

NORTH CAROLINA STATE UNIVERSITY AT RALEIGH

P. O. Box 5067, RALEIGH, N. C. 27607

OFFICE OF THE PROVOST AND VICE-CHANCELLOR

January 17, 1979

MEMORANDUM

TO: File

FROM: Lawrence M. Clark

We received a telephone call from Mrs. Parker, AID Office in Washington, D.C., informing us that original office of Department of Labor in Atlanta indicated that our proposal for an extension of the contract in Soil Science had been approved by their office.

Informed Dr. Winstead, Clauston Jenkins and John Nicholadis of this.

cw

1/2/79 learned of complaint re
from AID

awaiting approval from
EEOP in AID

Rose Robinson - acting head
Parker → Clark talked w/

had called regional
office (HEW/DOL?)

Told Clark would call back
* 85,000 extension

C. B. McCants

NORTH CAROLINA STATE UNIVERSITY AT RALEIGH

SCHOOL OF AGRICULTURE AND LIFE SCIENCES

DEPARTMENT OF SOIL SCIENCE
Box 5907 Zip 27650
PHONE: (919) 737-2838

December 15, 1978

Dr. Dean Peterson, Director
Office of Agriculture
Development Support Bureau
Agency for International Development
Washington, D. C. 20523

Dear Dr. Peterson:

Enclosed please find a proposal for a three-month extension from January 1 through March 31, 1979 of our current Contract AID/ta-C-1236, "Discovery of Economic Systems for Management of Tropical Soils." The proposal has been discussed with department, school and university administration and they are in agreement with its purpose and content.

The requested budget of \$91,040 reflects the bare minimum amount necessary to successfully accomplish the objectives of the program during this three-month extension.

Thank you for your support of this extension of our contract. We will be glad to furnish any additional information you, the Contract or Program Office may need.

Best regards.

Sincerely,

John J. Nicholaides, III

John J. Nicholaides III, Coordinator
Tropical Soils Research Program

JJN/ds
Enclosure

cc: Dr. J. L. Malcolm
Dr. C. B. McCants ✓
Assoc. Dir. J. L. Apple
Dean J. A. Rigney
Dean J. E. Legates

A PROPOSAL FOR EXTENSION

OF

CONTRACT AID/ta-C-1236

"DISCOVERY OF ECONOMIC SYSTEMS FOR MANAGEMENT OF TROPICAL SOILS"

Contractor: North Carolina State University

Duration of Contract: January 1-March 31, 1979

Amount of Contract: \$ 91,040

PURPOSE: Request for extension of Contract AID/ta-C-1236 through March 31, 1979 with the obligation for \$91,040 in additional funds.

BACKGROUND: Under Contracts AID/csd 2806 and AID/ta-C-1236, North Carolina State University (NCSU) has been involved in developing a package of economically-sound soil, fertilizer and plant management practices for increasing food production 1) via continuous cultivation of soils of the Amazon jungle that are presently under shifting cultivation and 2) in acid, highly weathered soils of the tropical savannas. An additional thrust of the present contract is 3) to develop means for interpreting and extrapolating the results from the two research programs to other areas of similar soil-crop-climatic conditions. Operational bases for objectives 1 and 2 are the Amazon jungle near Yurimaguas, Peru and the Cerrado near Brasilia, Brazil. Extrapolation bases for objective 3 have included a) small farms in Peru's Amazon jungle and b) savannas near San Ignacio, Bolivia.

Three crops per year have been cultivated continuously in Yurimaguas, Peru since 1972, utilizing various economically-sound soil and crop management practices. Systems have included both low-and-high input technologies, organic and inorganic fertilizers, monocultures and intercropping, labor- and capital-intensive practices. Yields of crops grown on slashed-and-burned land have been repeatedly shown to be superior to those grown on mechanically cleared land. Rice, peanut and soybean yields on land receiving native organic composts and lime are equal to those produced under maximum fertilization.

This AID-supported program has provided the first conclusive evidence that it is possible to continuously cultivate infertile jungle and savanna soils which have been subjected traditionally to migratory agriculture. The agricultural, sociological, economic and ecological implications are apparent and far-reaching. These findings have been used by the National Academy of Sciences to project that these inherently infertile soils of the humid tropics, heretofore thought to be non-arable, have the capability to produce crop yields 150-200% greater than those of the temperate zone on a per hectare per year basis.

JUSTIFICATION: Though progress has been made on resolving many of the agronomic and economic questions, numerous others remain. In the Amazon jungle of Peru adaptive research trials which will provide some of these answers are scheduled to be harvested in January of 1979. Extension of the contract will permit us to acquire this valuable information on problems of utmost practical importance to GOP and USAID/Peru.

Extrapolation activities were initiated in March 1978 with 11 small farmers within an 80 km radius of Yurimaguas. Following a three-day training session at the Yurimaguas Experiment Station with Peruvian "extrapolation" agents, farm demonstration trials were implemented by these agents on the lands of these small farm leaders. The farmer's own traditional system is being compared with two "improved" systems. The objective is to show the farmer in the simplest way possible how to improve yields economically and how to farm permanently the same plot of land. Yield increases on the farmers' lands have been dramatic after only one cropping (harvested October, 1978). Farmer interest and response has been overwhelming; more farmers are wishing to become involved than the program can handle. Planting of second crop began in December and will be harvested beginning March, 1979. Extension of the contract will enable us to continue these small farm demonstration trials which are of vital interest and importance to GOP and USAID/Peru.

The Planning Office of the Peruvian Ministry of Agriculture and Food has named as its number one priority on the jungle regions their research and extension linkage with NCSU's Yurimaguas Project. The Peruvian Ministry of Food and Agric. requested US\$200,000 through Title I-PL 480 funds to finance their component of the program. The USAID/Peru Mission cabled USAID/W in July 1978 of their vital interest in and support of this program. USAID/Peru feels this program is a critical resource base for some of its current programs in the jungle region. In fact, USAID/Peru requested USAID/W to continue funding this program through 1980, at which time USAID/Peru has agreed to provide the support.

Under the present contract, extrapolation activities were begun in San Ignacio, Bolivia in late 1977 to provide agronomic answers to crop production for a colonization project. When NCSU inaugurated this work, peanut yields on the experiment station and small farms, after the first cropping, had fallen to 500 kg/ha. Yield decline was so dramatic that GOB considered closing not only the colonization project, but also the experiment station. Based on our research elsewhere, it appeared that crop yields were limited by poor management and a lack of phosphorus. The cooperative Bolivia/NCSU research trials have shown that with proper management the native peanut variety yielded 2,500 kg/ha and with addition of only 13 kg P/ha increased to 3,500 kg/ha. The Bolivians were impressed enough to continue not only the experiment station's adaptive research activities and the colonization project, but also have begun a large number of small farm demonstration trials encouraging use of this economically feasible low cost technology.

Other necessary adaptive crop production research trials and farm demonstration trials were planted in early December 1978 and will be harvested in March 1979. Continuation of the contract will enable the Bolivians to receive the critical technical backstopping for these research and demonstration trials which are of high practical importance to the GOB and USAID/Bolivia.

The GOB requested of USAID/Bolivia in July 1978 that NCSU continue its technical backstopping of its research activities and small farm demonstration trials. The Bolivians have provided support for more than 50% of the cooperative project activities to date. USAID/Bolivia cabled USAID/W in August 1978 supporting GOB's need and requesting continuation of NCSU's activities in Bolivia.

ACTIVITIES UNDER EXTENSION: Activities in the Amazon jungle of Peru under contract extension will include continuation of on-going adaptive research crop production trials on the experiment station and on-going demonstration trials on small farms in surrounding areas. Emphasis is being and will be given to extending continuous cultivation practices from the research station as an economic alternative to the traditional shifting cultivation at the small farm level. Adaptive research will be conducted to solve unanswered questions of maintaining a physical and chemical environment on soils of the low humid tropics that is conducive to sustained high crop production. Low input technologies, organic vs. inorganic fertilizers, labor-intensive systems will continue to be investigated and extended to small farm leaders through on-farm demonstrations. Other small farmers in the area will be reached through the "filter-through" effect to encourage adaptation of improved practices demonstrated on leaders' lands. One on-site senior level NCSU scientist will direct the research on extrapolation program.

Activities in the savannas of eastern Bolivia under contract extension will include extrapolating soil and crop management information obtained from Yurimaguas, Peru and Brasilia, Brazil to this local situation. Technical back-stopping will be provided to Bolivian counterparts at critical management periods in the on-going adaptive research crop production and on-going small farm demonstration trials. Emphasis is being and will be given to extrapolating adaptive research crop production information to the small farms of the area. No on-site senior level NCSU scientist will be stationed at this location during this three-month contract extension.

BUDGET SUMMARY

Extension of Contract AID/ta-C-1236

Discovery of Economic Systems for

Management of Tropical Soils

January 1, 1979-March 31, 1979

<u>Category</u>	<u>Total Estimated Cost</u>	
Salaries and Wages	\$35,000	29,619 *
Fringe Benefits	5,100	4,334
Overhead	18,550	15,697
Travel and Transportation	8,500	2,960
		2,500
Supplies, Equipment and Other Direct Costs	23,890	23,890 **
	<hr/>	<hr/>
	\$91,040	85,000

Consultants →

* Inked corrections relayed verbally to Ken Bluteau (Contract Officer) 1/3/79

** $\frac{1}{2}$ to Supplies & Equipment
 $\frac{1}{2}$ to Other Direct Costs

STANDARD FORM 30, JULY 1966 GENERAL SERVICES ADMINISTRATION FED. PROC. REG. (41 CFR) 1-16.101		AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT			PAGE 1 OF 1
1. AMENDMENT/MODIFICATION NO. 5		2. EFFECTIVE DATE Block 19	3. REQUISITION/PURCHASE REQUEST NO. 3177607 A2	4. PROJECT NO. (If applicable) 931-0525	
5. ISSUED BY Agency for International Development Central Operations Division Office of Contract Management Washington, D.C. 20523		CODE	6. ADMINISTERED BY (If other than block 5)	CODE	
7. CONTRACTOR NAME AND ADDRESS North Carolina State University Raleigh, North Carolina 27607 <small>(Street, city, county, state, and ZIP Code)</small>		CODE	FACILITY CODE	8. AMENDMENT OF SOLICITATION NO. _____ DATED _____ (See block 9) <input checked="" type="checkbox"/> MODIFICATION OF CONTRACT/ORDER NO. AID/ta-C-1236 DATED 6-30-75 (See block 11)	
9. THIS BLOCK APPLIES ONLY TO AMENDMENTS OF SOLICITATIONS <input type="checkbox"/> The above numbered solicitation is amended as set forth in block 12. The hour and date specified for receipt of Offers <input type="checkbox"/> is extended, <input type="checkbox"/> is not extended. Offerors must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation, or as amended, by one of the following methods: (a) By signing and returning _____ copies of this amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE ISSUING OFFICE PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If, by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided such telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.					
10. ACCOUNTING AND APPROPRIATION DATA (If required) N/A					
11. THIS BLOCK APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS (a) <input type="checkbox"/> This Change Order is issued pursuant to _____ The Changes set forth in block 12 are in accordance to the above numbered contract/order. (b) <input type="checkbox"/> The above numbered contract/order is modified to reflect the administrative changes (such as changes in paying office, appropriation data, etc.) set forth in block 12. (c) <input checked="" type="checkbox"/> This Supplemental Agreement is entered into pursuant to authority of Foreign Assistance Act of 1961, as amended and Executive Order 11223 It modifies the above numbered contract as set forth in block 12.					
12. DESCRIPTION OF AMENDMENT/MODIFICATION On both the Cover Page and Article III - <u>Period of Contract Services</u> , delete the estimated completion date of 06-30-78 and substitute therefore the date 12-31-78.					
<small>Except as provided here-in, all terms and conditions of the document referenced in block 8, as heretofore changed, remain unchanged and in full force and effect</small>					
13. <input type="checkbox"/> CONTRACTOR/OFFEROR IS NOT REQUIRED TO SIGN THIS DOCUMENT <input checked="" type="checkbox"/> CONTRACTOR/OFFEROR IS REQUIRED TO SIGN THIS DOCUMENT AND RETURN 7 COPIES TO ISSUING OFFICE					
14. NAME OF CONTRACTOR/OFFEROR NORTH CAROLINA STATE UNIVERSITY <small>(Signature of person authorized to sign)</small>			17. UNITED STATES OF AMERICA AGENCY FOR INTERNATIONAL DEVELOPMENT <small>(Signature of Contracting Officer)</small>		
15. NAME AND TITLE OF SIGNER (Type or print) Earl G. Droessler Dean for Research		16. DATE SIGNED 12-15-77	18. NAME OF CONTRACTING OFFICER (Type or print) Morton Darvin		19. DATE SIGNED 20 DEC 77

NORTH CAROLINA STATE UNIVERSITY AT RALEIGH

SCHOOL OF AGRICULTURE AND LIFE SCIENCES

DEPARTMENT OF SOIL SCIENCE
Box 5907 ZIP 27607
PHONE: (919) 737-2655

December 13, 1977

MEMORANDUM TO: Mrs. Ann Caldwell
FROM: C. B. McCants
SUBJECT: Extension of Contract AID/ta-C-1236.

Enclosed are correspondence and documents relative to the subject extension. The effect would be to extend the contract, without additional funding, for six months beyond its current termination date. The Department approves of this action and requests that the documents be processed as appropriate. There are adequate funds remaining in the contract to carry out the necessary activities.

CBMcC/tm

Enclosures

DEPARTMENT OF STATE
AGENCY FOR INTERNATIONAL DEVELOPMENT
WASHINGTON, D.C. 20523

6 DEC 1977

Mr. C. B. McCants
Soil Science Department
Box 5907
North Carolina State University
Raleigh, North Carolina 27607



Subject: Contract No. AID/ta-C-1236
Amendment No. 5

Gentlemen:

Submitted herewith for your signature are an original and 8 copies of the subject document.

When you have completed your review of the attached document, please sign the original and all copies in the space provided for your signature and return the original and 7 copies to this office. Please retain the copy with the attachments, if any, for your records.

Sincerely yours,

A handwritten signature in dark ink, appearing to read "Morton Darwin".

Morton Darwin
Contracting Officer
Technical Assistance Branch
Central Operations Division
Office of Contract Management

Enclosures:
As stated

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. AMENDMENT/MODIFICATION NO. 5	2. EFFECTIVE DATE Block 19	3. REQUISITION/PURCHASE REQUEST NO. 3177607 A2	4. PROJECT NO. (If applicable) 931-0525
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5. ISSUED BY Agency for International Development Central Operations Division Office of Contract Management Washington, D.C. 20523	6. ADMINISTERED BY (If other than block 5) ORIGINAL
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7. CONTRACTOR NAME AND ADDRESS North Carolina State University Raleigh, North Carolina 27607 <small>(Street, city, county, state, and ZIP Code)</small>	8. AMENDMENT OF SOLICITATION NO. <input type="checkbox"/>	DATED _____ (See block 9)
	<input checked="" type="checkbox"/> MODIFICATION OF CONTRACT/ORDER NO. AID/ta-C-1236	DATED 6-30-75 (See block 11)

9. THIS BLOCK APPLIES ONLY TO AMENDMENTS OF SOLICITATIONS

The above numbered solicitation is amended as set forth in block 12. The hour and date specified for receipt of Offers is extended, is not extended. Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation, or as amended, by one of the following methods:

(a) By signing and returning _____ copies of this amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE ISSUING OFFICE PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If, by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided such telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

10. ACCOUNTING AND APPROPRIATION DATA (If required)
N/A

11. THIS BLOCK APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS

(a) This Change Order is issued pursuant to _____
The Changes set forth in block 12 are made to the above numbered contract/order.

(b) The above numbered contract/order is modified to reflect the administrative changes (such as changes in paying office, appropriation data, etc.) set forth in block 12.

(c) This Supplemental Agreement is entered into pursuant to authority of **Foreign Assistance Act of 1961, as amended and Executive Order 11223**

It modifies the above numbered contract as set forth in block 12.

12. DESCRIPTION OF AMENDMENT/MODIFICATION

On both the Cover Page and Article III - Period of Contract Services, delete the estimated completion date of 06-30-78 and substitute therefore the date 12-31-78.

ORIGINAL

Except as provided herein, all terms and conditions of the document referenced in block 8, as heretofore changed, remain unchanged and in full force and effect.

13. CONTRACTOR/OFFEROR IS NOT REQUIRED TO SIGN THIS DOCUMENT CONTRACTOR/OFFEROR IS REQUIRED TO SIGN THIS DOCUMENT AND RETURN **7** COPIES TO ISSUING OFFICE

14. NAME OF CONTRACTOR/OFFEROR NORTH CAROLINA STATE UNIVERSITY <small>(Signature of person authorized to sign)</small>	17. UNITED STATES OF AMERICA AGENCY FOR INTERNATIONAL DEVELOPMENT <small>(Signature of Contracting Officer)</small>
---	--

15. NAME AND TITLE OF SIGNER (Type or print)	16. DATE SIGNED	18. NAME OF CONTRACTING OFFICER (Type or print) Morton Darwin	19. DATE SIGNED
--	-----------------	---	-----------------

DEPARTMENT OF STATE
AGENCY FOR INTERNATIONAL DEVELOPMENT
WASHINGTON, D.C. 20523

25 OCT 1977

Mr. C. B. McCants, Head
Soil Science Department
Box 5907
North Carolina State University
at Raleigh
Raleigh, North Carolina 27607

Subject: Contract No. AID/ta-C-1236

Dear Mr. McCants:

We are responding to your letters of July 27, 1977, and October 14, 1977, requesting a six month extension of the subject contract from its current estimated completion date of June 30, 1978, to December 31, 1978, without additional funding.

In response to your requested extension, AID is reviewing the project. We will notify you as soon as it is decided whether or not to extend the estimated completion date beyond June 30, 1978.

If you have any questions, please feel free to contact Mr. Donald Lake, Contract Specialist, on (703) 235-9137.

Sincerely yours,



Morton Darvin
Contracting Officer
Technical Assistance Branch
Central Operations Division
Office of Contract Management

*PC sent to
Nicholaides*



October 14, 1977

Mr. Morton Darvin
Technical Assistance Branch
Office of Contract Management
Department of State
Agency for International Development
Washington, DC 20523

SUBJECT: Contract AID/ta-C-1236

Dear Mr. Thomas:

This request is for the extension, without additional funding, of the subject contract from its scheduled termination date of June 30, 1978 to December 31, 1978.

The reasons why the additional time is needed are:

1. On November 2, 1976, we received notification from the Technical Assistance Bureau that the contract would be terminated on June 30, 1977, which was one year in advance of our originally agreed to date. A series of discussions was held with AID concerning this unilateral decision and several months later, we were advised that the decision had been rescinded. However, this period of uncertainty resulted in substantial interruptions in on-going programs and delays in initiating scheduled work essential to completion of our contractual commitments.
2. We have lost, from the program, three key personnel. While every reasonable effort has been made to fill these vacancies, more than the average difficulty has been experienced in finding competent personnel. With the additional time requested, we can complete the work set forth in the contract either by employment of additional personnel or utilization of those already engaged in the program.

Your favorable attention to this request is appreciated.

Sincerely,

C. B. McCants, Head
Soil Science Department

cc: Dr. John L. Malcolm
Dr. John J. Nicolaides

July 27, 1977

Mr. Edward H. Thomas
Technical Assistance Branch
Central Operations Division
Office of Contract Management
Department of State
Agency for International Development
Washington, DC 20523

SUBJECT: Contract AID/ta-C-1236

Dear Mr. Thomas:

This request is for the extension, without additional funding, of the subject contract from its scheduled termination date of June 30, 1978 to December 31, 1978.

The reasons why the additional time is needed are:

1. On November 2, 1976, we received notification from the Technical Assistance Bureau that the contract would be terminated on June 30, 1977, which was one year in advance of our originally agreed to date. A series of discussions was held with AID concerning this unilateral decision and several months later, we were advised that the decision had been rescinded. However, this period of uncertainty resulted in substantial interruptions in on-going programs and delays in initiating scheduled work essential to completion of our contractual commitments.
2. We ^{have} ~~lost~~ ^{from the program, three} ~~due to resignations,~~ several key personnel involved in this program. While every reasonable effort has been made to fill these vacancies, more than the average difficulty has been experienced in finding competent personnel. With the additional time requested, we can complete the work set forth in the contract either by employment of additional personnel or utilization of those already engaged in the program.

Your favorable attention to this request is appreciated.

Sincerely,

C. B. McCants, Head
Soil Science Department

cc: Dr. John L. Malcolm
Dr. John J. Nicholaides

COST REIMBURSEMENT CONTRACT WITH AN EDUCATIONAL INSTITUTION

AGENCY FOR INTERNATIONAL DEVELOPMENT NEGOTIATED CONTRACT NO. AID/ta-C-1236	
NEGOTIATED PURSUANT TO THE FOREIGN ASSISTANCE ACT OF 1961, AS AMENDED, AND EXECUTIVE ORDER 11223	TOTAL ESTIMATED CONTRACT COST 31,658,368. (See Article IV)
CONTRACT FOR: Discovery of Economic Systems for Management of Tropical Soils	CONTRACTOR (Name and Address)
PROJECT NO: 931-17-120-525-73	North Carolina State University
ISSUING OFFICE (Name and Address) Agency for International Development Central Operations Division Office of Contract Management Washington, D.C. 20523	NAME
	STREET ADDRESS Raleigh, North Carolina 27607
	CITY, STATE, AND ZIP CODE
ADMINISTRATION BY SER/CM/COD/TAB	COGNIZANT SCIENTIFIC/TECHNICAL OFFICE TA/AGR
MAIL VOUCHERS (Original and 3 copies) To: Agency for International Development Office of Financial Management Washington, D.C. 20523	ACCOUNTING AND APPROPRIATION DATA PIQ/T NO. <u>315/580</u> APPROPRIATION NO. <u>72-11X1023</u> ALLOTMENT NO. <u>402-31-099-00-2251</u>
EFFECTIVE DATE	ESTIMATED COMPLETION DATE 06-29-78

The United States of America, hereinafter called the Government, represented by the Contracting Officer executing this Contract, and the Contractor, an educational institution chartered by the State of North Carolina with its principal office in Raleigh, North Carolina, agree that the Contractor shall perform all the services set forth in the attached Schedule, for the consideration stated therein. The rights and obligations of the parties to this contract shall be subject to and governed by the Schedule and the General Provisions. To the extent of any inconsistency between the Schedule and the General Provisions and any specifications or other provisions which are made a part of this contract, by reference or otherwise, the Schedule or the General Provisions shall control. To the extent of any inconsistency between the Schedule and the General Provisions, the Schedule shall control.

This Contract consists of this Cover Page, the Table of Contents, and the Schedule consisting of 22 pages, the General Provisions (Form AID 1420-23C), dated 9-74, and Additional General Provisions (Form AID-1420-D) Dated 9-74

NAME OF CONTRACTOR North Carolina State University	UNITED STATES OF AMERICA AGENCY FOR INTERNATIONAL DEVELOPMENT
BY (Signature of authorized individual) <u>L. Felix Joyner</u>	BY (Signature of Contracting Officer) <u>V. C. Perelli</u>
TYPED OR PRINTED NAME <u>L. Felix Joyner</u>	TYPED OR PRINTED NAME <u>V. C. Perelli</u>
TITLE <u>Vice-President - Finance</u>	CONTRACTING OFFICER <u>signed</u>
DATE <u>JUN 30 1975</u>	<u>6/30/75</u>

SCHEDULE
COST REIMBURSEMENT CONTRACT WITH
AN EDUCATIONAL INSTITUTION

Contract No. AID/ta-C-1236

TABLE OF CONTENTS

The Schedule, on pages 1 through 22 , consists of this Table of Contents and the following Articles:

ARTICLE I	- STATEMENT OF WORK
ARTICLE II	- CHANGES IN RESEARCH METHODS, PROCEDURES, OBJECTIVES, OR PHENOMENA UNDER STUDY
ARTICLE III	- PERIOD OF CONTRACT SERVICES
ARTICLE IV	- ESTIMATED CONTRACT COST AND FINANCING
ARTICLE V	- BUDGET
ARTICLE VI	- COSTS REIMBURSABLE TO CONTRACTOR
ARTICLE VII	- NEGOTIATED OVERHEAD RATES
ARTICLE VIII	- REPORTS
ARTICLE IX	- SPECIAL PROVISIONS

GENERAL PROVISIONS

1. The General Provisions applicable to this contract consist of form AID 1420-23C entitled "General Provisions - Cost Reimbursement Contract with an Educational Institution", dated 9-74, which includes provisions 1 through 38; and form AID 1420-23D entitled "Additional General Provisions - Cost Reimbursement Contract with an Educational Institution," dated 9-74, which includes provisions 1 through 18.

ARTICLE I - STATEMENT OF WORK

A. For a period hereinafter set forth in the Schedule, the Contractor agrees to develop a "package of economically-sound soil management practices for increasing food production in 1) jungle soils presently under shifting cultivation, 2) acid savanna Oxisols and 3) inter-cropping systems in volcanic highlands. Such practices could be extrapolated to areas other than where the research is conducted.

This work is a continuation of the research formerly carried out under Contract No. AID/csd-2806. The following objectives and products shall reflect the work previously done and incorporate those results into this scope of work.

B. Objectives: Expected Products

Objective 1): Contractor agrees to develop a package of economically-sound soil and fertilizer management practices for increasing food production via continuous cultivation of jungle soils presently under shifting cultivation. The result of such a set of recommendations when applied at the farm level will be to open large new areas of tropical rainforests for food crop production, on an ecologically-sound basis.

Objective 2): Contractor agrees to develop a package of economically-sound soil and fertilizer management practices for increasing food production in acid Oxisol tropical savannas. The result of such a set of recommendations when applied at the farm level will bring into production huge areas of tropical savannas presently not utilized.

Objective 3): Contractor agrees to develop a package of economically-sound soil and fertilizer management practices for increasing food production

in subsistence intercropped systems small farming operations in highland areas affected by volcanic activity. The result of such a set of recommendations, when applied at the farm level will be to markedly increase the productivity of intercropped systems and the well-being of such farmers.

Objective 4): Contractor agrees to develop means for interpreting and extrapolating the products of Objectives 1 to 3 to other areas via economic interpretations, additional greenhouse and laboratory work on campus and through cooperative field trials in other areas. The result of such studies will be the verification (or lack of) of the extrapolability of data from intensive study sites to other jungle and savanna or intercropped volcanic areas.

C. Strategy of Dissemination

The strategy of dissemination shall be as follows: To publish as quickly as possible new significant research results, first in the Technical Annual Reports and when appropriate in scientific articles. Significant results shall be published in English and Spanish. This information shall then be distributed to recipients on Contractor's mailing list and also to additional personnel by the cooperating institutions in their country.

D. Project Design and Methods

A specific list of research projects are outlined on Table 1 as a means for accomplishing the research objectives. Each activity involves one or several experiments. The starting dates, "milestones" and expected

completion appear in Table 1. The narrative of each activity follows. Activities under each objective are interdependent. Additional activities shall be identified in the course of research as needed for accomplishing the objectives. A certain amount of flexibility is needed when interpreting this table, because research cannot be planned with as much precision as the table might imply. Unless otherwise specified field activities are to be conducted in Yurimaguas, Peru, for Objective 1, in Brasilia, Brazil for Objective 2, in Central America for Objective 3 and on campus on Objective 4.

Objective 1: (As stated in Section B).

1. Characterization of Amazon Jungle Soils. 1* Studies on Colombian Amazon finished January 1973. 2. Field studies on Peruvian Amazon Jungle completed. 3. Detailed soils map of Yurimaguas Station shall be completed by September 1975. Further activities contemplated include characterization of potential extrapolation sites. Requests for cooperation received from Pucallpa and Iquitos (Peru), Amapa (Brazil), eastern Ecuador. Project personnel involved in characterization study of soils in the Venezuela Amazon with financial support from Venezuelan government. Personnel: S. W. Buol, E. J. Tyler.

2. Effects of land clearing methods on soil productivity.

1. Field research at Yurimaguas completed. Results show the advantage of the traditional slash and burn system over mechanized land clearing. Report in preparation. Shall be completed by December 1975. Personnel: P. A. Sanchez, C. E. Seubert, C. E. Lopez.

*These numbers refer to the "milestones" of Table 1.

3. Continuous cropping systems and changes in soil properties

Started August 1972. Experimental design consists of four consecutive yearly land clearings with four cropping systems and fertilization strategies to be tested as a function of age after clearing. Changes in soil properties associated with fertility depletion are measured. This is the central, long term experiment to develop cropping systems. To date, the first three land clearings have been carried (Milestones 1, 2, 3). The fourth is planned for July 1975. In addition to yield data collection, intensive soil and plant sampling taken at regular intervals monitors changes with time. Results so far indicate that continuous cropping is economically feasible in these jungle Ultisols and that adequate to excellent yields of upland rice, soybeans, cassava and pastures have been obtained with moderate amounts of fertilizers and lime. Personnel: P. A. Sanchez, C. E. Seubert, C. E. Lopez, H. Villachica, C. Langley.

4. Fertility requirements for pasture production in the
Jungle:

Two forage experiments with Panicum maximum are evaluating the nitrogen, phosphorus, and lime requirements, including an evaluation of urea, sulfur-coated urea and Stylosanthes guyanensis as the source of nitrogen, superphosphate and several rock phosphates including Bayovar rock.

Results of first 10 months indicate high yield levels with low P and lime rates and a promising response of sulfur-coated urea applications every six months. Feeding quality of forage determined by

nutrient analysis and in-vitro digestibility in cooperation with the Animal Science Department. A third experiment comparing methods of lime and phosphorus incorporation in exhausted pastures was initiated in 1974. An additional phase consisting of animal evaluation shall be initiated. Personnel: P. A. Sanchez, C. E. Lopez, C. Langley.

5. Fertility requirements of multiple cropping system for food production: Contractor agrees to develop information for the second component of the "model farm": intensive food production for subsistence purposes and local marketing. Experiments in progress in: (a) Inter-cropping effect on nitrogen fertilization x spacing in corn-soybeans-cassava intercropping. (b) Residue management at different fertility levels in corn-soybeans-cassava intercroppings. (c) Residue management at different fertility levels in corn-soybeans-rice succession. (d) Lime response and depth of liming in corn-cowpea intercropping and monocultures. (e) Fertility requirements for intensive cropping systems ranging from one to five crops a year. (f) Germplasm introduction and testing of materials received from CIAT, IITA, CATIE, and other sources. Preliminary results to date indicate a highly beneficial effect of incorporating Kudzu as green manure on yields and nodulation by soybeans. Personnel: M. K. Wade, P. A. Sanchez.

6. Major element responses in principal food crops: Responses to P, K, and lime by upland rice, soybeans, cassava, and plantains. The purpose is to establish the needed application rates and critical soil test levels. Termination of field experiments will be by September 1975.

Completion of work shall be by December 1975. Personnel: G.S. Miner, D. Anderson.

7. Sulfur and micronutrient requirements: The initial continuous cropping experiment demonstrated the existence of sulfur, boron and molybdenum deficiencies in these soils. Greenhouse tests in Raleigh confirmed these deficiencies and identified zinc and copper deficiencies. Field trials started in March 1975. Data suggests that sulfur and micronutrient deficiencies might be crucial limiting factors. If so their solution with small quantities of inputs transportable at low costs seems economically feasible. Personnel: H. Villachica, P. A. Sanchez.

8. Potential use of Bayovar rock phosphates in the Jungle: Peru is recently beginning to mine huge rock phosphate deposits in Bayovar on the Coast. Its potential is naturally believed to be for acid soils, most of which are in the jungle. Although Bayovar rock is included as treatments in certain experiments in projects 4 and 5, a systematic evaluation of its reactivity fineness and residual effects shall be carried out to ascertain whether this product could be used effectively in the Jungle. Government officials have keen interest and partial financial support has been obtained by Dr. Valverde from MINEROPERU. Preliminary greenhouse experiments are in progress in Raleigh and in Lima by counterpart personnel. Field experiments were planted in March 1975. Personnel: H. Villachica, G. S. Miner, P. A. Sanchez.

9. Developing of a "model farm" for continuous cropping in the Amazon: Shall be started in 1976. A synthesis of all findings into a model based on annual slash and burn of 2 hectares of which 80% shall be in pastures and 20% in intensive multiple cropping. Shall be done with actual farmers

10. Extrapolation of Studies

The third phase of this contract shall involve a series of field extrapolation studies to adapt the results already available from the jungle and savanna stations to other tropical areas with similar environmental conditions. The results of such work will further AID's objectives because (1) it will test the degree of extrapolation possible of the results and the necessary local modifications and (2) it will encourage direct utilization by farmers in other regions.

The Contractor will respond to requests from LDC institutions or USAID Missions for collaboration. Only those institutions that show a high priority interest and willingness to make solid financial and personnel commitments on their part shall be considered.

To date, indications of such an interest have been received from the following institutions:

- 1) - Universidade Federale Rural do Estado do Rio de Janeiro, Amapá, Brazil
- 2) - INIAP, Ecuador
- 3) - IVITA, Pucallpa, Peru
- 4) - Universidad Nacional Agraria La Molina, Peru
- 5) - Universidad de Panama

The following mode of operation shall be initiated:

- 1) Selection and evaluation of the sites shall be made jointly by the Contractor and the host institution's staff. This shall involve soil characterization studies.

- 2) A series of applied-type experiments shall be designed. These will synthesize the principal results from the main stations.
- 3) The experiments shall be conducted by personnel from the cooperating institutions. When appropriate they will serve as thesis topics for graduate studies at the Contractor's campus or other institutions. All operating expenses shall be borne by the cooperating institutions.
- 4) Contractor's staff shall serve as advisors, and will cooperate on execution and interpretation of the work. Certain soil and plant analysis shall be conducted at Raleigh to supplement results.
- 5) The cooperating institutions shall conduct appropriate field days, demonstrations and other extension functions.

Personnel: S.W. Buol, P.A. Sanchez

Objective No. 2 (As stated in Section B)

1. Soil Characterization (a) Determination of the potential area of extrapolation in the Campo Cerrado by Cline and Buol. (b) Work will continue in Llanos Orientales in collaboration with CIAT. (c) and (d). Additional studies in sites for potential extrapolation.

Personnel: S.W. Buol, L. Mejia.

2. Depth of Liming and Residual Effects. A long term experiment was initiated in December 1972, to evaluate the effect of different lime applications and the potential benefits of liming to 30 cms.depth. Results to date (a) indicate that deep liming is superior to shallow lime application because it increases root development and allows plants to withstand dry periods better. Two crops are grown per year and

and preliminary indications of the residual effects (b) indicate that relatively low rates are adequate. Several more years are needed to evaluate this effect in economic terms. Personnel: Kamprath, Gonzalez, Salinas, Naderman.

3. Phosphorus Rates, Placement and Residual Effects: A long term experiment was planted in October 1972 to evaluate the effect of rates, placement and timing methods. Results to date suggest that large applications have a marked residual effect and that a combination of an original broadcast application followed by banded applications at each successive planting might be recommendable, but these suggestions are not economically sound yet. Considerable progress will be made by mid 1975 although a much longer time span is needed for a thorough evaluation. Personnel: Kamprath, Yost, Naderman, Langley. LDC staff: Soares, Lobato, Galrao.

4. Zinc Rates and Residual Effects: A third set of long term experiments was planted in Brasilia in October 1972. They are designed to evaluate the rates, variety and ph interactions of zinc applications. Results to date (1) indicate that about 3 kg Zn/ha is essential to obtain yields and that lining of ph 6.4 induces additional zinc deficiencies. The residual effects of such applications shall be adequately established by early 1978. Personnel: Cox, Lopes.

5. Phosphate Sources - Silicate Applications: Field experiments were established in October 1973 to evaluate cheaper sources of phosphorous including native rock phosphate and fused phosphate silicates (Termofosfato) on a pasture grass and legume at three lime levels. Two

greenhouse experiments are also evaluating the interaction between lime, phosphorus and silicates with emphasis in decreasing phosphorus fixation. No preliminary results are available but considerable progress will be made by mid 1976 and 1978. Personnel: Kamprath, Yost, Naderman, Smyth, Sanchez.

6. Varietal and Species Differences in Tolerance to Al and low P.

A series of culture solution studies in Raleigh were conducted to characterize varietal differences in corn, rice and beans. Results to date quantified such varietal differences and related them to differential ability to take up and translocate phosphorus. A series of experiments shall be installed in Brasilia to test a large number of germplasm for Brazilian sources at three levels of P and three of exchangeable aluminum. Collaboration with Cornell plant breeder, C.O. Grogran will be made. Personnel: Salinas, Sanchez, Naderman, Jackson.

7. Distribution of Properties of Cerrado Soils: A total of 565 samples were taken throughout the Cerrado in order to quantify the variability in chemical properties. Results to date (1) indicate a very good correlation between several fertility parameters and native vegetation. Extreme low fertility characterizes the large majority of the samples. Work shall serve as a guide for extrapolation of experimental results. Completion in late 1975. Personnel: Lopes, Cox,

8. Chemistry and Mineralogy of Phosphorus Fixation: Basic studies, using modern techniques are needed to better understand the process of phosphorus fixation by iron and aluminum oxides and hydroxides which is

the main fertility limiting factor in these savanna Oxisols. Basic laboratory experiments were initiated in Raleigh to understand the process. Considerable progress will be accomplished by late 1975 and completion by mid 1977. Personnel: Buol, Bingham.

9. Sulfur Potassium and Magnesium Studies: These elements are also limiting in these soils and information in their behaviour and requirements are needed. A series of experiments starting in October 1975 and terminating in 1978 shall provide the necessary data. Personnel: Kamprath, others.

10. Extrapolation Studies: The operating pattern shall be essentially the same as for item 10. Objective 1. Contractor will examine the situation and help design the best limited number of management combinations which shall lead to economical field recommendations. Actual tests shall be financed and conducted by the local cooperators. Only those willing and capable of conducting satisfactory adaptive research trials shall be considered.

Management of the Oxisols under savanna ecology is critical in many countries.

Collaborators:

- 1) EMBRAPA, Brazil
- 2) CIAT, Carimagua, Colombia
- 3) Ministry of Agriculture, Dominican Republic

4) Universidad de Panama, Panama

Discussions shall be held with the institutions and where agreement can be reached cooperative projects shall be established.

Personnel: NCSU - S. W. Buol, E. J. Kamprath, Naderman and others.

Objective 3. (As stated in section B)

1. Soil Characterization: Soil soprosequence relationship in volcanic areas of Costa Rica completed by mid 1974 (1). Additional studies for new experimental areas planned. Personnel: Buol and assistants.

2 to 8. experiments in the process of completion of termination by the end of present contract period.

9. Nitrogen Management in Intercropping Systems: A series of corn-soybeans systems were compared with monocultures at different nitrogen levels to estimate efficiency of utilization and other parameters. Results of first set of experiments indicate significant intercropping effect in Turrialba. Other experiments programmed for other regions. Completion by mid 1978. Personnel: Oelsligle, McCollum, Rossiter and others.

10 to 12. Phosphorus, Sulfur, and Liming Management in Intercropping Systems: A proposed series of experiments to be conducted in important intercropped areas of Central America to determine the dynamics of P, S, Ca, Mg and Al in intercropped systems and what are the best ways to apply these nutrients or amendments. Long term experiments in which considerable progress is expected by mid 1978 but economically-sound interpretations at a later date. Personnel: McCollum, Rossiter, Oelsligle and others.

Objective 4. (As stated in section 2.b)

1 and 2: Essentially completed during the present contract period.

3. Economic Interpretation of Field Results: Economic research has shifted from the analysis of data gathered prior to the contract to analyzing the data produced by the field research activities. It involves translating the agronomic research results in economic terms and additional related data such as transportation costs. Personnel: Perrin and assistants.

4. Fertility-Capability Classification System: The system presented in 1971 went through preliminary evaluation in 1973 and the first formal version shall be published in 1975. Evaluation of Brazilian data is also finished. Additional evaluation and interpretation shall be planned using existing data for experiment stations in the tropics as well as in the U.S. Personnel: Granger, Pope, Buol, Sanchez.

5 and 6. Greenhouse, Laboratory and Soil Characterization Studies:

Needed to answer basic question passed by the field research or estimate degree of data extrapolation. Personnel: Kamprath, Buol, Cox, McCollum, Sanchez, Wollum, Perrin and assistants.

7. Publication and Distribution of Results: Annual technical report and reprints of publications mailed to over 450 individuals and institutions.

OBJECTIVE 1.

	<u>Starting Date</u>	<u>Expected Completion</u>
1. Characterization of Amazon Jungle soils.	June 71	June 78
2. Slash-and-burn vs mechanized land clearing methods.	Aug. 72	Dec. 75
3. Continuous cropping systems and changes in soil properties.	Aug. 72	June 78
4. Nitrogen, phosphorus and lime requirements of grass and grass-legume pastures.	Sept. 73	June 78
5. Fertility requirements of intensive multiple cropping system for food crop production.	Jan. 74	June 78
6. Major element response by upland rice, soybeans, cassava and plantains.	Aug. 74	Dec. 76
7. Sulfur and micronutrient requirements.	Feb. 74	June 78
8. Potential use of Bayovar rock phosphates in the Amazon Jungle.	Aug. 74	June 78
9. Development of a model farm for continuous cropping in the Amazon Jungle.	Sept. 75	June 78+
10. Extrapolation of results to other jungle areas via field experiments with cooperating institutions.	Sept. 75	June 78+

OBJECTIVE 2.

1. Characterization of savanna soils.	Sept. 71	June 78+
2. Residual effects of liming applications (including depth) in relation to crop requirements and soil moisture.	Dec. 72	June 78+
3. Residual effects of phosphorus fertilization in Oxisols of Brasilia.	Oct. 72	June 78+
4. Residual effects of zinc fertilization.	Oct. 72	June 78
5. Comparison of different phosphorus sources and silicon applications to reduce fixation. Residual effects.	Oct. 73	June 78+

	<u>Starting Date</u>	<u>Expected Completion</u>
6. Varietal and species differences in tolerance to high exchangeable aluminum and low available phosphorus.	Jan. 74	Jan. 78+
7. Distribution of soil properties in the Cerrado of Brazil.	May 73	Dec. 75
8. Basic chemistry and mineralogy of phosphorus fixation reactions in highly weathered soils.	Jan. 74	June 77
9. Extrapolation of results to other Oxisol savanna areas via field experiments with cooperating institutions.	Oct. 75	June 78+

OBJECTIVE 3.

1. Characterization of soils and climatic regimes of areas affected by volcanic ash in Central America.	March 73	June 78
2. Macro and micronutrient survey in Guatemala (concluded).	Aug. 71	Dec. 73
3. Long term P fertilization in Guatemala (transferred to ICTA)	Jan. 72	Dec. 73
4. Intensive forage sorghum fertilization for dry season cattle feeding in six sites of northern El Salvador.	March 73	Dec. 75
5. Fertility management for upland rice production in Costa Rica.	April 73	Dec. 75
6. Sulfur deficiencies and development of sulfur extraction methods in Costa Rica.	April 73	Dec. 74
7. Copper toxicity in upland rice soils in Costa Rica.	April 73	Dec. 74
8. Intensive multiple cropping systems at three fertility levels in volcanic soils of Turrialba, Costa Rica.	Dec. 72	Dec. 75
9. Nitrogen fertilization in intercropping and multiple cropping systems. Four locations in Costa Rica, possible in El Salvador.	July 73	June 76

	<u>Starting Date</u>	<u>Expected Completion</u>
10. Phosphorus fertilizer management in intercropping and multiple cropping systems. At several locations in Central America.	Sept. 75	June 78+
11. Sulfur fertility management in intercropping and multiple cropping systems. At several locations in Central America.	Sept. 75	June 78+
12. Liming intercropping and multiple cropping systems. At several locations in Central America.	Jan. 76	June 78+

OBJECTIVE 4.

1. Literature Review (State of the art) completed May, 1974.		
2. Economic analysis of methods for estimating fertilizer recommendations.	June 70	Dec. 74
3. Economic interpretation of experimental results and data extrapolation.	Jan. 75	June 78
4. Development and evaluation of the fertility-capability classification system (World Wide).	June 71	June 78
5. Greenhouse and laboratory studies to help interpret field data and to estimate possibilities of extrapolation of results to soils of other countries or regions (Fertility, chemical, and microbiological studies).	June 70	June 78

Location

6. Characterization studies of other tropical regions to help interpret and extrapolate data.	June 70	June 78
7. Publication and distribution of research results in two languages.	Dec. 71	June 78

Table 1. Timetable for each research activity by objectives.

Activity by Objective	PRESENT CONTRACT PERIOD					PROPOSED EXTENSION			
	70	1971	1972	1973	1974	1975	1976	1977	1978
<u>Objective 1</u>									
1. Characterization of Jungle soils	S	-----	1	-----	2	-----	3	-----	→C
2. Slash-and-burn vs mechanized land clearing			S	-----	1	-----	→C		
3. Continuous cultivation-soil dynamics			S	-----	1	-----	2	-----	3
4. Pasture fertilization.					S	-----	1	-----	2
5. Multiple cropping-fertility interaction..					S	-----	1	-----	→C
6. Major element response in principal crops (rice, soy-beans, cassava, plantains)					S	-----	1	-----	→C
7. Sulfur and micronutrient responses.					S	-----	1	-----	2
8. Potential use of Bayovar rock phosphate.					S	-----	1	-----	→C
9. Development of a model farm.						S	-----	1	-----
10. Extrapolation field studies in other areas.						S	-----	1	-----

S = Project start
 a = Significant accomplishment
 C = Project concluded

T = Transferred to cooperating national institution; limited advisory activities afterwards.

	PRESENT CONTRACT PERIOD						PROPOSED EXTENSION					BE
	70	1971	1972	1973	1974	1975	1976	1977	1978	1979		
	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q		
<u>Objective 2</u>												
1. Soil characterization	S	-----	1	-----	2	-----	3	-----	4	-----		
2. Depth of liming and residual effects			S	-----	1	-----	2	-----	3	-----		
3. Phosphorus rates, placement and residual effects.			S	-----	1	-----	2	-----				
4. Zinc rates and residual effects.			S	-----	1	-----						C
5. Phosphate sources - silicate applications					S	-----	1	-----	2	-----		
6. Varietal and species differences in tolerance to high Al and low P					S	-----	1	-----	2	-----		
7. Distribution of properties of Cerrado soils.					S	-----	1	-----				C
8. Chemistry and mineralogy of phosphorus fixation.					S	-----	1	-----				C
9. Sulfur, potassium and magnesium studies.							S	-----	1	-----		C
10. Extrapolation field studies to other areas.							S	-----	1	-----		

	PRESENT CONTRACT PERIOD						PROPOSED EXTENSION				BC		
	70	1971	1972	1973	1974	1975	1976	1977	1978				
	□	□	□	□	□	□	□	□	□				
<u>Objective 3</u>													
1. Soil characterization studies				S	-----	1	-----	2	-----	3	-----		
2. Macro and micronutrient survey in Guatemala.				S	-----	1	----->					C	
3. Long term P fertilization in Guatemala				S	----->							T	
4. Forage sorghum fertilization El Salvador				S	-----	1	-----	2	----->			C	
5. Upland rice fertilization - Costa Rica.				S	-----	1	----->					T	
6. Sulfur deficiencies and extraction methods in Costa Rican soils.				S	-----	1	----->					C	
7. Copper toxicity on rice.				S	-----	1	----->					D	
8. Multiple cropping systems - preliminary work.				S	-----	1	----->					C	
9. Nitrogen fertilizer management in intercropping systems.				S	-----	1	-----						C
10. Phosphorus fertilizer management in intercropping systems								S	-----	1	-----		
11. Sulfur fertility management in intercropping systems.								S	-----	1	-----		
12. Liming intercropping systems.								S	-----	1	-----		

	PRESENT CONTRACT PERIOD						PROPOSED EXTENSION				
	70	1971	1972	1973	1974	1975	1976	1977	1978		
<u>Objective 4</u>											
1. Literature Review (State of the Art).	S	1	2	3	4	5			C		
2. Economics of Fertilizer Response.		S	1	2	3	4	5	6	C		
3. Economic Interpretation of Field Results.						S			C		
4. Fertility-Capability Classification.		S	1	2	3	4	5	6	C		
5. Greenhouse and Laboratory Studies in Fertility, Chemistry, Microbiology.		S	1	2	3	4	5	6	7	8	C
6. Soil characterization studies.	S	1	2	3	4	5	6	7	8	C	
7. Publication and distribution of results		S	1	2	3	4	5	6	7	C	

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ARTICLE II - CHANGES IN RESEARCH METHODS, PROCEDURES, OBJECTIVES OR PHENOMENA UNDER STUDY

A. The Contractor may change the methods and procedures employed in performing the research without making special reports on proposed actions or obtaining A.I.D. approval. However, significant changes in methods or procedures shall be reported to the Government in periodic or final technical reports. In the event the methodology or experiment is stated as a specific objective of the research work, any changes to either fall within the scope of paragraph, "B" below.

B. The stated objectives of the research efforts shall not be changed, except with the prior approval of the Contracting Officer.

C. The phenomenon or phenomena under study, i.e., the broad category of research, shall not be changed except with the prior approval of the Contracting Officer.

ARTICLE III - PERIOD OF CONTRACT SERVICES

The effective date of this Contract is date of Contracting Officer's signature as shown on the cover page, and the estimated completion date of work, including final report(s), under this Contract is 06-29-78.

ARTICLE IV - ESTIMATED CONTRACT COST AND FINANCING

The Contractor will be reimbursed for the costs incurred by him in performing services hereunder in accordance with the applicable provisions of the Schedule and the General Provisions, subject to the following limitation made in respect thereto:

A. Total A.I.D. dollar funds available for payment and allotted to this Contract. See the clause of the General Provisions entitled "Limitation of Funds" and the article of the Schedule entitled "Budget", if applicable.

\$424,000

B. Estimated additional funds which may be provided, if funds are available. See the clause of the General Provisions entitled "Limitation of Funds" and the article of the Schedule entitled "Budget", if applicable.

\$1,234,368

Total Estimated Contract Cost

\$1,658,368

NOTE: It is estimated that the aforesaid amounts will be sufficient to complete the work required hereunder as set forth in the Schedule article entitled "Statement of Work".

ARTICLE V - BUDGET

<u>Categories</u>	<u>Firm Budget</u> <u>(Obligated Funds)</u>	<u>Projected</u> <u>Budget</u>	<u>Total</u> <u>Estimated Cost</u>
	<u>FR:04-01-75</u> <u>TO:1 -31-76</u>	<u>FR:02-01-76</u> <u>TO:03-31-78</u>	<u>FR:04-01-75</u> <u>TO:03-31-78</u>
Salaries & Wages	\$ 174,714	\$ 559,666	\$ 734,380
Fringe Benefits	20,063	64,267	84,330
Overhead	52,710	168,851	221,561
Consultants	- 0 -	- 0 -	- 0 -
Other Direct Costs	31,500	100,905	132,405
Equipment, Materials Supplies	51,000	100,320	151,320
Travel, Transportation Allowances	<u>96,013</u>	<u>240,359</u>	<u>336,372</u>
	<u>\$424,000</u>	<u>\$1,234,368</u>	<u>\$1,658,368</u>

ANTICIPATORY COSTS

1. The allowable cost of performance of this contract shall include all allowable and allocable costs which have been incurred by the Contractor in anticipation of this contract on or after 4-1-75 but prior to the execution date hereof, and which, if incurred after the date of this contract would have been considered as items of allowable and allocable costs under Article VII; provided, however, that such anticipatory costs shall not exceed \$71,555. unless such amount is subsequently increased in writing by the Contracting Officer.

2. Within the terms of the contract and within the grand total of the firm budget the contractor may make expenditures and may make adjustments in line items to achieve the objectives of the contract. With respect to the projected budget periods under the contract and within 6 months before the end of firm budget period Contractor shall submit to A.I.D. for approval a proposed new firm budget for the year (or other agreed upon period).

ARTICLE VI - COSTS REIMBURSABLE TO CONTRACTOR

The United States dollars costs allowable under the contract shall be limited to reasonable, allocable, and necessary costs determined in accordance with the Clause of the General Provisions of this contract entitled "Allowable Cost, and Payment."

ARTICLE VII - NEGOTIATED OVERHEAD RATES

A. Establishment of Postdetermined Indirect Cost Rates

Pursuant to the clause of the General Provisions of this Contract entitled "Negotiated Overhead Rates - Postdetermined", a rate or rates shall be established for each of the Contractor's accounting periods during the term of the Contract. Pending establishment of final indirect cost rates for the initial period, provisional payments on account of allowable indirect costs shall be made on the basis of the following provisional rates applied to the base(s) which are set forth below:

	<u>Rate</u>	<u>Base</u>	<u>Period</u>
On Campus	47.01%	Salaries & Wages	FROM: 4-1-75 TO : 1-31-76
Off Campus	21.47%	Salaries & Wages	FROM: 4-1-75 TO : 1-31-76

Postdetermined indirect cost rates for subsequent periods shall be established in accordance with the terms of the "Negotiated Overhead Rates - Postdetermined" clause of this Contract.

ARTICLE VIII - REPORTS

One hundred copies of the Annual Report of the project shall be prepared and submitted to AID/W (TA/AGR) within 45 days after the anniversary date of the contract. Preparation and distribution of the Annual Report shall conform to the Guidelines for Preparation of the Research Annual Report (Attachment A).

ARTICLE IX - SPECIAL PROVISIONS

A. Prior to making any visits to LDC's, the Contractor shall review its plans with TA/AGR. Contractor shall keep AID Missions in countries to be visited fully informed of proposed visits, ask them to provide any advice they wish and to participate if they desire, and shall inform the Missions of the outcome of consultations. Contractor shall make its own appointments and logistics arrangements directly.

B. Upon completion of any project funded travel, a copy of the trip report shall be provided to TA/AGR Project Monitor. The report format shall be established jointly by the Contractor and the Project Monitor.

C. In accordance with paragraph (2) of Additional General Provision No. 3 entitled "Personnel", whereunder the Contractor may not send individuals outside of the US. to perform work under the contract without the prior written approval of the Contracting Officer, the Contracting Officer does, hereby, provide said approval for those individuals required to travel outside

United States; provided, however, that concurrence with the assignment and/or travel of any and all said individuals outside the U. S. is obtained, in writing, from the Cognizant Technical Office of A.I.D. prior to their assignment and/or travel abroad.

This approval by the Contracting Officer, shall not apply to any other clause or provision of this contract which specifically requires Contracting Officer approval.

After approval of the proposed international travel, the Contractor shall provide the cognizant USAID mission advance notification, with a copy to the Contracting Officer, of the arrival date and flight identifications of AID financed travellers.

making such commitments does not preclude future determinations of noncompliance based on a finding that the commitments are not sufficient to achieve compliance.

(c) The Compliance Agency shall have the primary responsibility for the conduct of compliance reviews. Agencies shall institute programs for the regular conduct of compliance reviews in accordance with the Director's guidelines, and shall also conduct compliance reviews in accordance with any special requests or instructions of the Director. Compliance reviews may also be conducted by the Director. Compliance reviews should be conducted by qualified specialists regularly involved in equal opportunity programs.

(d) Each agency shall include in the invitation for bids for each formally advertised nonconstruction contract or state at the outset of negotiations for each negotiated contract, that if the award, when let, should exceed the amount of \$1 million or more, the prospective contractor and his known first-tier subcontractors with subcontractors of \$1 million or more will be subject to a compliance review before the award of the contract. No such contract shall be awarded unless a preaward compliance review of the prospective contractor and his known first-tier \$1 million subcontractors has been conducted by the compliance agency within 12 months prior to the award. If an agency other than the awarding agency is the compliance agency, the awarding agency will notify the compliance agency and request appropriate action and findings in accordance with this subsection. Compliance agencies will provide awarding agencies with written reports of compliance within 30 days following the request. In order to qualify for the award of a contract, a contractor and such first-tier subcontractors must be found to be in compliance pursuant to paragraph (b) of this section, and with Part 60-2 of these regulations.

[33 FR 7804, May 28, 1968, as amended at 34 FR 744, Jan. 17, 1969; 35 FR 10680, July 1, 1970]

§ 60-1.21 Filing complaints.

Complaints shall be filed within 180 days of the alleged violation unless the time for filing is extended by the agency or the Director for good cause shown.

[42 FR 3459, Jan. 18, 1977]

§ 60-1.22 Where to file.

Complaints may be filed with the compliance agency or the OFCCP, 200 Constitution Avenue, N.W., Washington, D.C. 20210. Those filed with the Director may be referred to the compliance agency for processing, or they may be processed by the Director in accordance with § 60-1.24.

[42 FR 3459, Jan. 18, 1977; 42 FR 5978, Feb. 1, 1977]

§ 60-1.23 Contents of complaint.

(a) The complaint shall include the name, address, and telephone number of the complainant, the name and address of the contractor or subcontractor committing the alleged discrimination, a description of the acts considered to be discriminatory, and any other pertinent information which will assist in the investigation and resolution of the complaint. The complaint shall be signed by the complainant or his/her authorized representative. Complaints alleging class-type violations which do not identify the alleged discriminatee or discriminatees will be accepted, provided the other requirements of this paragraph are met.

(b) If a complaint contains incomplete information, the compliance agency or OFCCP shall seek the needed information from the complainant. In the event such information is not furnished to the compliance agency or the Director within 60 days of the date of such request, the case may be closed.

[42 FR 3459, Jan. 18, 1977; 42 FR 5978, Feb. 1, 1977]

§ 60-1.24 Processing of matters by agencies and the Director.

(a) *Complaints.* A copy of each complaint filed with the compliance agency shall be transmitted to the Director within 10 days after the receipt thereof. OFCCP and the compliance

agencies may refer a complaint to the Equal Opportunity Commission for processing under Title Rights Act of 1964, as the regulations in the referring complaints compliance agencies of appropriate, shall complainant(s) and such referral.

(b) *Complaint in conducting complain OFCCP or the complainant shall, as a minimum, a thorough evaluation of the complaint and shall for developing a complaint. The compliance agency shall provide such other guidance the complaints as to provides. The case record the name, address, number of each person interviewed, statements, scripts, or summaries (a) of pertinent data to be at least one and a narrative report with references to other evidence which alleged violations. When filed against a prime subcontractor who is involving more than one otherwise provided, the agency shall conduct and make such findings as shall be an administration of the*

(c) *Resolution of complaint investigation.* The complaint agency pursuant to (b) of this section shall so inform the Director may request further investigation may undertake such he/she may deem appropriate.

(2) If any complaint compliance review in the equal opportunity matter should be recommended whenever possible means may include a compliance copy