

AID 150-1X (7-71)

DEPARTMENT OF STATE
AGENCY FOR
INTERNATIONAL DEVELOPMENT

1. Cooperating Country
TA Bureau

2. PIO/T No.
931-1181-3177629

3. Original or
Amendment No. _____

4. Project/Activity No. and Title
931-1181
Aflatoxin Reduction in Maize

PIO/T

PROJECT IMPLEMENTATION
ORDER/TECHNICAL
SERVICES

DISTRIBUTION

5. Appropriation Symbol
72-11x1023

6.A. Allotment Symbol and Charge
402-31-099-00-22-71

6.B. Funds Allotted to:
 A.I.D./W Mission

7. Obligation Status
 Administrative Reservation Implementing Document

8. Funding Period (Mo., Day, Yr.)
From 9/1/77 to 9/30/79

9.A. Services to Start (Mo., Day, Yr.)
Between 9/1/77 and 10/30/77

9.B. Completion date of Services (Mo., Day, Yr.)
9/30/80

10.A. Type of Action
 A.I.D. Contract Cooperating Country Contract Participating Agency Service Agreement Other

10.B. Authorized Agent
AID/W

Estimated Financing		(1)	(2)	(3)	(4)
		Previous Total	Increase	Decrease	Total to Date
11. Maximum A.I.D. Financing	A. Dollars		\$265,000		\$265,000
	B. U.S.-Owned Local Currency				
12. Cooperating Country Contributions	A. Counterpart				
	B. Other				

13. Mission References

14. Instructions to Authorized Agent

This PIO/T authorizes the Contract Office to negotiate a new contract with the Curators of the University of Missouri, on behalf of the Missouri Agricultural Experiment Station, Columbia, Missouri, for the three years of the proposed three-year project.

Funding for the period from 9/1/77 to 9/30/79 is for \$265,000; for the period from 10/1/79 to 9/30/80; funding will be \$150,000. RAC recommended for approval this project on July 14, 1977. See continuation sheet for voucher identification.

15. Clearances - Show Office Symbol, Signature and Date for all Necessary Clearances.

A. The specifications in scope of work are technically adequate
TA/AGR/CP, E. Leng *E. Leng* Date: 7/14/77

B. Funds for the services requested are available
TA/RES, M. Rechcigl *M. Rechcigl* Date: _____

C. The scope of work lies within the purview of the initiating and approved Agency Programs
TA/AGR, G. Baird *G. Baird* Date: 7/14/77

D. TA/PPU, C. Molfetto *C. Molfetto* Date: 8/19/77

E. TA/AGR, L. Hesser *L. Hesser* Date: 7/22/77

F. TA/PPU, M. Mozynski *M. Mozynski* Date: 8/30/77

16. For the cooperating country: The terms and conditions set forth herein are hereby agreed to

Signature and date: _____
Title: _____

17. For the Agency for International Development
Signature: Kenneth Milow
Title: Chief Program Office, TA/PPU

18. Date of Signature
8/30/77

PIO/T

TA Bureau

Project/Activity No. Title

Aflatoxin Reduction in Maize

SCOPE OF WORK

19. Scope of Technical Services

A. Objective for which the Technical Services are to be Used To provide basic information and source materials to increase the supply of high quality human food in maize eating LDCs; by reducing or eliminating a serious health hazard which occurs in maize.

B. Description

The research will have two major specific objectives:

- a. Identify maize genotypes with resistance to kernel rots caused by Aspergillus flavus and/or A. parasiticus.
- b. Search for genetic factors that inhibit the biosynthesis of aflatoxins following fungal growth of these Aspergillus species.

C. Technicians

(1) (a) Number	(b) Specialized Field	(c) Grade and/or Salary	(d) Duration of Assignment (Man-Months)
One	Agronomist	Professor Grade	6 WM annually
Two	Plant Pathologist	Professor Grade	4 WM annually (total)
One	Research Associate	Professor Grade	2 WM annually
Other: Two	Graduate Assistants		12 WM annually
Two	Technicians		24 WM annually

(2) Duty Post and Duration of Technicians' Services

University of Missouri and outlying stations

48 WM annually

(3) Language requirements

N/A

(4) Access to Classified Information

N/A

(5) Dependents

Will

Will Not

Be Permitted to Accompany Technician

D. Financing of Technical Services

(1) By AID - \$ 189,550 for two years

(2) By Cooperating Country -

PIO/T

Project/Activity No. Title

Aflatoxin Reduction in Maize

22. Reports by Contractor or Participating Agency (Indicate type, content and format of reports required, including language to be used if other than English, frequency or timing of reports, and any special requirements)

Contractor shall submit three copies of all reports listed as being a product of the contract (administrative, progress, final and technical reports containing R&D findings) to the Documentation Coordinator, TA/PPU/EUI, Technical Assistance, Agency for International Development, Washington, D.C. 20523, or his designee. Such reports shall include a title page showing the title of the report, project title as set forth in this contract (or grant) and the contract number. One copy of each report shall be clearly typed or printed on white paper so that it may be photographed to produce a microfilm master. Technical reports shall be accompanied by an author-prepared abstract.

35 copies of the Annual Reports will be submitted to the Project Manager

23. Background Information (Additional information useful to Authorized Agent and Prospective Contractors or Participating Agency; if necessary cross reference Block 19.C(4) above.)

Project Statement: See item K "Literature Cited" on pages 12, 13 and 14 of the Project Paper dated 5/10/77.

Other information may be obtained from CIMMYT, IITA, Commercial Seed Firms, the USDA-ARS Northern Regional Laboratory and other U.S. Research Stations and Land Grant Universities.

RAC Minutes

24. Relationship of Contractor or Participating Agency to Cooperating Country and to AID

A. Relationships and Responsibilities

N/A

B. Cooperating Country Liaison Official

N/A

C. AID Liaison Officials

Dr. E. Leng TA/AGR/CP

Dr. G. Baird TA/AGR

Dr. L. Hesser TA/AGR

20. Equipment and Supplies (Related to the services described in Block 19 and to be procured outside the Cooperating Country by the supplier of these services)

A. (1) Quantity (2) Description	(3) Estimated Cost		(4) Special Instructions
	1st Year	2nd Year	
Equipment	\$6,000	\$7,450	
Winter Nurseries	10,000	\$11,000	
Misc. Supplies	4,000	5,000	
Analytical Services	5,000	6,000	
Subcontract Services	10,000	11,000	
Total	\$35,000	\$40,450	

B. Financing of Equipment and Supplies

(1) By AID - \$ 75,450 for two years

(2) By Cooperating Country

N/A

21. Special Provisions

- A. This PIO/T is subject to AID (contracting) (PASA implementation) regulations.
- B. Except as specifically authorized by AID, or when local hire is authorized under the terms of a contract with a U.S. Supplier, services authorized under this PIO/T must be obtained from U.S. sources.
- C. Except as specifically authorized by AID/W, the purchase of commodities authorized under this PIO/T will be limited to the U.S. under Geographic Code 000.
- D. Other (specify): Prior to making any visits to LDCs, the Contractor will review his plans with TA/AGR*. He will keep AID Missions in countries to be visited fully informed of proposed visits, ask them to provide any advice they wish regarding timing and content of the visits and to participate if they desire, and will inform the Missions of the outcome of consultations. He will make his own appointments and logistics arrangements directly. Upon completion of any project funded travel, a copy of the trip report will be provided to the TA/AGR project manager. The report format will be established jointly by the contractor and the project manager.

*Also, contractor will obtain clearances from USAIDs and concerned Regional Bureaus prior to any visitations to LDCs.

LOGISTIC SUPPORT

25. Provisions for Logistic Support A. Specific Items (Insert "X" in applicable column at right. If entry needs qualification, insert asterisk and explain below in C. "Comments")	IN KIND SUPPLIED BY		FROM LOCAL CURRENCY SUPPLIED BY		TO BE PROVIDED OR ARRANGED BY SUPPLIER
	AID	COOPERATING COUNTRY	AID	COOPERATING COUNTRY	
(1) Office Space	X	(for consultants)	for	contract	personnel
(2) Office Equipment					
(3) Housing and Utilities					
(4) Furniture					
(5) Household Equipment (Stoves, Refrig., etc.)					
(6) Transportation in Cooperating Country	X	(for consultants)	for	contract	personnel
(7) Transportation To and From Country					
(8) Interpreter Services/Secretarial	X	(for consultants)	for	contract	personnel
(9) Medical Facilities					
(10) Vehicles (official)					
(11) Travel Arrangements/Tickets					
Other: (specify) (12)					
(13)					
(14)					
(15)					

B. Additional Facilities Available From Other Sources

- APO PX COMMISSARY

 OTHER (specify, e.g., duty free entry, tax exemption)

C. Comments

Information obtained from the research and any resistant breeding stocks discovered will be made promptly available to all interested maize breeders, including both public and commercial agencies and firms. The established working cooperation with CIMMYT, IITA other experiment stations and commercial firms will make this dissemination and application particularly effective.

During the past five years researchers at the University of Missouri have been heavily involved in cooperative research on aflatoxin. Total work month inputs of the contractor for the first two years of this project will be 24 WM for professionals and 72 WM for nonprofessionals.

Continuation Sheet for PIO/T Aflatoxin Reduction in Maize

Summary:

Aflatoxin has recently been discovered to be of wide occurrence in maize, particularly in warm, humid areas. Since this mycotoxin is known to be a potent carcinogen in animals and to have lethal effects when ingested in sufficient quantity, it is suspected of being very dangerous to human health. This project proposes to search among the maize strains from different geographical areas in the world for genetic factors that either reduce the fungal growth by these Aspergillus species or inhibit the synthesis of aflatoxin. Resistant maize types would then be used in breeding programs to produce agronomically desirable strains having reduced likelihood of containing aflatoxin.

Block 14 "Article # Voucher-Identification. In each instance of voucher (SF 1034) submission made by the contractor for payment hereunder, the following identification data will appear on the face of the voucher:

Contract: AID/ _____
Project 931- _____
Project Office TAB/ _____"

BUDGETS are attached as ATTACHMENT A

WORK PLAN is attached as ATTACHMENT B

LIFE-OF-PROJECT BUDGET

	Salaries and Wages		
	<u>1st year</u>	<u>2nd Year</u>	<u>3rd Year</u>
1. Project Supervisor*	7,500	7,875	8,250
2. 2 Technicians (100% time each)	24,000	27,000	29,500
3. 2 Graduate Research Assistants (50% time each)	11,000	11,400	12,000
4. Hourly Labor	<u>8,000</u>	<u>9,000</u>	<u>10,000</u>
TOTAL Salaries & Wages	50,500	55,300	59,750
5. Staff Benefits (16% of positions 1 and 2; 5.85% of position 4)	5,500	6,100	6,625
6. Indirect Costs	29,000	32,150	34,750
7. Travel and Transportation	5,000	6,000	7,000
8. Equipment	6,000	7,450	4,875
9. Winter Nurseries	10,000	11,000	12,000
10. Misc. Supplies	4,000	5,000	6,000
11. Analytical Services	5,000	6,000	7,000
12. Subcontract Services**	<u>10,000</u>	<u>11,000</u>	<u>12,000</u>
TOTAL	125,000	140,000	150,000

* 25% time paid by this budget; additional 25% contributed by University.

** Expected for field and laboratory work in Central America.

1977-1978

1. Search for resistance involving:
 - a. Aspergillus flavus and Aspergillus parasiticus fungal growth.
 - b. Inhibitors of aflatoxin due to above fungi.
2. Systematically screen exotic strains in storage:
 - a. ARS Plant Introduction Station, Ames, Iowa.
 - b. Various seed banks.
 - (1) CIMMYT.
 - (2) CIAT.
 - (3) ICTA.
 - c. Examine at least 10 accessions for each of the 130 (more or less) races of maize for response to A. flavus and A. parasiticus inoculation.

1978-1979

1. Continue screening of exotic strains not previously examined.
2. Confirm previously identified resistance.
3. Use strains with confirmed resistance in:
 - a. Cyclic breeding programs for population development.
 - b. Inheritance of resistance studies by:
 - (1) Diallel analyses.
 - (2) Generation mean analyses.
 - (3) Location of genes according to chromosome arm by B-A translocations.
 - c. Incorporate sources of resistance in breeding materials for use by breeders in developing countries' programs where aflatoxin is a problem.

1980-1981

1. Expand studies of confirmed resistant selections by evaluation under:
 - a. Different environments, such as:
 - (1) Different rainfall areas.
 - (2) Tropics-coastal vs. highland.
 - (3) Temperate zone.
2. Continue:
 - a. Inheritance studies.
 - b. Cyclic selection programs.
 - c. Development of breeding material with resistance for use in commercial production or as sources of resistance.