

I. PROJECT IDENTIFICATION

2. PROJECT TITLE

Seed Program and Industry Development

APPENDIX ATTACHED

YES NO

2. PROJECT NO. (PP) 031-11-130-203

ORIGINAL REV. NO. 1 10 Mar. 75

CONTRACT AID/CN/ta-73-34

3. RECIPIENT (specify)

COUNTRY Worldwide
 REGIONAL INTERREGIONAL TA Bureau

4. LIFE OF PROJECT

BEGINS FY 1958
 CONTINUING
 ENDS FY

II. FUNDING (DOLLARS AND MAN MONTHS) AND REQUIREMENTS

A. FUNDING BY FISCAL YEAR	B. TOTAL \$	C. PERSONNEL		D. PARTICIPANTS		E. COMMODITIES \$	F. OTHER COSTS \$	G. PASA/CONTR.		H. LOCAL CURRENCY RATES \$/L (U.S. DOLLAR)		
		(1) \$	(2) MM	(1) \$	(2) MM			(1) \$	(2) MM	(1) L.S. GRANT	(2) L.S. LOAN	(3) L.S. OTHER
1. PRIOR YEAR ACTUAL FY	1369							1369	X			
2. OPN. FY 1975	187							187	59			
3. BUDGET FY 1976	209							209	63			
4. BUDGET FY 1977	220							220	63			
5. BUDGET 12 FY												
6. BUDGET 13 FY												
7. ALL SUBQ. FY												
8. GRAND TOTAL	1985							1985				

9. OTHER DONOR CONTRIBUTIONS

(A) NAME OF DONOR	(B) KIND OF GOOD/SERVICES	(C) AMOUNT
NA	NA	NA

III. ORIGINATING OFFICE CLEARANCE

1. DRAFTER <i>Andrew R. Downie</i> Andrew R. Downie, TA/AGR	TITLE Project Manager	DATE 3/27/75
2. CLEARANCE OFFICE <i>Leon F. Hesser</i> Leon F. Hesser, TA/AGR	TITLE Acting Director	DATE 3/27/75

IV. PROJECT AUTHORIZATION

1. CONDITIONS OF APPROVAL

This Project Proposal for a three year extension was reviewed by the Research and Development Committee in March 24, 1975 and unanimously endorsed.

2. CLEARANCES

BUR/OFF.	SIGNATURE	DATE	BUR/OFF.	SIGNATURE	DATE
RESH/TECH	<i>David I. Steinberg</i> David I. Steinberg	3/27/75	AFR/RA	Woodrow W. Leake	4/1/75
E/ASIA	<i>Donald Yeaman</i> Donald Yeaman (Draft)		TA/PM	John Gunning	4/7/75
LA/DR	<i>Carl van Maellen</i> Carl van Maellen	5/27/75	PPC/DPRE	Arthur Handly	
APPROVAL AUTHORITY	<i>Curtis Farrar</i> Curtis Farrar	4/8/75	ADMINISTRATOR	<i>John H. Handly</i> John H. Handly	4/20/75

SEED INDUSTRY DEVELOPMENT

Introduction

This is a TA Bureau field service project which provides a contractual mechanism whereby AID can respond readily and effectively to the requests of LDCs and USAIDs for short-term services in areas related to seed technology.

The goals and purposes to be served within a particular country are formulated by the concerned LDC, USAID, and regional bureau. The TA Bureau project manager is concerned primarily with the quality and quantity of services provided and is associated only incidentally with the final outputs, purposes, and goals of specific LDC and USAID mission activities for which this project provides important inputs.

A. Goal Toward Which Project is Addressed

1. Statement of Sector Goal

To increase the quantity and quality of food and feed crop production in cooperating LDCs so that the socio-economic position of the farmer will be improved.

2. Measurement of Goal Achievement

- a. Better quality and variety of food and food stuffs available on the market as verified by on-site inspection and laboratory tests.
- b. Increased production per unit area of major food and feed crops in assisted LDCs as reflected in crop production records and statistics maintained by Ministry of Agriculture and Farmers.
- c. Farmers have better farming equipment, improved housing, education and medical services available.

3. Basic Assumptions

- a. That Governments in the LDCs will give high priority and adequate support, both financial and political, to the agriculture sector for improved social/rural development.
- b. That farmers use their extra earnings to purchase necessary equipment and supplies, schooling for their children, and pay for medical services.

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B. Subsector Goal

1. Statement of the Subsector Goal

The development of policies, institutions, and manpower resources which will contribute to greater effectiveness and efficiency in the seed input delivery system which is vital for sustained growth of the agricultural sector.

2. Measures of Goal Achievement

- a. LDCs with long range seed industry development programs formulated and national seed and crop improvement policies adopted as verified by Mission, LDC reports and on-site observations.
- b. LDCs with the operational capability to produce, harvest, dry, clean, store and distribute high quality seed of improved varieties of major food and feed crops which can be proven by actual on-site inspection.
- c. An increased number of companies, associations, and farmers engaged in specialized seed production and supporting supply operations verified by the availability of high quality seed for sale for own use and for exchange/sale with other LDCs.
- d. Inadequate seed supply will cease to be a major constraint to improvement in crop production verified by the availability of high quality seed for sale for own use and for exchange/sale with other LDCs.
- e. An increased number of small to medium size farmers planting seed of improved varieties of major food and feed crops as shown in participation within local, regional and national commodity marketing.
- f. Seed laws promotive of seed industry development and protective of farmers' interests implemented and locally enforced in assisted countries. Ministry of agriculture enforcement of seed laws.
- g. The demand and need for outside training and technical assistance decreasing to a low level in assisted countries as verified by the fact that they are training replacements locally and are satisfying local demand.

3. Basic Assumptions

- a. Major advancements in food and feed production in the LDCs will be achieved primarily through the introduction or development and use of improved crop seed and other components of the crop improvement package (e.g. fertilizer, pesticides, storage and marketing).

- b. Governments in the LDCs will formulate and implement policies conducive to the development and/or improvement of a responsive and responsible input supply industry, especially as these relate to improved seed.
- c. That credit facilities will be made available for small farmers and for agricultural related industries.

C. Project Purpose

1. Statement of Purpose

The purpose of this project is to provide , upon request from cooperating LDCs and USAIDs, assistance in seed program/industry planning, implementation, and evaluation leading toward a responsible, responsive seed production industry capable of meeting the farmers' needs for improved seed.

2. Conditions Expected at End of Project

Note: This is a technical support project designed to assist LDCs upon request to: 1) identify and advise on specific problems; 2) assist in design of projects to attain the conditions described under B.2 above. Short term services--and the maintenance of a response capability--are funded under this project. Longer term services to implement recommendations resulting from TDYs would be justified and funded as separate projects, usually funded under bilateral programs.

The project is approved for three year periods. Annual appraisals are made of contractor performance and a review of project relevance/importance held every three years.

3. Basic Assumptions

Achievement of the full purpose of this project will depend in large measure on the assumptions stated below:

- a. Agricultural officials and planners in the Missions and cooperating LDCs recognize the crucial role of an adequate supply of quality seed of high yielding varieties in improving food and feed production.
- b. The governments of cooperating LDCs have recognized the need for and are willing to commit the necessary financial and manpower resources for crop varietal introduction, improvement, testing, and demonstration programs.
- c. Programs for identification and continual improvement of the "package of inputs" vital for increased crop production are operational or recognized as needed in cooperating countries.

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- d. Food Price, crop marketing, and production credit policies in cooperating countries should provide reasonable incentives to farmers for purchase of improved seed and other modern technological farm inputs.
- e. On-going extension programs are seen by LDCs as critical requirements in demonstrating the benefits of improved crop production practices to farmers.
- f. Where above requirements are lacking, LDCs policy makers requesting assistance are in a position to make necessary policy changes and intend to do so.
- g. That short-term services are effective means of stimulating beneficial changes in LDCs.
- h. Technical assistance and services available under the project will be requested and utilized by the Bureaus, Missions and cooperating LDCs.

D. Project Outputs

Specific outputs will in general result from other projects for which this project provides inputs and will be largely determined by the number and nature of requests received from USAIDs and LDCs for the available technical assistance and services. In general, however, the following kinds of outputs are expected if the specified inputs described later are provided. These outputs will be verified by USAID and LDC reports reflecting quality of services provided by the contractor and degree of implementation of advice provided.

The magnitude of outputs cannot be specified in advance since the nature of requests for assistance is an unknown factor.

The kinds of outputs expected under this service project concern advice provided to the requesting LDCs to improve and/or develop its seed industry and will vary from one to all of the following aspects of seed activity:

- a. Advice provided for more effective and efficient implementation of crop improvement and production programs and projects.
- b. Advice to improve service and regulatory components and procedures of seed technology.
- c. Advice for improving organizational structure and administration of seed programs and industries.
- d. Advice provided to improve procedures and practices for seed production under climatic conditions prevailing in assisted countries.

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- e. Provision of improved designs, layout, and operational procedures at seed facilities.
- f. Advice for effective solutions to technical, operational, and managerial problems in seed industry achieved through adaptive "problem solving" approaches.
- g. Advice in improvement, identification and selection of technically and economically sound agricultural development projects involving seed propagated crops.

The specific quantifiable kinds of outputs for this project are:

Kinds of Outputs	Magnitude of Outputs (indicators)		
	<u>FY 75</u>	<u>FY 76</u>	<u>FY 77</u>
1. LDC personnel trained through regional conferences or seminars	30	30	30
2. Use of Information Center to answer LDC technical inquiries (contractor's man/months)	9 MM	9 MM	9 MM
3. Preparation, publication and distribution of manuals on seeds	<u>1</u>	<u>1</u>	<u>1</u>

1. Basic Assumptions

Realization of the foregoing outputs is dependent on the following assumptions:

- a. Technical assistance and services available under this project will be requested by LDCs through Missions and Bureaus.
- b. Financial resources needed for development of seed systems will be provided by assisted country, donors, and/or through loans.
- c. Manpower needed to implement, operate, and manage seed industry will be made available for training and employment.
- d. Commitments by LDCs to seed systems development will be of sufficient depth and duration to permit establishment of an operational seed program.
- e. Governments in assisted countries will approve organizations of seed industry with sufficient flexibility to accomplish its work.
- f. Programs for development of other related inputs of the production of improvement "package" will be adequately supported, i.e.:

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extension, credit, varietal improvement and testing, plant protection, fertilizer available, etc.

- B. That the LDCs will implement plans on advice provided by contractor.

E. Project Inputs

The following inputs are required if the outputs indicated are to be achieved.

1. <u>Kinds of Inputs</u>	FY 75 M/M	FY 76 M/M	FY 77 M/M
<u>a. US Contractor</u>			
1) Advisory Consultant Service to Missions/LDCs	22	23	23
2) Information Library Center Activities	9	9	9
3) Adaptive Research (for varying conditions and new situations in different LDCs)	8	9	9
4) Seminars/Workshops	4	4	4
Subtotal	43	45	45
5) Technician (on campus)	4	6	6
6) Secretary	12	12	12
Grand Total	59	63	63
<u>b. USAID and/or LDCs</u>			
1) Funding for LDC personnel to participate in workshops/seminars			as required
<u>c. LDCs</u>			
1) Provide qualified personnel to be trained			as required
2) Provide in-country facilities for local training			as required

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- 3) Provide necessary funds to implement seed cropping programs as required

d. Other Donors

- 1) Loans from International organizations negotiated
- 2) International technical organizations send representatives to participate in seminar/workshop. as required

2. Input Basic Assumptions

- a. That contractor will have necessary manpower to respond to Mission, LDC and Regional Bureau requests for assistance on a timely basis.
- b. That LDCs have qualified personnel readily available to participate in seminar/workshops organized by contractor and others.
- c. That International lending organizations willing to negotiate loans with LDCs.
- d. That International Technical Organizations willing to actively participate and cooperate in seminars/workshops.

F. Rationale

A major tactic in the current strategy for increasing world food and feed production is the development of more adaptable, resistant, nutritious, and productive crop varieties, and their introduction into the agricultural systems of the LDCs along with the "package" of essential inputs and practices. Relatively massive crop breeding and improvement programs are underway in the developed countries, the international research centers, and in some of the LDCs.

In cases where lack of improved seed varieties is a constraint, this project will furnish assistance in providing improvements in the various facets in the seed systems. This dependence on timely and adequate seed supply and usage for the realization of crop improvement objectives has not been well understood or appreciated until recent times. In all too many cases, seed multiplication and supply - the crucial step from experimental plot to farmer's field - has not been (and is not) adequately provided for, or totally neglected in crop improvement projects and programs. The result is much reduced and extremely slow "pay-offs" on efforts and resources expended in crop improvement research and development.

In traditional agriculture as practiced for hundreds of generations and still the pattern in many LDCs, the farmers set aside a part of each harvest for

planting of the next crop. Beyond this "seed-saving" practice, little distinction is made between the edible grain and the regenerative seed. While this traditional practice suffices for a static, relatively primitive agriculture, it is one of the most serious impediments to agricultural development in all countries. A progressive agriculture, involving great expanses of monocultures of crop kinds and varieties, requires the rapid and effective multiplication and dissemination of genetic improvements in crop varieties as they are effected.

Seed are the mechanism through which plant populations are distributed over both time and space, and the only practical means of transmitting and multiplying into succeeding generations of crops the improvements genetically engineered into small populations of improved varieties by modern plant breeders.

The quality and orientation of a country's agriculture are closely related to the availability and use of good seed. No country or society in our time has developed or can develop a highly productive, progressive and market-oriented agriculture without an effective seed supply system. A well organized, effective seed production and supply industry is as important - and really more basic - to agricultural development - as are supply programs, for fertilizer, pesticides, irrigation, credit and so on.

Seed production and supply systems are notably ineffective or - in most cases - totally lacking in the LDCs, except, significantly, for some of the highly commercialized, plantation, export crops such as peanuts, cotton, and rice (in Latin America). Small to medium sized farming operations which mainly produce basic food and feed crops, have had only limited access to supplies of improved seed. Improvement of their socio-economic condition will require far greater access and usage of the outputs of crop improvement and development programs including an adequate and timely supply of improved seed at reasonable prices.

Efficient and effective seed production and supply program/industries are vital for any real sustained progress in food and feed production in the LDCs. Seed industries will have to be established in a relatively short period of time in contrast to the nearly 100 year development period of the seed industries in the developed countries of North America and Western Europe. These developments will have to take place under climatic conditions decidedly less favorable than those prevailing in the developed, temperate climate countries.

Production and supply of good quality improved seed requires sound planning, effective organization, cooperation, coordination, facilities and equipment, trained managers, technicians and workers, supporting services (in country), adequate regulation, technical information, adaptive research and adequate support. This project provides for the technical assistance and services needed to fulfill these requirements in the cooperating LDCs.

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The Role of Women

Women have been involved in some facets of seed technology since the inception of this project. Many of the South American country seed programs employ women technicians, especially in the seed germination and the seed quality laboratories. A woman is president of the seed technologists organization in Thailand. Of the foreign students getting advanced degrees in seed technology at Mississippi State University, 15 percent have been women. These individuals have returned to their native countries and most of them are in positions of some importance in the governmental and industrial seed programs. The Assistant Director of International Programs at Mississippi State University is a woman whose chief duties are in assisting the foreign students enrolled in Seed Technology to become better adapted to American customs. Dr. Dean Bunch published an article in the Seedsman's Digest of October 1961 entitled "Opportunities for Women in Seed Technology".

There is no doubt that an increasing role can be played by women in the LDCs, both in the technical end of seed technology and as an active partner with her husband in maintaining seed purity by learning to rogue out off types of plants in seed increase fields and by becoming a more active partner in the farming (seed production) enterprise.

Role of the Small Farmer and the Rural Poor

This project aims chiefly at benefitting the small farm operators through increasing yields per unit area. The small seed grower should also benefit through a premium per unit of pure seed produced in order to stay in business. Higher returns to the small farmer will allow him to be more active in purchasing at the market place.

Impact on Environment and Ecology

This project does not require high levels of energy. A minimum of energy is required for drying of seed. However, if seed is harvested during the dry season, sun drying may suffice. Seed cleaning plants that use gravity flow of seed from upper to lower floors will conserve electrical energy. Electricity is needed to operate seed cleaning machinery, however, maximum efforts will be expended to conserve energy in the many processes involved. The use of disease and insect resistant varieties should minimize pesticide useage and reduce harmful ecological influences.

G. Course of Action1. Implementation Plan

This project basically provides for technical services to the Bureaus, Missions and LDCs requesting assistance in the areas of seed improvement and seed technology. Services and activities will include but not be limited to the following:

- a. Assistance in planning, organization or reorganization, and implementation of seed improvement programs or projects and their integration into the overall LDC strategies for agricultural development.
- b. Identification, analysis and resolution - as possible - of technical and operational problems in seed production, harvesting, drying, processing, testing, storage, and distribution.
- c. Conduct studies and make analyses to determine the need for and feasibility of seed facilities, and when needed and feasible, determination of the most efficient type, capacity and location to include production sites, drying and storage units, processing and packaging plants, testing and research laboratories, certification agencies, and foundation seed programs.
- d. Designs and technical specifications for physical facilities requisite for an on-going seed industry/program and assistance in installation and operational checks of equipment, taking into account the climatic patterns of the assisted LDC. Such facilities include seed drying units, handling systems, storage bins and warehouses, processing plants, testing and research laboratories, and seed production sites.
- e. Adaptive technical and economic studies to develop essential methodology, establish design criteria, identify and characterize economic-management requisites vital for efficient and effective seed operation in the LDCs, especially those in the humid subtropics and tropics where adverse climatic conditions prevail.
- f. Planning and execution of training programs of varying intensity, depth, duration and emphasis on the technical, operational, and managerial phases of a seed industry program. Training programs will be U.S., third country and in-country, and range from graduate degree programs in Agronomy-Seed Technology to in-service or on-the-job training for workers at operational level.
- g. Functioning as an information and advisory center on all aspects of seed industry development and operations to AID personnel, nationals in cooperating countries, other AID contractors, and the International lending, technical assistance, research and support agencies and institutions.

2. Narrative Statement

To achieve the purpose of this project the experience and expertise of the contractor will be utilized by Bureaus, Missions and LDCs to assist with the improvement of seed production and supply systems, or selected components thereof, adequate for the needs in each cooperating country.

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The enormity of this task is recognized and appreciated by AID, the contractor, other international development and assistance agencies, and the LDCs. Establishment of an adequate seed program/industry in most LDCs will require a long term effort, firm commitment on the part of all parties concerned, and the necessary resources. It will involve the adoption of favorable policies, the development and interlocking of the several diverse but interdependent components of a seed production and supply system in both the public and private sectors so that a seed industry - the ultimate "output" of this project - can and will emerge.

It is also recognized and appreciated that the enormous task of seed industry development in the LDCs will - in most cases - have to be accomplished under climatic conditions (humid subtropics and tropics) which are relatively unfavorable for seed production, drying and storage - all vital operations in a seed industry. Available technology developed mostly in temperate climates in the U.S. and Western Europe will, therefore, have to be tremendously "stretched" and modified, and new technology developed, to fit the condition prevailing in most LDCs.

Achievement of the project purpose and specified project outputs will be generally accomplished through methods and approaches stated below:

- a. To the extent of funds made available, the contractor will respond to Bureau and Mission requests for specified in-country services, however, cooperating country services will be available only up to 30 in-country man days per specialist per request unless a longer period is specifically justified and authorized by AID/TA/AGR. Under such conditions such services will be funded by the requesting mission/regional bureau including salary, transportation and per diem. In most cases in-country visits will be used for on-site analysis of the situation and conditions, collection of needed technical, climatic and economic data, determination of requirements, and review of on-going or planned projects, in which seed production and supply is or should be integrated. Observations, information and data collected will be developed into reports, plans, recommendations, designs and specifications on return of specialist(s) to home station where these tasks can be done most effectively and efficiently.
- b. Emphasis and priority in services will be given to those LDCs in which ineffectiveness of the seed production and supply system or lack thereof, has become a severe constraint to achievements of food and feed production program objectives as identified by the LDCs, Missions, international development and assistance agencies, and/or the contractor.
- c. Serious seed problem - potential or current - will be anticipated or identified as soon as possible so that a satisfactory solution can be developed or formulated before they severely impede crop production. As an example, the extension of soybean production in the humid subtropics and tropics is totally dependent on the development of an adequate technology for drying soybean seed and maintaining germinability in storage

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until the next planting season. Development of this technology is already well advanced by contractor. Many other outputs from adaptive research are needed and will be produced to adapt technology that was essentially developed for temperate climates to subtropical and tropical conditions.

d. References and other informational materials on the technical, economic, and management features and aspects of a seed industry are relatively non-existent as compared to other areas within agriculture such as plant breeding, plant and animal protection, water management, etc. This deficiency is almost as acute in the U.S. as in the LDCs. In view of this situation a substantial portion of contractor's effort since 1958 has been directed toward the compilation, development, preparation, publication and dissemination of technical and operational information on the several specialized elements of a seed industry. As a result the contractor has become the recognized world center of technical information on agricultural seed. These efforts and activities will be intensified and expanded as they pertain to servicing the needs in the LDCs for information on seed under this project, and strongly supported by a parallel effort under contractor's standing objective and commitment to service similar needs in the U.S. and other developed countries. Contractor will, therefore, fulfill to the limits of its capacity all requests for information and advice on seed directed to its attention by the Missions, Bureaus, LDC agencies and officials, and private individuals and enterprises thereof.

e. In no country can a seed industry operate effectively or be established without trained managers, technicians, and workers. Training of personnel for all levels in a seed industry has been given high priority by AID and contractor since 1956. Although hundreds of nationals from more than 40 countries have been funded from other sources and have been trained to some degree by contractor, and many presently occupy key positions in the "seed programs" of most LDCs the task is far from complete. The contractor will conduct in-country on-the-job training as requested and required and conduct one workshop/seminar annually for approximately thirty participants from LDCs who will be funded by interested USAID, LDC or other international agency.

f. It should be recognized that the level of effort envisioned in terms of expert services under this project is slight in relation to the enormity of the tasks to which it is addressed. Successful achievement of the project purpose will be largely dependent on the inputs specified for AID, other donors, and, most importantly, the cooperating countries.

g. Requests from Missions are on hand or anticipated for at least 11 months of in-country services. Eleven months of in-country services will require an additional 11 man-months or more of home-station services for completion of reports and plans, development of facility designs and technical specifications, other after-actions, and follow-throughs. Development and preparation of informational materials and references, and operation of the information center, will require 9 man months annually. A seminar/workshop conducted annually will require 4 months of contractor's inputs per year.

Although the projected demand for services is about 50 professional mm/year or greater, 40-45 man months/year is considered as a reasonable level of effort under this project for the next 3-5 years.

The TAB specialist assigned to this project is responsible for monitoring progress, coordinating project activities with those of multilateral organizations, handling Bureau and Mission requests for services, and initiation and monitoring of funding documents necessary for execution of the project.

Evaluation Plan

This project will be reviewed annually by TA/AGR with participation by technical representation of the regional bureaus. This will be accomplished by visit to contractor's facilities and/or analysis of contractor's annual progress report. In addition, a special review will be conducted after 27 months of operation under this contract. The special review committee will include but not limited, to, representatives from TA/AGR, TA/PM and AID geographic bureaus and outside consultants. The results of this review will provide guidance for future funding or termination of the contract at the end of the third year.

Utilization Plan

The experience gained by the contractor in providing services under this PROP will be documented, published and disseminated to appropriate AID Missions and LDCs for use in resolving similar problems in seed technology. In addition, the contractor will use conferences and seminars as means to transfer new technologies developed. Inquiries are answered by letter or by sending publications wherever these will suffice to resolve the problem in seed technology.

Mississippi State University's capability to execute this contract is reflected in Appendix A.

Most recent services performed by the contractor for the the period April 1, 1974 to March 31, 1975 is given in summary form in Appendix B while Appendix C gives briefly the summary of activities for the previous year April 1, 1973 to March 31, 1974.

Projected Budgets

Line Item	FY 75		FY 76		FY 77	
	M/M	\$	M/M	\$	M/M	\$
1. Salaries						
A. Professional						
Agronomist	14	31,565	14	34,090	14	36,817
Assoc. Agronomist	17	26,168	19	31,585	19	34,111
Agr. Engineer	6	11,725	6	9,663	6	13,675
Agr. Economist	6	9,192	6	9,927	6	10,721
B. Non-Professional						
Secretary	12	6,225	12	6,927	12	7,260
Technician	4	1,840	6	3,034	6	3,276
Subtotals	59	86,715	63	98,022	63	105,860
2. Employees'						
Fringe benefits (11% of salaries)		9,538		10,782		11,644
3. Travel and transportation		1,000		1,200		1,200
4. International travel		20,000		22,000		22,000
5. Per diem		17,000		18,000		18,000
6. Other Direct Costs (communication, printing, expendable supplies, reproduction postage, etc.)		6,000		7,000		7,000
7. Overhead (53.8% of salaries)		<u>46,652</u>		<u>52,735</u>		<u>56,952</u>
Totals		187,000		209,739		220,646

THE NETWORK FOR APPLICATION OF RESOURCES
AND MISSISSIPPI STATE UNIVERSITY'S CAPABILITY

The resources available at Mississippi State University (MSU) under this contract can be most efficiently and effectively utilized to assist the LDCs in four critical phases of seed program/industry development.

- (1) Identification of the need for a seed production and supply program or improvement thereof, for achievement of agricultural development goals, and when needed its type and scope.
- (2) Planning and organization; or reorganization, of complete seed programs with capabilities adequate for immediate and projected needs in the LDCs.
- (3) Implementation of seed program development plans including designs and specifications for equipment and facilities, operational training, and in-depth training of key personnel, and continued backstopping by providing technical and operational information and advice.
- (4) Modified technologies to effect satisfactory solution to immediate or anticipated technical and operational problems.

To apply MSU's expertise and resources to seed program development in the LDCs, the Missions in cooperation with the host LDCs must identify the need of and initiate the requests for assistance. Requests channeled through the Bureaus or Missions to TAB/AGR will be acted upon by responding with appropriate MSU resources, i. e., technical assistance and services, adaptive research, informational

services, and training. See Diagram, Appendix A.

The Seed Technology Laboratory at Mississippi State University is a Section of the Agronomy Department, Mississippi Agricultural and Forestry Experiment Station (MAFES) and College of Agriculture. It has a permanent staff of 7 professionals (one stationed overseas under a contractual arrangement with the Government of Brazil), plus two attached specialists from the Department of Agricultural and Biological Engineering, and Department of Agricultural Economics. Additionally, the Director of International Programs at MSU is a seed specialist (and former head of the Laboratory) and participates in training, research and service activities. This core staff of the Seed Technology Laboratory is supported by the Mississippi Seed Regulatory Laboratory responsible for seed testing services to the seed industry and farmers and enforcement of the state seed law, the Mississippi Seed Improvement Association, the Official Seed Certification Agency in the state and third largest in the U. S. , and the Foundation Seed Stocks Project of MAFES, an operational unit responsible for production and supply of foundation seed of publicly developed varieties to the seed producers and companies in the state. These various units are administratively interlocked through the Director of the Seed Technology Laboratory who also serves as the Director of the Mississippi Seed Regulatory Laboratory, the permanent member of the Board of Directors of the Certification Agency and the principal advisor to the Foundation Seed Stocks Project.

Within the past year the four "seed units" at MSU have moved into adjacent buildings of a new complex of seed facilities constructed at a cost of over \$1 million from state appropriations.

MSU's Seed Technology Laboratory has been the recognized world center of "seed expertise" and experience since soon after its establishment in 1950. Its regular research, teaching and training, and service programs have greatly benefited and influenced every segment of the U.S. seed industry and the seed industries of the other developed countries. Since 1958 the laboratory has been heavily engaged in technical assistance to the LDCs under several contractual arrangements with AID, and specific consulting arrangements with the UNDP, FAO, World Bank and Ford Foundation. Its staff specialists have provided specific in-country services to 36 countries, in many on more than one occasion (7 separate times in one country), and have served as advisors or instructors in regional seed conferences in Africa, Latin America, and the Far East (See Appendix B-1).

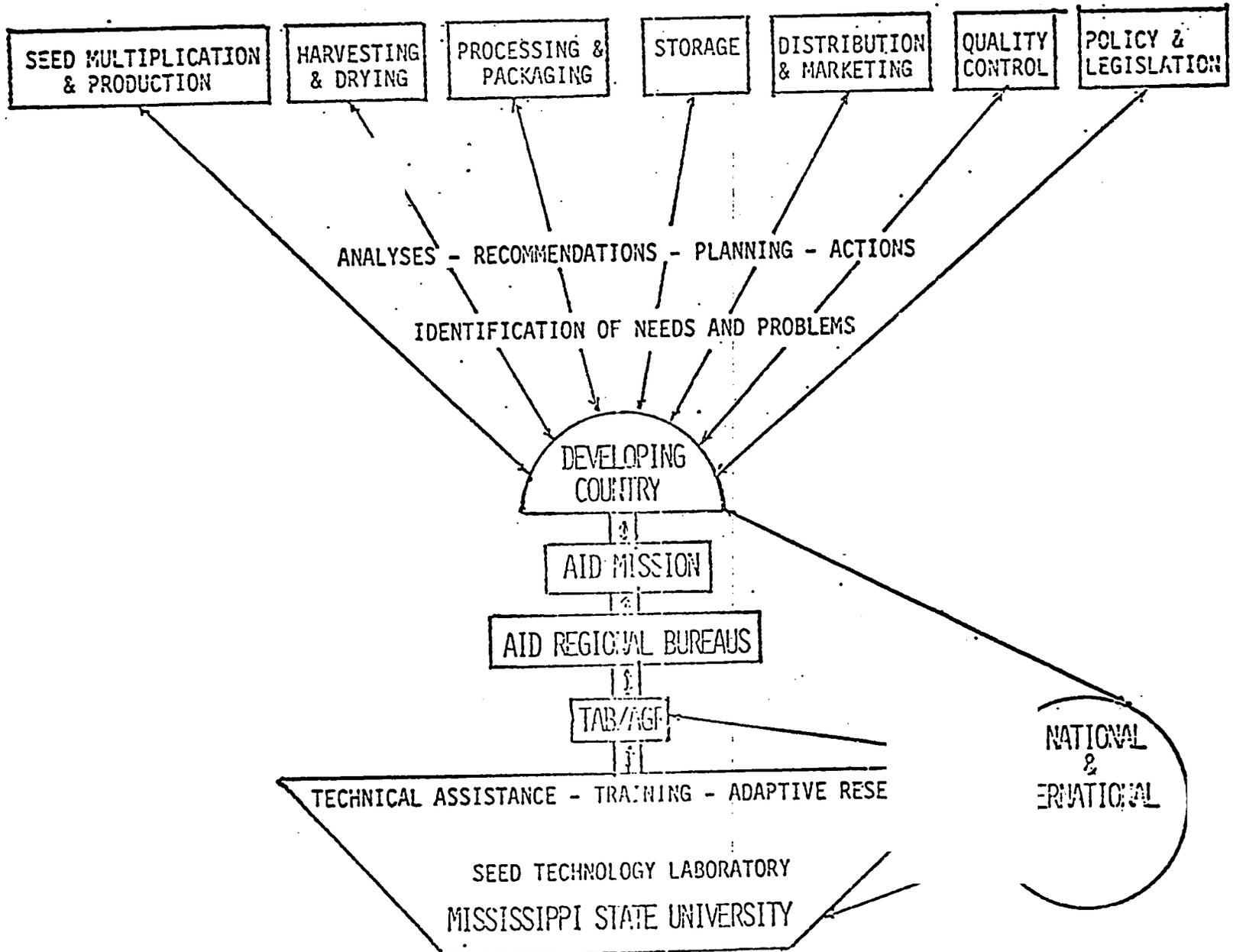
Thousands of copies of references, informational materials, and technical articles have been distributed to 87 countries - developed and less developed - during the past 16 years.

Because MSU is first and foremost an educational institution, training has been and will continue to receive highest priority. International students who have received training in seed technology at MSU are listed in Appendix B-2. Training periods ranged from a minimum of 5 weeks through the Ph.D. degree, and the trainee number more than 400. Presently (January, 1975) 38 international students from 12 LDCs are enrolled in special (2), undergraduate (2), and graduate programs (34) in Agronomy-Seed Technology. Trainees are variously sponsored and financed by the Missions, LDC governments, Foundations, and FAO.

The Seed Technology Laboratory and associated units are backstopped by related departments within the University and the supporting services and facilities

of the University. Additionally, the Laboratory maintains close linkage with and has the confidence of the U.S. "seed associations" (ASTA, SSA, etc.), the professional societies of seed specialists (AOSA, AOSCA, AASCO, ISTA) the major seed companies in the U.S. and other developed countries, and the seed equipment suppliers and manufacturing companies. The Laboratory (and its staff) also maintains a close and personal relationship with sections and specialists concerned with crop improvement in UNDP, FAO, SIDA, and the Rockefeller Foundation. One area needing substantial attention and development is linkages to and relationship with the International Research Centers,

NETWORK FOR APPLICATION OF RESOURCES



REPORT TO TAB/AID
ON
SERVICES RENDERED UNDER CONTRACT AID/CM/TA-C-73-34
MISSISSIPPI STATE UNIVERSITY PERIOD: 1 Apr. 1974 - 31 Dec. 1974

Region/ Country	Requesting Org./Mission	Type of Services	No. Persons*	Man Days		Est. Cost. \$US** Salary	Remarks
				TDY	Home Sta.		
<u>AMERICAN</u>							
1. Argentina	Direct inquiries	Technical information	1 HS		0.5	51	
2. Bolivia	USAID/Bolivia	Technical assistance	1 HS		5.0	330	Follow-up to previous consultation
3. Brazil	Direct inquiries and visitors	Technical information and training	5 HS		9.0	641	20 Brazilian seed workers visited 3 days; plus one other visitor for 2 days
4. Colombia	Direct inquiries	Technical information	2 HS		1.8	157	
5. Chile	Direct inquiries	Technical information	1 HS		0.2	21	
6. Costa Rica	USAID/Costa Rica	Technical information; one week training seminar	2 TDY 3 HS	16.0	13.0	2167	Report TA 74-17
7. Dominican Rep.	Direct inquiries	Arrangements for visit; Technical information	1 HS		1.0	80	Rice seed problems
8. El Salvador	Direct inquiries	Technical information	1 HS		1.0	80	
9. Ecuador	Direct inquiries	Technical information	2 HS		3.0	144	
10. Guatemala	USAID/Guatemala & direct inquiries	Consultations with GOG, MAG officials. Technical information	4 HS		6.5	443	Senior MAG officials
11. Haiti	USAID/Haiti	Follow-up previous consultation	1 HS		1.0	103	Tentative arrangements for follow-up consultation

Region/ Country	Requesting Org./Mission	Type of Services	No. Persons*	Man Days		Est. Cost. SUS** Salary	Remarks
				TDY	Home Sta.		
12. Guyana	INTSOY	Coordination of consulting assignment	1 HS		1.0	63	
13. Honduras	USAID/Honduras	Consultation on capital assistance project	1 HS 1 TDY	14.0	14.0 6.0	2380	Prepared section of capital assistance document
		Direct Inquiries	Technical information	2 HS		560	
14. Mexico	Direct Inquiries	Technical information and materials	2 HS		1.5	140	
15. ROCAP (Including Guatemala, El Salvador, Honduras, Nicaragua and Costa Rica)	USAID/ROCAP	Completion of study of seed production and marketing in CA; preparation of final reports.	3 HS		39.0	3484	Reports TA 74-05 TA 74-06 TA 74-07 TA 74-08 TA 74-09 TA 74-10
16. Paraguay	USAID/ROCAP	Follow-up to previous and continuing consultation	2 HS		8.0	658	Explanation of facility specs to bidders
17. Peru	USAID/Peru Direct Inquiries	Completion of report	1 HS		7.0	560	Report TA 74-11
		Technical information	1 HS		1.0	80	
18. Venezuela	Direct Inquiries	Technical information	1 HS		0.5	50	
19. Uruguay	Direct Inquiries	Technical information	1 HS		0.3	30	
<u>Africa</u>							
20. A R Egypt	Direct Inquiries	Technical information	1 HS		0.5	51	
21. Ethiopia	USAID/Ethiopia	Assistance on Pulses Project	1 TDY 4 HS	18.0	8.0	2580	Report in preparation

Region/ Country	Requesting Org./Mission	Type of Services	No. Persons*	Man Days		Est. Cost. SUS** Salary	Remarks
				TDY	Home Station		
22. Ghana	USAID/Ghana	Follow-up to previous TDY, and TDY on Seed program development	1 TDY 5 HS	30.0	35.0	4680	Reports TA 74-15 74-15A
23. Ivory Coast	AID/W	Visit and briefing of high level delegation	3 HS		9.0	747	Delegation interested in soybeans
	U.S. Embassy, Ivory Coast	Preparation for consulting visit; follow-ups to previous visit.	3 HS		9.0	711	Trip scheduled in January, 1975
24. Kenya	Direct inquiries	Technical information and training materials	1 HS		4.8	450	Training materials for East Africa seed training course
25. Libya	Direct inquiry	Technical information	1 HS		0.5	50	
25. Liberia	Direct inquiry	Technical information	1 HS		0.5	50	
27. Morocco	USAID/Morocco	Follow-up to previous consultation	1 HS		8.0	528	
25. Niger	USAID/CWA	Advisory services on seed component of cereals project	1 TDY 2 HS		11.0	3220	Prelim. Report issued; after-actions in progress
		Preparation for projected consultation on foundation seed facilities; visit with staff members from Zamaru	4 HS		13.0	1135	Visits with Major Cereals Project's James Clifton and AID's Tom Cooper at different times
29. Nigeria	FAO	Visit with FAO's Jim Beck	1 HS		2.5	250	Discussion on grain storage
	Direct inquiries	Technical information and advice	1 HS		1.0	103	

Report to TAB/AID Continued Page 4

Region/ Country	Requesting Org./Mission	Type of Services	No. Persons*	Man Days		Est. Cost. \$US** Salary	Remarks
				TDY	Home Sta.		
31. Tunisia	Direct Inquiry	Information on training	1 HS		0.5	51	
32. Sudan	Direct Inquiries	Information on training	1 HS		0.5	51	
33. WARDA (West Africa Rice Association, Liberia)	AID/W and WARDA	Assistance on seed facilities for plant introduction station	1 HS	7.0	3.0	800	Continuing assistance
<u>Near East and South Asia</u>							
34. India	Direct Inquiries	Technical information	1 HS		1.0	66	
	Visitor	Visit of Mr. Parya, son of important agriculturalist	1 HS		1.0	103	
	Visitor	Visit with Mr. Barnale, Maharashtra Hybrids	2 HS		2.0	170	
35. Iran	Direct Inquiry	Technical information	1 HS		0.5	51	
36. Iraq	FAO	Technical information	1 HS		1.0	103	
37. Nepal	USAID/Nepal	Follow-up to Dec. 1973 Consultation	2 HS		8.0	1160	Projected continuing assist- ance
38. Sri Lanka	Direct Inquiry	Technical information	1 HS		1.0	103	
39. Turkey	Direct Inquiry	Technical information	1 HS		1.0	66	
<u>East Asia</u>							
40. Laos	USAID/Laos	Technical information	1 HS		1.0	80	Information on seed program development

Region/ Country	Requesting Org./Mission	Type of Services	No. Persons*	Man Hours		Est. Cost. \$US** Salary	Remarks
				TDY	Home Sta.		
41. Indonesia	Direct Inquiries	Technical information and advice	1 HS		1.5	155	
42. Korea	MOA, Korea	Advice on implementation of IBRD "Seed" project loan	1 HS		2.0	206	
43. Philippines	Direct Inquiries	Advice on various technical matters	1 HS		2.5	260	
44. Thailand	USAID/Thailand	Seed program development and training	3 TDY 3 HS	126.0	32.0	10,850	Report TA 74-16 Another in preparation
45. Viet Nam	USAID/Viet Nam FAO	Seed processing information. Technical information	2 HS		4.3	370	
<u>Contract Wide</u>							
	INTSOY	Participation in Regional Soybean Conference, Addis Ababa	1 HS	4.0	8.0	1236	Presented 32 page paper
		Personal visits of INTSOY staffers, exchange of views	4 HS		8.0	764	
	UNDP	Project reviews; technical information	2 HS		3.0	290	
	FAO/Rome	Cooperation in preparation of handbook on seed program dev.	1 HS		5.0	515	Handbook in preparation
		Participation in work conference for authors of handbook on seed program development in Vienna	2 HS 1 TDY	7.0	13.0	1980	Prepared 78 page manuscript
	FAO/Rome	Technical information	1 HS		1.0	80	

Report to TAB/AID Continued Page 6

Region/ Country	Requesting Org./Mission	Type of Services	No. Persons*	Man Days		Est. Cost \$US** Salary	Remarks
				TDY	Home Sta.		
	Funk's International	Informational materials in Spanish	1 HS		1.0	80	
	KSU/Manhattan	Informational materials	1 HS		1.0	80	
	VPI/Blacksburg	Informational materials	1 HS		1.0	103	
	Ford Fda/Tunisia	Reviews of training materials	1 HS		1.0	103	
	Texas A&M/College Station	Informational materials	1 HS		1.0	80	
	International Plant Breeders, Miami	Information on grass seed prod. in tropical countries	1 HS		0.5	40	
<u>U.S. Travel</u>							
	TVA/Muscle Shoals MSU	Coordination of technical pub- lication between MSU's ex Foster and Couvillion	1 TDY	2.0		130	Couvillion replaced Foster as contract Ag. Economist. Foster now with TVA
<u>Other Contract Activities</u> Per contract							
A. Development of informational materials and references		Writing and preparation of -					
		- Seed storage manual	2 HS		18.0	1594	75% complete
		- Seed legislation bulletin	2 HS		7.0	650	First draft
		- Foundation seed bulletin	2 HS		4.0	412	75% complete
		- Seed drying manual	3 HS		8.0	584	Completed
		- Revision seed processing and handling handbook	1 HS		3.0	309	In early stages
B. Adaptive Research		Development work on -					
		- Drying procedures for soy- beans in tropical environments	2 HS		23.0	1700	First phase completed; man- script prepared and submitted to TAB

Region/ Country	Requesting Org./Mission	Type of Services	No. Persons*	Man Days		Est. Cost \$US**	Remarks
				TDY	Home Sta.		
		- Small batch seed dryers	4 HS		10.0	830	One phase completed; paper submitted to TAB
		- Equipment and operational specs for conditioned storerooms	2 HS		7.0	640	Nearing completion
		- Economic analyses and studies on selected aspects of seed programs	2 HS		28	1820	Several manuscripts in final editing
C. Coordination and Administration		Coordination of contract activities with TAB and Bureaus; Admin. responses to TAB; preparation of periodic services reports; and other miscellaneous contract activities	2 HS		32	3112	
		Sub-Total Professionals		<u>253</u>	<u>469</u>	<u>59,054</u>	
		Supporting Staff (Secretaries, Clerks & Technicians)	3 HS		385	8100	
		GRAND TOTAL		<u>253</u>	<u>854</u>	<u>67,154</u>	

* TDY = overseas duty; HS = home station

** Travel and per diem are funded by missions; salaries by contract; cost of other like items in contract (other direct costs, overhead, etc. are not estimated).

REPORT TO TAB/AID
ON
SERVICES RENDERED AND OBLIGATIONS UNDER CONTRACT AID/CM/TA-C-73-34
MISSISSIPPI STATE UNIVERSITY PERIOD: 1 Jan. 1975 - 31 Mar. 1975

Region/ Country	Requesting Org./Mission	Type of Services	No. Persons*	Man Days**		Remarks
				TDY	Home Sta.	
<u>LATIN AMERICA</u>						
Costa Rica	USAID/CR	Technical Assistance	1 TDY	14	est. 5	TDY Feb. 2 - 15 and report preparation TDY Feb. 16 - March 1 and report preparations
Honduras	USAID/H	Technical Assistance	1 TDY	14	est. 5	
<u>AFRICA</u>						
Ghana	USAID/G	Technical Assistance (Program Development)	2 TDY 4 HS	60	60	Awaiting Mission report 6 man months obligation under contract amendment
Ivory Coast	Amer Embassy	Technical Assistance and Preliminary Eng. Plans & Specifications	2 TDY 3 HS	28	est. 30	TDY Jan. 4-18 & preparation of preliminary design drawings and equipment specifications
Niger	AFR/	Prelim. Eng. Plans & Specifications for 2 processing storage units	3 HS	0	est. 30	Follow up to visit Oct.-Nov. 14 Authorized by Contract Manager Jan. 8
Tanzania	AID/W	Member of Review team for AID/W	1 TDY	28	?	TDY Jan. 26-Feb. 23
Warda	AID/CWR	Technical Assistance	1 TDY 2 HS	8	5	TDY Jan. 19-27 follow up and report preparation
<u>SOUTH ASIA</u>						
Thailand	USAID/T	Technical Assistance Report	2 HS	0	est. 10	Preparation of report of consultants visits Dec. 4-22, 1974.
Response to Technical Inquiries Contract		On campus visits & correspondence	7 HS	28		Visits to MSU by personnel 1 Jan.-28 Feb. Dr. Raben (1), Dr. Richter (4) Dr. Blanton (1), Srs. Lopez and Campos (3) Boonsut (1) Mr. Gavva (1)

Region/ Country	Requesting Org./Mission	Type of Services	No. Persons*	Man Days**		Remarks
				TD	Home Sta.	
<u>Other Contract Activities</u>						
AID Contractors Meeting	AID/W	Conference	7 HS	0	est. 21	Host for TAB/Contractors meeting March 17, 18, 19.
Preparation of informational materials	Contract		7 HS			Work done as time permits
Adaptive Research	Contract		7 HS			Work done as scheduled by staff involved
Coordination and administration			3 HS			Coordination with TAB and AID/W, report preparation, etc.
				92 (60)	134 (60)	

*Number of Professionals involved. IDI=out of country services HS=Services performed at home station

**Includes only professional man days

SUMMARY OF ACTIVITIES

CONTRACT AID/CM/TA-C-73-34

"Seed Program and Industry Development"

1 April 1973 - 31 March 1974

1. Overseas Assignments with Missions

A. Bolivia (April - May 1973)

- (1) Assistance requested in development of a seed processing plant design and layout and equipment specifications for the National Seed Program's storage-processing unit in Cochabamba.
- (2) Assignment completed with recommendations. Report No. TA-73-7, 28 pp. with drawings.

B. Panama (April - May 1973; March, 1974)

- (1) Consultation in 1973 was requested in continuing assistance to Panama's developing seed program with emphasis on operational management and maintenance of seed facilities at Panama, Divisa and Alanje. Assignment in 1974 involved on-the-job training to seed analysts, field inspectors, and plant operators.
- (2) Assignments completed. Follow-up is anticipated. Reports No. TA 73-6, 21 pp.; TA 74-03 (15 pp.).

C. Paraguay (July 1973)

- (1) Follow-up to previous consultations was requested for purpose of reviewing the translation of specifications for equipment to be purchased for the Seed Subproject of Paraguay's Integrated Project for Agricultural Development. Conferences were also held with architect regarding construction of buildings.
- (2) Assignment completed. Continued assistance anticipated. Report No. TA 23-S, 6 pp.

D. Thailand (May - June 1973) (Assignment undertaken under T. O. No. 2 to AID/csd 2976).

- (1) Assistance requested to review over-all seed program development in Thailand, and to specifically assist with development of a "seed center" at Phitsanulok.
- (2) Twenty-three specific recommendations were made along with time-phased action program. The seed center was designed, equipment specifications prepared, and equipment ordered. Implementation of recommendations was begun and follow-up assignment is scheduled for July-August, 1974. Report No. TA 73-10, 98 pp. with 8 blueprints.

E. Morocco (August - September, 1973)

- (1) Assistance was requested to review state of repair and adequacy of seed facility at Merchouch (designed and installed with assistance of MSU in mid-1960's) and to prepare design and specifications for second seed facility at Douyet.
- (2) Assignment completed; recommendations made regarding renovation of Merchouch facility, and design and specifications prepared for new facility at Douyet. Reports No. TA 73-11, 54 pp.; TA 74-03, 27 pp. plus 4 blueprints. Follow-up assistance is anticipated.

F. Ghana (August - September, 1973)

- (1) Assistance requested in review of Ghana's seed program with emphasis on enlisting participation of international seed companies.
- (2) Numerous seed companies with international interests were contacted and none expressed any real interest in establishing operations in Ghana. Situation was reviewed and alternative recommendations were offered for further development of Ghana's seed program. Follow-up consultation for developing 5 year plan based on recommendations is scheduled for July and August 1974. Report No. 73-12, 47 pp.

G. Haiti (November 1973)

- (1) Advisory services were requested to review current status of seed production, supply and needs for basic food grain crops in Haiti, to identify needed improvements, and to development appropriate recommendations.
- (2) Review completed. Pilot rice seed program recommended for Artibonite Valley. Request for assistance in implementation anticipated. Report No. TA 74-13, 68 pp., 3 blueprints.

H. ROCAP Region - Guatemala, Honduras, Nicaragua, Costa Rica, El Salvador. (July 1973 - Current).

- (1) Assistance was requested in July 1973 to prepare project for study of "Seed Production and Marketing in Central America." Project was prepared in cooperation with IICA-ZN. Field study was begun in October and completed in late December 1973.
- (2) Preliminary report with recommendations was prepared in January, 1974, and individual country reports during period January-May, 1974. Short visit was made to ROCAP in Guatemala City in March for purpose of reaching decisions on format and scope of reports. Five country reports are in draft and have been submitted to ROCAP, and pertinent USAID Missions for review before finalization. Regional Report is prepared but will not be submitted until reviews of country reports are completed. Reports No. TA 74-1 (preliminary), 25 pp.; TA 74-05 (Guatemala), 68 pp.; TA 74-06 (Honduras), 50 pp.; TA 74-07 (Costa Rica), 71 pp.; TA 74-08 (El Salvador), 41 pp.; TA 74-09 (Nicaragua), 39 pp.

I. Nepal (November - December 1973)

- (1) Consultation was requested to review current status of seed production and supply in Nepal, to identify improvements, and to develop recommendations.
- (2) Thirteen specific recommendations were offered with explanatory comments and facility for experiment station was designed. Follow-up is anticipated. Report No. TA 74-02, 36 pp., with later supplements.

J. Peru (January - February, 1974)

- (1) Advisory services were requested to assist the Government of Peru in planning a comprehensive seed program/industry.
- (2) Plan with specific recommendations was prepared and submitted. Report No. TA 74-11, 74 pp.

K. Miscellaneous (October 1973)

- (1) James C. Delouche and H. Dean Bunch were invited to participate in "International Seed Symposium", Vienna, organized by FAO and sponsored by the Austrian Government. Delouche presented invita-

tional paper on "Seed Processing and Storage" and chaired one of four "commissions" charged with developing recommendations related to seed program/industry development in the LDC's. Dean Bunch presented review of AID's activities in seed program development. Expenses were re-imbursed by FAO and MSU.

Follow-up is progressing. A "handbook" on seed program development is in preparation.

2. Informational and Reference Activities

(a) Requests - mostly direct - for technical and "program development" type information has and is increasing geometrically. These requests come from the rapidly expanding MSU-Seed Tech. Lab "alumni" (now well over 500) in almost every country, from specialists with other bi-lateral and multi-lateral technical assistance agencies, from other AID contractors, and from just plain workers who have never visited MSU, but who have problems and have heard that we might be of some help. We hope to improve our efficiency in this vital activity after move to new quarters is completed and facilities are better.

(b) Handbook on Seed Drying which has been in preparation for the past four years is in essentially final draft form and will be submitted for review in a few months.

Handbook on Seed Storage behind schedule - about 75% complete.

Pamphlet on Foundation Seed Program is about 90% complete.

Pamphlet on Seed Legislation is about 75% complete.

Revision of Handbook No. 1, Seed Processing and Handling has begun.

Synoptic Chapter outline of Handbook on Seed Quality Evaluation is being prepared.

Several other technical articles were published or are in press.

3. Adaptive Research and Developmental Activities

(a) Study of economic efficiency in seed processing facilities was completed and is in draft stage.

(b) A small seed dryer suitable for breeder and foundation seed and utilizing a "vacuum cleaner" as blower and heat source was de-

signed, constructed and evaluated. Technical publication has been prepared and will be submitted shortly for review.

- (c) Designs of various other small simple seed dryers designed for specific projects (and proven) are being written-up into a technical publication.
- (d) Design criteria and specifications for environmentally conditioned store rooms are being developed into technical publication.
- (e) Considerable developmental research has been conducted on drying of soybean seed, which is not of great importance in U.S., but will be important in all sub-tropical and tropical countries which are becoming interested in soybean production. Work should be completed this fall.

4. Pending and Probable Assignments

- (a) Honduras (completed in May, 1974).
- (b) Ghana (July-August)
- (c) Thailand (July-August)
- (d) Costa Rica (August)
- (e) Nigeria (not definite)

5. Related Activities

- (a) H. D. Bunch served on AID-team organized to review seed situation in Upper Volta (May, 1974).
- (b) H. D. Bunch visited in Ivory Coast at invitation of Government of Ivory Coast to look into feasibility of soybean production (June, 1974).
- (c) J. C. Delouche served as consultant to the MSU-AID/Brazil contract relating to organization of research program in seed technology (February, 1974).
- (d) Bill Boyd will serve as consultant to INTSOY in their Guyana project (soybeans) in August.