1974 during which the highest priority was placed on developing self-sufficiency in basic grains by 1980.

The goal of self-sufficiency can be more quickly attained by using appropriate fertilizers in the most effective way possible with special attention towards the needs of small farmers. Thus, technical assistance in solving soil fertility problems quickly and efficiently in the face of rising fertilizer costs and limited availability is a top priority program in Central America because:

- (1) Proper use of the research findings can lead to rational allocation of short supplies of fertilizers and,

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- (2) The small farmer can be more effectively informed of the proper quantity of fertilizer to use thereby reducing risk.

This project has been developed on a regional basis because of the need to utilize the same methodology in laboratory, greenhouse and field fertility studies in all countries of Central America. This will allow direct comparison of research findings among all these countries and can lead to a reduction in the quantity of such work in each country when research findings show applicability in more than one of these countries. This is an important factor because, in general, these countries have common problems and in many areas soils are sufficiently similar to allow transfer of technology without extensive field work. The regional nature of this project allows for economies in the allocation of technicians and resource inputs.

Since the International Soil Testing Project's initiation in 1964 under an AID/W-funded contract with NCSU, all Central American countries have been provided technical assistance advice which would permit them to develop or to upgrade soil and plant analysis, greenhouse facilities and analytical methodologies. All C.A. countries except Honduras have done so; however, Nicaragua's facilities were affected by the 1972 earthquake and Nicaragua requires additional technical assistance inputs in order to establish the physical plant necessary for maximizing its utilization of the assistance offered through this new Soil Fertility Project. In early 1974, AID/W evaluated the soil fertility research activities in Latin America and determined that in the future far greater emphasis was needed in field research and on the application of research results to the small farmers' situations. Subsequently, ROCAP was asked to poll each C.A. USAID to determine interest in continued soil fertility assistance. Each one responded affirmatively with an indication of its needs. This project is designed with that evaluation in mind.

### III. PROJECT DESCRIPTION

There is a need to introduce a higher degree of regionality in the existing soil fertility programs of the Central American countries. However, in order to achieve the regionality, emphasis must be placed first on strengthening national programs.

Soil fertility research is an essential part of each cooperating country's agricultural development programs. This project is designed to support the agricultural programs of the USAIDs, and additionally, will support ROCAP's regional agricultural projects:

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Small Farm Cropping Systems and Agricultural Information Management. Data generated by the project in each country plus information from the Small Farm Cropping Systems will be utilized in cooperation with CATIE in the development and dissemination of technological packages by the Agricultural Information Management Project to the small farmer in a usable form.

NCSU will be contracted to provide two full-time soil scientists and short-term technical assistance for training national technicians in:

- (1) Designing and implementing a Ministry of Agriculture soil fertility program to include the development of a functioning physical plant (laboratories and greenhouses).
- (2) Designing and managing fertilizer response trials on fields of small farmers and correlating the response to fertilizer with chemical analysis of the soil.
- (3) Analyzing data relating crop response in field fertilizer trials to the economics of fertilizer use, and the presentation of this data to the agricultural information system in such a way that it can be used to meet the needs of national planners, the fertilizer industry, the change agents and the farm community.
- (4) Identifying soils and geographic areas where conditions are sufficiently similar to allow extrapolation of fertilizer use recommendations within and among the Central American countries.
- (5) Initiating experimentation with organic and ground-cover sources of plant nutrients and with mulches including the evaluation of the agro-economic productivity of their use.

Initially, the NCSU team, in conjunction with CATIE, the host countries' Ministry of Agriculture and USAIDs, will identify host country institutions and personnel who will participate in the new aspects of this project. Concurrently, an annual work plan, utilizing the results of the survey of technical assistance requirements, which was made in June 1974 by ROCAP and NCSU for each Central American country, will be developed with CATIE, the cooperating countries and USAIDs.

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Following this phase, agronomists from each country, utilizing the results of previous chemical analysis and greenhouse work with the soil under study, will receive appropriate training from the NCSU technical advisors necessary to increase their capabilities in field trial design, installation and management and collection and interpretation of the resultant data. There is a substantial number of women technicians currently working in regional technological centers such as CATIE. Every effort will be made to draw upon them in the design, implementation and training aspects of the project.

The training required for the installation of the field trials to evaluate crop response to plant nutrients will include instruction on how to utilize: 1) the principal food crops grown by the target group of farmers on the major agricultural soils of the area; 2) the essential plant nutrients; 3) traditional and improved intercropping and rotation systems; and 4) organic sources of plant nutrients, mulches, chemical fertilizers, lime, and other soil amendments. The project will place special emphasis on those agricultural commodities and production areas of the respective countries in which AID loan and grant support is being provided.

Future field trials will emphasize small farms where particular plant nutrient problems have been identified. These trials will utilize the best available "state of the art" production techniques on which to evaluate crop response to plant nutrients. The present production practices of small farmers will also be included in the trials to enable the comparison of research results with present practices. This will permit comparative economic evaluation of the farmers technology with the technology under trial. Thus, cooperating country personnel will develop the best information on how fertilizers can be used to improve crop yields and income for large numbers of small farmers.

Another result of shifting soil fertility research off government experiment stations to small farmers' fields will be the development of effective personal linkages between research people and farmers. This approach will form a link in a "feedback" system which can lead to a re-alignment of experimentation directed toward solving the problems which farmers face and should help prevent the dissemination of non-viable recommendations. It will also improve viable recommendations by permitting CATIE and national technicians to refine them in line with changing economic, marketing and technological conditions.

The crop/fertilizer response studies generated by this activity, in conjunction with other technical information, will provide data identifying the types of soils for which efficient production technology can be transferred. These studies will also identify those

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soils for which efficient technologies have not yet been developed and are needed. This approach will multiply the effectiveness of past work in soil fertility by enlarging the area to which existing results can be applied. The procedure will also shorten the time required for developing fertilizer use alternatives and will allow cooperating country research personnel to concentrate their efforts on those soils and areas for which efficient technologies have not yet been developed. The resultant data will be fed into existing national agricultural information systems and, ultimately, into the proposed regional Agricultural Information Management Project for further analysis and dissemination of recommendations.

A single set of field trials will suffice to indicate whether efficient transferable production techniques exist for similar soils occurring in more than one country. Thus, cooperating countries can concentrate future research efforts on soil areas for which no transferable efficient production technique exists.

#### IV. COUNTRY SPECIFIC SITUATION

In each Central American country, the technical assistance advisory services to be provided by NCSU technicians under this project represent the sole source of expertise to the USAIDs. This project is linked to all activity in soil fertility research currently underway in Central America.

In the management and implementation of this project ROCAP will provide assistance directly to the country program in response to requests for assistance and interest demonstrated on the part of each country in achieving the objectives sought. The counterpart contribution of each cooperating country will consist of the services of technical personnel, laboratory and greenhouse facilities, the vehicular support and other necessary materials which are required for the implementation of this project. Support by governments to match inputs financed by this project will be a condition on which allocation of project resources will be made. Each USAID has been consulted and agreed to assist ROCAP in supporting this project. They have checked with Central American governments to assure that present staffing levels in Soil Science Departments will be maintained to support this project and the host governments understand the additional support which is considered necessary for implementation of this project. This additional support will be detailed in the work plans to be developed upon initiation of this project. These work plans will become attachments to the Memorandums

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of Understanding<sup>#</sup> which were signed in 1971 in each Central American country.

The status of each Central American country's soil research program is as follows:

1. Guatemala - This country has one of the best soil fertility programs among the LDC's. The laboratory is efficient and results of sample analysis are accurate. Greenhouse facilities are modest but adequate. Field activities for the major crops are well developed. The staff is relatively large and well-trained. The primary need is to incorporate this activity into other Guatemalan agricultural research and development programs and create a means of exchanging soil fertility research findings with the other Central American countries having similar soil situations.
2. El Salvador - This country's soil fertility program is above average for the LDC's. The main government laboratory is equivalent to Guatemala's and there are three other laboratories which also provide good service. The overall soil fertility staff is not quite so large or well-trained as that in Guatemala, but the discrepancies are not great; however, low salaries threaten stability. Field experimentation is at perhaps 60% of the level in Guatemala, but only relatively small inputs would be required to bring it to equivalence. The main problems are dispersion of efforts and rapid turnover of personnel.
3. Costa Rica - This country's soil fertility program is midway between El Salvador's and Guatemala's. Laboratory, greenhouse, and field capabilities are essentially equal to Guatemala's. The staff is technically capable but further assistance is required in program management and in strengthening assistance to small farmers. A similar need for greater linkage with other Costa Rican agricultural research and development program is also apparent.
4. Honduras - All aspects of this country's program are at present very weak. However, there is a fairly large amount of data from past field research which provides a basis for initially improving fertilizer recommendations and developing a more effective integrated

<sup>#</sup>A Memorandum of Understanding was signed in each C.A. country in 1970/71. In it the Ministry of Agriculture, USAID Mission and NCSU detailed their mutual interest in improving existing national soil fertility program and facilities. A work plan was attached to each Memorandum of Understanding covering objectives to be attained by 1974. These work plans will be reevaluated, updated and modified to cover the activities proposed for the period 1975-1977.

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program in support of national food production goals. Few trained personnel are presently available. Given past experience, it will be difficult to develop a strong program within the next three years unless a concerted assistance effort is provided and increased GOH support is secured. The GOH, recognizing the weaknesses in the existing program, has ordered equipment for a new laboratory following NCSU recommendations and is reorganizing its total research program. The Ministry of Agriculture has expressed a strong desire for greater NCSU soil fertility support in program design, training and analysis of crop response data. In addition to GOH inputs, the IDB has contributed substantially to the soil fertility program for greenhouse and on-farm demonstration work.

USAID/Honduras has \$19,000 allotted to purchase lab equipment for the Pan American Agricultural School. This will take some of the burden off the lab in Tegucigalpa and provide facilities for training future technicians from Latin America on regionwide soil fertility program methodologies. In addition, the Honduras USAID Agricultural Sector Loan provides funds for soil fertility field testing (\$40,000). This is to be used by the Ministry of Agriculture in making on-farm tests, portions of which will be located on "Asentimientos."

5. Nicaragua - This country's soil fertility program is difficult to evaluate because of several contradictory aspects. The national laboratory is fairly well-equipped and could function well. However, it is physically isolated from its clientele and lacks dependable basic supplies. A number of relatively competent staff members are available but their efforts would be more productive under better management. Increased GON support will be required for the program in the future.

The GON, as a result of an agricultural sector analysis, is presently restructuring its support to the rural sector with priority emphasis on the rural poor. Upon reorganization, agricultural research will be located in a new Nicaraguan Institute of Agricultural Technology. Future research will be carried out as an integrated applied action program, and the GON proposes close cooperative working relations with other Central American countries. The rapidity of implementation of this new focus in the soil fertility area cannot be fully evaluated at this time. The GON, however, has requested greater NCSU soil fertility advisory assistance in order to attain their research objectives in this field.

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## V. COURSE OF ACTION - IMPLEMENTATION PLAN

In January 1975 Soil Fertility Project personnel in cooperation with USAIDs and counterparts will develop a work plan for each country. This work plan will be an attachment to the existing Memorandums of Understanding\* between Ministries of Agriculture, USAIDs and NCSU. Details of the work plan will be based upon the results of the regionwide survey of country program status and needs made in cooperation with USAIDs and Ministries of Agriculture in 1974 by Mr. E.M. Stickney of ROCAP and Drs. J. L. Walker and John Nicholaides of the NCSU team. It is anticipated that work plans will be completed within 3 months.

### A. Continuous Activities

In January 1975 the Soil Fertility Project staff in cooperation with CATIE, the Agricultural Information Management Project and cooperating country agencies will initiate the location of data relating plant response to the use of fertilizers and will evaluate and reduce this data to a manageable form.

At the same time, the same agencies will identify the user institutions' data needs. Part of this activity will include the coordination of this project's work with similar work being carried out or which will be initiated under USAID or other sponsorship.

Additional activities which will be initiated in January of 1975 include the following:

1) In cooperation with host country agencies the Soil Fertility Project staff will design, help organize and provide training to host country personnel in the proper sampling of soils and plants and the selection of areas suitable for yield trials. Considerations include small farmers, their soils and cropping patterns.

2) The Soil Fertility Project staff will cooperate with host countries in evaluating the data from yield trials and from soil and plant analysis to establish economic and technical production efficiencies, and area and region specific correlations. These results will then be recycled by the cooperating country agencies and by the NCSU team to the user agencies through the Agricultural Information Management Project.

3) Soil Fertility Project staff will help train personnel from the cooperating agencies in the assessment of soils and on soil-related agricultural production potentials and on problems to include the

\*please refer to footnote on Page 8.

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identification of plant nutrition research needs and the requirements for solutions.

Additional activities will be initiated in October 1975 by the Soil Fertility Project staff in cooperation with designated host country agencies, as follows:

- 1) Delineation of the areas of soil and ecological region homogeneity both within the cooperating countries and on a regional basis.
- 2) Publishing the results of the yield trials and correlation studies.

The following activities are expected to be initiated during February 1976:

- 1) Testing of production technology in accord with specific soil fertility analysis results for otherwise homogeneous soil areas throughout the Central American region. This process involves the use of the techniques developed in extending experimentation to similar soil areas within and between countries for testing. If successful results are obtained, further intensive research in the new area will not be required and host country resources can be brought to bear on other problems.

- 2) Transferring fertilizer use alternatives to the Agricultural Information Management Project.

#### B. Short-Term Activities

In addition to the continuous activities delineated in the preceding paragraphs, the following short-term activities will be undertaken:

- 1) In each calendar year during the life of the project during the period February to November, the Soil Fertility Project personnel will train host country field agronomists and provide technical assistance in the installation, maintenance, record-keeping and harvesting of yield trials.

- 2) Beginning in January of 1975 and for the first three months of every calendar year during the life of the project, based upon analysis of previous results, the soil fertility personnel, in cooperation with host country agencies, will distribute the improved on-the-farm yield trial designs and the updated evaluation methodology.

- 3) A two-week Soil Fertility Seminar for C.A. Ministry of Agriculture, University and other counterpart technicians will be scheduled in the Central American region. It is anticipated that these seminars will be held every year during the life of the project.
- 4) The design and organization of the laboratories and greenhouses for Honduras, El Salvador, and Nicaragua.
- 5) During the months of July and November of every calendar year during the life of the project, in accord with requirements, host country personnel will receive in-country training on data processing and data reduction.
- 6) Special training on computer techniques that apply to soil fertility data will be given during the months of July and August of each year either at regional workshops or in Raleigh at North Carolina State University, as required.
- 7) The Soil Fertility Project staff will provide technical assistance to Honduras and possibly El Salvador and Nicaragua to enable them to modernize their laboratory and greenhouse methodology so that they can attain the levels presently reached by Guatemala and Costa Rica.
- 8) Training and trouble shooting on laboratory and greenhouse maintenance will be provided during the months of October and November strictly on an as-needed and as-requested basis.

#### RELATION OF PURPOSE TO GOAL

At the sector level, the MDCC has defined the goal as creating an environment, or the conditions, in which the rural poor will have increased opportunity to participate in the benefits emanating from development.

The purpose of this project is to create, through a coordinated Central American soil fertility research program, a system capable of producing fertilizer recommendations which are suitable for crops and cropping systems of small farmers.

This project can contribute to the attainment of the sector goal in both direct and indirect ways. The direct contribution lies in the provision of specific fertilizer use alternatives which are designed to meet the fertilizer needs of the principal cropping systems which are followed in specific geographic areas. This will reduce unnecessary and excessive use of fertilizers and will also provide those farmers who are not now using fertilizers an opportunity to use this scarce and expensive production input at minimal risk.

An indirect way in which this project can contribute to the attainment of the sector goal is through provision of information concerning crop response to fertilizer use to national planners and the fertilizer industry. These groups can then use the information to plan the allocation of fertilizer supplies to those areas where production increases attributable to fertilizer use justify such a procedure. This can minimize waste of a scarce resource and can lead to both increases in total food production and increases in income for the overall rural population.

**VI. INPUTS**

<u>Kinds of Inputs</u>	<u>Magnitude</u> (mm)	<u>Date Scheduled for Delivery</u>		
		FY 75	FY 76	FY 77
		(\$000's)		

**I. LOCAL INPUTS (in Central America)**

**A. Technical Assistance**

2 Soil scientists	73	100	100	100
Ag. Economist/ statistician	5	0	25	10
Short-term soil fertility evaluation technicians	49	30	80	42
Short-term contracts- local	87	0	0	0

**B. Commodities**

2 four-wheel-drive closed vehicles for use by the technicians		0	0	0
Laboratory equipment (chemicals, etc.)		0	0	0

**C. Other Costs**

Travel & per diem		22	22	22
Office supplies, etc.		7	7	7
Language training and other regional seminars and other training programs		21	21	20
<b>Subtotal:</b>	<b>200</b>	<b>220</b>	<b>250</b>	<b>200</b>

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## Kinds of Inputs

Magnitude (mm)	Date Scheduled for Delivery		
	FY 75	FY 76	FY 77

(\$000's)

II. ROCAP INPUTS TO CORE BUDGET  
(on Raleigh Campus)

A. <u>Salaries</u>		22.1	32.0	32.0
Project Director	11			
Laboratory Director	11			
Administrative Assistant	11			
Bilingual Secretary	22			
B. Overhead (52%)		11.5	16.6	16.6
C. *Other Direct Costs		9.9	13.4	13.4
D. Travel and Transportation		3.6	4.3	4.3
E. Equipment	—	.3	.7	.7
Subtotal	55	47.4**	67.0	67.0
TOTAL	269	297.4	317.0	367.0

\* Other direct costs include retirement, social security, workmen's compensation insurance, and special risk insurance.

\*\* Represents nine months of core costs since the L.A. Regional Project covers the initial three months' costs.

III. Cooperating Countries

No firm illustrative budget can be furnished because cooperating country soil fertility program yearly budgets have in the past fluctuated from a low of \$30,000 (Honduras) to a high of \$150,000 (Guatemala) for salaries and supplies, excluding capital expenditures. With this amount Guatemala has been able to develop a sound research program as described earlier in this paper. Lesser amounts would be required in the smaller countries (El Salvador) or those with more modest research facilities at this stage (Honduras).

ROCAP estimates that for the initial year each country will budget at least \$40,000 for operating expenditures; specific budget amounts will be decided at the time the annual work plans are prepared. The technical assistance advisory inputs to be provided under this soil fertility project will allow each cooperating country to make much more efficient use of their soil fertility operational budgets and facilities in meeting proper objectives.