AID 1050-25 (10-70)

REPORT NO. 9310575

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PROJECT APPRAISAL REPORT (PAR)

1. PROJECT NO.	2. PAR FOR PERIOD:	3. COUNTRY	PAR SERIAL NO.
931-17-130-575	Feb. 1974 TO Sept. 1975	TA/BUREAU	PD-AAF-217-A1

4. PROJECT TITLE

Development of High-Yielding Sorghum Cultivars and Studies on Physiology of Yield

AID/TA-C-1068 Sp

6. PROJECT DURATION: Began FY 74 Ends FY 76	7. DATE LATEST PROP	8. DATE LATEST PIP	9. DATE PRIOR PAR
	N.A.	N.A.	None - New

10. U.S. FUNDING	a. Cumulative Obligation Thru Prior FY: $ 160,000	b. Current FY Estimated Budget: $135,000	c. Estimated Budget to completion After Current FY: $110,000

11. KEY ACTION AGENTS (*Contractor, Participating Agency or Voluntary Agency*)

a. NAME	b. CONTRACT, PASA OR VOL. AG. NO.
Prof. Jerry D. Eastin	Univ. of Nebraska

I. NEW ACTIONS PROPOSED AND REQUESTED AS A RESULT OF THIS EVALUATION

A. ACTION (X) AA	A. ACTION (X) AID/W	A. ACTION (X) Other	B. LIST OF ACTIONS	C. PROPOSED ACTION COMPLETION DATE
X			1. Expand activities in limited tillage practices to include cultural investigations in general.	February 1977
X	X		2. Screen research activities to determine relative pertinence to AID goals.	December 1975
X			3. Complete expanded environmental control facilities being provided by AID grant.	March 1976
X			4. Prepare project proposal for continuation of research.	March 1976
	X		5. Complete project statement.	April 1976
	X		6. Submit project paper for RAC approval.	September 1976

D. REPLANNING REQUIRED REVISED OR NEW: [X] PP [ ] PIP [ ] PRO AG [X] PIO/T [ ] PIO/C [ ] PIO/P

E. DATE OF MISSION REVIEW: September 15-16, 1975

PROJECT MANAGER: TYPED NAME, SIGNED INITIALS AND DATE	MISSION DIRECTOR: TYPED NAME, SIGNED INITIALS AND DATE
Earl R. Leng ERL 10/24/75	Leon F. Hesser 10/25/75

II. 4 x 4 Matrix

III. Narrative

1. Utilization and Impact to Date

It is unrealistic to expect positive results after only one year's research on sorghum breeding and improving cultural practices. A close working linkage has been established with ICRISAT's sorghum breeding and cultural programs to achieve complimentarity of efforts. Similar collaboration is maintained with Purdue University, Texas A & M University and the University of Puerto Rico---all of which are engaged in AID supported sorghum research.

There have not as yet been any findings under this research grant which are directly usuable in LDC programs.

2. Project Potentialities for LDCs

It is expected that the contractor will be able to develop sorghum varieties which will be superior in performance to those now being grown in most tropical, subtropical and temperate areas of the world. Improvement is being sought in yield, drought tolerance, heat and cold tolerance, and pest resistance. Yellow types are being emphasized for their superiority in food quality.

The first year's work was focused upon the production of mass crosses, screening of promising types, and identification of the outstanding genotypes. The selection of varieties and lines which exhibit greatest tolerance to moisture and temperature stresses can be of major immediate value to areas which are subject to droughts, such as the Sahel Zone of Africa. The contractor is giving priority to these studies.

Attention is also being given to refining screening techniques in order to accelerate the selection process. Some of the evaluation and screening techniques being perfected may be of immediate value to international and LSC sorghum breeding programs.

Although sorghum is being grown in many of the food deficit countries, relatively little organized research in its breeding and physiology has been undertaken beyond American and some French efforts. Many of the fundamental findings of this project will therefore provide basic information and plant material for adaptive and extended research at international centers and in national programs. Wide-range field testing of promising lines and cultural practices will be required before indicated findings can be verified for specific geographic areas. To broaden this information base it is advisable to (1) expand the activities in limited tillage practices to include cultural investigations in general. This

should be achievable without an increase in level of effort by the (2) elimination of those activities which have less pertinence to AID's interests.

The Contractor has reported that progress was being limited by a lack of environmental control facilities. Consequently, an additional $40,000 has been added to the budget to correct this constraint. To maximize the benefits, the Contractor is urged to (3) proceed without delay in the development of the expanded facilities.

Direct impacts of this project on economic, social and ecological factors at the farm level in recipient countries are several years away in the developmental process, but all of such impacts would be construed as beneficial at this point in time.

3. Plan for Utilization

A research network on sorghum studies has been established, largely due to support of research in U.S. universities and international centers. Periodic formal meetings are held with participating researchers, ad hoc contacts are continuous, and experimental results and germplasm are exchanged. Five students from LDCs are participating in the investigations at Nebraska and will likely be cooperators with the project upon return to their home countries.

4. General Management

No significant general issues have arisen.

ATTACHMENT

LIST OF UNIVERSITIES, AGENCIES, AND PERSONS REPRESENTED AT REVIEW

1. Texas Technical University, Lubbock:
   Dr. Daniel Krieg - Department of Agronomy

2. Lubbock Branch Station, Texas Agricultural Experiment Station:
   Dr. D. T. Rosenow - Sorghum Breeder
   Dr. J. W. Johnson - Sorghum Pathologist

3. Texas A&M University, College Station:
   Dr. R. A. Frederiksen - Professor (Project Leader)
   Dr. George Teetes - Entomologist
   Dr. L. W. Rooney - Cereal Chemist
   Mr. F. R. Miller - Sorghum Breeder

4. University of Nebraska, Lincoln:
   Dr. R. W. Kleis - Associate Director, Nebraska Agr. Exp. Station
   Dr. D. G. Hanway - Head, Department of Agronomy
   Dr. J. D. Eastin - Physiologist (Project Leader)
   Dr. V. A. Johnson - Wheat Breeder
   Dr. J. W. Maranville - Sorghum Physiologist
   Dr. W. M. Ross - Sorghum Breeder
   Dr. R. B. Clark - Sorghum Physiologist
   Dr. Warren Sahs - Asst. Director, Agr. Exp. Station
   Mr. R. F. Holland - Research Director, DeKalb Ag. Research, Inc.
   Mr. Jack King - Research Director, Grain Sorghum Growers Association
   Mr. Gene Dalton - Research Specialist, Pioneer Hi-Bred International
   Dr. Hugh Doggett - ICRISAT TO4
   Dr. Lee House - ALAD/Rockefeller Foundation TO4
   Dr. Abad Morales - University of Puerto Rico TO4

5. Purdue University, West Lafayette, Indiana:
   Dr. J. D. Axtell - Professor (Project Leader)

6. AID/W
   TA/RES, M. Rechcigl
   NESA/TECH, C. Antholt
   AFR/ESA, H. Kugler
   TA/N, H. Rice
   TA/AGR, G. Beck
   TA/AGR, E. Leng

AID 1020-29 (1-72)

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Life of Project: From FY 74 to FY 77
Total U. S. Funding
Date Prepared: 10/20/75

II. Project Title & Number: Development of High-Yielding Sorghum Cultivars - Physiology of Yield AID/ta-C-1068

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Program or Sector Goal: The broader objective to which this project contributes: **To increase quantity and nutritional value of food crops in developing countries**	Measures of Goal Achievement: 1. Significant increase in per capita production of major food crops in LDCs. 2. Improvement in nutritional quality of major LDC food crops.	1. Official production and population statistics (FAO, Foreign Agricultural Service estimates). 2. Nutritional quality surveys in LDCs.	Assumptions for achieving goal targets: 1. LDCs will actively attempt to expand food crop production. 2. Nutritional quality can be improved without major constraints on yield.
Project Purpose: **To make available to LDCs high-yielding, nutritious varieties of sorghum with multiple resistance to moisture and temperature stresses, diseases and insects, together with improved practices for their cultivation.**	Conditions that will indicate purpose has been achieved: End of project status. 1. New, superior varieties available to farmers in LDCs. 2. Research and development activities in sorghum effectively assumed by LDC agencies and international institutions and linked by communications network.	1. Publication and reports of LDC governmental agencies; on-site inspections of seed supply. 2. On-site inspection and review by AID/W personnel and consultants.	Assumptions for achieving purpose: 1. Solutions can be found to major constraints. 2. Agriculture extension services are able and willing to promote proven practices. 3. LDC research institutions develop adequate capabilities.
Outputs: 1. Identification of superior germ plasm. 2. Incorporation of desirable traits into broadly-adapted varieties suitable for LDC use. 3. Evaluation of improved varieties and practices in LDCs. 4. Training of LDC personnel in sorghum research. 5. Establishment of effective linkages with LDC agencies.	Magnitude of Outputs: 1. Not quantifiable. 2. At least 2 superior varieties for each major agroclimatic region. 3. At least 1 test location in each major sorghum-growing zone. 4. Total of 10 LDC trainees completing training. 5. Linkages with 3 international centers and at least 10 LDC institutions.	1. Reports by contractor. 2. Reports by contractor, USAIDs, LDC cooperators, and international agencies. 3. Same. 4. Contractor reports. 5. Contractor reports, communications and reports from LDCs and international agencies.	Assumptions for achieving outputs: 1. LDCs and USAIDs will request technical assistance; research findings will be available. 2. Cooperation of LDCs. 3. Interest and resources exist in LDCs. 4. Collaboration of international institutions. 5. Sufficient interest among LDCs and qualified personnel.
Inputs: 1. AID/W provides financial support and project guidance. 2. Contractor provides qualified personnel and backstopping facilities. 3. Participating personnel and cooperation provided by 1) LDCs, 2) USAIDs, and 3) international organizations.	Implementation Target (Type and Quantity) 1. AID/W funding at approximately $135,000/year. 2. 60 man months/year technical personnel; adequate laboratory facilities; 5 or more acres field research area. 3. Not directly quantifiable.	1. AID/W records. 2. Contractor reports, on-site inspections. 3. USAID reports, on-site verification.	Assumptions for providing inputs: 1. AID/W funding will be available on schedule and in quantity agreed upon. 2. Contractor will have necessary qualified personnel; university facilities will be available to project. 3. International organizations, USAIDs, and LDCs will have personnel and resources to support this activity.