

ANNUAL REPORT

1978-1979

AID/ta-C-1162

PIN-AAU-173

43066

ANNUAL REPORT

Review of Activities
July 1, 1978 through June 30, 1979

Prepared for the

AGENCY FOR INTERNATIONAL DEVELOPMENT
UNITED STATES DEPARTMENT OF STATE

AID/ta-C-1162

Technical Assistance in Grain Storage, Processing, and Marketing
and Agri-business Development

at the

FOOD AND FEED GRAIN INSTITUTE
KANSAS STATE UNIVERSITY
MANHATTAN, KANSAS 66506

Dr. Charles W. Deyoe, Director

TABLE OF CONTENTS

	<u>Page</u>
SCOPE OF WORK	1
REVIEW OF ACTIVITIES	3
I. TECHNICAL ASSISTANCE EFFORT	3
A. Technical Services Performed	3
AFRICA - Tunisia	3
AFRICA - Chad	4
AFRICA - Ivory Coast	6
AFRICA - Chad	7
AFRICA - Ethiopia	8
AFRICA - Upper Volta	10
ASIA - Thailand	11
ASIA - Sri Lanka	11
ASIA - Korea	12
LATIN AMERICA - Haiti	14
LATIN AMERICA - Ecuador	16
LATIN AMERICA - Honduras	19
LATIN AMERICA - Panama	20
LATIN AMERICA - Costa Rica	21
NEAR EAST - Afghanistan	21
B. Follow-up on Previous Overseas Requests	23
AFRICA - Senegal	23
ASIA - Sri Lanka	23
ASIA - Sri Lanka	24
ASIA - Korea	25
ASIA - Korea	27
LATIN AMERICA - Haiti	27
C. Potential Areas for Technical Assistance	28
AFRICA - Chad	28
AFRICA - Ivory Coast	28
AFRICA - Ethiopia	28
AFRICA - Mali	28
AFRICA - Niger	29
ASIA - Korea	29
ASIA - Philippines	29
LATIN AMERICA - Ecuador	29
LATIN AMERICA - Honduras	29
LATIN AMERICA - Costa Rica	29

	<u>Page</u>
D. Long-term Technical Assistance in Philippines	29
E. Other U.S. and Foreign Technical Assistance Programs .	30
II. INFORMATIONAL SERVICES	31
A. Post-harvest Documentation Services	31
B. Technical Information Requests	32
AFRICA - Nigeria, Niger, Senegal; ASIA - Korea, Philippines; LATIN AMERICA - Colombia	32
C. Visitors Under USAID Sponsorship and Others	32
AFRICA	32
ASIA	33
LATIN AMERICA	34
NEAR EAST	34
EUROPE	34
AUSTRALIA	35
CANADA	35
UNITED STATES	35
D. Requests for Reports	36
AFRICA - Ivory Coast, Nigeria, Zaire	36
ASIA - Indonesia, Philippines, Burma	36
CANADA	36
EUROPE - France, Russia, Holland, Netherlands, England Spain, Switzerland, Yugoslavia, Italy (FAO)	36
LATIN AMERICA - Colombia, Guyana, Panama, Mexico, Venezuela, Guatemala	37
NEAR EAST - Turkey, Sri Lanka, India, Pakistan	37
UNITED STATES - Commercial, Government, Individuals, Universities	39
III. TRAINING PROGRAMS	41
A. AID Grain Storage and Marketing Short Course - 1978 . .	41
B. AID Grain Storage and Marketing Short Course - 1979 . .	58
C. Short-term On-campus Training	60
D. Degree Program Training	60
E. Off-campus Training	61
LATIN AMERICA - Brazil and Haiti	61

	<u>Page</u>
IV. LABORATORY AND DEVELOPMENTAL SERVICES	63
A. Developmental Services	63
1. Design of Natural Air Grain Drying Systems	63
2. Modification of the "Brook" Grain Dryer for Farm Use in Developing Countries	63
3. A Bibliography on Post-harvest Losses of Grains	64
4. Flight capability and factors involved in initiating grain infesting <u>Sitophilus weevil</u> flights	64
5. Methods for determining equilibrium moisture content/ maintenance of relative humidity under static conditions	64
6. Milled Rice Losses Due to Insect Infestation	65
7. Susceptibility of Millet Varieties to Insect Infestation and Loss	65
8. Post-harvest Deterioration of Rough Rice	65
9. Analysis of Alternative Post-harvest Handling Systems for Rice	65
10. Feed Processing Plant Design and Analysis for Developing Countries	66
11. Evaluation of Hygroscopic and Thermal Properties of Cereal Grain and Oilseeds	66
12. Rough Rice Drying (Computer Model)	66
13. Loss Assessment Techniques on Various Types of Cereal Grains	67
14. Volumetric Methods of Dry Weight Loss	67
B. Slide File	67
C. Preparation of Grain Storage and Marketing Manuals	67
V. ADDITIONAL ACTIVITIES	69
VI. CURRENT LIST OF PUBLICATIONS	73
A. Technical Assistance Reports	73
B. Special Reports	77
C. Research Reports	78
D. Manuals	79
SUMMARY OF ACTIVITIES	81

ANNUAL REPORT

TECHNICAL ASSISTANCE IN GRAIN STORAGE, PROCESSING, AND MARKETING AND AGRIBUSINESS DEVELOPMENT

AID/ta-C-1. 62

FOOD AND FEED GRAIN INSTITUTE
KANSAS STATE UNIVERSITY, MANHATTAN, KANSAS

In June 1967, an agreement was entered into between Kansas State University and the Agency for International Development under which Kansas State University agreed to provide technical assistance to the Agency for International Development and its missions in developing countries in the solution of problems involving the drying, storage, handling and transportation of grain or grain products under the contract, AID/csd-1588, entitled "Technical Assistance in Food Grain Drying, Storage, Handling and Transportation."

In September 1974, Kansas State University and the Agency for International Development agreed to a new contract, AID/ta-C-1162 entitled, "Technical Assistance in Grain Storage, Processing, and Marketing and Agribusiness Development."

The current OBJECTIVES of the contract include the following:

1. To provide technical assistance to AID and cooperating countries, agencies and institutions in planning and implementing programs for more effective post-harvest handling, drying, conditioning, storage, transportation, marketing, processing and distribution of grains and grain products from field to final consumer as requested and authorized by AID. Services to be rendered by Kansas State University to AID and its cooperators will be tailored to the needs and resources of each recipient country.
2. To provide technical assistance to AID and cooperating countries, agencies and institutions in planning and implementing agribusiness development programs based upon feasible modular units in viable food chains extending from farm inputs through production, marketing and processing to final consumers as requested and authorized by AID. Services rendered will be tailored to the needs and resources of each recipient country.
3. To plan and execute general and specialized training in grain storage, marketing, processing, and in agribusiness development for AID and cooperating country, agency, and institution personnel and to prepare instructional, informational and reference publications and materials on the several administrative and technical aspects of grain storage, marketing, processing, and in agribusiness development for use by AID and cooperating countries, agencies and institutions and by the Contractor in its training activities. Training, publications and material will be tailored to the needs and resources of developing countries.

4. Develop methodology, establish criteria, and design systems and technology through adaptive and developmental research and exhaustive review of literature in pertinent fields to support the technical assistance and training objectives outlined in paragraphs 1, 2 and 3 above. Adaptive and developmental research will be tailored to the needs and resources of the developing countries.

A more detailed statement of the specific objectives can be found in the contract document.

REVIEW OF ACTIVITIES
July 1, 1978 through June 30, 1979

The following review summarizes Kansas State University's activities during fiscal year 1979 of its Contract, AID/ta-C-1162, which provided technical assistance in grain storage, processing, and marketing and agribusiness development in developing countries.

This report is organized under the following major areas of assistance:

- I. Assistance to USAID Missions and Host Countries
- II. Informational Services
- III. Training
- IV. Laboratory and Developmental Services
- V. Other Activities
- VI. Current List of Publications

I. TECHNICAL ASSISTANCE EFFORT

A. Technical Services Performed

AFRICA - Tunisia - July through August 1978

Nature of Activity At the request of the Government of Tunisia and USAID/Tunis, Dr. Reynold Dahl, serving as KSU consultant, assessed marketing and transportation problems that might constrain proposed agricultural development projects (specifically, the improvement of cereal production in dryland farming, and improvement on existing shallow wells and the digging of new ones) in Tunisia.

Dr. Dahl was in Tunisia from July 8 through August 4, 1978.

Objectives The primary objectives were: (1) to assess the present agricultural marketing and transportation system, (2) to examine marketing and transportation requirements which will arise from the proposed agricultural projects, (3) to determine the nature and magnitude of the marketing problems relating to these projects, and the ability of existing structures and institutions in the area to meet increased marketing and transportation requirements arising from the projects, and (4) to suggest policy alternatives to be considered in the overall planning for agricultural intensification of the region to reduce these market-transportation constraints.

A secondary objective was to suggest further market-transportation analysis for the region which should be carried out over the next 3 years.

Summary of Activities The consultant found the time to complete the assignment was too short to permit recommendations supported with empirical evidence. Thus, the recommendations are largely based on his subjective judgments made from field observations and interviews.

Reporting and Distribution Dr. Dahl's recommendations and observations are recorded in Report No. 68, "Agricultural Marketing, Transportation, and Storage in Central Tunisia", August 1978 of the Grain Storage, Processing and Marketing series.

AFRICA - Chad - September 1978

Nature of Activity At the request of the Government of Chad through the USAID Mission in N'Djamena, Dr. Robert E. Julian, project coordinator, and Frank Bolduc, storage specialist, received initial instruction from Food For Peace Officer, Mr. Robert Roussel. The team discussed the need to determine specific needs and the necessary logistics for a warehouse management training program to be held in Chad.

The team was in Chad from September 7 through September 13, 1978.

Objectives A complete change in government was taking place in Chad in order to fulfill the promises made in a treaty which this year ended a 12-year civil war. Early this year, the ONC (Office National des Cereales) was created to coordinate all government efforts in grain storage treatment (insecticides and fumigants) and merchandising. ONC controls 14 warehouses and plans to build 150 more at a capacity of 40 metric tons each over the next 3 years. They would like KSU to take the role of training warehouse managers for these warehouses in all aspects and phases from the time grain enters, is treated, stored and is commercialized.

The government would like to control the wide fluctuation in sorghum prices, especially in N'Djamena, where the price of sorghum at harvest time (October) is \$.035/pound and \$.145/pound just before sowing (June). The unit of trade in Chad is the Koro (5.5 pounds). Three principle food grains are grown in Chad: sorghum, millet and rice, with sorghum having an overwhelming importance as a staple (600,000 metric tons a year is grown). Only 10 percent of these feed grains are commercialized; 90 percent are consumed at the village or farm level and, thereby, never enter the market.

I. There are two categories of people which ONC desires to be trained:

- A. The "responsibles" or technicians who will be responsible for the grain purchasing, insect identification and accounting at each warehouse. These people will each have a truck at their warehouse for purchasing grain and will be required to keep inventory on all warehouse activities. It was suggested that 1 week of training be reserved for these people.
- B. The warehouse managers or non-technical practitioners were suggested as trainees for the second week. Here it was asked that the training be kept at a very practical level and that training literature be kept at a 6th grade reading level. These people will be the warehouse maintenance and repairmen. They will be expected to be well versed in unloading techniques, stacking techniques, pallet construction and repair techniques, bag repairing and fumigation-application techniques.

II. Miscellaneous discussions on:

- A. Timing: It was decided that the best time for the short course would be the last week in May and the first week in June 1979.

- B. **Participants:** Two people from every warehouse (one for each category mentioned in Part I) plus one warehouse manager for every prefecture in the country (total of 14). Also, participants from other agencies presently involved and the private sector involved will send participants, bringing the total to 65 participants.
- C. **Transport:** In 1973, the last year of the West African drought, all the present warehouses were built for food reserves. It was much easier to travel then because of the drought, but the situation has now drastically changed because of the return of normal rains. From July to October, transport virtually stops until the end of October when all precipitation virtually ceases.
- D. **Financing:** Funds for equipping existing and new warehouses is a joint venture of the Dutch Government and FAO. Rather than use FAO equipment for training, AID requested that KSU purchase (under a project agreement) the equipment necessary for the training program and leave it in the country upon completion of training.
- E. **Fumigants:** It was agreed that Phostoxin would be the safest and most practical fumigant to use for the training.

Summary of Activities A visit was made to a private corporation in N'Djamena that sells fumigants, insecticides and rodenticides. The corporation had only one fumigant on hand, Dowfume MC-2 Fumigant. It is considered very dangerous and the label (written in English only) warns that it is not be used on food but only for treating soil. It is 98 percent Methol Bromide and 2 percent Chloropicrin. The assistant manager was told by sales agents from Cameroon that it was safe to use on food grains.

In visiting the Director of the DEFPA (Direction de l'Enseignement et de la Formation Professionnelle Agricole), Mr. Zacharia Ousman, the opinion was expressed that KSU send a technician to study the problem of determining the level of training the course should be geared towards and to develop the basic accounting system. An example given for the accounting part was a simple system of "Rotating Funds."

Four government organizations were visited: ONDR (Office National du Developpement Rural, FDAR (Fonds de Developpement et de l'Action Rurale), DLCCN (Direction de la Lutte Contre les Calamites Naturelles), and Ministry of Health and Social Affairs (Ministre de la Sante et des Affaires Sociales). Each agency expressed similar problems and needed training, in respect to short course training for warehouse management, with stresses on the following:

- Because of the problem of division among agencies leading to a duplication of efforts, it was unanimously agreed upon that all government agencies dealing with grains should be involved and a uniform type of management should be taught.
- The training should be kept very simple, including the training manuals to be used.

Reporting and Distribution A tentative training proposal and budget was presented in draft form to AID/Chad. This included suggested equipment and logistics. A finalized proposal will be presented in the near future.

AFRICA - Ivory Coast - November 1978

Nature of Activity Upon request of African Development Bank through USAID/Abidjan, Dr. Dale G. Anderson, agricultural economist, and Frank Bolduc, storage specialist, met with members of REDSO and the ADB to assist them in developing strategy for evaluating the need for grain storage loans in the Sahel.

The Bank has a mandate to make grain storage loans, money to lend, and a desire to move ahead quickly but carefully in placing the loans. The Bank needed assistance in establishing a process for evaluating the need for loans for storage improvements.

Objectives While some progress has been made in identifying Sahelian storage problems and their potential solutions, much important information is missing. Any major Bank activity in the area of grain storage should be guided by results of a thorough pre-investment study. Such a study, if its geographic scope were the entire Sahel, would require at least 2 scientific man years of effort. In view of the desirability of moving ahead quickly as well as carefully, the assessment of storage needs might better be accomplished one country at a time with investment decisions made subsequent to each study.

A pilot study should be undertaken in a single country. Owing to its apparent considerable need for storage improvement, Chad may be a good starting point. Chad is one of the larger Sahelian countries and has considerable diversity of climate and storage conditions. The study team would encounter conditions here which would provide guidance for follow-up studies. The study would provide basic information about existing storage facilities, storage conditions and storage needs. Its purpose would be to provide the Bank with specific storage loan recommendations for Chad or another selected country. Guidelines for the subsequent country studies would also be developed.

While the data collection and analysis to be undertaken by the study team(s) would provide the basis for initiating lending activities, a seminar of grain storage and marketing specialists should be commenced before major projects are financed. Purpose of the seminar would be to exchange views and research findings on storage needs in the Sahel. Such an exchange would be helpful in sharpening the findings and recommendations of the pilot study team. Guidelines for subsequent teams could be refined, and guidelines for monitoring outstanding loans developed. The seminar would be primarily for the benefit of Bank representatives and donor agencies, although it could be broadened to include borrower representatives as well.

The seminar probably should be timed to follow submission of the pilot study team's report, although it could precede initiation of the study and be structured so as to assist the team in its investigation. The former approach might

be more logical, but the latter might speed initiation of lending activity as a seminar might be organized more quickly than a study team can be fielded.

Follow-up studies should be initiated subject to recommendations by the pilot study team, Bank and donor agencies. The studies could be made in succession by a single team or simultaneously by two or more teams. Objectives and procedures of these studies would be those of the pilot study.

Reporting and Distribution A "Summary Proposal for African Development Bank Funding for Grain Storage Improvement Activities in the Sahael" was developed and copies left with ADB and REDSO.

AFRICA - Chad - November 1978

Nature of Activity Dr. Roe Borsdorf, agricultural economist, and Steve Graham, storage specialist, upon request of Food For Peace Officer, Peggy Sheehan to the USAID/N'Djamena Mission traveled to Chad to discuss (a.) Seminar on Management and Handling Practices. The Seminar was scheduled to be held in May 1979.

The request also asked assistance in (b.) reviewing management and accounting system and forms to be included in short course handbook being prepared for seminar. Also, (c.) a cooperative specialist reviewing with the Ministry of Agriculture and Board of Cereals staff the farmers' associations organization, it's management and accounting system. It is planned that the farmers' associations supply Board of Cereals with grain and they will eventually become producer and consumer cooperatives.

Summary of Activities All management and accounting form systems are developed and have been in use since mid-October. All forms, except master stock card, are explained and illustrated in training manual being used by ONC/FAO advisors. All forms, including master stock card, were reviewed and found to be sufficient for purpose of agency.

Apparent earlier agreement on Food & Feed Grain Institute warehouse management short course sponsored by USAID was valid based upon need for training in September. Given the impossibility of having training course in September ONC, forced to adhere to their planned schedule of developing the organization, was forced to initiate their own training program. Part of training program was completed in first half of October and balance to be completed in December.

After questioning the ONC Acting Director, it was ascertained that a decision regarding proposed training course in May would be forthcoming and that USAID/Chad would be advised upon the decision. It was also resolved that ONC did not require the administrative section of the training program as per project outline. The Head of Department of Marketing/ONC had trained persons in this particular portion and he was on leave. Pertaining to the balance of the proposed training program (warehouse practices, commodity management, and insect pests and rodent control), until the Head of the department returned, it could not be determined whether ONC would participate in

the proposed course. If so, it would be as a review only as some of the material had been taught in a course given in October by the Head.

A review of inventory management systems of CARE and DLCCN reveal that inventory control forms and systems being used are suited to specific needs of each agency.

It is strongly suggested and recommended that inventory control management be deleted from proposed training course, because

- This section holds no validity for apparent participants since warehouse managers are currently using stock control cards which give them a single, simple system of control within the warehouse. Observation reveals that all managers are using the stock control cards very well.

- The balance of the inventory control system is carried out at the main office of each agency under the direction of personnel who are currently using these systems and providing periodic required reports. No expressed need was determined for any change in the system.

- A review of these systems finds they are not compatible, nor can they be standardized. Standardized systems cannot be constructed for such a diverse group of agencies having different objectives. Since each agency has a completely different goal, a standardized system of inventory control management is not practical.

Reporting and Distribution Trip Report was completed and forwarded to AID/Washington, DSB/AGR.

AFRICA - Ethiopia - March 1979

Nature of Activity Upon request of Government of Ethiopia through USAID/Addis Ababa, Dr. Robert E. Julian, project coordinator, and Dr. Robert B. Mills, entomologist, traveled to Ethiopia to assess training needs in grain storage.

Objectives To provide an intensive short course for the training of Agricultural Marketing Corporation (AMC) personnel in the fundamentals of grain preservation and storage management (including handling, drying, grading and preservation).

This proposal would also include training AMC storekeepers, purchasing and sales division personnel in warehouse management which would include inventory control of receiving, holding, and dispatching of grains.

Summary of Activities A training proposal was developed and presented to AMC representatives. A starting date of October 1 with a period of 3 to 4 weeks was discussed for the short course. Funding of the short course was also discussed.

A field trip to an AMC silo storage site in Addis Ababa was arranged and the facility, the largest in Ethiopia, was observed. We visited the quality control lab and found that there apparently is no grading system; the sample is sieved and foreign material (insects, etc.) are removed. The sample is then weighed and judgment is based upon the amount. If live insects are found, the grain is fumigated.

Only maize, wheat, and sorghum are stored in this facility. Grain is trucked to the storage in quintal bags (100 kg), dumped, and elevated into the silos. Grain is loaded out in bags filled from either of two hoppers.

A visit to an AMC warehouse facility followed. The two warehouses each had a capacity of 10,000 MT of bagged grain. They were constructed of cement blocks and metal roof, and were approximately 70 meters long and 22 meters wide. They appeared to be excellent, although louvers in the doors were not screened against rodents and birds. The warehouses were financed by the World Bank.

In each warehouse the stacks were approximately 10 meters wide and 15 bags (100 kg) high. Stacks were in 4 rows with two driveways, one between each 2 rows. Some stacks extended the full length of the warehouse. All stacks were at least one meter from walls and from each other. Bags were placed on the floor, not on pallets.

All stacks in one warehouse had been fumigated recently. The Phostoxin tablets had been placed singly on the floor along each stack, between the edges of the bags, and on top. Rate was 4 to 5 per MT (100-135/1000 bu). Residue of the tablets was still in place on the floor and on the bags. There were numerous dead weevils on the floor along the stacks of bagged corn. A few were identified as Sitophilus zeamais. The wheat stacks had few dead insects around them.

We were informed that all grain is fumigated as soon as the warehouse is filled; grain (at least maize) is infested in the field, therefore, infested when received. A white insecticide powder was sprinkled along the stacks after fumigation as a barrier for insects moving to the stacks. This would not ban flying insects such as S. zeamais.

There was no evidence of rodent infestation, but the warehouses are new, being used for the first time.

Several grains were stored: maize, wheat, sorghum, and imported cracked rice. Some of the wheat was imported from Canada.

It appeared that management of the grain was good, at least for the storage period, which does not exceed 6 months. A few live weevils were seen, and a live moth, so the fumigation was not completely effective.

Arrangements were to be made for visits to other storage sites, not as modern or as large as the ones previously visited, but were not completed. Permission was not received to visit sites outside Addis Ababa although it was stated that storage management was poor in outlying storages.

Reporting and Distribution A draft of the training proposal was to be reviewed by the KSU staff and a finalized copy will be returned to the Mission. Revised copies of the training proposal were also forwarded to AID/Washington, DSB/AGR.

AFRICA - Upper Volta - May through June 1979

Nature of Activity The USAID/Upper Volta Mission through USAID/Washington, requested assistance in project paper development. Dr. Dale Anderson, agricultural economist, and Frank Bolduc, storage specialist, traveled to Ouagadougou May 17 through June 19 to respond to this request.

Objectives The objective of the project paper was documenting grain marketing development needs and outlining recommendations for USAID assistance. KSU participants were part of a larger team including USAID staff from Washington and the Mission. The two-man team was assigned primary responsibility for writing certain sections of the project paper.

Basis for the PP was a Project Identification Document (PID) prepared by USAID/Ouagadougou and approved by Washington. The PID, in turn, was in part an outgrowth of a request from the Upper Volta National Cereals Office (OFNACER), a parastatal grain marketing board, for assistance in construction of facilities to hold price-stabilizing stocks of grain sorghum and millet.

Summary of Activities The PP team concluded that funding for four lines of grain marketing development should be sought. First, technical assistance should be provided to OFNACER in the form of an agricultural economist and two Voltiac assistants for a period of 2 years. The technical assistance team would assist OFNACER in streamlining its operations and improving its planning capabilities. Particularly needed is assistance in developing improved data collection and analysis activities. Transport planning and centralized inventory control are areas of special emphasis. Technical assistance will also be utilized in establishing specific needs for local (sous prefecture and village-level) storage facilities--locations, sizes, etc.

Second, funding should be sought for construction of storage facilities in a limited number of sous prefectures, number and specific locations to be established by the technical assistance team. Suggestions as to appropriate type and complementary equipment were developed.

Third, a study team composed of an economist and an anthropological economist should be fielded for a period of 2 years. The team would analyze the structure of private grain markets and evaluate long-term implications for government market intervention. The study team would work in close cooperation with the technical assistance team. While the latter team ideally might work directly with OFNACER, the study team should have independence from Government of Upper Volta marketing board influence.

Fourth, support should be provided on a limited and experimental basis for development of village-level grain banks. Purpose of the banks is to provide for farmers' credit needs at harvest time and to facilitate local storage to meet local needs.

The KSU team members wrote drafts of the following PP sections:

- Economic feasibility
- Technical feasibility
- Social soundness
- Environmental impacts
- Annex-OFNACER's data collection and analysis capabilities and needs
- Annex-Selected references.

Reporting and Distribution Copies of the KSU team's contribution were submitted to the USAIL/Mission and forwarded to AID/Washington upon return to KSU.

ASIA - Thailand - September 1978

Nature of Activity Dr. Roe Borsdorf, agricultural economist, traveled to Thailand September 10 through 19 in response to a request from USAID/Washington to assist in external evaluation of second year of Seed Development Project.

Objective The objective of this travel was to act as a member of an external evaluation team for the second year evaluation of the Thailand Seed Project. Dr. Borsdorf had assisted in the early phases of the project development.

Summary of Activities Dr. Borsdorf assisted in preparing evaluation report by drafting given sections of the report as directed by team leader, Dr. Lloyd Fredrick of DSB/Washington, D. C.

Dr. Borsdorf met with Agricultural Research Department personnel to discuss post-harvest food loss programs.

Reporting and Distribution Copies of those sections which KSU economist assisted in drafting were left with team leader.

ASIA - Sri Lanka - November 1978

Nature of Activity In response to a request from CARE and USAID/Colombo Mission, Dr. Cho C. Tsen, baking/nutritionist staff member, traveled to Sri Lanka November 9 through 23, 1979. The request was for assistance in nutrition of soy-flour biscuits.

Objectives Dr. Tsen was to study the local facilities and operations for processing biscuits used in the school feeding program, to evaluate the acceptability of biscuits prepared from different formulas, to run large-scale trials with modifications in formula and baking temperature in a local plant to improve the quality of biscuits.

Summary of Activities Meetings and discussions were held with personnel of the CARE Office in regard to the biscuit program. A visit was made with CARE personnel to inspect the storage conditions of PL 480 commodities located in Beira Lake Stores. The stores are run by the government of Sri Lanka. However, CARE has one worker assigned specifically to take care of the commodities.

The Ceylon Biscuits Ltd. in Pannipitiya was visited to observe the factory facilities and operation. During the visit, a report on the development of improved biscuit formulas at Kansas State University was presented and discussed.

The local school (Bloemondhal, in a poverty area,) was visited to ascertain the breakage and acceptability of biscuits. Reactions of 25 students, aged 8 through 11, were taken towards biscuits prepared at KSU and results tabulated.

Five trial batches of varied biscuit formulas were run at Ceylon Biscuits, Ltd. in the presence of CARE representatives and a Ministry of Education representative. Results indicated that the dough handling properties were much improved by adding a higher level of oil. Soy-fortified flour could be conveniently used for making biscuits without the addition of instant corn soy milk (CSM).

Four additional trial batches of the current formula with modifications in baking temperature and baking chemicals were run with a view to improve the biscuit quality. The samples made with a baking chemical mixture of $(\text{NH}_4)_2\text{CO}_3$ 4.0 lb and NaHCO_3 7.0 lb and baked at 360, 450, 475, 450, and 360 of gradient temperatures were much better in terms of color and crispiness.

At Kandy, a tour was taken to observe the Intsoy (International Soybean Program) processing facilities and to visit with personnel exchanging views on improvements that could be made there.

Personnel of Maliban, Intsoy, CARE, and Ministry of Education met with Dr. Tsen to discuss soy fortified biscuits. A visit with the board chairman of the State Flour Milling Corporation was held with discussions concerning the utilization of full-fat soy flour in instant string hoppers.

Reporting and Distribution Copies of trials and recommendations were left with the CARE office in Sri Lanka. A trip report with trials and recommendations were forwarded to DSB/AID/Washington upon return.

ASIA - Korea - January 1979

Nature of Activity Seoul National University, through USAID/Seoul Mission, requested that a short course on "Feed Manufacturing Technology" be taught in Korea. Dr. Do Sup Chung traveled to Seoul January 20 through January 30, 1979 to respond to this request for technical assistance.

Objectives Dr. Chung met with representatives of Seoul National University, and the Program Officer of USAID/Korea to discuss and finalize the plan for the in-country short course. The objectives included: setting up dates of short course, selection and total number of participants, funding, program including subject matter and other pertinent information,

Summary of Activities It was decided that a 10-day short course would be held April 9 through 19 at the main campus of Seoul National University. The participants would number 99 with personnel from private feed manufactur-

ing companies, Agricultural Cooperative Federation and Livestock Development Corporation, Ministry of Agriculture and Fisheries, provincial governments, Feed Ingredient Association members and universities.

A complete program describing the subject matter, schedules and other information was developed.

A field trip was made to Kimpo, Kymnggi province, Kunsan, Cholla Buk-do province and Taejon, Choong-Chung Hamdo province, to observe old and new feed mills and to evaluate the subject matter to be stressed at the short course. Feed mills observed were several different capacities of old plants, ranging from 100 T/day to 300 T/day, and 450 T/day capacity of a newly built modern feed mill. In addition, a plant manufacturing leather meal for a feed ingredient was observed.

All feed mills visited are experiencing a shortage and unreliable supply of raw materials, especially feed grains and plant protein meals. Also observed were inflexibility of feed formulations due to the government regulations and definite needs of trained personnel, especially for feed mill operations, improvements in the areas of quality control for raw materials, processing of products, and finished products, and improvement on physical aspects of plant management.

After the field trip, a formal meeting was held to discuss the current and future needs for improving feed industries in Korea with officials of the Ministry of Agriculture (MAF), Korean Feed Association, National Agricultural Cooperative Federation, Korean Poultry Association, Korean Livestock Development Corporation and Korea-Purina Feed Company. The specific items discussed were (1) brief history of formula feed industry in Korea in terms of production, number of feed mills and their facilities and (2) future directions and changes in the feed industry of Korea. Dr. Chung was informed that minutes of this meeting would be published in the Korean Poultry Journal.

As a follow-up of last year's Grain Storage and Marketing Short Course and the Food Grain Reserve Seminar, Dr. Chung met with representatives of the Ministry of Agriculture and Fisheries. They indicated that the short course provided a positive impact on the food grain management practices at many provincial locations in Korea. At least five participants were scheduled to attend the 1979 Short Course to be held on the campus at Kansas State University. They also indicated that the development of food grain reserve systems is being considered by MAF.

Four individuals who had received special training on "Computer Applications for Project Evaluations" were visited and they indicated that the training received was very helpful and were being applied for actual project evaluations. Mr. S. R. Cho, Director-General, Projection Evaluation Bureau, Economic Planning Board expressed a desire to send additional individuals to KSU for similar training. Upon request from Mr. Cho, an informal presentation on agri-

cultural mechanization and post-harvest problems was given to about 25 staff members at the Economic Planning Board.

Discussions were held in regard to Mr. Yong Kook Lee's Ph.D. program on "Effects of Drying on Rice Milling." Mr. Lee's study was financed by ORD, MAF under a loan from USAID/Korea.

Reporting and Distribution A rough draft of the proposed training project was given to SNU personnel and finalized program was later forwarded. Copies of the proposed project were also forwarded to DSB/USAID/Washington, D. C.

LATIN AMERICA - Haiti - August 1978

Nature of Activity Upon a request from the Government of Haiti, through the USAID/Port au Prince Mission, Mr. John R. Pedersen, grain quality/preservation specialist, and Dr. Robert E. Julian, coordinator-Food and Feed Grain Institute, traveled to Haiti August 21 through 27, 1978. The request was for assistance in setting up a training program including a brief pre-program tour of duty to plan the training schedule with the Department of Agriculture.

Objectives The objectives of this request included the planning and development of a Grain Storage Seminar for approximately 1 week's duration. This training would be for technicians and agronomists of the department. The subject matter emphasis would be on handling, storage techniques, and pest control.

Summary of Activities This request for assistance included an inquiry into the situation of individual or community installations for the storage of maize, sorghum, rice, and food legume seeds on a national level. In the course of a coordination-reunion, organization by the National Seed Service in June 1978, the Director-General of DARNDR insisted on the importance of seed storage installations in the programs that the government was currently implementing to improve the situation for the production and distribution of seeds to farmers. He also asked that an inquiry be undertaken with the objective of defining the situation of seed storage installations for the entire country. This was intended to permit installations that participate in the national program to eventually develop a strategy for improving the present situation.

Observations were made at the DARNDR storage site where Bush-Hog Eaton bins are being erected at Bon Repos, near Port-au-Prince. Several observations were: no visible means of the bins being attached to the poured concrete foundations could be seen; the three hatches located around the lower periphery of the bins' roof appear to have a hinging and fitting problem and apparently cannot be sealed sufficiently to guarantee no leakage; and the bolts used to fasten the roof of the bin to the walls were fastened in place without rubber washers that were supplied with the bolts.

A quonset-hut storage building installed for PL480 commodity storage by Hoesch America was observed. The building is designed for storage of bulk grain but is being constructed for storage of bag commodities. It is definitely going to be a very inefficient use of floor space as far as storage is concerned.

Another field trip was taken with Mr. Montaigu Cantave, who indicated the type of production programs in Haiti and the route the flow of grain takes as it moves from field to central storage.

It should be strongly stressed that the type of training program established ought to also provide some training so that the district silo operators can visit the sector personnel and demonstrate the use of moisture meters down to the unit level. The type of training being sought would probably be for the district silo personnel and others from the districts that are now set up at the sectors. Part of the training in the course being considered for Haiti would be to prepare materials and training so that those attending from the district silo sections and the sectors can be utilized to train others delivering grain to them. The district people ought to be versed in the operation of moisture testers and in the holding of grain in bulk. The sector personnel need to be aware of the problems as far as handling grain in sacks and what can be done to keep the quality, for short periods of time, at marginal moisture contents.

Another field trip was to the Artibonite Valley where the director of the regional area organization for crop production (ODVA) was visited. This organization operates as a cooperative-type operation where each farmer has approximately 1 hectare of land controlled by ODVA. Observations were made of the method of threshing (rice is spread out and walked on) and cleaning. Storage methods and warehouses were also observed at ODVA.

Next an ODVA rice mill involved with parboiling was visited. The parboiling procedure was observed and it was noted that apparently each person that was working was parboiling for himself and drying the rice before having it milled.

The region of Gonaïves was visited and an A-frame type of on-farm storage unit was observed. The first farmer visited in this region has a similar storage unit and used a powder or dust formulation of malathion for treatment of coltons; however, he did not use it to treat his maize.

The second farmer visited was drawing maize on the ear with some of them already husked. His storage unit had a galvanized metal roof with mud and straw walls and was also elevated above ground. At a third farm, a similar storage structure was observed. Our host informed us that this type of structure was one of the most common used for on-farm storage.

A rice drying and storage facility at ODVA was also visited. Even though the dryer could not be used, there are five bolted steel tanks that could be used for bulk storage of rough rice with some additions of thermocouple cables to the center of the bins.

A visit to the Haitian Tractor and Equipment Company was also made. Bin capacity was discussed as well as the method of transferring the grain from one bin to the other for the five silo complexes. Also discussed were the rather flimsiness of the peripheral hatch cover collars; the wheels on the

cleaner needing to be corrected; and the absence of the anchor bolts that should be at the base of the bins. It appears that they will correct the latter situation.

Reporting and Distribution Recommendations were made by the team and given to the USAID/Haiti Mission Food and Agriculture Officer.

LATIN AMERICA - Ecuador - September through October 1978

Nature of Activity The Government of Ecuador, through USAID/Quito, requested technical assistance in planning and designing programs and courses for training and education in grain storage and post harvest loss reduction programs. Dr. Charles W. Deyoe, director of Food and Feed Grain Institute; Dr. Robert E. Julian, coordinator; and Cornelius Hugo, agricultural economist; traveled to Quito and Guayaquil September 26 through October 4, 1978 in response to this request.

Objectives Among the objectives were: the need to determine the current and future training needs of ENAC in respect to grain storage plant managers and operators and personnel responsible for grain purchasing center operations. The agency, ENAC (Empresa Nacional de Almacenamiento y Comercialización Agropecuario) is a division of the Ministry of Agriculture which was officially founded in February 1974 to provide the following:

- grain storage programs
- assist the small farmer in reducing the periods of low prices at harvest through base pricing, purchasing and storage
- to commercialize agriculture products.

Summary of Activities In July 1977, a new agreement was signed to include new plant construction for greater country coverage in purchasing and storing of grains, and in some instances, cotton.

In determining the training needs of ENAC, in-depth discussions were held with the various divisions to identify problem areas which training is needed in the up-grading of current staff and training of new staff.

Meetings were held with representatives of the Subgerencia Técnica (ENAC). This technical department is in charge of the facilities (storage and processing) operated by ENAC. The department is subdivided into three units, (1) storage, (2) maintenance and (3) construction. At this moment, they are in charge of ten plants and/or warehouses throughout the country. They will also be responsible for the operation of the eight new plants being built by Tiffany, as well as the purchasing centers.

Field trips to:

- traveled to Guayaquil to the ENAC central office.
- Planta Modelo is a central plant for storage and processing of rice and corn. It includes one of two central laboratories.
- Planta Aldegran was recently taken over from the private sector. It is a modern plant for storage and drying with a 5,000 M.T. capacity.
- Planta Adagro is a private cooperative in which ENAC contracts drying and storage. It is an excellent facility of 30,000 M.T. capacity with excellent management.
- A rice mill - Mill visited was privately owned. It did all the rice processing for Planta Adagro and other private producers. The management seemed excellent.
- Warehouse (cotton) ENAC has government cotton storage responsibilities which cause considerable problems. The warehouse observed was poorly managed and will probably be returned to the Ministry of Agriculture.

Meetings were also held with the personnel of the Direccion de Planificacion (ENAC). This planning department is in charge of formulating ENAC's activities according to government policy. Though their personnel has had some university training as well as other short course training, general deficiencies in the area of agricultural marketing and abilities to analyze marketing processes (channels) are visible. The above stated areas of deficiencies are important in terms of recurrent, medium and long-term planning activities for an efficient intervention.

The following approach was suggested to improve their intervention and results:

- Apply approved quantitative methodologies to describe and analyze (efficiency and effectiveness) existing marketing channels handling products of concern to them.
- Determine weak points which can be improved and/or deleted. Develop a yearly planning capability for effective intervention in the marketing of agricultural products.
- Develop long-term planning capabilities to improve agricultural marketing processes.

Interest was shown in the area of futures market to improve their handling of imports and exports.

The department Subgerencia Financiera (ENAC) is in charge of all financial matters concerning ENAC. This responsibility ranges from daily financial transactions, such as payroll, control of purchases; to financial analysis of new projects. Two areas were mentioned needing improvement. First, financial management and control of daily operations, and second, financial management with planning in mind to optimize resource use.

The commerce department of ENAC (Subgerencia Comercial) coordinates with Ministry of Agriculture (MAG) the intervention activities which are based on

policy decisions taken by MAG. Thus, every year MAG elaborates policy and working plan, defines which products ENAC will intervene to regulate their commercialization.

The intervention is aimed to maintain a minimum floor price in the area of production in order to keep farmers on the land, increase production, reduce imports.

The areas of concern were described as follows:

- (1) Political interference distorts policy recommendations coming from MAG.
- (2) Minimum floor prices are not realistic and up to date.

The above two points are partly due to lack of adequate information for production estimates which impacts on the decision as to where to put purchasing centers, how much to buy, etc.

Also, lack of adequate consumption numbers reflecting rural and urban differences hinder reasonable decision making.

- (3) Lack of adequate grading standards and their implementation.

Grading standards seem to be too stringent; farmers bring all kinds of quality which is purchased. However, on the other hand, their grading standards do not meet international standards which are required for possible export of rice.

The possibility of training extension workers in the area of grading standards and thus, transferring their knowledge to the farmers, was discussed. A control program to evaluate ENAC's performance in the intervention process was mentioned in connection with the level of intervention.

The possibility of having the mobile purchasing centers give a "pre-treatment" to the grain purchased in order to maintain the quality received was considered.

Finally, the possibility of having one or two persons trained in the functions of the futures market was discussed. They saw a need to have this market available to improve their import position and possible export possibilities.

A visit was made to INIAP, a federal financed experiment station. The station was well equipped with excellent research laboratories. Assistance in developing the station had been given by North Carolina State University and Michigan State University. Several of the staff were U.S. trained.

Reporting and Distribution A training proposal was drafted and copies left with USAID/Quito personnel. An in-depth report will be prepared. A Trip Report was filed with DSB/AGR/Washington, D. C.

LATIN AMERICA - Honduras - January 1979

Nature of Activity The Government of Honduras, through the USAID/Tegucigalpa Mission, requested technical assistance in developing a course of action for improving marketing activities including marketing policy, information systems and planning, quality control and commercial and physical aspects of grain marketing.

Dr. Richard Phillips, agricultural economist; Dr. Dale Anderson, agricultural economist; and Dr. Harry B. Pfost, consulting engineer, responded to the request and traveled to Honduras January 7 through 17, 1979.

Objectives The request for the team specified that the services to be provided would include:

- Work with IHMA, Ministry of Agriculture and other appropriate Government of Honduras agencies to evaluate their present programs, facilities and future plans
- Review past market studies and programs as to their relevance to the current environment
- Recommend to GOH/USAID an appropriate course of action to develop future programs including the establishment of necessary marketing policy, planning and capabilities and grain handling facilities.

Summary of Activities The team evaluated the organization and operation of the Honduran Agricultural Marketing Institute (IHMA), and made recommendations for improving grain price stabilization activities in Honduras; the team also made partial evaluation of the technical support of agricultural marketing policies and programs of the Honduran Government, and made preliminary recommendations for enhancing this technical support.

Reporting and Distribution Recommendations and observations of the team are recorded in "Support Recommendations for Honduran Grain Marketing Policies and Programs," Report No. 75, January 1979 of the Grain Storage, Processing and Marketing series.

LATIN AMERICA - Paraguay - January 1979

Nature of Activity The Ministry of Agriculture, Paraguay, through USAID/Asuncion, requested technical assistance in completing an analysis of silos, evaluation and design of small wooden on-farm silos and review of short-term training needs. In response to this request, Cornelius Hugo, agricultural economist, and William Briggs, consulting engineer, traveled to Asuncion and various locations in Paraguay January 6 through 21, 1979.

Objectives Mr. Briggs was to observe and analyze silo design through second phase of national silo program as well as the grain storage equipment at the silo site. Mr. Hugo was to assist in translation as well as analysis.

Summary of Activities The team visited a storage site near Asuncion Airport with the engineer for grain storage, representative of the Minister of Agriculture. Site was at a private rice mill called "Adelaida." Most of the grain storage equipment was on an open concrete slab next to the rice mill building. A severe wind storm apparently destroyed this building or the building where the parts were previously stored.

Field trips were taken to various other locations to observe and make recommendations.

Reporting and Distribution A report entitled, "Analysis of Silo Design Through Second Phase of National Silo Program in Paraguay", was completed and copies left with AID/Asuncion and Ministry of Agriculture. It was suggested that a translation be made of the report and it be forwarded to KSU to print in English and Spanish. The report has not yet been received. A trip report and brief summary were filed with USAID/DSB/AGR, Washington.

LATIN AMERICA - Panama - January through February 1979

Nature of Activity Upon request of the Government of Panama, through USAID/Panama City, Dr. Roe Borsdorf, agricultural economist, and Cornelius Hugo, agricultural economist, traveled to Panama January 20 through February 3, 1979. The request was made in reference to the proposed Panama Project "Applied Agricultural Research."

Objectives The objectives of this assignment were the assessing of the adequacy of marketing infrastructure as related to likely crops/products of Panamanian small farmers as proposed in "Applied Agricultural Research" project. Also required was an evaluation of the Government of Panama pricing policies affecting small producers and an evaluation of market potential per commodity.

Summary of Activities An evaluation was made and a scope of work written up. The subject matter of the evaluation addresses itself to the impact of different marketing conditions which could affect the levels of success of the proposed priority commodity program under the national project by IDIAP.

From the SCOPE OF WORK: Given the time constraints and data limitations, the following areas investigated are:

- marketing structures as related to priority commodities
- the apparent impact of GOP pricing actions upon small producers
- evaluation of market potentials for priority commodities
- apparent marketing research needs.

This evaluation was approached from a broad marketing point of view which focuses on the end-uses of products and takes into consideration the movement of the products from the producer to consumer.

The data bank available to the team was composed of a limited number of government statistical publications, IDIAP's project paper, one FAO study,

and other miscellaneous publications as well as interviews with government agencies and private companies. Though the sources of information were useful for a general background, the critically needed data concerning marketing structures, flows, volume, elasticities, income levels and expenditures, rice data, etc., was not available.

Reporting and Distribution Copies of the working paper were forwarded to USAID/Panama. Copies of the paper and a trip report were also forwarded to USAID/DSB/AGR, Washington, D. C.

LATIN AMERICA - Costa Rica - February through March 1979

Nature of Activity Following a request by the Peace Corps through USAID/San Jose, Carl Reed, post-harvest loss specialist, traveled to Costa Rica February 17 through March 5, 1979. The request was for post-harvest loss assessment training assistance to the Peace Corps.

Objectives The objectives were to provide specific training to Peace Corps trainees in on-farm post-maturity loss assessment (basic grains). Also a copy of the new Central American agreements on grain quality grading standards was to be obtained. Other objectives were to discuss local and Central American practices and standards for grain buying and marketing with staff at University of Costa Rica, CIGRAS, as well as formulating and discussing ideas to relate grain grading portion of KSU Grain Storage and Marketing Short Course to conditions of third world countries.

Discussions were to be made with UCR personnel to make recommendations on proposed KSU/UCR cooperative agreement in grain storage research.

Summary of Activities Activities included in-class instruction at the training center for Peace Corps; meetings with University of Costa Rica (CIGRAS) staff and Peace Corps staff. Mr. Reed traveled to volunteer work sites (three) within the country and included field practice of in-field drying loss estimation and interview technique.

Reporting and Distribution A trip report was filed with USAID/DSB/AGR, Washington, D. C.

NEAR EAST - Afghanistan - September through October 1978

Nature of Activity Dr. Floyd Niernberger, consultant in economics, statistics and cooperative services, responded to a request from World Bank through USAID/Kabul for technical assistance under the KSU contract. Dr. Niernberger traveled September 29 through October 28, 1978. The request was to provide a man-month of assistance to an ongoing feasibility study in Afghanistan being made by the World Bank, I. B. R. D. It is a combined agency project involving other donor countries and the Mid-America Consortium for Wheat Development.

Objectives The overall goal of the total project is development of a wheat system with special emphasis on storage and U. S. PL 480 wheat use. As the USAID representative on the three-man team, Dr. Niernberger would also be assisting in determining policy as to the future U. S. Government rural development support for the next 5 years. These objectives were in coordination with an IBRD appraisal team.

Summary of Activities Meetings were held with the IBRD team and the ODM Middle East Development Division representative on responsibilities of participating members as to the appraisal project. Development of plans and activities of members for the appraisal period and a tentative travel schedule were made. Background materials made available by the IBRD team and USAID/Kabul were read and analyzed.

Two major in-country investigative trips to grain production and marketing areas outside Kabul were made. The first consisted of vehicle travel south and east of Kabul (land bordered by Pakistan and Iran) on the half-circle highway route to Herat. The 4½ day trip, in company with USAID Agriculture Officer, IBRD Agronomist and Afghanistan counterparts focused on land characteristics, cropping practices, farmer income, production yields and farm-gate prices, local grain market structure and operating prices, marketing practices and storage facilities. Major provinces examined were Ghazni, Zabul, Kandahar, Helmand, Farah and Herat. Return by air to Kabul was made over the central provinces of Ghor, Oruzgan, Bamyan and Maidan where land characteristics and cropping patterns of early October were noted.

The second trip (5 days) was made in conjunction with all members of the IBRD team, ODM representatives, the USAID Agriculture Officer and Afghanistan counterparts. Air travel was made from Kabul over the north central region of Mazar-i-Sharif. At Mazar-i-Sharif, vehicles were obtained and travel was made as far east as Sheberghan to view markets and obtain pricing data. The remainder of the trip was divided between travel with either the IBRD storage consultant or economist to obtain information necessary for the appraisal. Major provinces (bordered by the USSR and Pakistan) examined were Jawzjan, Balkh, Samangan, Kunduz, Baghlan and Parwan.

Meetings were held with the several counterparts from the DRA Ministries directly involved in the appraisal (Agriculture, Finance and Planning) were held at intervals throughout the appraisal period. Meetings were held almost daily with individuals from the Food Procurement Department and USAID/Kabul.

The IBRD appraisal team and USAID/ODM members met to discuss the information gathered from meetings and travel. As a result of this meeting, the IBRD team leader prepared an IDA Mission AIDE-Memoire (dated October 23) which was presented orally to USAID/Kabul and the DRA Ministry of Planning and Ministry of Agriculture.

Reporting and Distribution A brief analysis and comments on the material in the IDA Mission Aide-Memoire was prepared by Dr. Niernberger and presented to Dr. Fort, the USAID/Kabul Agricultural Officer. Also, a briefing and notes on the results of the two DRA Ministry meetings were given to Dr. Fort prior to Dr. Niernberger's departure.

The material contained in the IDA Mission Aide-Memoire is only preliminary. More detailed information is to be prepared by the IBRD and released in a draft copy by year's end.

A trip report was filed with USAID/DSB/AGR in Washington, D. C.

B. Follow up on Previous Overseas Requests

AFRICA - Senegal

Nature of Activity As a result of KSU technical assistance provided by Mr. John R. Pedersen, grain quality/preservation specialist and Ken Steinke, storage engineer, during the period June 1 through 16, 1978, the Government of Senegal through USAID/Dakar Mission requested additional technical assistance. Dr. Harry B. Pfof, consulting grain storage engineer, traveled to Dakar March 14 through April 2. The purpose of this travel was to discuss the development of bulk storage for a National Food Security Reserve System as requested by the Grain Marketing Agency, ONCAD.

Objectives The objective of this study was to analyze the current grain storage situation in Senegal and make recommendations regarding the quantity, type and size of storage facilities needed. The facilities would be financed from PL 480 Title III funds which will probably become available.

Data gathered indicated that the government grain marketing agency, ONCAD, will have 110,000 to 140,000 tons of good central storage available within the next 2 to 4 years. This is considerably above the storage recommendations made in any previous studies.

Farm stored grain probably represents a major reserve of food in the Sahel area and has received little consideration in previous studies in Senegal.

Summary of Activities After considering the probable needs for storage in Senegal, the final conclusion was that a need exists for small storages at the cooperative (village level). These storages might provide for storage of about 100 T on grain, 100 T on fertilizer and provide facilities for sales of other farm inputs and consumer items.

Reporting and Distribution Report No. 77, "Current Storage Situation for Domestic Grains in Senegal", March 1979 of the Grain Storage, Processing and Marketing series, contains Dr. Pfof's recommendations and observations.

ASIA - Sri Lanka

Nature of Activity As a follow up to technical assistance January 6 through February 9, 1978 by Dr. Roe Borsdorf, agricultural economist and Dr. Richard Phillips, agricultural economist, USAID/Colombo requested continued assistance through the Asia Bureau, Washington, D. C.

Dr. Roe Borsdorf and Cornelius Hugo, agricultural economists, and William Briggs, KSU consulting engineer, traveled to Colombo during the period August 11 through September 10. The request, originating through the USAID/Colombo Mission, required a transportational analysis and site location study team as well as a CARE corn soya milk processing plant evaluation.

Objectives The assistance request, for the economist study team, was of two components, each of which are related to proposed development of USAID/Colombo in the paddy and rice industry.

The team was to develop a work plan with target dates for supplying results of study to USAID Mission. Also required was the development of a working paper concerning specific training needs within the Government of Sri Lanka sector of the paddy and rice industry.

The consulting engineer was to set up procedures for data generation and collection encompassing the cost of moving paddy and rice in current marketing channels; requirements for transport levels; and testing of alternative transport configurations, locational storage and processing alternatives, and direct movement of rice from millers to retail outlets.

Summary of Activities Following components set forth, the KSU economist team proceeded as follows:

- Data, required to complete desired study, was collected and inspected. This data included truck and rail transport costs, consumption data, population, prices, factors which impact on yields and land area development (fertilizer use, improved variety use, irrigation, etc.).
- A working paper, including training needs; instructional procedures for in-country training; suggested training areas; and structures and costs of suggested training areas, was developed.

The consultant studied the new plant at Ja-Ela and developed a report on the "Thriposha" project for CARE. Thriposha is a blend of corn, soybeans, vitamins and minerals. It is a local product to gradually replace "ICSM", furnished under the PL480 program.

Reporting and Distribution Copies of the working paper for Proposed Phase II Project were discussed and left with the USAID/Colombo Mission personnel as well as the procedural outlines. Copies of these materials were forwarded to DSB/Washington.

ASIA - Sri Lanka

Nature of Activity Continuing assistance began in January/February, Dr. Roe Borsdorf, marketing specialist, and Dr. Dale Anderson, transportation specialist, traveled to Sri Lanka February 9 through March 11, 1979. They were accompanied by KSU consultant, Dr. Don Anderson. The request was for technical assistance in agricultural economy planning and marketing policy and was received from the Government of Sri Lanka through the USAID/Colombo Mission.

Objectives The objectives of this assistance were to determine basic problems and needs in the current environment for agricultural policy development and implementation and assess the problems and needs of the Paddy Marketing Board (PMB) and of the dryland agricultural sector.

Summary of Activities Agricultural policy formulation in Sri Lanka is handicapped by inadequate data and inadequate analytical capabilities. These two basic deficiencies have adversely affected the ability of GSL to plan for the rational development of the agricultural sector. Manifestations of the deficiency include the lack of a central focus in government marketing operations, internal management problems in operating agencies such as PMB and poorly-defined policies toward development of the dryland crops sector.

Data collection, dissemination and analysis must be upgraded substantially. Responsibilities for each of these basic functions must be centralized and clearly identified. An interface such as the proposed Food Policy Committee, must be established between upgraded analytical agency and top-level government policy makers.

Rationalization of marketing organizational structures should be a first priority for the upgraded policy-making apparatus. The role of PMB, in particular, should be clarified. Internal management capabilities of PMB should be reinforced. In the long term, as need for the ration system diminishes, attention should be given to the price-stabilization potential of reserve stock management. At the same time, refinements in PMB's pricing system will be needed. In the short run, consideration should be given to a modest increase in paddy prices. Continued importation of wheat or wheat products is both necessary and desirable.

The demand potential for dryland crops and the capability of the marketing system to absorb added production of these crops should be analyzed intensively. Rational plans for development of the dryland sector can then be formulated. In the short run, attention should be directed to a rationalization of certain relative and absolute price relationships.

Donor support should be focused on technical assistance and training aimed at upgrading data collection, dissemination and analytical capabilities. Specific assistance is recommended for upgraded policy formation, for improved PMB management capabilities, private sector development, and for evaluation of dryland crops sector needs.

Reporting and Distribution The team's recommendations and observations are recorded in Report No. 78, "Recommended Support for Grain Policy Development and Implementation in Sri Lanka", March 1979 of the Grain Storage, Processing and Marketing series.

ASIA - Korea

Nature of Activity As a follow up to Dr. Chung's travel in January, four staff members traveled to Korea April 5 through 27, 1979. Dr. Charles W. Deyoe, Director of Food and Feed Grain Institute; Dr. Do Sup Chung, storage engineer; Dr. Keith Behnke, Assistant Professor, Formula Feeds; and Mr. James Balding, Associate Professor, Formula Feeds Extension, responded to a request to conduct a Feed Manufacturing Short Course. Drs. Chung and Behnke were funded under the AID/ta-C-1162 contract.

Objectives In addition to the short course training program, Dr. Chung followed up on research activities at the Institute of Agricultural Engineering and Utilization and the Korean Institute of Science and Technology.

Summary of Activities The team traveled to Seoul National University (SNU) where the short course instruction involved 107 participants actively involved in feed manufacturing, management and inspection.

Visits were made to a port grain facility of Korea Silo Company in Incheon. It was learned that a grain handling and storage facility expansion program is in progress. A 600 T/day capacity feed mill, near completion, was located near the port grain facility (Dae-Han Sugar Company) and was visited.

At the request of participants and Dr. I. K. Hahn, the KSU team reviewed the blueprints of three feed mill designs and provided several suggestions for changes on the designs.

As a follow up of last year's Grain Storage and Marketing Short Course, Drs. Deyoe and Chung met with members of the Food Grain Management Bureau and the Grain Storage Division of Ministry of Agriculture and Fisheries (MAF). It was indicated that five persons would attend the 1979 short course at KSU.

Discussions were held with members of MAF, Economic Planning Board and Korea Rural Economics Institute (KREI) concerning food and feed grain reserve systems in Korea. Also discussed with members of College of Agriculture, SNU, and Institute of Agriculture Development were mutual interest areas for establishing a joint program on training and research. The mutual interest areas discussed were staff training and exchange; cooperative research on cereal chemistry; grain processing (flour milling, feed manufacturing and baking); feed formulation and nutrition; and post-harvest technology including grain marketing.

Dr. Chung presented a special seminar on post-harvest technology at the annual meeting of Korean Agricultural Machinery Society held at the Institute of Agricultural Engineering and Utilization, MAF, Suweon.

Activities of staff members who received training in grain sciences at Kansas State University under the USAID loan program were discussed with the Director of Crop Improvement Research Center, MAF. Discussions were also held with Korean Institute of Science and Technology representatives to discuss the progress of a bulk grain storage and drying project which Dr. Chung had provided technical assistance at an earlier stage of planning. A few suggestions and approaches on conceptual designs of rice storage and processing centers which would be established at various locations in Korea were discussed. It should be mentioned that the plans for establishing various rice storage and processing centers are being reviewed by MAF.

Reporting and Distribution Trip reports were filed by Drs. Chung and Behnke and forwarded to DSB/AGR, Washington, D. C.

ASIA - Korea

Nature of Activity As continued technical assistance to the Government of Korea from the original Seminar held in March of 1978, Dr. Richard Phillips received an invitation from the Ministry of Agriculture and Fisheries (MAF) to travel to Korea. He was requested, through USAID/Seoul, to review and analyze the MAF plans for improving food grain marketing systems, price policies and storage facilities. The travel commenced on June 21 and terminated on July 11, 1979.

Objectives MAF is currently implementing a plan to improve the food grain marketing system, price policy, and storage facilities, which are major concerns of the Republic of Korea Government. MAF desired Dr. Phillips' assistance to review and analyze its current plan to determine its validity and effectiveness, and to make necessary recommendations. As Dr. Phillips was stationed in Korea for several years, he was fully conversant with the Korean situation in this particular field.

Reporting and Distribution Dr. Phillips' recommendations were left with representatives of the Ministry of Agriculture and Fisheries.

LATIN AMERICA - Haiti

Nature of Activity As followup to a technical assistance request in August 1978 to set up a training program in Haiti, KSU team members traveled to Haiti February 1 through 26, 1979 to conduct the Grain Storage Preservation and Management short course. Members included Dr. John Pedersen, entomologist; Frank Bolduc, storage specialist; Ray Cudney, consultant in grain drying; and Mark Meyer, SUKUP representative.

Objectives The objectives of this assignment were to prepare for and train DARNDR (Département de l' Agriculture des Ressources Naturelles et du Développement Rural) personnel in the fundamentals of grain storage, handling, drying, preservation, equipment operation, and maintenance. This would include theoretical and fundamental instruction in the first week and on-site training for the following weeks. This course was translated into French simultaneously in the manuals produced by KSU's team, in the classroom, and during the on-site training.

Summary of Activities The first week of training (theoretical and fundamental instruction in grain storage) went quite well with few problems. Due to a misunderstanding, all 44 participants were taken through the practical training during the next 2 weeks instead of the original 13 scheduled to receive the training. These were split into three groups as follows:

- a quality control group
- a fumigation group
- a machine operation and maintenance group.

Bolduc worked with the quality control group; Cudney and Meyer worked with the machine operations and maintenance group and Pedersen/Audant worked with the fumigation group. A practical training course involving 44 persons proved to be too large because individual interests were too diverse to be accommodated in a "workshop" atmosphere.

With the results of the two exams plus observations, the team discovered that Haiti has some potential top managers that definitely should continue to study in the grain storage field. Their goal should be to become managers for the proposed strategic grain reserve centers presently under construction.

Power surges are a definite problem in the Port-au-Prince area. There is an immediate need at the Cul-de-Sac site, not only for a transformer, but also for a voltage regulator so that motors have a good steady flow of electricity.

It should be emphasized to the Haitian Agriculture Service that they should have top managers stationed at each storage location because of the problems that can arise with a dryeration system under tropical conditions. Also, when equipment fails to function, it should be repaired immediately.

Report and Distribution Draft copies of the observations and recommendations of the short course training were sent to AID/DSB/AGR, Washington, D.C.

C. Potential Areas for Technical Assistance

1. AFRICA

a. Chad - A training program proposal was presented in draft form to AID/Chad. The Government of Chad through ONC (Office National des Cereales) would like KSU to take the role of training warehouse managers for their warehouses in all aspects and phases. The training, scheduled for June 1979, has been temporarily delayed.

b. Ivory Coast - There is expected to be continued assistance to Ivory Coast through the African Development Bank with a possible pilot study of Chad due to its apparent considerable need for storage improvement.

c. Ethiopia - A possible intensive short course for the training of Agricultural Marketing Corporation (AMC) personnel could be scheduled for October 1979 in Ethiopia. This would include training in the fundamentals of grain preservation and storage management (including handling, drying, grading, and preservation).

d. Mali - The African Development Bank sent a technician for a week's workshop with a KSU team to develop an instrument for evaluating Grain Storage and Marketing assessment of Sahelian countries. Mali was suggested as being the first country for initial study. KSU is expected to be involved in this study.

e. Niger - It is anticipated that KSU will provide a team consisting of an Agricultural Extension Advisor/Agricultural Economist to assist in assessing the progress and evolution of the cooperative movement in Niger under the Agricultural Sector Analysis review. The technical assistance will possibly be scheduled in October/November 1979.

2. ASIA

a. Korea - The Economic Planning Board of the Government of Korea plans to send a delegation of 7 to 8 participants to receive instruction in the short course training program "Computer Analysis for Feasible AgriBusiness Development" on the KSU campus. The training is scheduled to begin in late September/early October 1979.

b. Philippines - Backup support for Mr. Norman Teter, Agricultural Engineer, supplied to SEARCA (Southeast Asian Regional Center for Graduate Study and Research in Agriculture) is expected to commence in mid-November 1979. This request is for assistance in a training program and will be supplied under Contract AID/ta-C-1162.

3. LATIN AMERICA

a. Ecuador - As follow up to previous training assessment needs, KSU is expected to send a four-man team to conduct intensive training by providing a Grain Storage Management Training short course. The training is scheduled to commence in mid-October 1979.

b. Honduras - There is a possibility for future training in Honduras brought about by technical assistance work in January 1979 and a visit by representatives of IHMA (Instituto Hondureño de Mercadeo Agrícola) in August 1979.

c. Costa Rica - As a follow up to previous training assessment needs, KSU has been requested by the University of Costa Rica, through USAID/San Jose, to conduct a Grain Storage Management Short Course for the training of Consejo Nacional de Produccion personnel. The training would be in the fundamentals of storage management, grain preservation, equipment operation and maintenance and is to commence in August 1979.

D. Long-term Technical Assistance in Philippines

Mr. Norman Teter, Agricultural Engineer, continues to serve as a team member of the multi-national post-harvest technical group. He is headquartered at the South-east Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA), University of Philippines, Los Banos. The team works throughout the South-east Asian area identifying post-harvest technology problems. Mr. Teter is serving in the Philippines under Contract AID/ta-C-1162.

E. Other U. S. and Foreign Technical Assistance Programs

1. Ibadan, Nigeria

Dr. John R. Pedersen and Dr. Robert B. Mills traveled to Ibadan September 8 through 20, 1978 to attend the 2nd International Working Conference on Stored Product Insects at the University of Ibadan. Dr. Mills presented a paper on "Potential and Limitations of the Use of Low Temperatures for the Prevention of Insect Damage in Stored Grain," which was part of a Panel on Radiation and Other Nonchemical Means of Insect Control.

2. Ouagadougou, Upper Volta

A paper entitled, "Developing an Appropriate Grain Storage System," was presented by Dr. Dale G. Anderson to the West African Community Workshop/ Training Course on Improved Grain Storage Methods participants. The Workshop/ Training Course was sponsored by the West African Economic Community (CEAO) and German Foundation for International Development and was held November 20 through 25, 1978. Frank Bolduc, storage specialist, accompanied Dr. Anderson.

Dr. Anderson's paper was reproduced as a Special Report, and was also translated into French, of the Grain Storage, Processing and Marketing series.

3. Bangkok, Thailand

Upon request of the Economic and Social Commission for Asia and the Pacific (ESCAP) team, Dr. Richard Phillips traveled to Bangkok March 24 through 30, 1979 to assist in a Jointly Organized Post-harvest Technology Expert Meeting which also included members of SEARCA (The Southeast Asia Cooperative Post-harvest Research and Development Programme). The purpose of the meetings was to review social and economic motivations for existing rice post-harvest practices; to review briefly the existing scientific knowledge in rice post-harvest technology; and to discuss probable ways and means to accelerate the development of rice post-harvest capability in the region.

4. Eschborn (Frankfurt), Germany

The Annual GASGA (Group for Assistance on Systems relating to Grain After-harvest) meeting was held in Eschborn June 10 through 13, 1979 and was the 13th annual meeting. Dr. Charles W. Deyoe and Dr. John R. Pedersen, acting as KSU representatives, attended the meetings.

II. INFORMATIONAL SERVICES

As a part of the technical assistance provided under Contract AID/ta-C-1162, project staff members reply to numerous requests for information on specific items. Some of the requests come directly through or from USAID Missions in host countries. Other requests come directly to staff members at Kansas State University, either as a result of assistance we have provided under USAID sponsorship or through personal professional contacts. In many cases, the requests for information can be answered by sending reports or other printed materials prepared under the contract.

A. POST-HARVEST DOCUMENTATION SERVICE

In its first year of operation, the Post-Harvest Documentation Service has information available on all phases of post-harvest storage, processing and marketing of cereal grains.

The purpose of the service is to provide information to improve existing grain storage and marketing systems in developing countries and to aid in the development of new marketing and storage systems.

The service provides subject searches of titles and abstracts as well as a monthly computer printout of all items acquired that month. Subject searches and document copies are available free when requested through an AID mission to researchers, missions and U. S. government agencies in developing countries and at minimal cost to other persons. The monthly printout is available by subscription.

The information service is built around the collection of citations in "Postharvest Food Losses in Developing Countries: A Bibliography" by Robert F. Morris (NAS, 1978) and Food and Feed Grain Institute reports. Journal articles, reports, government documents, monographs and other published and unpublished material related to the economic, engineering and preservation aspects of post-harvest grain technology are used to supplement that collection.

Descriptions of services available are as follows:

Monthly Acquisitions List--Monthly acquisitions lists are available by subscription. These lists will contain citations and abstracts of the new materials acquired each month, arranged by subject categories.

Automated Searches--Automated subject searches of the Post-Harvest Documentation Service materials can be made on any subject, author, geographical location, or for material in a specific language.

When the search is completed, the individual requesting the search will receive a print-out containing containing a list of relevant documents and a short summary (abstract) of each one.

Document Distribution Microfiche copies may be requested of any document in the PHDS collection. Photocopies, however, are available only for documents less than 100 pages long. Only one copy (microfiche or photocopy) will be supplied of each document.

Occasionally, a microfiche may contain more than one document. The microfiche copy cannot be read without a microfiche reader equipped to read 24x reduction.

B. TECHNICAL INFORMATION REQUESTS

Nigeria-International Institute of Tropical Agriculture (IITA) through VITA, Washington, D. C. requested assistance and information on the design of a rice/cowpea harvesting machine.

Niger - Fred Whittemore, Washington, requested technical information on cowpea weevil problem.

Senegal - USAID/Washington desk requested training requirements for bulk storage of grains.

Senegal - USAID/Washington desk requested information on grain storage facilities.

Korea - H. S. Lee requested information on feed manufacturing processes.

Philippines - Dr. Elvis Heinichs - International Rice Research Institute, requested stored grain insect literature and other technical information on storage problems.

Korea - Dr. Y. I. Mok, Associate Director, Research and Development Center, Ajon Institute of Technology requested information on rice milling procedures.

Colombia - Luis Moncada requested feed formulation information.

C. VISITORS UNDER USAID SPONSORSHIP AND OTHERS

1. AFRICA

a. Republic of South Africa (October 1978)

Two officials of the South African Wheat Marketing Board visited with Food and Feed Grain Institute Staff to obtain information about wheat marketing procedures and to discuss problems in procedures of marketing in South Africa and Lesotho.

b. Tanzania (October 20, 1978)

Edward Barongo, Junior Minister of Agriculture and Wilfred Ngirwa, Marketing Economist with the Marketing Development Bureau visited the Grain Science Department and Food and Feed Grain Institute staff to discuss storage, processing and marketing problems.

- c. Ghana (October 1978)
Three individuals visited with Food and Feed Grain Institute staff to discuss and review the post-harvest technical program.
- d. Ivory Coast (March 25-29, 1979)
M. Nanthambwe, African Development Bank, Abidjan, visited with Food and Feed Grain Institute Staff to discuss and plan an upcoming request for technical assistance. A pre-feasibility study of prospects for Bank funding of post-harvest projects was developed.
- e. Nigeria (April 1979)
Dr. T. Ajibola Taylor, Director of Institute of Agricultural Research and Training, University of Ife, Ibadan, visited with Food and Feed Grain Institute Staff, toured USDA Grain Marketing Research Center and Grain Science Department. Discussions were on farm-level grain storage, AID project and current developmental work.
- f. SAHEL REGION (May 18-19, 1979)
An 11-man team from 6 Sahelian countries visited members of the Food and Feed Grain Institute and received information on grain storage pests and controls and chemical application.

2. ASIA

- a. Korea (September 1978)
Dr. Inku Hahn, Seoul National University visited with members of the Food and Feed Grain Institute and discussed the in-country Feed Manufacturing Technology Short Course being planned for Korea.
- b. Philippines (November 7-8, 1978)
Dr. Dante B. de Padua, SEARCA, discussed and requested technical assistance on free convection problems in grain storage systems and post-harvest molding of rough rice.
- c. Korea (October 1978)
Mr. H. J. Lee, President of Cheil Feed Mill Company, discussed and reviewed Food and Feed Grain Institute activities and programs with staff members.
- d. Indonesia (May 25, 1979)
A 5-man Wheat Milling Team visited the Grain Science Department and discussed grain storage and milling pest control with Institute members.
- e. Korea (June 1979)
Mr. J. H. Lee and Miss C. L. Kim of the Department of Agriculture and Fisheries discussed grain storage and processing projects with Institute staff members.

- f. Malaysia (June 25, 1979)
A 4-man Milling Team visited the Department of Grain Science and discussed grain and mill sanitation with members of the Food and Feed Grain Institute.

3. LATIN AMERICA

- a. Paraguay (September 1978)
Dr. Carlos Ocampos, General Secretary of Chamber of Senators, visited members of the Food and Feed Grain Institute staff in regard to the Paraguay/Kansas partnership.
- b. Costa Rica (February 6, 1979)
Mr. Harry Lightner visited staff members of the Food and Feed Grain Institute and discussed problems with small farmer groups such as grain production, harvesting, drying and storage.
- c. Paraguay (March 6, 1979)
Mr. Robert C. White, U. S. Ambassador to Paraguay visited the KSU campus and several members of the Food and Feed Grain Institute staff attended his lecture "Emerging Trends in Latin American Relations with a Focus on Paraguay." Several members also visited with him briefly.

4. NEAR EAST

- a. Sri Lanka (August 3, 1979)
Discussions on grain mill sanitation were held with a 5-man Government Wheat Mission and members of the staff of the Food and Feed Grain Institute.
- b. Syria (August 14-17, 1978)
Mr. Badawia Kawaan, specializing in agribusiness management and marketing, visited the Grain Marketing Research Center, and toured the American Institute of Baking as well as the Department of Grain Science and Industry. Discussions were held with Institute staff in Mr. Kawaan's specializations.
- c. Egypt (May 4, 1979)
A 5-man Flour Milling Team discussed pest control and sanitation in flour mills with emphasis on the role of packaging materials in product contamination with members of the Institute staff. They also toured the Department of Grain Science's facilities.

5. EUROPE

- a. Yugoslavia (August 4, 1978)
Mrs. Radmila Almasi, Novi Sad University, discussed problems in stored products with Food and Feed Grain Institute staff.
- b. Romania (May 23, 1979)
Discussions were held with a 5-man Wheat Milling Team including grain storage and mill sanitation problems in general by Food and Feed Grain Institute staff and Grain Science Department personnel.

- c. Portugal (April 28, 1979)
An 11-man Feed Mill Team (Mill Administrators) visited the Department of Grain Science and discussions were held with staff of the Food and Feed Grain Institute regarding the AID Project and grain storage problems.
- d. Italy (June 1979)
Miss Field of FAO met with Institute members to discuss training programs available through the Institute.
- e. Italy (June 1979)
A Feed Team consisting of 6 industry representatives visited the Department of Grain Science and Industry and toured the facilities and discussed training programs available under the Institute with staff members.

6. AUSTRALIA

- a. Mr. W. J. Murray of the Australian Wheat Board, visited the Department of Grain Science and members of the Food and Feed Grain Institute and discussed problems of storage and sanitation.
- b. Mr. Harry G. Bate, Engineer and Mr. J. Small, Grower Member from the Rice Marketing Board for the State of New South Wales discussed Food and Feed Grain Institute programs and toured the training facilities of the Grain Science Department with personnel of the department.
- c. Mr. M. G. Phillips (General Manager) and Mr. D. Price (Grower-member) of the State Wheat Board, Queensland, discussed Food and Feed Grain Institute programs and toured the facilities of the Grain Science Department and American Institute of Baking.

7. CANADA

Dr. R. N. Sinha, Scientist and Professor, University of Manitoba, met with Institute members and discussed grain storage problems, international training programs and assistance programs May 9, 1979.

8. UNITED STATES

Dr. Kennard H. Morganstern, Radiation Dynamics, Inc., visited with Staff members on an electron accelerator to disinfect grain for use in lesser developed countries (LDCs), August 4, 1978.

Dr. Thomas Sanders, New Hampshire, visited with Institute staff regarding agribusiness development in Latin American countries (Brazil, Chile, etc.).

D. REQUESTS FOR REPORTS

Report numbers refer to reports prepared under this contract. Full title, author, etc., are given in Section VI of this report.

AFRICA

Ivory Coast - M. Nathambwe (African Development Bank) Special Report No. 6.

Nigeria - International Institute of Tropical Agriculture Report Nos. 56, 68, 70, 71, 72; Research Report Nos. 11, 12, 13.

Zaire - Ngwala Ndambi Report Nos. 51, 54.

ASIA

Indonesia - Richard Bernsten (CRIA-IRRI) Report Nos. 29, 30, 39, 65; Research Report No. 10; Special Report Nos. 1, 5.

Philippines - Asela B. Ulanday Report Nos. 46, 63, 66; Special Report Nos. 1, 6.

- Norman Teter (SEARCA) Report Nos. 56, 68, 70, 71, 72, 73; Research Report Nos. 12, 13.

- Jessica Licuanan Special Report No. 6.

Burma - Myo Lwin (Ministry of Trade) Research Report No. 6.

CANADA

- Dr. Robert S. Forrest (IDRC) Report Nos. 56, 68, 70, 71, 72, 73; Research Report Nos. 11, 12, 13.

- Claire Gravel Research Report Nos. 4, 5, 6, 7, 8, 9, 10.

EUROPE

France - Yvon de Luca Special Report No. 4.

- Mr. F. R. Baker (Organization for Economic Cooperation and Development) Special Report No. 6.

- Monsieur Jean-Claude Miche Report Nos. 56, 68, 70, 71, 72, 73; Research Report Nos. 11, 12, 13.

- Francoise Darcourt (CEEMAT) Research Report No. 10.

Russia - Central Scientific Agricultural Library Report Nos. 52, 59.

Holland - Kniphorst Report No. 62.

Netherlands - Royal Tropical Institute Report Nos. 56, 68, 70, 71, 72, 73; Research Report Nos. 11, 12, 13.

- Domien Bruinsma (Agricultural University) Research Report No. 11; Special Report No. 8.

- G. G. M. Schulten (Department of Agricultural Research) Special Report No. 6.

England - Kenneth Piper Report Nos. 4, 6, 7, 8, 9, 10, 12, 17, 17a, 18, 23, 24, 25, 27, 29, 30, 32, 34, 36, 37, 38, 39, 40, 42, 43, 44, 46, 48, 49, 50, 51, 52, 53, 54, 55, 57, 58, 59, 60, 61, 62, 63; Research Report Nos. 4, 5, 6, 7, 8, 9, 10; Special Report No. 3.

- Blackwells Report Nos. 54, 61, 63.
- Peter Prevett (TPI) Report Nos. 56, 68, 70, 71, 72, 73; Research Report Nos. 11, 12, 13.
- Phillip Spensley (TPI) Report Nos. 56, 68, 70, 71, 72, 73; Research Report Nos. 11, 12, 13.
- Dartington House Report No. 71.
- David Calverly (TPI) Research Report Nos. 12, 13.
- Shirley Jarman Special Report No. 6.
- Spain - M. K. Gajapathy (University of Madras) Special Report No. 4.
- Switzerland - Dr Mikulas Micatek Research Report No. 8.
- Yugoslavia - Mrs. Radmila Almasi Research Report Nos. 8, 9.
- FAO/Rome - G. G. Corbett Report Nos. 56, 68, 70, 71, 72, 73; Research Report Nos. 11, 12, 13.
 - Axel Caro-Greiffenstein Report Nos. 56, 63, 65, 72.
 - E. J. Barker Special Report No. 6.

LATIN AMERICA

- Colombia - Alonso Morero Report Nos. 51, 60.
- Guyana - R. Bhim Research Report No. 6.
- Panama - A. Chon Research Report No. 6.
- Mexico - Pedro Barrito Research Report No. 10.
- Venezuela - CREA team Special Report No. 2 Volumes I and II.
- Guatemala - Jrafael Vargas Special Report No. 2 Volume II.

NEAR EAST

- Turkey - Macit Ulubelde Report Nos. 4, 7, 8, 9, 10, 11, 16, 17a, 17b, 18, 23, 29, 30, 34, 37, 42, 43, 48, 50, 51, 54, 55, 57, 59, 60, 63, 68, 71, 73; Research Report Nos. 4, 5, 6, 8, 10, 12; Special Report Nos. 1, 2 Volumes I and II, 3, 4, 6 (French).
- Sri Lanka - Ceylon Institute of Scientific and Industrial Research Research Report No. 10.
- India - T. P. Ojha Research Report No. 12; Special Report No. 1.
- Pakistan - Dr. Amin M. Hussain (Nuclear Institute of Agriculture and Biology) Research Report No. 10.

UNITED STATES

- Commercial - Development Planning and Research Associates Jean Mithen Report Nos. 6, 7, 27, 36, 42, 49, 52, 54, 57, 59.
 - Agricultural Research Service Report No. 1.
 - Academic Press Report No. 63.
 - Donald S. Jack & Associates Report No. 73.
 - Bank of America Mary Ojala Special Report No. 5.

- GRC/ATA Mr. Scaf Brown Special Report No. 2 Volumes I and II.
- Development Planning and Research Associates Dr. Harry Pfost Report Nos. 56, 63, 68, 70, 71, 72, 73; Research Report Nos. 11, 12, 13.
- Government - Agency for International Development (AID) Smith Greig Report Nos. 56, 68, 70, 71, 72, 73; Research Report Nos. 11, 12, 13; Special Report Nos. 2 Volumes I and II, 6 (French), 8 (English & French).
 - AID Charles Antholt Sri Lanka Report No. 70.
 - AID Carl H. Penndorf Kenya Report No. 72.
 - AID F. J. Bell Indonesia Research Report No. 12.
 - AID Vicky Reeves LAC/DR/RD Special Report No. 2 Volume II.
 - United States Central Intelligence Agency Mrs. Katherine Duggan Special Report No. 6.
 - Rural Bank Wayne Ringlien Special Report 2 Volumes I and II.
 - Department of State Food For Peace Ms. V. L. Sam LaFoy Special Report No. 6.
 - United States Atomic Energy Commission Brookhaven National Laboratory Library Report No. 57.
 - National Academy of Sciences Dr. Robert F. Morris Report Nos. 56, 68, 70, 71, 72, 73; Research Report Nos. 11, 12, 13.
 - Department of State Jack Morgan Research Report No. 11.

- Individuals - Rose Molendyk (Colorado) Report Nos. 7, 30, 63.
 - L. Bruce Knudson (Utah) Special Report No. 4.
 - Bill Trotter (Arizona) Report No. 58.
 - Dr. Robert Davis (Georgia) Research Report No. 10.
 - Ken Steinke (Virginia) Research Report No. 12.
 - John Robson (Missouri) Research Report No. 13.
 - Sam Maurer (Missouri) Research Report No. 13.
 - Dr. Charles Fulhage (Missouri) Special Report No. 6.
 - Dr. Richard E. Wallace (Illinois) Special Report No. 4.
 - Betty Sayles (Kansas) Special Report No. 4.
 - Kenneth Baum (Virginia) Special Report No. 4.
 - Dr. T. Habtemariam Report No. 34.
 - Mr. William Briggs (Georgia) Report No. 70; Research Report Nos. 11, 13.
 - Yousef Assalimy (Kansas) Research Report No. 13.
 - V. G. Rao (Kansas) Research Report No. 13.
 - Pete Tangprasertchai (Kansas) Report No. 37.
 - Frank Bolduc (Kansas) Report Nos. 31, 37, 43, 62, 65; Research Report Nos. 8, 9, 12; Special Report No. 6.

Department of Agricultural Economics (KSU) - Report Nos. 8, 29, 33, 37, 39, 40, 42, 43, 44, 45, 46, 51, 54, 55, 56 (5 copies), 58 (2 copies), 59, 62 (2 copies), 63, 65 (2 copies), 66, 68 (4 copies), 70 (4 copies), 71 (4 copies), 72 (4 copies), 73 (5 copies); Research Report Nos. 8, 10, 11 (5 copies), 12 (4 copies), 13 (5 copies); Special Report Nos. 1, 2 Volume I (3 copies), Volume II (2 copies), 3, 4, 5 (2 copies), 6 (2 copies), 8.

Department of Agricultural Engineering (KSU) - Report Nos. 6, 56, 68, 70, 71, 72, 73; Research Report Nos. 11, 12, 13 (2 copies).

Department of Entomology (KSU) - Research Report No. 13.

Department of Grain Science & Industry (KSU) - Report Nos. 1, 3, 4, 6, 37, 42 (2 copies), 48, 49, 52, 54 (2 copies), 56 (5 copies), 68 (5 copies), 70 (5 copies), 71 (5 copies), 72 (5 copies), 73 (5 copies); Research Report Nos. 11 (7 copies), 12 (6 copies), 13 (6 copies); Special Report Nos. 1, 6 (2 copies English, 1 copy French).

Department of Agricultural Economics (KSU-Teaching) - Special Report No. 2 Volume I (16 copies), Volume II (17 copies).

Documents Department Farrell Library (KSU) - Report Nos. 56, 68, 71, 72, 73; Research Report Nos. 12, 13; Special Report No. 8 (English & French).

Post-harvest Documentation Service (KSU) - Report Nos. 2, 4, 5, 9, 12, 30, 34, 35, 40, 44, 47, 48, 49, 50, 51, 52, 53, 55, 56, 57, 58, 59, 60, 61, 62, 63, 65, 66, 68, 70, 71, 72, 73; Research Report Nos. 11, 12, 13; Special Report Nos. 2 Volume I, 3, 4, 6.

Universities - Cornell University Diana Callear Special Report No. 6.

- Mississippi State University Andrew Maxey Report Nos. 31, 37; Research Report No. 7.

- Michigan State University Report No. 51.

- University of Minnesota Report No. 55.

- University of Texas Rex Edwards Report Nos. 59, 63; Special Report Nos. 1, 3, 5, 6.

- University of California Mary Farrens Report Nos. 58, 61, 71; Special Report Nos. 3, 4, 5, 6.

- University of California U. Fox Report No. 62.

- Michigan State University Pauline Sondag Report Nos. 65, 68, 71, 72; Special Report No. 6.

- University of Minnesota Reynold Dahl Report No. 71.

- University of Nebraska Thomas Thompson Research Report No. 13.

- Purdue University (Indiana) George Foster Research Report No. 13.

- University of Missouri Donald Brooker Research Report No. 13.

- Michigan State University Dr. Erdener Kaynak Special Report No. 1.

- Michigan State University J. J. Lauer Special Report Nos. 4, 6 (English & French).

- University of Idaho Jim Jones Special Report No. 5.
- University of Missouri Tom Kennedy Special Report No. 5.
- University of California Virginia Fox Report Nos. 61, 66;
Special Report Nos. 3, 4, 5, 6.
- Texas A & M Ray Billingsley Special Report Nos. 2 Volumes
I and II, 6 (French).
- University of Arizona Roger Fox Special Report No. 4.
- Harvard (Massachusetts) Baker Library Special Report Nos. 5, 6.
- Pace University Library (New York) Special Report No. 4.
- Cornell University (New York) Special Report No. 6.
- University of Michigan Dr. Mary Ryan Special Report No. 6.
- University of Maryland Mr. John Wysong Special Report No. 6.

III. TRAINING PROGRAMS

Observations made by project staff members while on overseas assignments continue to indicate the need for increased technical training of various types. The technical training provided under this contract is considered to be one of the most significant contributions of the contract. Training provides a foundation on which the developing countries can rely in self-resolution of technical problems related to storage, processing and marketing.

A variety of types of training are possible under this contract and some training has been utilized as shown in previous technical assistance assignments. The on-campus AID Grain Storage and Marketing Short Course, held each year at Kansas State University, continues to be the main training effort under the contract.

Other on-campus training includes degree program training and special training programs for AID sponsored participants. In addition, project staff members have taken part in a special training program, Latin America Short Course, held for 4 weeks in June 1979 and continuing into July, for 28 participants.

Training provided in conjunction with Contract AID/ta-C-1162 is discussed in greater detail in the following paragraphs.

A. AID GRAIN STORAGE AND MARKETING SHORT COURSE - 1978

The eighth annual AID Grain Storage and Marketing Short Course was held June 10 through August 5, 1978.

One week's orientation in Washington, D. C. was provided by the USDA/AID International Training Office. Six weeks of intensive lecture, discussion, laboratory, workshop and field trip training was provided on the Kansas State University campus June 19 through August 5, 1978.

A 1-week field trip included the Kansas City area to observe grain storage facility manufacturing, river storage facilities and the Board of Trade marketing functions; and the Houston/Beaumont, Texas area to observe rice production, storage, handling and processing and export facilities.

On the basis of recommendations made in participant evaluations of the 1977 Short Course, an attempt was made to provide greater depth of instruction in the economic and technical aspects for participants interested in these specific areas. A core of subject material for all participants included the following subject areas: Structure of cereal grains; Grain Inspection; Standards and grading; Moisture and its measurement; Causes of losses; Microflora and chemical, physical and nutritive changes; Pest control; Methods, equipment and structures for drying, aerating and handling of stored grains; Principles of management and operation; Storage costs and alternatives; Bookkeeping and inventory control; Transportation and Government in marketing.

The technical group received expanded training in the areas of: Moisture measurement; Microflora; Insect identification; Biology and methods of detecting contamination; Rodent and bird biology; Pest control - inspection, house-keeping, physical and mechanical methods; Insecticides and fumigation practices; Grain drying and aeration; Storage structure design; and Grain grading and inspection practices.

The economic group received expanded training in the areas of: Facilitating marketing operations; Analysis of the marketing system; Organization of the grain business; Government involvement in grain marketing; Grain transportation planning; Master projection of grain data; and Feasibility analysis of grain projects.

This approach seemed to work quite well in that the total group was about equally split between the technical and economic groups based on participant preference.

The 1978 Short Course had the greatest attendance of any Grain Storage and Marketing Short Course to date. There were 41 participants from 18 countries including Botswana (1), Lesotho (1), Liberia (2), Senegal (9), Somalia (1), Swaziland (1); Indonesia (3), Korea (1), Taiwan (1); Colombia (1), Ecuador (4), El Salvador (3), Guyana (1), Haiti (1), Jamaica (1), Mexico (1), Panama (4); Tunisia (5).

"Participant Country Reports" continue to be an effective way of getting participants actively involved in discussing their individual country grain storage and marketing systems and problems. It is extremely important for the participants to be able to look at their own storage and marketing situations and evaluate them from the standpoint of strong and weak links in the total marketing chain. We have had some difficulty in providing "Participant Country Information Summary" manuals to participants before they depart their home countries for the Short Course. The manuals are provided to assist the participants in gathering pertinent data on their countries' storage and marketing systems. Unfortunately, we are not receiving notification of which missions are sending participants with enough lead time so that manuals can be sent. Participants without the benefit of the manual are at somewhat of a disadvantage in presenting their "country reports" and in certain other workshop activities.

"Grain Storage and Marketing Short Course Evaluation Questionnaires" are completed by each participant at the end of the 6 weeks' intensive training at Kansas State University. A verbal critique is also held with participants. A composite summary of responses to the written questionnaire is as follows:

1973
GRAIN STORAGE AND MARKETING
SHORT COURSE EVALUATION QUESTIONNAIRE
QUESTIONARIO PARA LA EVALUACION DEL CURSO INTENSIVO
SOBRE EL ALMACENAMIENTO Y EL MERCADO DE LOS GRANOS
QUESTIONNAIRE POUR L'EVALUATION DU COURS ACCELERE SUR
LE STOCKAGE ET LA COMMERCIALISATION DES GRAINS

To help us evaluate the Grain Storage and Marketing Short Course in which you have just participated, we ask that you complete this questionnaire honestly and objectively.

Para ayudarnos en la evaluación del curso intensivo sobre almacenamiento y mercadeo, que Ud. acaba de terminar; le pedimos que responda este cuestionario honesta y objetivamente.

Pour nous aider à évaluer le Cours accéléré sur le stockage et la Commercialisation des Grains, nous vous demandons de remplir ce questionnaire avec franchise et objectivité.

Please indicate if you were in the Economic Group I 13; or Technical Group II 16.

Por favor indicar si usted es del grupo Economico I el Grupo Tecnico II .

Veillez indiquer si vous étiez dans le groupe I (économique) ou le groupe II (technique) .

Short Course Content
Contenido del Curso Intensivo
Contenu du Cours accéléré

How was time devoted to course material Relacion del tiempo dedicado al curso Que pensez vous du temps consacré aux sujets traités	Too Much Demasiado <u>Trop</u>	Too Little Muy Poco <u>Trop Peu</u>	OK Correcto <u>Bien</u>
Structure of Cereal Grains I & II (3) Estructura de los cereales Structure du grain de céréales	<u>1</u>	<u>3</u>	<u>29</u>
Chemical, Nutritive and Physical Changes in Storage I & II (3) Cambios químicos, nutritivos y físicos con el almacenamiento Changements chimiques, nutritifs et physiques durant le stockage	<u>0</u>	<u>12</u>	<u>21</u>
Moisture Measurement I (1½) II (4½) Medida de la humedad Mesure de l'humidité	<u>0</u>	<u>9</u>	<u>24</u>
Microflora I (1½) II (4½) Microflora Microflore	<u>0</u>	<u>12</u>	<u>18</u>

	<u>Too Much Demasiado Trop</u>	<u>Too Little Muy Poco Trop Peu</u>	<u>OK Correcto Bien</u>
Mold-Moisture Relationships I & II (1½) Relaciones entre humedad y mohos Relation entre l'humidité et les moisissures	<u>0</u>	<u>7</u>	<u>26</u>
Grain Standards I & II (1½) Standards para granos Normes des grains	<u>2</u>	<u>10</u>	<u>21</u>
Grain Grading I (1½) II (7½) Clasificación de granos Classification des grains	<u>2</u>	<u>13</u>	<u>17</u>
Grain Handling Equipment I & II (1½) Equipos para la manipulación del grano Equipement pour la manutention du grain	<u>0</u>	<u>11</u>	<u>23</u>
Methods of Handling Grain I & II (3) Métodos del manipuleo de granos Méthodes de manutention du grain	<u>0</u>	<u>9</u>	<u>25</u>
Types of Storage Structures I & II (6) Tipos de estructuras para almacenamiento Types de structures de stockage	<u>0</u>	<u>11</u>	<u>22</u>
Aeration of Grain I (1½) II (4½) Ventilación de granos Ventilation du grain	<u>0</u>	<u>10</u>	<u>24</u>
Grain Drying I (1½) II (4½) Secamiento de granos Séchage du grain	<u>0</u>	<u>12</u>	<u>21</u>
Causes of Grain Losses I & II (1½) Causas de pérdidas en granos Causes des pertes de grains	<u>0</u>	<u>14</u>	<u>20</u>
Sanitation and Pest Control I & II (1½) Sanidad y contrarestar de los depredadores Mesures sanitaires et lutte contre les insectes nuisibles	<u>0</u>	<u>9</u>	<u>25</u>
Insect Identification and Biology II (7½) Identificación y biología de insectos Identification et Biologie des insectes	<u>0</u>	<u>12</u>	<u>19</u>

	<u>Too Much Demasiado Trop</u>	<u>Too Little Muy Poco Trop Peu</u>	<u>OK Correcto Bien</u>
Methods of detecting contamination in Grain II (1½) Detección de contaminantes de granos Méthodes pour détecter la contamination	<u>1</u>	<u>14</u>	<u>15</u>
Sanitation: Inspection & Housekeeping II (1½) Sanidad: Inspección y limpieza Hygiène: Inspection et nettoyage	<u>1</u>	<u>8</u>	<u>22</u>
Physical and Mechanical Methods of Pest Control II (1½) El Control de depredadores Méthodes physiques et mécaniques de Lutte contre les insectes nuisibles	<u>0</u>	<u>7</u>	<u>23</u>
Insecticides II (3) Insecticidas Insecticides	<u>0</u>	<u>8</u>	<u>23</u>
Fumigation II (9) Fumigación. Fumigation	<u>0</u>	<u>4</u>	<u>27</u>
Fumigation Safety II (1½) Medida de seguridad en fumigación Mesures de sécurité en fumigation	<u>0</u>	<u>5</u>	<u>27</u>
Rodent Control II (3) Control de roedores Lutte contre les rongeurs	<u>2</u>	<u>4</u>	<u>25</u>
Storage Methods and Procedures I & II (3) Métodos y procedimientos de almacenamiento Méthodes et procédures de stockage	<u>0</u>	<u>7</u>	<u>25</u>
Storage Costs and Alternatives I & II (3) Costos de almacenamiento y alternativas Frais de stockage et autres solutions	<u>1</u>	<u>13</u>	<u>19</u>
Principles of Management I & II (3) Principios de administración Principes de gestion	<u>0</u>	<u>10</u>	<u>20</u>

	<u>Too Much Demasiado Trop</u>	<u>Too Little Muy Poco Trop Peu</u>	<u>OK Correcto Bien</u>
Principles of Operation I & II (3) Principios de operación Principes d'opération	<u>0</u>	<u>10</u>	<u>20</u>
Organization of the Grain Business I (4½) Organización del negocio de granos Organisation du commerce des céréales	<u>0</u>	<u>10</u>	<u>19</u>
Bookkeeping, Accounting and Inventory Control I (3) II (1½) Tenencia de libros, contabilidad y control de inventario Tenue des livres, comptabilité et contrôle de l'inventaire	<u>2</u>	<u>17</u>	<u>8</u>
Transportation I (9) II (1½) Transportación Transport	<u>2</u>	<u>10</u>	<u>18</u>
Facilitating Market Operations I (3) Facilitando operaciones de mercadeo Faciliter la commercialisation	<u>1</u>	<u>9</u>	<u>16</u>
Analysis of Marketing Systems I (3) Análisis del sistema de mercadeo Analyse des systèmes de commercialisation	<u>0</u>	<u>12</u>	<u>13</u>
Data Preparation I (3) Preparación de los datos Préparation des données	<u>0</u>	<u>13</u>	<u>12</u>
Feasibility analysis of grain projects I (12) Análisis de factibilidad de proyectos para granos Analyse de factibilité de projets de céréales	<u>0</u>	<u>14</u>	<u>11</u>
Master projections of grain data I (9) Proyecciones maestras de datos de granos Modèle de prévisions pour les données portant sur les grains	<u>1</u>	<u>10</u>	<u>11</u>
Sizing Facilities and Equipment I & II (3) Estimación del tamaño de Elevadores (silos y maquinaria Dimensions des installations et équipement	<u>0</u>	<u>17</u>	<u>10</u>

Are there other subjects that should have been included in the Short Course? Indicate subject and time.

¿Hay otras materias que se debieran haber incluido en el curso intensivo? Indique la materia y el tiempo debido.

Y a-t-il d'autres sujets qui auraient dû être traités dans le cours accéléré? Indiquer le sujet et le temps nécessaire.

PARTICIPANT COUNTRY REPORTS
INFORMES DE PARTICIPANTES SOBRE SUS PAISES
RAPPORTS SUR LES PAYS DES PARTICIPANTS

1. How would you rate the work sessions and presentations made by participants?
¿Como clasificaria Ud. el trabajo y las presentaciones hechas por los participantes?
Comment évaluez-vous les réunions de travail et les rapports faits par les participants?

<u>Valuable</u> <u>Valiosas</u> <u>De valeur</u>	<u>OK</u> <u>Acceptable</u> <u>Passable</u>	<u>No value</u> <u>Sin valor</u> <u>Sans valeur</u>
<u>13</u>	<u>15</u>	<u>14</u>

2. Was the amount of time for preparation of the reports sufficient?
¿El tiempo para preparar los reportes era largo suficiente?
Le temps prévu pour la préparation des rapports était-il suffisant
Yes (Si) (Oui) 31 No (No) (Non) 2

3. How much time should be allowed for presentation of each country report?
¿Cuanto tiempo le debieramos permitir para las presentaciones?
Combien de temps devrait être consacré à la présentation de chaque rapport?
1 Hour (Hora) (Heure) 19 ; 2 Hours (Horas) (Heures) 3 ; 3 Hours (Horas) (Heures) 2 ; More (Más) (Plus) 2 ; ½ Hour 1 .

INSTRUCTION
ENSEÑANZA
ENSEIGNEMENT

	Good	Average	Poor
Please rate the following:	Bueno	Regular	Malo
Por favor califique lo siguiente:	<u>Bien</u>	<u>Moyen</u>	<u>Mauvais</u>
Veuillez évaluer les points suivants:	<u>Bien</u>	<u>Moyen</u>	<u>Mauvais</u>
1. Quality of Instruction Calidad de la enseñanza Qualité de l'enseignement	<u>23</u>	<u>10</u>	<u>2</u>

	<u>Good</u> Bueno Bien	<u>Average</u> Regular Moyen	<u>Poor</u> Malo Mauvais
2. Methods of Instruction Métodos de enseñanza Méthodes d'enseignement	<u>20</u>	<u>12</u>	<u>2</u>
3. Answers to Questions Respuestas a las preguntas Réponses aux questions	<u>16</u>	<u>15</u>	<u>3</u>
4. Use of Visual Aids Uso de ayuda visual Utilisation de méthodes visuelles	<u>25</u>	<u>7</u>	<u>2</u>
5. Use of Examples Uso de Ejemplos Utilisation d'exemples	<u>19</u>	<u>11</u>	<u>2</u>
6. Demonstrations Demonstraciones Démonstration	<u>18</u>	<u>13</u>	<u>1</u>
7. Lectures Clases Conférences	<u>16</u>	<u>15</u>	<u>1</u>
8. Laboratory Sessions Sesiones de laboratorio Heures de laboratoire	<u>15</u>	<u>12</u>	<u>3</u>

Field Trips
Giras
Déplacements

	<u>Valuable</u> Valioso De valeur	<u>OK</u> Acceptable Passable	<u>No value</u> Sin Valor Sans Valeur
1. How would you evaluate the stops made on field trips to Clay Center, Topeka and Kansas City? ¿Como evalua Ud. las paradas hechas en Clay Center, Topeka, y Kansas City? Evaluation des visites faites à Clay Center, Topeka, et Kansas City?	<u>9</u>	<u>21</u>	<u>3</u>

Clay Center Trip
Viaje a Clay Center
Clay Center

Hutchinson-Royal Company	<u>15</u>	<u>8</u>	<u>3</u>
Farmers Union Coop Assn.	<u>11</u>	<u>9</u>	<u>4</u>
Gilmore-Tatge Company	<u>12</u>	<u>7</u>	<u>6</u>

	<u>Valuable</u> <u>Valioso</u> <u>De valeur</u>	<u>OK</u> <u>Acceptable</u> <u>Passable</u>	<u>No Value</u> <u>Sin Valor</u> <u>Sans Valeur</u>
<u>Topeka Trip</u> <u>Viaje a Topeka</u> <u>Topeka</u>			
Kansas State Control Lab.	<u>14</u>	<u>12</u>	<u>4</u>
Kansas State Grain Inspection Office	<u>13</u>	<u>12</u>	<u>2</u>
FARMARCO Elevator	<u>15</u>	<u>9</u>	<u>3</u>
<u>Kansas City Trip</u> <u>Viaje A Kansas City</u> <u>Kansas City</u>			
Farmland Industries	<u>6</u>	<u>14</u>	<u>12</u>
Butler Manufacturing Company	<u>9</u>	<u>13</u>	<u>9</u>
FarMarCo River Terminal	<u>8</u>	<u>15</u>	<u>10</u>
Board of Trade	<u>9</u>	<u>15</u>	<u>5</u>
Consumers Marketing Service	<u>9</u>	<u>10</u>	<u>10</u>
2. <u>Local Field trips in Manhattan</u> <u>Viajes en Manhattan</u> <u>Visites à Manhattan</u>			
Farmers Co-Op Elevator	<u>12</u>	<u>17</u>	<u>4</u>
Manhattan Milling Company	<u>11</u>	<u>16</u>	<u>3</u>
U.S.D.A. Grain Marketing Research Center	<u>13</u>	<u>14</u>	<u>1</u>
Agronomy Farm (Fumigation) (Fumigación) (Fumigation)	<u>12</u>	<u>14</u>	<u>2</u>
3. <u>With respect to field trips, would</u> <u>you prefer:</u> <u>Con respecto a las excursiones usted</u> <u>prefiere:</u> <u>En ce qui concerne les visites,</u> <u>préférez-vous:</u>			
	<u>More</u> <u>Mas</u> <u>Plus</u>	<u>Some</u> <u>Igual</u> <u>Même nombre</u>	<u>Fewer</u> <u>Menos</u> <u>Moins</u>
Local trips (Manhattan) Viajes locales (Manhattan) Les visites sur place (Manhattan)	<u>5</u>	<u>21</u>	<u>7</u>
Long trips (Clay Center, Topeka) Viajes largos (Clay Center, Topeka) Les déplacements (Clay Center, Topeka)	<u>7</u>	<u>15</u>	<u>9</u>

DISCUSSION GROUPS
DISCUSION DE GRUPOS
GROUPE DE DISCUSSION

1. Do you feel scheduled sessions where participants can discuss specific grain storage and marketing problems would be valuable? Yes 23 No 3

¿Usted cree que reuniones fijas donde los participantes discutir temas específicos sobre el almacenamiento y mercadeo de granos seran de algun valor? Si No

Estimez-vous qu'il serait utile de prévoir des séances où les participants pourraient discuter des problèmes spécifiques de stockage et de commercialisation des céréales? Oui Non

2. If yes, how many hours should be scheduled? 2 9, 4 6, 6 4, 8 4, 10 4, more 2.

¿En caso de que Usted prefiera estas discusiones fijar, cuantas horas se le debieran dar? 2 , 4 , 6 , 8 , 10 , más .

Dans l'affirmative, combien d'heures devraient être prévues? 2 , 4 , 6 , 8 , 10 , Plus .

GENERAL

- | | | |
|-----------------------------------------------------------------------------|----------------------------------|------------|
| 1. Would you recommend this Short Course to others in your country? | Yes | No |
| ¿Recomendaria Ud. este curso intensivo a otros en su país? | Si | No |
| Recommanderiez-vous ce Cours Accéléré à d'autres personnes dans votre pays? | <u>Oui</u> | <u>Non</u> |
| | <u>29</u> | <u>5</u> |
| 2. Do you think the Short Course was: | Too long <u>8</u> | |
| Cree Ud. que el curso fue: | Demasiado largo <u> </u> | |
| Estimez-vous que le Cours Accéléré: | Trop long <u> </u> | |
| | Too short <u>15</u> | |
| | Demasiado corto <u> </u> | |
| | Trop court <u> </u> | |
| | Proper length <u>13</u> | |
| | Longitud apropiada <u> </u> | |
| | De la bonne longueur <u> </u> | |
| 3. Was the Short Course: | Difficult <u>0</u> | |
| Como fue el curso: | Difícil <u> </u> | |
| Le Cours Accéléré était-il: | Difficile <u> </u> | |
| | Easy <u>17</u> | |
| | Facil <u> </u> | |
| | Facile <u> </u> | |
| | Proper Level <u>17</u> | |
| | Nivel apropiado <u> </u> | |
| | Au Niveau approprié <u> </u> | |

How do you feel about the amount of time devoted to group social activities?
¿Qué opinión tiene usted sobre el tiempo destinado a la actividad social?
La durée des activités des groupes sociaux est-elle à votre avis?

Too Much 1
Mucho _____
Trop Longue _____

Too Little 13
Poco _____
Trop courte _____

Just right 17
Correcto _____
Adequate _____

Comment
Observaciones
Remarques: _____

How do you feel about the physical arrangements for this program such as:
¿Qué opina usted sobre los siguientes aspectos:
Que pensez-vous des services procurés pour ce programme, tels que:

Training facilities
Facilidades de Entrenamiento
Salles et Equipments

Inadequate 6
Inadecuado _____
Insuffisants _____

Adequate 18
Adecuado _____
Suffisants _____

Very Good 13
Bueno _____
Largement suffisants _____

Housing accommodations
Alojamiento
Logis

Inadequate 4
Inadecuado _____
Insuffisants _____

Adequate 21
Adecuado _____
Suffisants _____

Very Good 11
Bueno _____
Largement suffisants _____

Meals
Alimentación
Repas

Inadequate 9
Inadecuado
Insuffisants

Adequate 18
Adecuado
Suffisants

Very Good 9
Bueno
Largement suffisants

Transportation
Transporte
Moyens de transport

Inadequate 3
Inadecuado
Insuffisants

Adequate 21
Adecuado
Suffisants

Very Good 13
Bueno
Largement suffisants

Other
Otros
Autre: _____
 (identify)

Inadequate 5
Inadecuado
Insuffisants

Adequate 7
Adecuado
Suffisants

Very Good 1
Bueno
Largement suffisants

If any of your answers was "inadequate," please explain how this can be improved.
Si le parece inadecuado, aclare:
Dans le cas où vous aurez coché "insuffisant," veuillez indiquer vos suggestions
pour améliorer les déficiences:

ADDITIONAL REMARKS
COMENTARIOS ADICIONALES
REMARQUES SUPPLEMENTAIRES

ADDITIONAL REMARKS

In the remarks section of the questionnaire, participants were asked to indicate any additional comments they wanted to make, especially with respect to improving future Short Courses. Remarks were as follows:

There should be more social activities so that there is no homesickness.

The meals are not appropriate for Africans. Most of the meals are sweet and we are used to hot meals.

I would recommend this short course to others from my country if there are some changes considered. Consider the input in regards to material taught. The course was very easy. I would like to suggest Kansas State University should play a vital role in the standard of people that come for this short course. I feel that the instructors are good quality to improve the material taught, but due to the fact that they do not have the standards makes it very difficult to plan a good lecture. I feel personally that some social programs should have been held so that we could get to know the people we have lived with and eaten with. These are the kinds of social activities I am talking about.

For the next training, it is better if you give more laboratory sessions.

I hope the manual is separated in English, French, and Spanish and the maximum of participants should be 30.

Participants should come from throughout the world in equilibrium. Two to three participants from each country is preferable. No language but English makes relationship among the participants closer. Talking about recreation, we did not have time to know how the participants from various countries sing or dance or have attraction. It was a better time to do so after banquet in the last day.

The course should be aimed in the different fields related to the grain science as a whole first. After the first week the fields of study should be related to the needs of the country. The time allowed for country reports is not important - the information they give should be accurate. Night sessions should be established. I would not recommend this short course unless changes are made. The participants should be selected prior to the course, so the time of the lectures are used properly. The translation from English to Spanish was quite deficient. Mr. Manzano did satisfactory work and Mr. Salcedo did unsatisfactory work. If possible, there should be follow-up courses to keep us informed of new techniques. The participants should be related (if possible) to the grain industries or related fields, otherwise time is lost in answers that to us are basic. There should be more practices or work in the different fields like aeration, moisture measurements, drying practices, etc. Less time in Washington, more time in lectures.

This course was valuable to me and the people of my country.

Trips with definite objectives instead of touring long and short elevators. Unless better direction is given to the course, I will not recommend it to others in my country. We were dumped and left to fend and make our own, (social activities) but it was otherwise stated. The meals were adequate but given too early especially the evening meal. One great drawback in this course is the wide diversity in academic training of the participants. It is my opinion that the course objectives must be given serious rethinking. With such diversity at least two groups out of three are lost or bored. It is not the fault of the lecturers but of the selection committee. In fact, I would hate to be in the lecturers shoes. The perpetual question must be "Where must I aim my lectures." Practical sessions should be practical sessions instead of demonstration sessions. It is an acceptable fact that one learns by seeing, hearing, and doing. Practical sessions also include the so called "field trips" to numerous elevators. Lecturers should attend these field trips and demonstrate on site what we're preached in class. We saw elevators and coops and elevators and coops -- a museum. Why not invite one coop manager to speak to the class instead. I am sure this can be done. Assistance from lecturers and team leader, E. Gutierrez - Without these kinds of people we would have died from boredom and confusion. Every lecturer has taken personal time and effort to secure extra information and interviews for which I am appreciative and grateful. Unfortunately, this course has not offered me "on-site" challenge, in fact, I am enlightened and confused. Cut the country reports - they can be useless tourist guides and most information given is shared in off-classroom sessions. Use the country report time and have more time given to Drs. Pedersen, Chung, and Mrs. Burroughs. Instead of country reports have workshop sessions where common and unique problems can be discussed under the chairmanship of a lecturer. Interpreters - M. Pichot and T. Manzano are good. M. Pichot is outstanding - very outstanding interpreting technical language is assisted by some knowledge of the subject.

This course could be very useful to developing countries but more serious consideration needs to be given by the administration with respect to its organization, the field trips and the general welfare of the participants. Apart from general information which can be obtained from discussion, the country reports serve no useful purpose to the participants. The time could be better spent in more important work. Recommending this short course is subject to substantial re-structuring and better organization. In regard to the amount of time devoted to group social activities, this was one of the worst aspects of the course. No consideration seems to have been given to keeping the participants entertained or even meeting socially with the common people. The meal times were badly arranged in that the times between meals were much too short for good digestion. This is particularly so since transportation facilities does not allow for eating out.

The course can be much improved if levels of academics are taken into consideration. Maybe it would be of help to have participants on research work separately. I would desire the social activities side to be much improved.

We lost one whole day in Kansas City--didn't obtain anything positive from that trip.

Time in the Economic section appeared to be a little short, as a result, each subject matter had to be covered rather hurriedly. There is need for more continuity in arranging the lecture periods. Dealing with one subject completely and then proceeding to another may improve continuity. Country reports are useful if they could come at the beginning even if it means presenting a written report highlighting the country's pressing problems which the lecturers would attempt to resolve during the course. Concerning field trips - the idea of building up the marketing organization in the U.S. is useful, i.e., starting at a local elevator ending up with FarMarCo. However, repetition of visiting similar facilities is not very useful. Would like to take this opportunity to thank all of those that made this course successful and assure them that their efforts were well appreciated. Thank you.

We didn't come to the United States to visit buildings and to know conference rooms for that we have too many problems in our countries with respect to grains and we have similar conference rooms here, which we never visit, since time and problems do not allow us to do so.

In the same way as students in this university have to present a certain academic level, I think that it should also be demanded from the participants in this short course. It is not funny for us to come here and repeat introductory courses which we have learned in detail in our own universities.

It would be valuable to be able to participate in some research. I understand this would be difficult to coordinate, but it would be highly valuable.

The answered questions should be clear and should stay at the level demanded from the participants.

A list of topics with which the key participants ought to be familiar should be mailed to the interested countries with a pre-evaluation of the participant in the countries: principles of entomology, principles of economics, principles of administration, principles of hydrology, etc.

I could recommend the course in my country for storage people and fumigation so that they will be able to know the principles of these techniques, but this is nothing that we could not do without using examples of domestic problems.

It is recommended that the interpreters be technicians, i.e., that they know the subject matter.

It is very difficult to understand a technical course through one interpreter.

Too little time was allocated--especially when one has to differentiate between varieties within the same family (Insect Identification and Biology II).

I think that the educational background of the students should be known in order to teach at a higher level since most of what was taught corresponds to frequent works in our country.

Too much emphasis on things that we know and too little on others, such as more mycology, more time to drying with the table.

If the level is upgraded, yes, I insist that too many things are being repeated that we already know.

It is normal for us to invite friendship and to throw a little party at the end of the course. One cannot see the real friendship of the North American.

I think the course had too many things that we already know and therefore, I insist that the educational background of the participants must be known in order to divide it into groups.

Too much time was dedicated to things that we use daily and little time to things that we don't know. More practical and laboratory exercises.

With respect to the translation, I think that the place where they were seated was not the most adequate place since on several occasions they failed to translate some things. Also they should know the technical terms of the course.

A higher level is required and a deepening in one subject, capital and interest since they were too broad and vague (Principles of Management).

Each country should have no more than five participants; a problem should be assigned to each country in relation to what they think they need most and they should solve their problem with the help of the instructors. I consider this very important and necessary for Kansas State University.

If possible, teach this course at different levels such as one level of engineers, high school another level, technicians another, etc.

Congratulations Kansas State University -- especially Dr. Chung, Mr. Pedersen, Mr. Hugo and Mr. Borsdorf.

The topics should be treated with more calm and to rush through them, go into it more.

More time for the labs in order to practice what we learned in class. Social activities, not to leave in doubt problems such as the one with the press which was never clarified. More professionalism is required and we should be treated as such. Improve per diem.

The interpreter, Mr. Salcedo, translated only 15 percent of the meetings, he always was sleepy and worse in the afternoon classes -- he was yawning all the time, criticizing the instructors, etc. It is necessary to use interpreters that know the technical terms of marketing and grain storage.

Change classes of different professors -- it is very boring to listen to one teacher for one whole day.

Given the different backgrounds, the course was adequate. Nevertheless, it is necessary to improve the selection of the participants and classify them adequately in order to teach every person the knowledge he requires. Another practice would be to introduce the quantification of the students' progress and give a test at the end of the short course. Finally, this doesn't happen and, therefore, though the knowledge obtained is excellent, it gives the impression that the short course is too easy.

More social activities should be programmed with the producers, industrial, commercial sectors of the State of Kansas.

The planning of these trips should be improved in order to avoid loss of time, confusion, and useless trips (Long trips - Clay Center, Topeka).

The technical guide was efficient. There are possibilities for specific solutions to problems which were not taught during the trips and we are returning and not even the inflatable storage structures which could solve some of the problems have been mentioned.

The remarks of the technical guide with reference to the group are out of place.

The visits were not adequate.

The interpreters should be aware of the time it takes to translate. Mr. Salcedo was unsatisfactory. Mr. Mangano good.

The classes should be better organized and the participants should be more actively involved with homework and bibliography revision.

From my standpoint, the short course is very good but more time should be given to labs. Demonstrations since in a direct manner can be learned and retained.

I think this says that Mr. Salcedo was a bad interpreter and should not be brought back.

I suggest that the course be done in this way: (a) Select participants of the same level, (b) the administration should give the greatest support to the group leaders in terms of organization, (c) in terms of the field trips, the teachers should go along so that they can answer any further questions after the trip.

The one thing I would have to say is that there were too many visits to farms and elevators. I think that once you have visited one, it's very boring to keep doing the same thing over and over. There were times when we would have liked to be a little freer - that is not to be scheduled or accompanied by anyone. Thank you.

For the meals, the main course should have had much more protein in it.

I am very satisfied with the course and I thank very much the professors and directors of the University and also Mr. Gutierrez and the interpreters. Everything went very well. Thank you to University and to Manhattan, Kansas.

Too much time was spent on country reports. Too much time was lost in the field trips to see the same thing, and in the country reports. You could give more detailed information in the course be demanding certain prerequisite knowledge by the participants.

Thank you to all the professors who were so kind as to give us this information which will help us a lot in our work in our country and also with our problems of grain loss and conservation. Thanks to all of you and see you soon in Senegal and in my region which is St. Louis.

For the technical group, there was a lack of practical sessions with a task to do. The participants should also have been able to do some practical work applying theory themselves. Qualitatively the meals were inadequate for us because they served things that we do not eat. But we understand that you cannot meet all the wishes of each different country.

B. AID GRAIN STORAGE AND MARKETING SHORT COURSE - 1979

Dr. Robert E. Julian, project coordinator, and Ulysses Acasio, assistant instructor, traveled to Stuttgart, Arkansas and Baton Rouge, Louisiana to set up locations for observation training for the annual Grain Storage and Marketing Short Course.

Participants for the 1979 Grain Storage and Marketing Short Course arrived on campus June 14, 1979 after a 1-week orientation in Washington, D. C.

Participants will spend 7 weeks of intensive training on the KSU campus. The training for the 1979 Short Course will follow the same general format as the 1978 Short Course with a field trip to Kansas City, Arkansas, and Louisiana being taken during the fifth week. As a result of comments made by the 1978 participants, three staff members will travel with the group.

Mr. Robert Doan, Program Specialist, Foreign Economic Development Service, U.S.D.A. and Mr. Nathaniel Ferris, Office of International Training, AID, have worked closely with Kansas State University in notifying USAID missions worldwide of the Short Course and seeing that participants were "called forward" to attend the Short Course.

Participants for the 1979 Grain Storage and Marketing Short Course include 22 individuals from 8 different countries and are listed below:

AFRICA

Ethiopia - Tesfaye ADEM

Swaziland - Luke M. MASUKU
- Johannes F. MBULI



65

1978 AID GRAIN STORAGE AND MARKETING SHORT COURSE

FOOD AND FEED GRAIN INSTITUTE
KANSAS STATE UNIVERSITY
MANHATTAN, KANSAS 66506

June 19 - August 5, 1978

FRONT ROW (Left to Right): S. N'diaye (Senegal); M. Achour (Tunisia); A. Jeffy (Liberia); S. Taukobong (Botswana); O. Matthews (Panama); L. Kandji (Senegal); G. Carrillo (Ecuador); A. Mohamed (Somalia); H. Diop (Senegal); Soewarto (Indonesia); A. Sukabdi (Indonesia); F. Monroy (El Salvador).

SECOND ROW (Left to Right): S. Galdamez (El Salvador); B. Youssef (Tunisia); R. Bhim (Guyana); A. Gueye (Senegal); S. Hassen (Tunisia); R. Burroughs (KSU); E. Clarke (Jamaica); M. Rimpel (Haiti); M. Diop (Senegal); J. Gaviria (Colombia); J. Quiros (Panama); G. Sampedro (Ecuador); U. Acasio (KSU); J. R. Pedersen (KSU); S. Dlamini (Swaziland).

THIRD ROW (Left to Right): R. Julian (KSU); D.S. Chung (KSU); F. Deme (Senegal); A. Chin (Panama); S. Dia (Senegal); D. Juliao (Panama); B. Taoufik (Tunisia); R. Patten (Liberia); F. Molina (El Salvador); J. Lejaha (Lesotho); C. Niang (Senegal); L. Ramirez (Mexico); R. Punin (Ecuador); N. Lee (Korea); A. Bruno (French Interpreter).

FOURTH ROW (Left to Right): C. Hugo (KSU); D. Wetzel (KSU); P. Diop (Senegal); T. Manzano (Spanish Interpreter); D. Anderson (KSU); B. Abdelkader (Tunisia); O. Salcedo (Spanish Interpreter); J. Ravayo (Ecuador); R. Borsdorf (KSU); A. Pichot (French Interpreter); H. Pfost (KSU); E. Gutierrez (Technical Leader).

- Tanzania - Roman Thomas HAULE
- Abdu Ally Mavura MBAGA
- Ernest G. MOSHA
- Gabriel Edward MPUNGAH
- Kaswija MTEBE
- Louis Xsavel NGONYANI
- Solomon N. NNKO
- Upper Volta - Cisse ABOUBAKARY
- Abassiri Akorpini ADOLPHE
- Toure AMADOU
- Rouamba JEAN-BAPTISTE
- Ouedraogo SIMANDE

ASIA

- Korea - Haeng Ha KIM
- JI Leong KIM
- Young Kook KIM
- Taiwan - Kun-shan SU

LATIN AMERICA

- Costa Rica - Guillermo Herrera CASTRO

NEAR EAST-SOUTH ASIA

- Yemen - Ahmed Frhan AL-ATTAB
- Ahmed Abdulkader A. ZAID

Evaluation and summary of the 1979 Grain Storage and Marketing Short Course will be included in next year's annual report.

C. SHORT-TERM ON-CAMPUS TRAINING

Korea - Training was provided over a 5-week period (October 2 - November 6, 1978) for the following men:

- Y. C. Song (Economic Planning Board)
S. W. Hong (Korean Development Institute)
H. Y. Park (Economic Planning Board)
B. K. Lee (Korea Rural Economic Institute).

The training was on the use of computer programs for Analysis of Market Potentials and Economic Feasibility.

D. DEGREE PROGRAM TRAINING

Several students are in various stages of progress toward advanced degrees in post-harvest grain technology under AID and other international organizations' support. Participants are listed below with the area of study included:

1. Grain Science

Ulysses Acasio - Philippines
Frank Bolduc - Former Peace Corps, Dahomey (Benin)
V. G. Rao - India
Sam Maurer

2. Agricultural Economics

Cornelius Hugo - Venezuela
Zenida Toquero - Philippines

3. Agricultural Engineering

Luis Moncada - Colombia
Dong L. Chang - Korea
Kyung K. Park - Korea

E. OFF-CAMPUS TRAINING

1. Brazil - ITAL (Instituto de Tecnologia de Alimentos)

A training program held in Campinas, Brazil was taught by Dr. Richard Phillips and sponsored by the Consortium for Development of Technology, University of Rhode Island. The program began the first week in June 1978 and was completed July 14, 1978.

The 3-hour graduate credit course was on the application of computerized system for feasibility analysis and entitled "Agricultural Economics Problems." Students enrolled for the course included:

Yone Costa	Laura de Almeida
Wilson do Canto	Joao Marques
Vasco Moretti	Luis Vieira
Ana Heloisa Faga	

2. Haiti - DARNDR (Département de l'Agriculture des Ressources Naturelles et du Développement Rural)

The Grain Storage Preservation and Management Short Course was conducted in Port-au-Prince, Haiti February 1 through 26, 1979 by Dr. John Pedersen, entomologist; Frank Bolduc, storage specialist; Ray Cudney, consultant in grain drying; and Mark Meyer, SUKUP representative.

The first week of training was in theoretical and fundamental instruction in grain science. An original number of 13 were scheduled to participate in the remaining 2 weeks but due to a misunderstanding, 44 students were taken through the practical training. These were split into three groups as follows:

- a quality control group
- a fumigation group
- a machine operation and maintenance group.

IV. LABORATORY AND DEVELOPMENTAL SERVICES

This section of the annual report is devoted to describing activities under Contract AID/ta-C-1162 that are rather broad in scope and not specifically directed to any one USAID Mission or host country. It includes activities that may have application and utilization in many host countries by USAID Missions such as: (1) developmental services, (2) development of slide series, (3) preparation of Grain Storage and Marketing manuals, and (4) linkages with other U. S. and foreign technical assistance programs.

A. DEVELOPMENTAL SERVICES

1. Design of Natural Air Grain Drying Systems

KSUDRYER is a Fortran IV program which calculates grain conditions across a drying bed in a crossflow batch dryer. Grain moistures, temperatures and dry matter decompositions are calculated for the ambient weather conditions supplied. Optional features of the program include type of grain, type of fan, when grain is to be loaded in bin and what fan management procedures are to be followed. Output can include moisture and temperature profiles at any time as well as final reports on drying time, energy consumption and grain quality. Echo checks are made of all input data and equation constants used for calculation verification.

The program is only designed to provide a model for the natural air drying of corn (maize). Additional research data is needed before it can be extended to other grains. However, this program has been released because corn is a major food grain and it is probable that dryers designed for corn drying can be satisfactorily used for drying other grains with minor modification.

This program was developed by Samuel G. Maurer in cooperation with Dr. Harry B. Pfof. The program is available in Research Report No. 13 entitled, "Design of Natural Air Grain Drying Systems" of the Grain Storage, Processing and Marketing series dated September 1978.

2. Modification of the "Brook" Grain Dryer for Farm Use in Developing Countries

The work reported here is a continuous development of a natural convection grain dryer model that began with the Samoan cocoa dryer and has continuously maintained its design for small scale on-farm use in developing countries. Basic information developed in this study can be used to help farmers use better drying methods in humid areas where conditions at harvest time are not favorable for natural sun drying.

The specific objective of this study was to evaluate the drying performance of a modified dryer with its unmodified prototype by testing four main factors on the drying rate, the fuel efficiency, the dryer efficiency and the grain quality (moisture gradient). The four main factors were:

1. initial moisture contents of 20 percent and 25 percent (w.b.)
2. grain depths of 4 inches and 6 inches.
3. effects of turning the grain every 2 and 4 hours with no turning as a control
4. air intakes of one half and full size.

The major accomplishments achieved by the investigation were as follows:

- A) Among the four main factors studied, the effects of turning the grain and using a full air inlet were more pronounced than the effects of the initial moisture content and the grain depth on the drying rate, the fuel efficiency and the dryer efficiency.
- B) A considerable improvement of the drying performance of the modified dryer over the unmodified model with current drying procedures was observed:
 - the moisture gradient was virtually eliminated,
 - the drying performance was increased by more than 100 percent in terms of drying rate (capacity), fuel efficiency and dryer efficiency,
 - the mean airflow rate was improved by 24 percent (fm/bu),
 - safer drying temperatures could more easily be maintained.

Research Report No. 14, dated December 1978, and titled "Development of a Natural Convection Dryer for On-farm Use in Developing Countries" is authored by Frank Bolduc and Dr. Do Sup Chung.

3. A Bibliography on Post-harvest Losses of Grains

Dr. Fabian N. C. Osuji, Senior Lecturer in Zoology, University of Ibadan, Ibadan, Nigeria spent a 6-month sabbatical leave at Kansas State University in 1978. During this time, Dr. Osuji prepared a review and annotated bibliography on post-harvest losses in grain legumes.

This material is in the final editing stages and will be published as a Food and Feed Grain Institute Special Report.

4. Flight capability and factors involved in initiating grain infesting *Sitophilus* spp. weevil flights.

Work has been completed on basic studies of the flight capability and factors involved in initiating grain infesting *Sitophilus* spp. weevil flights. This background work will be used to direct further investigations of weevil flight to infest maize in the field. The major objective is to develop a method to reduce field infestation of maize which carries into grain storage.

5. Methods for determining equilibrium moisture content/maintenance of relative humidity under static conditions.

Work continues on studies of the following properties of several grains:

- Hygroscopic equilibrium isotherms (equilibrium moisture content/ equilibrium relative humidity)
- Specific heat
- Test weight
- Quality loss (modeling).

6. Milled Rice Losses Due to Insect Infestation

Work continues on the final stages of measurement of milled rice losses due to separate and combined infestations of Sitophilus zeamais and Tribolium castaneum. Four methods of loss measurement are being compared.

7. Susceptibility of Millet Varieties to Insect Infestation and Loss

Comparison of the susceptibility of various varieties of millet to insect and mold invasion studies continues. Bulk and head storage of several varieties of millet are also being compared to determine the loss potential in storage. This will be further investigated in field surveys and study.

8. Post-harvest Deterioration of Rough Rice

CO₂ evolution is being used to follow the deterioration of two types of rough rice during storage at four temperature and four moisture levels. Dry matter weight loss/temperature/moisture/time interrelationships are being developed for predictive indices of rice storage.

9. Analysis of Alternative Post-harvest Handling Systems for Rice

The problem of determining the magnitude and source of losses in the post-production sequence of operations is an important and complex issue. The interdependency of operations, both at the field and processing stages of the post-production systems, makes evaluation of discrete operations difficult and results often inconclusive in pinpointing the nature and characteristics of losses. The technology employed, the timing of each operation and the environmental conditions under which they are carried out all contribute to the quality and quantity of paddy farmers ultimately sell or retain for home consumption.

This study aims to: 1) determine the range of available technologies in rice harvesting, threshing, cleaning and drying in Central Luzon and Bicol regions, Philippines, 2) evaluate the relative technical and economic efficiencies of alternate rice post-production systems tested in the field trials and single out the most efficient one, 3) determine the conditions under which the alternate efficient technique becomes optimal, and attempt to relate this to the prevailing conditions in the area, and 4) examine the impact of the improved post-production technology (mechanized threshing and drying using the IRRI-designed axial-flow thresher and twin bed batch dryer) upon employment and income distribution within the institutional and social context of the area under study.

10. Feed Processing Plant Design and Analysis for Developing Countries

The study on optimum feed mill design in developing countries continues. The optimum plant size depends on energy consumption per tons of feed product and operating costs as well as initial investment cost in equipment and facilities.

Selection of optimum size equipment and arrangement of the best location of the unit system is being closely considered. Therefore, the objective of the study is to develop a computer model of optimum feed mill design by optimizing the equipment selection and arrangement of machinery and equipment for the developing countries.

11. Evaluation of Hygroscopic and Thermal Properties of Cereal Grain and Oilseeds

Work continues on the examination of physical and thermal properties of oilseeds that are useful in analyzing storage and drying processes. These studies are being conducted at various moisture contents and temperatures.

12. Rough Rice Drying (Computer Model)

Due to renewed interest in unheated air drying of cereal grains, work was started and progresses on this subject. Two factors seem to be contributing to this interest. One is the expense and complexity of high capacity heated air drying systems. The other is the farmers' desire for drying systems capable of accepting wet grain as rapidly as it can be harvested.

The effectiveness of unheated air drying is, of course, dependent upon the weather. It is the uncertainty of the weather that prompts us to set the limits of the operation for these systems.

A list of factors affecting the operation of unheated air drying systems should include: airflow rate, grain moisture content, grain depth and harvest date. The evaluation of these factors as well as the effect of year-to-year weather variations would require the operation of a large number of field or laboratory systems for several years. Such an approach seems prohibitive in time and funds required. Therefore, a computer simulation was suggested for a feasibility study over several years of weather data, harvest moisture contents and dryer designs. This simulation would give benefits by the control of input variables, and allow testing of many proposed designs and management methods.

The purpose of work is to make reasonable modifications of a drying simulation model to predict the drying results of rough rice by natural air, to investigate the drying characteristics of rough rice at various drying conditions, and to suggest the design parameters of natural air drying systems of rough rice.

13. Loss Assessment Techniques on Various Types of Cereal Grains

Work has been started on comparing the reliability of two primary loss assessment techniques when used on various types of cereal grains.

14. Volumetric Methods of Dry Weight Loss

The development of post-harvest loss evaluation system to determine grain losses in developing countries has been started.

B. SLIDE FILE

As each of the teams under Contract AID/ta-C-1162 work in the field, we continue to build our file of colored slides showing grain storage, processing and marketing situations. The slides have been used extensively in training sessions conducted at Kansas State University, both in the AID Grain Storage and Marketing Short Courses held in 1970, 1971, 1972, 1974, 1975 through 1978, and in discussing grain storage and marketing with visitors and students under the USAID sponsorship. Also, these slides are used in teaching off-campus training programs.

As the slide file continues to build, we plan to prepare series of slides with either taped or printed narratives on various aspects of storage and marketing that can be distributed to USAID Missions for use in self-training programs.

C. PREPARATION OF GRAIN STORAGE AND MARKETING MANUALS

Training Manuals

1. The Grain Storage and Handling Manual used in the KSU/AID Grain Storage and Marketing Short Course was revised and separate manuals prepared in English and French. Handouts were also revised and made available. No Spanish manual was printed this year as only one Spanish/English speaking participant attended the short course.

2. A manual entitled, "Feed Manufacturing Technology", was developed for the short course held on-campus in Korea in April 1979. The manual was also translated into Korean for simultaneous translation.

3. Revision of Volume 2, Special Report 2, "User's Guide to Computerized System for Feasible Agribusiness Development" has been started. The report will be used for special on-campus training at KSU by the staff members in the Agricultural Economics Department.

4. A Grain Accounting Manual is currently being developed by the Agricultural Economics Department.

5. The Haiti Short Course presented in Haiti in February 1979 required the development of another manual which was titled, "Grain Preservation and Storage Management." The manuals were also translated into French and simultaneous translation was given during the course.

6. Work has begun on the development of a short course manual for the Ecuador in-country short course scheduled to be held in October 1979.

7. "Rice Milling Technology" was a manual developed for Grain Storage and Marketing Short Course use in 1978-79. The manual will probably be reprinted as a Special Report in the Grain Storage, Processing and Marketing series.

8. A manual with grain standardization and grading systems for developing countries is currently being developed by staff of the Grain Science Department/ Food and Feed Grain Institute staff.

V. ADDITIONAL ACTIVITIES

As a means of keeping current in the latest developments related to grain storage and marketing, staff members attend and participate in professional conferences and seminars.

1. Basic Grain Inventory Accounting School. Des Moines, Iowa, July 1978

Cornelius Hugo, economics research assistant, attended this school to gain knowledge and information to be used in conducting the Annual Grain Storage and Marketing Short Course.

2. American Agricultural Economics Association Annual Meeting. Blacksburg, Virginia, August 1978

Dr. Dale G. Anderson, agricultural economist, attended meetings dealing with trade, development and other international agricultural issues.

3. Radiation Dynamics, Inc. Meeting. Rosslyn, Virginia, August 1978

Dr. Dale Anderson, agricultural economist, participated in discussions of "Economic Implications of Using Electron Beam Accelerators for Disinfestation of Bulk Grain" for use in LDCs. (AID/Washington request)

4. LDC Food Security: The International Response. Reston, Virginia, August 1978

Dr. Richard Phillips, grain marketing economist, and Dr. Do Sup Chung, agricultural engineer, attended a seminar sponsored by Agricultural Development Council. Dr. Phillips presented a paper to the Council with emphasis on (1) what the existing system offers LDCs in the area of food security, (2) what policy tools are available and effective, and (3) what are policy parameters and how researchers can include these parameters in their models. (financed by A/D/C)

5. Grain Drying and Storage Meeting. Ames, Iowa, August 1978

Dr. Harry Pfoest, grain processing and storage engineer; Rosemary Burroughs, mycologist; and Ulysses Acasio, assistant instructor, visited with Iowa State University specialists on equipment and methods used in their studies. A similar developmental services project will be initiated at KSU.

6. International Cereal and Bread Congress. Winnipeg, Canada, September 1978

Dr. Do Sup Chung, agricultural engineer, attended the 6th international meeting and presided as chairman at technical meetings on grain storage.

7. AID/University Conference. Washington, D.C., November 1978

Dr. Richard Phillips, marketing economist, met with personnel to discuss the KSU agribusiness economic projection model. (AID/Washington request)

8. American Society of Agricultural Engineers. Chicago, Illinois, December 1978

Dr. Do Sup Chung, agricultural engineer, attended the annual meeting and presented a technical paper on grain drying.

9. AID/University Conference. Washington, D.C., December 1978

Dr. Richard Phillips, marketing economist, met with project manager and other AID personnel and attended Food Grain Reserve Committee Meeting. (AID/Washington request)

10. Grain Drying and Storage Meeting. Ames, Iowa, January 1979

Ulysses Acasio, assistant instructor, transported samples of rough rice to continue work with Iowa State University specialists in grain drying and storage of rough rice. This is support of the Developmental Services work being done at KSU in the rough rice drying area.

11. Rough Rice Studies. Ames, Iowa, February 1979

Ulysses Acasio, assistant instructor, met with Iowa State University specialists to collaborate work on rough rice drying evaluations.

12. AID/University Conference. Washington, D.C., March 1979

Dr. Charles W. Deyoe, project director, and Dr. Robert E. Julian, project coordinator met with project manager and discussed contract related items.

13. AID/University Conference. Washington, D.C., March 1979

Dr. Lanny Bateman, agricultural economist/consultant, represented KSU in reviewing responses from Missions regarding Project Identification Documents on proposed post-harvest food loss reduction projects.

14. Rice Conference. Ames, Iowa, March 1979

Ulysses Acasio, assistant instructor, and V. G. Rao, research assistant, conferred with Jerry Kline of Iowa State University on rice deterioration studies and obtained data for comparative analysis.

15. Grain Drying Systems Seminar. Mason City, Iowa, March 1979

Dr. Do Sup Chung, agricultural engineer, and Mr. Carl Stevens, grain processing engineer, attended the Seminar sponsored by Sukup Manufacturing Company.

16. Entomological Society of America - Annual Meeting. Indianapolis, Indiana, March 1979

Mr. John R. Pedersen, project grain quality/preservation specialist, presented a paper on Insect Control Problems in Developing Countries.

17. Western Kansas Agriculture Tour. Kansas, April 1979

Dr. Robert E. Julian, project coordinator, conducted a group consisting of a visiting professor, one U.S. and two international research workers on tour showing on-farm storage, 3-I Agricultural Show and various small industrial storage fabrication projects.

18. Association of Operative Millers. Los Angeles, California, May 1979

Dr. John R. Pedersen, project grain quality/preservation specialist, attended AOM Food Protection Committee meetings as a committee member.

19. Short Course Tour. Arkansas and Louisiana, June 1979

Dr. Robert E. Julian, project coordinator, and Ulysses Acasio, research assistant, traveled to Stuttgart, Arkansas and Baton Rouge, Louisiana to set up observation training for annual Grain Storage and Marketing Short Course.

20. AID/University Conference. Washington, D.C., June 1979

Dr. Robert E. Julian, project coordinator, attended meeting with project manager and other AID personnel in regard to contract-related items.

21. American Society of Agricultural Engineers. Winnipeg, Canada, June 1979

Dr. Chang Joo Chung, visiting professor/consultant, attended National Convention and presented a paper on grain drying.

VI. CURRENT LIST OF PUBLICATIONS

A report is prepared for each overseas technical assistance assignment which Kansas State University completes under an AID contract. The following reports were completed under Contract AID/csd-1588; Food Grain Drying, Storage, Handling and Transportation Report series:

A. TECHNICAL ASSISTANCE REPORTS

- *No. 1 Rice Drying Technology and Equipment Which Might be Applicable to Tropical Developing Countries. June 1968.
- *No. 2 Brief Description for a Corn Handling Facility in Tropical Areas. June 1968.
- *No. 3 Structural Requirements of Grain Bins. July 1968.
- No. 4 Report on Food Grain Storage, Marketing Handling and Transportation in Jordan. July 1968
- *No. 4A Photographic Supplement, Food Grain Storage, Handling and Transportation in Jordan. July 1968.
- *No. 5 A Proposal to Equip Metal Silos in Jordan with Aeration and Temperature Monitoring Equipment. August 1968.
- No. 6 Review of Grain Storage, Handling, Processing and Distribution Problems and Proposals in the Republic of Korea. September 1968.
- No. 7 Assessment of Food Grain Storage Facilities, West Pakistan - 1968. October 1968.
- No. 8 Implementation of Grain Storage Operations, Marketing Services and Price Stabilization in Honduras. October 1968.
- No. 9 Annual Report - 1967-1968 (November 1968).
- *No. 10 Review of Grain Storage, Handling and Distribution - Morocco 1969. April 1969.
- *No. 11 Report on Grain Sanitation Workshop - July 7-12, 1969. Central Food Technological Research Institute, Mysore, India. July 1969.
- No. 12 Annual Report - 1968-1969.
- *No. 13 Observations and Recommendations Concerning the Corn Marketing System in Guatemala. August 1969.
- *No. 14 An Analysis of Grain Storage and Price Stabilization Problems in El Salvador. September 1969.

* Indicates supply depleted - available on microfiche only.

- *No. 15 Review of Elevator Project in Honduras. October 1969.
- *No. 16 A Review of Rice Drying and Storage Problems in Ecuador. January 1970.
- No. 17 Cereal and Dry Edible Bean Marketing and Warehousing in the States of Piauí and Paraíba, Brazil. February 1970.
- No. 17A Warehousing and Marketing Cereal and Beans in the State of Piauí, Brazil, February 1970.
- No. 17B Warehousing and Marketing Cereal and Beans in the State of Paraíba, Brazil, February 1970.
- No. 18 Annual Report - 1969-1970.
- *No. 20 Observations and Recommendations for Improving Grain Storage and Marketing in Columbia. December 1970.
- *No. 21 A Study and Plan for Regional Grain Stabilization in West Africa. December 1970.
- *No. 22 Observations and Recommendations for Improving Grain Storage and Marketing in Bolivia. May 1971.
- No. 23 Annual Report - 1970-1971.
- No. 24 Recommendations for FECOAGROH Grain Storage and Handling Facilities in Honduras. July 1971.
- No. 25 Observations and Recommendations for Construction of Feed Mills in Senegal, Mali and Mauritania. August 1971.
- No. 27 Observations and Review of Regional Grain Storage and Purchasing Facilities in Guatemala. September 1971.
- *No. 28 Improved Grain Marketing in Panama During the Decade Ahead. October 1971.
- No. 29 Rice Storage, Handling and Marketing Study for the Republic of Indonesia. February 1972.
- *No. 30 Tour of Some U.S. Grain Storage Facilities for Entente Fund Officials. May 1972
- No. 31 Progress Report on Development of a Simple Storage Unit and Method Applicable to Humid Areas. June 1972.
- No. 32 An Evaluation of INDECA's Role in the Guatemala Rural Development Program (Loan Paper Compliance and Organization Efforts). February 1972.
- No. 33 Supply and Demand Projections for Food Grains in Ethiopia, 1970-1980. December 1972.
- No. 34 Annual Report - 1971-1972.

- *No. 35 Review of Economics and Engineering Study - Rice Storage, Handling and Marketing. The Republic of Indonesia. March 1973
- No. 36 Needs and Opportunities for Improved Grain Marketing in Panama. Executive Digest. March 1973.
- No. 37 Research Report - Development of a Simple Grain Storage Unit and Method Applicable to Humid Areas. I. Laboratory Testing for Small Scale On-Farm Drying and Storage. March 1973
- No. 38 Recommendations for Technical and Managerial Assistance - Rice Modernization Project - Guyana. May 1973.
- No. 39 Priorities for Improving Grain Marketing in Indonesia. May 1973.
- No. 40 Report on the Storage of Imported Corn in Indonesia. May 1973.
- No. 41 Survey of the Quality of Imported Corn Stored in East Java, Indonesia-- (Supplement to Report No. 40, June 1973). July 9-21, 1973.
- No. 42 Study of Grain Storage and Marketing in Bolivia. September 1973.
- No. 43 Grain Marketing and Market System Development in Haiti. December 1973.
- No. 44 Evaluation of the Grain Management Program Simulation Model--Being Developed for Korea by Michigan State University-Contract AID/csd-2975. February 1974.
- No. 45 Implicit Exchange Rate Criterion Applied to Policies Regarding Foreign Investment in Korea. February 1974.

Due to a change in contract, the following reports were completed under Contract AID/ta-C-1162 (Formerly AID/csd-1588); Grain Storage, Processing and Marketing Report Series:

- No. 46 Recommendations for Improving Philippine Grain Marketing and Price Stabilization Programs. May 1974.
- *No. 47 Study of the Tunisian Grain Marketing System. August 1974.
- No. 48 Recommendations for Drying and Storage of Grain in Peru. December 1974.
- No. 50 Evaluation and Cost Estimates for Grain Unloading, Storage and Distribution Facilities in Egypt. May 1975.
- No. 51 Maize Marketing in Zaire. July 1975.
- No. 52 Farm Storage and Handling of Rice, Corn and Soybeans in the Guayas River Basin of Ecuador. July 1975.
- No. 53 Evaluation of the Current Position of Agricultural Development and Diversification Program as Pertaining to Soybeans. July 1975.
- No. 54 Recommendations for Grain Storage and Preservation in Senegal. November 1975.
- No. 55 Evaluation of Grain Storage and Handling Aspect of Proposed Agricultural Marketing Capital Assistance Program. April 1975.
- No. 56 Review of Existing Proposal for Rice and Corn Drying and Storage Facilities in Ecuador. March 1975.
- No. 57 Assessment of Grain Storage and Marketing Facilities in the Dominican Republic. March-April 1976.
- No. 58 An Assessment of Agricultural Marketing Needs of the Soybean and Grains Sector in Ecuador. April 1976.
- No. 59 Bangladesh Food Grain Storage and Stock Management Study. July 1976.
- No. 60 Annual Report - 1975-1976. (In Press)
- No. 61 Evaluation of the Market System and Potential for Agricultural Products in Paraguay. September 1976.
- No. 62 Evaluation of Proposed Marketing Interventions for Chad. October 1976.
- No. 63 Foodgrain and Oilseed Storage in Pakistan: An Assessment of the Sector's Problems and Plans. November 1976.
- No. 64 Annual Report - 1976-1977 (In Press)
- No. 65 Evaluation of Proposed "Rural Family Grain Storage" by CARE in Chad. February 1977.

(In Press) denotes publication in stages of being completed.

- No. 66 Evaluation and Suggested Initiatives for the Development of Local Marketing of Agricultural Commodities in Paraguay. May 1977.
- No. 67 Annual Report - 1977-1978 (In Press)
- No. 68 Agricultural Marketing, Transportation, and Storage in Central Tunisia. July 1978.
- No. 69 Korea Report (In Press)
- No. 70 Future Supply Potentials and Facility Requirements Government Sector of the Sri Lanka Rice Industry. January/September 1978.
- No. 71 Marketing, Transportation and Storage of Domestic and Imported Wheat in Bolivia. March 1978.
- No. 72 Smallholder Grain Storage in Kenya: Problems and Proposed Solutions. February 1978.
- No. 73 Grain Storage Problems and Needs in Lesotho and Botswana. June 1978.
- No. 74 Recommendations for Implementation of an In-Country Training Program for Grain Storage and Preservation in Senegal. June 1978.
- No. 75 Support Recommendations for Honduran Grain Marketing Policies and Programs. January 1979.
- No. 76 Haiti Report (In Press)
- No. 77 Current Storage Situation for Domestic Grains in Senegal. March 1979.
- No. 78 Recommended Support for Grain Policy Development and Implementation in Sri Lanka. March 1979.
- No. 79 Annual Report 1978-1979 (In Press).

B. SPECIAL REPORTS

- No. 1 Building Viable Food Chains in the Developing Countries. August 1973.
- No. 2 User's Guide to Computerized System for Feasible Agribusiness Development Volume One: Text and Charts. May 1975.
User's Guide to Computerized System for Feasible Agribusiness Development Volume Two: Computer Programs. May 1975.
- No. 3 Status of Grain Storage in Developing Countries. October 1974.
- *No. 4 Losses Which Occur During Harvesting and Storage of Grains: A Bibliography. July 1976.

- No. 5 LDC Wheat Imports in 1985 and the Impact of Development Assistance on LDC Wheat Imports. September 1977. Prepared by Dr. Patrick J. Gormely, Dr. Thomas E. Kennedy and Gurprit S. Chhatwal.
- *No. 6 Food Grain Reserves in Developing Countries. March 1978. Prepared by Dr. Richard Phillips and Dr. L. Orlo Sorenson.
- Les Réserves de Grains Alimentaires dans les Pays en Voie Développement. Mars 1978. Préparé par Dr. Richard Phillips et Dr. L. Orlo Sorenson.
- No. 7 Post-Harvest Losses in Grain Legumes: A Review and Annotated Bibliography. September 1978. Prepared by Fabian Osuji. (In Press)
- No. 8 Developing an Appropriate Grain Storage System. December 1978. Prepared by Dr. Dale G. Anderson.
- Developper un Systeme Convenable De Stockage du Grain. Decembre 1978. Par Dr. Dale G. Anderson.

C. RESEARCH REPORTS

- No. 1 Progress Report on Development of a Simple Storage Unit and Method Applicable to Humid Areas. June 1972. Prepared by Dr. Do Sup Chung. (Technical Assistance Report No. 31)
- No. 2 Research Report--Development of Simple Grain Storage Unit and Method Applicable to Humid Areas. I. Laboratory Testing for Small Scale On-farm Drying and Storage. March 1973. Prepared by Dr. Do Sup Chung and Louis F. Fleske. (Technical Assistance Report No. 37)
- No. 3 Development of Equipment to Measure Wetting of Stored Grain. August 1973. Prepared by Edgard M. Breton Caneva and Dr. Harry B. Pfost. (In Press)
- No. 4 Rice Drying Rates. September 1973. Prepared by Jairo F. Robaye and Dr. Harry B. Pfost.
- No. 5 Equilibrium Moisture Content of Beans. October 1973. Prepared by Melquiades Guevara Guio and Dr. Harry B. Pfost.
- No. 6 Moisture Adsorption of Bulk Stored Grain Under Tropical Conditions. December 1973. Prepared by Axel Caro Greiffenstein and Dr. Harry Pfost.
- No. 7 Regeneration Capacity of Silica Gel for Grain Drying. April 1974. Gangadhar Vemuganti Rao and Dr. Harry B. Pfost.
- No. 8 Measurement of Maize Weevil and Fungi Damage to Stored Corn. May 1975. Prepared by Miguel A. Mora and John R. Pedersen.
- No. 9 Damage to Stored Maize Infested with Sitophilus zeamais Motsch. May 1976. Prepared by Miguel A. Mora and John R. Pedersen.

- No. 10 High Temperature and High Humidity Grain Storage. July 1976. Prepared by Gabriel Rengifo and Dr. Harry B. Pfost.
- No. 11 Design and Operation of Community Grain Storages in Rwanda. December 1976. Prepared by Robert Burks and Dr. Harry B. Pfost.
- No. 12 Development of Grain Standards in Developing Countries. June 1978. Prepared by Ken Steinke and Dr. Harry B. Pfost.
- No. 13 Design of Natural Air Grain Drying Systems. September 1978. Prepared by Sam Mauer and Dr. Harry B. Pfost.
- No. 14 Development of a Natural Convection Dryer for On-farm Use in Developing Countries. December 1978. Prepared by Francis N. Bolduc and Dr. Do Sup Chung.

D. MANUALS

- No. 1 Participant Country Information Summary. May 1973. Prepared by Richard Phillips and John R. Pedersen.
- No. 2 Grain Storage and Marketing Short Course Outlines. June 1974. Prepared by KSU Staff.
 - Section "A" Fundamentals
 - Section "B" Inspection and Grading
 - Section "C" Handling Conditioning and Storage
 - Section "D" Sanitation
 - Section "E" Marketing, Operations and Management
- No. 3 Rice Mill Feasibility Manual. September 1974. Prepared by Richard Phillips and Cornelius Hugo.
 - Rice Mill Feasibility Worksheets. July 1976. Prepared by Cornelius Hugo.

SUMMARY OF ACTIVITIES
 July 1, 1978/June 30, 1979
 Contract AID/ta-C-1162

II.A DIRECT SUPPORT

Institute Staff/KSU personnel	978.5 man-days		
Consultants*	180.0 man-days		
Student Assistant**	<u>9.0 man-days</u>		
		Total	1,167.5 man-days

II.A.1 On-Campus Related Direct Support

Institute Staff/KSU personnel	534.5 man-days		
Consultants*	8.0 man-days		
Student Assistant**	<u>1.0 man-days</u>		
		Total	543.5 man-days

II.B ALL OTHER CONTRACT RELATED ACTIVITIES

Institute Staff/Other KSU Staff	1,422.4 man-days		<u>1,422.4 man-days</u>
Grand Total man-days of contract activities			<u><u>3,133.4 man-days</u></u>

<u>Institute Staff</u>	<u>Tenths Time</u>	<u>Man-days/year</u>
Acasio, Ulysses (on contract 9/78)	1.0 equals-----	218.13
Anderson, Dale	1.0 equals-----	238.00
Bolduc, Frank (on contract 1/79)	1.0 equals-----	119.00
Borsdorf, Roe	1.0 equals-----	238.00
Burroughs, Rosemary	1.0 equals-----	238.00
Chung, Chang Joo (on contract 4/79)	1.0 equals-----	79.30
Chung, Do Sup	.4 equals-----	95.20
Hugo, Cornelius	1.0 equals-----	238.00
Julian, Robert	1.0 equals-----	238.00
Mills, Robert (on contract 11/78)	.2 equals-----	27.72
Pedersen, John	.5 equals-----	119.00
Pfost, Harry (off contract 11/78)	.5 equals-----	29.73
Phillips, Richard	.4 equals-----	95.20
Reed, Carl (on contract 1/79)	1.0 equals-----	118.98
Teter, Norman <i>SEARCH</i>	1.0 equals-----	<u>238.00</u>
		<u>2,330.26</u>

<u>Consultants*</u>	<u>Total Man-days</u>	<u>Country/U.S.A.</u>
Dahl, Reynold	28	Tunisia
Briggs, William	38	Sri Lanka/Paraguay
Niernberger, Floyd	32	Afghanistan
Pfost, Harry	33	Honduras/Senegal
Cudney, Ray	24	Haiti
Anderson, Don	30	Sri Lanka
Bateman, Lanny	<u>3</u>	Washington, D. C.
	188	
<u>Other KSU Personnel</u>	<u>Total Man-days</u>	<u>Country/U.S.A.</u>
Deyoe, Charles W.	12	Ecuador/Costa Rica/U.S.A.
Graham, Steve**	10	Chad
Tsen, Cho C.	22	Sri Lanka
Stevens, Carl	138	USA
Kelley, Paul	<u>14</u>	Honduras
	196	

SUMMARY OF MAN-DAYS

Grand Total man-days of contract activities	3,133.40
Total man-days paid under contract (Food and Feed Grain Institute Staff only)	<u>-2,330.26</u>
	803.14
Less man-days supplied by Consultants and other KSU personnel	<u>-384.00</u>
Man-days Institute Staff worked over days paid under contract	<u><u>419.14</u></u>