

1. PROJECT NO. 931-17-130-560	2. PAR FOR PERIOD: April 1974 TO March 1975	3. COUNTRY TAB	4. PAR SERIAL NO. PD-AAC-820-D1
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5. PROJECT TITLE
Development of Improved Varieties of Soybeans

6. PROJECT DURATION: Began FY 73 Ends FY 76	7. DATE LATEST PROP N/A	8. DATE LATEST PIP N/A	9. DATE PRIOR PAR
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10. U.S. FUNDING	a. Cumulative Obligation Thru Prior FY: \$ 539,605	b. Current FY Estimated Budget: \$431,000	c. Estimated Budget to completion After Current FY: \$ 2,332,865
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11. KEY ACTION AGENTS (Contractor, Participating Agency or Voluntary Agency)

a. NAME	b. CONTRACT, PASA CR VOL. AG. NO.
William N. Thompson, Contract Manager	University of Illinois
Willard H. Garman, Project Manager (temporary)	TAB/Agriculture

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

A. ACTION (X)			B. LIST OF ACTIONS	C. PROPOSED ACTION COMPLETION DATE
AA	AID/W	OTHER		
X	X		1. Extend project and realign program to dovetail more closely with 211(d) and BOA activities.	Early 1976
X			2. Initiate major research effort on enhancing nitrogen fixation of the soybean.	Early 1976
X			3. Increase research efforts to develop disease and insect resistant lines for use in plant development programs of LDC institutions.	1976
X	X		4. Conduct major workshop on production, protection and utilization in Asia, February 1976.	February 1976
X	X		5. Ongoing research on soybean processing and nutrition to be monitored by TA/N beginning April 1, 1976.	Mid 1976
X	X		6. Conduct research on containers for soybean seed storage to maintain viability of seed stored by small farmers or in village storage centers. (Coopn, Kansas State University)	During 1976
X			7. Improve LDC reporting, collection, cataloguing of data from field varietal trials.	1976 and 1977

D. REPLANNING REQUIRES REVISED OR NEW	Research Project Statement	E. DATE OF MISSION REVIEW
<input type="checkbox"/> PROP <input type="checkbox"/> PIP <input type="checkbox"/> PRO AG <input type="checkbox"/> PIO/T <input type="checkbox"/> PIO/C <input type="checkbox"/> PIO/P		September 1975

PROJECT MANAGER: TYPED NAME, SIGNED INITIALS AND DATE Willard H. Garman <i>W.H.G.</i> 10/24/75	MISSION DIRECTOR: TYPED NAME, SIGNED INITIALS AND DATE Leon F. Hesser <i>L.F.H.</i> 10/24/75
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3. Narrative.

This appraisal is based upon the progress during the first two years of this three-year contract. Admittedly, "breakthrough" results cannot be expected, in so short a period when production cycles of crop plants are involved, thus the soybean breeding work and plant pest resistance studies must be regarded as longer term activities. In this light, progress to date has been satisfactory. The balance of the activities under the contract are of a more concrete nature and are on track. One addition to the original project concerns studies on nitrogen fixation. These are discussed below.

4. Objectives, Progress and Potential.

The general objective of the project was "to perform a research and development program directed toward the development of improved varieties of soybeans". This was broken down into seven activities, many of which lent themselves to "extended mileage" since they meshed with related work under AID's 211(d) contract and Basic Ordering Agreement with the University of Illinois.

- 1) Development of technical assistance and research linkages in soybean variety improvement, cultural practices, inoculation, pest control and harvesting-processing-storage methods.
- 2) Research to screen the soybean for broad adaptation to tropical soils, tropical climates, and insect and disease resistance.
- 3) To make available improved soybean varieties and products to LDCs and cooperating research institutions for trial under conditions of the individual countries.
- 4) Assistance and backstopping to LDC institutions in conducting cooperative adaptive research in soybean improvement.

Discussion: Building upon the banks of information available at the Illinois campus and at the Mayaguez Campus of the subcontractor, the University's International Soybean Program (INTSOY) is cataloguing worldwide information on soybean varietal characteristics, insect pests and diseases. The three information banks enable INTSOY to service information requests from USAIDs and LDCs as well as other American and international organizations.

In addition to the breeding work conducted by the University of Illinois and Puerto Rico, trial kits of 20 promising varieties of soybeans were sent to 33 cooperating countries in 1973. Data were returned from 58 of the 90 plantings and were subsequently analyzed as to yield, planting latitude and altitude, number of days to maturity, rainfall, pest resistance, and other factors.*

The 12 best performing varieties were again distributed in 1974, augmented by three new promising varieties. These were sent to 60 countries for planting at 139 locations. (Cooperators were encouraged to add their best local varieties for comparison in the trials.) Analyses will be expanded to include oil and protein content and nodule count.

Promising local varieties have been added to the Mayaguez multiplication program which now numbers 46 varieties. This effort enhances the 211(d) program at both Illinois and Puerto Rico. After a succession of these widely scattered field trials, certain varieties and lines should surface as valuable germ plasm for individual country breeding programs. Much worthwhile information has emerged from this effort but the return of data from the field has been far from complete. Steps should be taken to insure more complete response from the field trials.

The quarterly INTSOY Newsletter and the INTSOY Publication Series, now numbering six, serve to maintain ties among national and international soybean specialists.

- 5) Programs of formal and practically oriented training and guidance in soybean research.
- 6) Demonstration in selected countries of the University of Illinois process for rapidly rendering soybeans available as human food; to determine what local modifications may be necessary to improve acceptability.

Discussion: Individual country requests for these services are handled under the BOA, but overseas workshops and home campus short courses are the vehicles for more general audiences from the LDCs.

INTSOY, AID and the Ethiopian Institute of Agricultural Research sponsored the second regional soybean workshop in Addis Ababa in

* The highest yield in the LDC trials was 72.2 bushels per acre (4911 kg/ha) in Pakistan. Of the total, 30% of the trials reported more than 44 bushels.

October 1974. Eighty soybean scientists from Africa, the Middle East, and South Asia attended. The third regional workshop is scheduled for February 1976 in Chiang Mai, Thailand.

The USDA solicited assistance from the University in presenting a 2½ week course on "Soybean Processing for Food Uses" at Urbana for AID participants from 11 countries in the Spring of 1975. An evaluation of the course has led to planning an additional presentation in 1976. Another short course on "Technical and Economic Aspects of Soybean Production" was slated for individuals from 17 countries during the summer of 1975.

Responses to all six of the above activities indicate a surge in interest in soybean production and utilization in the developing world. Although dramatic pay-offs cannot be expected rapidly, this interest should be nurtured and groundwork prepared in the LDCs against the day when cultural improvements are revealed by current research.

Acceleration and expansion of the food and nutrition aspects of this research project are being abetted with grants by AID's Office of Nutrition in FY76 and FY77. Consequently, an extension of the original contract should insure an intensification of the plant improvement activities. (See below).

- 7) Research on isolating and testing Rhizobium strains for their effect on fixing nitrogen and increasing yields.

Discussion: It was recognized in the Contractor's first annual report that the magnitude of the original scope of work and the funds involved in the original contract could not do justice to the important Rhizobium factor. With nitrogen fertilizer shortages looming as a serious limitation to crop production in the future, it is strongly recommended that an extension of the soybean work provide for in-depth studies in soil microbiology and plant physiology to relate the compatibility of nitrogen-fixing bacteria with the promising breeding lines.

Conclusion

Progress to date under this research grant has been satisfactory. The 211(d) grant and the BOA to the University of Illinois are mutually supportive arrangements to this contract. These two elements, combined with the increased emphasis on food protein needs of the rural poor, an AID grant to strengthen nutrition studies on soybeans, and a shortage of nitrogen fertilizer, suggest an extension of this contract with increased funding, consistent with the expanded objectives.

Development of Improved Varieties of Soybeans and Supporting Cultural and Marketing Practices for Production in the Tropics and Information Delivery Systems

**PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK**

Life of Project: from FY 76 to FY 79
Total U. S. Funding: _____
Date Prepared: 10/15/75

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p>Program or Sector Goal: The broader objective to which this project contributes: To increase the quantity and quality of food for the rural poor in LDCs.</p>	<p>Measures of Goal Achievement: Availability of soybeans at markets and in use in rural family diets.</p>	<p>On-site inspection of markets. Spot checks in rural areas of LDCs.</p>	<p>Assumptions for achieving goal targets: LDCs give priority to food crop production. Improved cultural practices and varieties will be developed. There will not be cultural constraints to production and consumption of soybeans.</p>
<p>Project Purpose: To minimize the agricultural problems which inhibit the production of soybeans. To encourage the inclusion of soybeans in human diets of LDCs.</p>	<p>Conditions that will indicate purpose has been achieved: End of project status. a. Ministries of Agriculture recommend cultivation of soybeans; availability of improved varieties; dissemination of cultural recommendations. Soybeans included in research activities of LDC institutions. b. Soybean "dishes" accepted and promoted by home economics services of LDCs.</p>	<p>Publications and reports of LDC government agencies. On-site inspection of farms and markets Surveys among homemakers in LDCs.</p>	<p>Assumptions for achieving purpose: Solutions can be found to major constraints. LDC research institutions support soybean promotion. Agriculture extension services are able and willing to promote proven practices.</p>
<p>Outputs: a. Recommendations on breeding, pest control, cultural practices, storage and marketing of soybeans. b. Economic studies of production. c. Research programs established in LDCs. d. Permanent international linkages strengthened and expanded. e. Regional technical workshops on soybean production. f. Information bank established.</p>	<p>Magnitude of Outputs: a. Unquantifiable - depends upon degree of participation of LDCs and research results. b. Accomplished in ___ situations. c. As (a) above. d. Not quantifiable. e. One or two. f. At contracting institution.</p>	<p>a. Reports by contractor, USAIDs and LDCs. b. Contractor reports. c. " " " d. Reports of contractor and international research institutes. e. USAID and Contractor reports. f. Observations at Contractor campus.</p>	<p>Assumptions for achieving outputs: a. LDCs and USAIDs will request technical assistance; research findings will be forthcoming. b. Cooperation of LDCs. c. Interest and resources exist in LDCs. d. Collaboration of other institutions. e. Sufficient interest among LDCs and qualified personnel. f. Home organizations' cooperation.</p>
<p>Inputs: a. AID/W provides financial support and project guidance. b. Contractor provides necessary personnel and backstopping facilities. c. Participating personnel and supportive services provided by 1) international organizations, 2) USAIDs and 3) LDCs.</p>	<p>Implementation Target (Type and Quantity) -- a. AID funding: FY76 FY77 FY78 738 784 811 b. Contractor Personnel (Man/Months) FY76 41Q FY77 FY78 FY79 Spec. 63 120 120 60 Support 66 132 132 66 c. Joint research support costs (1) personnel for Conferences & Workshops (1,2,3) participants in research projects (3)</p>	<p>a. AID/W records. b. University reports, on-site inspections. c. Reports of University and International Institutes. Reports, on-site observations. Country and USAID reports.</p>	<p>Assumptions for providing inputs: a. AID/W funding will be available on schedule and in quantity agreed upon. b. Contractor will have necessary qualified personnel; university facilities will be available to project. c. International organizations USAIDs and LDCs will have personnel and resources to support this activity.</p>

UNITED STATES GOVERNMENT

Memorandum

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TO : SEE DISTRIBUTION

DATE: November 26, 1975

FROM : TA/AGR, Leon F. Hesser *LH*

SUBJECT: Project Appraisal Report (PAR), Soybean Varieties,
University of Illinois

Attached is a copy of the recent project appraisal report that was developed for the project with the University of Illinois titled "Development of Improved Varieties of Soybeans" under AID Contract AID/ta-C-73-19. The report summarizes the work being done on the project and covers the areas being explored for further study.

It is distributed for your information.

Attachment
a/s

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