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TRIP REPORT

Trinidad - Tobago

Date Submitted: 16 December 1974

NAME: A. H. Boyd

TITLE: University of Illinois - Consultant

DIV/UNIT: INTSOY (International Soybean Program)
University of Illinois, Urbana Illinois 61801

PERIOD OF REPORT: November 10-12, 1974

ITINERARY: See attachment A which includes time and details of itinerary.

PURPOSE:

1. To make follow - up visit to the Chaguaramas Agricultural Development Project concerning seed production, handling and storage.
2. To discuss INTSOY trials with plant breeders and report on progress.
3. To bring information and publications requested by Lawrence Cross and Sheryl Gonsalves.
4. To consult with members of the staff on specific problems they may have.

ORGANIZATIONS AND PERSONS CONTACTED:

Practically all the time was spent in Chaguaramas with the staff. See attachment B. A short visit was made to the Single Cell Protein Seminar at the University of the West Indies, Trinidad Campus, where brief contact was made with CARICOM, UN, and university personnel.

RESULTS AND ACCOMPLISHMENTS:

1. Discussed with Lawrence Cross some of alternatives in seed production schemes as it may be affected by transportation, location, and government policies in the islands.
2. Reviewed recently harvested INTSOY trials and preparation for new plantings with plant Dr. Seidl, Lothar Bednarz, Sheryl Gonsalves, and T. Indal Singh.

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Room 1656 B5

3. Gave one hour slide talk on seed processing with emphasis on particular weed problems in soybeans that have evolved in the Southeastern U.S. and seed characteristics associated with them.
4. Presented additional reprints and publications for use of the staff (See attachment C for list) and mailed address and catalogs of some U.S. equipment manufacturers.
5. Held discussion sessions with the staff on:
 - a. Seed storage and processing problems.
 - b. Seed handling in the new drying and storage facility.
 - c. Training possibilities in the U.S. for some of the staff.
 - d. Graduate program plans for Mrs. Gonsalves at the University of the West Indies (Trinidad Campus).
 - e. Possible directions of effort in plant breeding to affect improvements in seed production and seed quality.
6. Attended Single Cell Protein Seminar. See Remarks/Discussion.

FOLLOW-UP ACTION NEEDED

1. Training:
 - a. Mrs. Gastell should attend the Summer Seed Improvement Short Course at Mississippi State University beginning June 1975. After this twelve week course an 8-12 week period of practical work with a private company would be helpful if arrangements can be made.
 - b. Mr. Terrence Indal Singh should attend the Summer Seed Improvement Course in 1976.
 - c. Mrs. Gastell should begin training for an MS degree in seed technology at Mississippi State University in August 1976.
 - d. Mr. Cross and/or Dr. Seidl should attend the INTSOY Soybean Seminar or MSU Seedsmen's Short Course in 1975.
 - e. Mrs. Gonsalves should visit Herman Adams at the Central Experiment Station, Mon Repos, Guyana to familiarize herself with the soybean breeding program there in preparation for her proposed program of study.
 - f. It is expected that the government of West Germany will provide funds for the proposed training.
2. Administrative:
 - a. Catalogs and other pertinent information on enrollment at Mississippi State University will be furnished by MSU Office of International Programs.

- b. MSU Seed Technology Laboratory will furnish information on the Seedsmen's Short Course.
 - c. INTSOY should determine the availability of a private company for Mrs. Gastell's requested practical work.
 - d. INTSOY should furnish information on the proposed Soybean Symposium.
 - e. INTSOY should furnish Mrs. Gonsalves with copies of literature on soybean maturation not available to her.
3. Further Consulting Visits:
- a. Short visits as have been made to answer specific questions or give advice would be useful in the future whenever a seed technologist is passing through.
 - b. A longer period (1-2 weeks) could easily be utilized in discussion and preparation of proposed regulations and/or laws to govern movement in and among the CARICOM nations. Some concrete proposals should be prepared if the Chaguaramas station is to take the desired lead in the area. This consultant does not have enough detailed background information on the whole area to make such recommendations except in a general way as was done.

REMARKS/DISCUSSION

1. In discussion with Lawrence Cross concerning the possible utilization of the Chaguaramas Agricultural Development Project as a central research and seed production center, we asked if the islands would be receptive to the idea or if they would want a complete set up for themselves because of national prestige or other reasons. He was of the opinion after talking with many people who would be involved that most of them realized the expense involved and were ready to cooperate to prevent too much duplication of effort. He pointed out also that most of the islands were small and had too little adapted soybean land to enter into a multiplication program. We agreed that basic seeds should probably be produced at C.A.D.P. but the multiplication of planting seed for the farmer might better be done on the island where it is to be grown because of transportation and storage problems. Again, this decision should be made on an individual island basis. We currently do not have enough information on potential for each location to make recommendations at this time.
2. The recently harvested INTSOY Trials were discussed with Dr. Seidl, Lothar Bednarz, T. Indal Singh, and Mrs. Gonsalves.

Some comments were:

- a. All calculations not made but the best yields appeared to be Jupiter, Improved Pelican, Hardee, Davis, Hampton, Bossier.
- b. Hill could not be harvested because the seeds rotted.

- c. There are 500 plants of the Chaguaramas selection from Jupiter.
- d. The next INTSOY Trial is awaiting land preparation. Should be planted within 10 days.

All the seeds appeared to be 20% damaged or more. Many were almost 100% damaged. Seed quality on the rainy season harvest is expected to be low.

- 3. Much of the discussion with the staff was in the nature of answering specific questions on seed storage, packaging, equipment, etc. and will not be detailed in this report.
- 4. The discussion with Mr. Scheutz, Mr. Cross, Dr. Siedl, Mr. Graul, and Mrs. Gastell centered around training possibilities in the United States and resulted in the recommendations made in the previous section of this report. The rationale being that the 12 week program at Mississippi State University Seed Technology Laboratory would give an immediate boost to the level of training. Mrs. Gastell could then return and work most of a year gaining experience and working with Mr. Singh who would go to the same course in 1976. Mr. Singh would then return to Trinidad from the Summer Seed Improvement Short Course in time to take over duties from Mrs. Gastell who would begin MS degree training at MSU Seed Technology Laboratory in August 1976. The project directors were optimistic that such training could be financed by the project.

The Seedsman's Short Course at MSU Seed Technology and the INTSOY Soybean Symposium were recommended to the project directors and Dr. Seidl, the senior plant breeder, as of more usefulness to them.

- 5. It was recommended that Mrs. Gonsalves visit Guyana because this consultant observed several lines in Herman Adams' research plots that may be of use in her study. She wishes to embark on a study of maturation and planting date with determinate and indeterminate lines. She would like help in obtaining more literature on soybean maturation. Herman Adams was contacted and says that she will be welcome to visit Mon Repos at any time.
- 6. On the brief visit to the Single Cell Protein Seminar at the University of the West Indies some of the points that were emphasized in B summary were:
 - 1. Some researchers have shifted emphasis on their work from animal to human consumption of the SCP because of the high cost of production.
 - 2. The Japanese representative reported that production of SCP was not allowed in Japan because the people would not accept it as a food.
 - 3. Cuba is working with SCP from sugar cane molasses. They say it is expensive but they are proceeding with a large project because they have plenty.
 - 4. There are not enough adapted acres to produce the protein with soybeans at 1500#/acre.

5. Urea is a much cheaper source of protein for ruminants.
6. Poultry and pigs can take about 10% of their ration as SCP.

DISTRIBUTION

AID/Washington - 5 copies

Chaguaramas Agricultural Development Project - 5 copies

Ministry of Agriculture (attention Lawrence Cross) - 5 copies

The University of the West Indies - 5 copies (Attention: John Cropper)

Dr. Kuehl Hinson

Dr. A. H. Boyd

Dr. J. C. Delouche

University of Illinois - 15 copies

ATTACHMENT A

Itinerary

A.H. Boyd

10-12 November 1974

November 10	9:00 P.M.	Arrive Port of Spain, met by Lawrence Cross
November 11	A.M.	Picked up by Lawrence Cross to go to Chaguaramas Agricultural Development Project for discussions with Mr. Cross, Mr. Scheutz, Mr. Graul, Dr. Seidl, Mrs. Gastell on technical problems
	P.M.	Further discussions on training with the above group. Discussion on INTSOY Trials with Seidl, Bednarz, Singh, Gonsalves, and Cross. Inspected construction and equipment on storage facility.
November 12,	12:00 noon	Prepare and give slide talk on soybean processing and equipment. Discuss graduate program with Mrs. Gonsalves and Dr. Seidl.
	P.M.	Visit Single Coll Protein Seminar. Go to airport for trip to Guyana.
	6:30 P.M.	Leave Port of Spain

ATTACHMENT B

Staff Contacted at Chaguaramas

Mr. Hans Scheutz	Projects Director
Mr. Lawrence Cross	Counterpart Project Director
Dr. Seidl	Senior Plant Breeder
Mr. M. Graul	Farm Manager
Mrs. Gastell	
Mr. Lothar Bednarz	Plant Breeder Assistant
Mrs. Sheryl Gonsalves	Counterpart Plant Breeder
Mr. T. Indal Singh	Counterpart Plant Breeder in charge of research plots

ATTACHMENT C

Information furnished Chaguaramas.

1. La Ley Para la Produccion, Certificacion y Comercio de Semillas en Costa Rica
2. Effects of mechanical shelling on storability of peanuts (*Arachis hypogaea* L.) seed. - Baskin, C. C. and Delouche, J. C. - MAFES Journal No. 2194.
3. Differences in metabolic activity in peanut seed of different size classes - Baskin, C. C. and Delouche, J. C. - MAFES journal No. 2192.
4. Information sheet (mimeographed) moisture, height, and number of drops as related to soybean damage.
5. Systems for controlling relative humidity and temperature - Beck, J. M.
6. Seeds - development, structure, function - Potts, H. C.
7. A closer look at seeds - Potts, H. C.
8. Heated air drying of soybean seed - Matthes, R. K., Boyd, A. H., Welch, G. B.
9. Articles on seed drying - Welch, G. B.
10. Harvesting, source of many problems - Miller, Lee
11. Maintaining soybean quality - Delouche, J. C.
12. Electrical properties of seed associated with viability and vigor - Matthes, R. K. and Boyd, A. H.
13. Physical properties of seed related to seed viability - Matthes, R. K., Boyd, A. H., and Delouche, J. C.
14. Low cost temperature controlled rooms - Seed Technology Laboratory - MSU, Misc.
15. Seed processing and storage facilities for tropical areas - Welch, G. B. and Delouche, J. C.
16. Quality control in seed production - Grabe, D. F.

NOTE:

All information sheets and reprints listed above were supplied by the Seed Technology Laboratory, Department of Agronomy, Mississippi State University, Mississippi State, MS 39762.

LAT.

TRIP REPORT - BRASIL & CENTRAL AMERICA

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Date Submitted:

NAME: Les K. Ferrier TITLE: Assistant Professor Food Science DIV. INTSOY

PERIOD OF TRAVEL (inclusive dates): November 4 - December 8, 1973

ITINERARY: Champaign - Ribeirao Preto - Campinas-Porto Alegre - Brasilia - Recife - Brasilia - Cali - Bogota - Costa Rica - Guatemala City - Ithica - Champaign. See Attachment A (Travel under contract AID/CM/ta-C-73-19)

PURPOSE:

1. To attend the Meeting on Nutritional Aspects of Common Beans and Other Legume Seeds as Animal and Human Food, 6-10 November, 1973 and to present a paper at the meeting.
2. To discuss cooperative programs between Intsoy and Brazilian agencies, institutions and scientists for testing the use of whole soybean foods in Brazilian diets.
3. To visit organizations or scientists involved in soybean research in Brazil, Columbia, Costa Rica and Guatemala and to discuss subjects of mutual concern in soybean research and utilization.

ORGANIZATIONS AND PERSONS CONTACTED:

- A. Brasil - Scientists and/or officials in : the Institute for Food Technology (ITAL) in Campinas; the National Soybean Project (PNIS) in Porto Alegre; the superintendent of the national school lunch program in Brasilia, the Institute of Nutrition, Recife.
- B. Columbia - Scientists at the International Center for Tropical Foods (CIAT) and the Institute for Columbian Agriculture Palmira; scientists at the Institute for Technological Research in Bogota; personnel in USAID/Columbia.
- C. Costa Rica - Thomas Bentley, director of CARE, Costa Rica.
- D. Guatemala - Scientists at INCAP

See Attachment C for complete list of persons and organizations contacted.

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RESULTS/ACCOMPLISHMENTS

1. **Brasil - Possible formal or informal research or testing projects were discussed at each visitation site as follows:**
 - a. **ITAL in Campinas.** Verbal agreements were made to seek exchange visits between ITAL and Intsoy for purposes of training ITAL personnel in specific areas and for technology transfer to ITAL. ITAL would like a "consultant" to visit ITAL in order to carry out experiments and advise on preparation of several soybean flours with different functional properties. The funds are available for a stay of 2-3 months.
 - b. **Projct Nacional da Soja in Porto Alegre.** Dr. Jardim Preire, director of PNS, agreed to supply technical advice to a community soybean project in Northeast Brasil (Maranhao project). Dr. H. Minor agreed to supply small quantities of soybeans (corresponding to an Intsoy variety trial) grown in Brasil for use in Intsoy investigations on bean rehydration and cooking properties.
 - c. **Dr. Alceu de Castro Romeu,** superintendent in the Brazilian National School Lunch program agreed to test cooked whole soybeans and roasted soybeans for acceptability in the school lunch program. No mechanism exists at this time for preparation and use of drum dried flours. (However, ITAL is conducting research in this area.) INAN is very interested in financing this test. It is necessary for Intsoy to supply and fund technical assistance for this program. See Attachment D for a summary of this project.
 - d. **The Institute of Nutrition in the Univ. of Pernambuco** is willing to cooperate in a joint INTSOY/Inst. Nutrition project to test the nutritional quality and acceptability of U. of I. soybean foods in their centers where malnourished children are treated. Products to be tested are cooked whole soybeans (black), roasted soybeans halves and drum dried soybean mixtures. Intsoy will supply soybean food samples where the Institute of Nutrition does not have the capability. Intsoy will supply technical expertise and training. INAN is seriously interested in financing the "in Brasil" portion of this project.
 - e. **Maranhao project.** This project is expected to be a joint project involving Dr. Jose Dutra de Oliveira, Sister Therese Drummond and the Utilization section of Intsoy. The project will be community based but it is still in the discussion stage. No project outline was made.
2. **Columbia -** The discussions between members of CIAT, ICA and IIT and myself indicated mutual interests in soybean foods. There is a possibility that CIAT may cooperate in testing of soybean foods as part of a very large five year project involving many aspects of the food chain. However, no cooperative program was outlined.

3. Guatemala - Verbal agreements were made between INCAP scientists and myself for scientist to scientist contact and cooperation on matters involving food science, food technology and nutrition properties of soybean foods. Scientists at INCAP and Intsoy will seek formal agreements for cooperation in these areas.

FOLLOW UP ACTION REQUIRED:

Proposals for the projects mentioned in c and d above outlined in Attachment D will be cooperatively written and submitted to INAN and USAID or other appropriate Brazilian and USA agencies for funding.

Discussions will continue toward organizing and implementing a community based project for growth and utilization of soybeans in NE Brasil.

Further inquiry should be made into possible cooperation between Intsoy and CIAT, ICA and IIT.

INCAP and Intsoy will continue communications to formulate and fund cooperative research in utilization of soybeans of human food.

ADDITIONAL COMMENTS:

1. During this trip I received many adverse comments from scientists and others who normally ate beans as part of their daily diet concerning the eating quality of soybeans. The criticisms were mostly about the lack of desirable, typical bean taste and the difficulty of cooking soybeans to achieve the desired degree of softness. In addition, most of the people of South and Central America consume black or brown beans. I believe that a program should be initiated in the Dept. of Food Science and/or Home Economics to investigate the cooking and eating qualities of many varieties of soybeans. This program should lead to the development of a breeding program to develop varieties which are most suitable for eating and processing as whole beans.

2. There was great interest at each scientific institution which I visited in participating in short term (1-3 month) training programs at the U. of I. There was also great interest in cooperative MS and PhD programs in which 6-12 months of thesis research would be carried out in the students home country at an institution such as CIAT or ITAL. Such programs should be actively encouraged if possible.

3. While INAN personnel indicated moderate to very serious interest in financing the soybean utilization projects which were discussed with them, it should be remembered that their primary interests are industrial. Thus, they are mostly interested in a soybean "milk" and soybean "TVP" made from defatted soybean meal.

Unfortunately, I received many negative comments about the capability of this new organization. INAN probably needs more time to develop competence and expertise. To date, INAN does not appear to have lived up to the expectations of numerous personnel in Brasil.

This may mean that it may be necessary to seek other sources of funding the above projects.

4. If the cooperative programs mentioned in this report are to be carried out, an additional Food Scientist/Nutritionist or Home Economist/Nutritionist faculty member will be necessary.

ATTACHMENTS:

- A - Itinerary
- B - Program for the Meeting on Common Beans and Other Legume Seeds as
Animal and Human Food
- C - Organizations and Persons Contacted
- D - Summaries of Cooperative Projects Outlined

DISTRIBUTION:

AID/W - 5 copies (sent Attn: Mr. George Parman)
15 copies - Intsoy

Attachment A - Itinerary and Activities

Brasil

- 4 - 5 Nov. Traveled by plane and bus to Ribeirao Preto, Brasil via New York and Sao Paulo.
- 6 - 9 Nov. Attended a conference on legumes and nutrition at Ribeirao Preto. The program consisted of papers presented in the morning and a discussion groups in the afternoon. See attachment C for program and a summary of the discussion. Presented a paper titled "Weaning Foods Prepared from Whole Soybeans and Bananas". Discussed present research on beans and nutrition with scientists from several countries. Areas in which further research and development is needed and possible cooperative research programs were discussed. Dr. José Dutra de Oliveira and I discussed the possibility of a community based project in the state of Maranhão (N.E. Brasil). See attachment D for project summary.
- 9 - 10 Nov. Participated in disucssions on possible cooperative research between scientists at the meeting (and their organizations).
- 11 Nov. Traveled by bus to Campinas, Brasil.
- 12 - 13 Nov. Briefly discussed research at ITAL on use of whole soybeans for human food. This research is based on methods developed in the Dept. of Food Science, Univ. of Illinois, and concerns primarily the preparation of soybean flours by drum drying and the use of the powders to increase the protein quantity and quality in bakery products and weaning foods. Discussed the possibility of training ITAL scientists at the U. of I. Possibilities discussed included one month to one semester training programs and joint U. of I./ITAL M.S. and Ph.D. programs.
- 13 Nov. Traveled to São Paulo by bus.
- 14 Nov. Flew to Porto Alegre, Brasil.
- 15 Nov. National Holiday
- 16 Nov. Visited members of PNS. Discussed progress in PNS programs and visited experimental soybean plots. Discussed possible cooperation and assistance from PNS to Mananhão project and cooperation between Dr. H. Minor and myself in tests of the effect of variety on rehydration and cooking characteristics of soybean.
- 17 Nov. Flew to Brasilia.

- 19 - 20 Nov. Discussed possible methods for increasing use of soybeans as human food with Mrs. M. Frazao and Mr. R. Lockwood, USAID/Brasil. Discussed a cooperative project to test soybean foods in the Brazilian school lunch program with Dr. Alceu de Castro Romeu, Superintendent, CNAE/MEC. Discussed the possibility of cooperative projects with Luiz Cesar Auvray Guedes, Director, Dept. of Science and Technology, INAN and the possibility of financial support of such projects by INAN. (See 26 Nov.)
- 21 Nov. Flew to Recife.
- 22 - 23 Nov. Visited the Institute of Nutrition, University of Pernambuco and outlined a possible small program for nutritional testing of some soybean foods and development of soybean foods suitable for people in N.E. Brasil. Discussed the possibility of short term training at U. of I. and joint U. of I./Inst. of Nutrition M.S. and or Ph.D. programs.
- 23 Nov. Flew to Brasilia.
- 26 Nov. Formulated a general plan for cooperative soybean testing program between CNAE/MEC, INAN and INTSOY. The acceptability (in the school lunch program) of roasted soybeans as snacks and several recipes for cooked, black soybeans would be tested. The program would be jointly financed by INAN and INTSOY. See Attachment D.
- Visited Sr. Luiz Cesar, INAN, and discussed the possibility of financial support from INAN for the Brazilian portion of three projects; viz the Mananhao project, the school lunch project and the Institute of Nutrition project. Sr. Cesar stated that INAN had strong interests in each project and would seriously consider financial support of all these projects on submission of written proposals.
- Columbia
- 27 Nov. Flew to Cali, Columbia.
- 28 - 29 Nov. Discussed CIAT programs involved in testing of new crops and foods. CIAT is about to begin a comprehensive study on the effect of inputs and variations in the food supply chain (agric. practices through marketing) on individual, family and community nutrition and economics. Testing of soybean foods might fit in as part of such a project. Possible test products and their feasibility were discussed with Dr. Alberto Pradilla, M.D. and Dr. Chuck Frances. However, no plan or project was made for the use or testing of soybean foods because Dr. Pradilla was unexpectedly prevented from attending the meeting for this purpose. The product thought most likely to succeed was a soy banana weaning food.

Discussed the programs at Intsoy with Dr. Per Instrup-Andersen, Head of the Economics Section at CIAT. He is willing to conduct cooperative studies on the economics and marketing of soybean products in Columbia. However, there was a lot of negative reaction to soybeans in CIAT because soybeans have been promoted strongly in the past and acceptance was essentially zero.

Visited Dr. Luis Camacho, ICA in Palmira. He is willing to cooperate with Intsoy/CIAT soybean tests by supplying soybeans.

30 Nov.

Flew to Bogota

Visited Sr. Guillermo Varela, Dept. of National Planning and discussed the International Soybean Program at the U. of I.

Visited IIT and discussed some of the soybean food research at IIT and U. of I. No cooperative programs were discussed.

2 Dec.

Flew to San Juan, Cost Rica

2 - 3 Dec.

Visited soybean trials in three locations in Costa Rica and discussed the progress of the CARE program there with the director, Mr. Tom Bentley. We discussed, in general, soy foods and methods of preparation which might be useful in Costa Rica after soybeans become established as a crop. At present the only feasible tests are those which depend solely on home preparation. Future commercial production of soy foods was thought possible.

4 Dec.

Flew to Guatemala City

4 - 6 Dec.

Visited INCAP and discussed present and possible future programs at INCAP and Intsoy. Visited the INCAP experimental farm and the Incaparina plant. (Production - 15-18,000 lb/day; capacity - 35-40,000 lb/day)

Discussed possible cooperative programs between INCAP and the Utilization section of Intsoy with Dr. Ricardo Bressani. Possibilities include nutritional testing, storage studies and adaptation of Intsoy technology and food products to tastes and conditions in Central America.

6 Dec.

Flew to Cornell University, Ithaca, N.Y.

7 Dec.

Visited Dr. Jose Dutra de Oliveira and Sister Therese Drummond and discussed a possible project for growing and using soybeans at the community level in the state of Maranhao, Brasil. In general, the project will be planned and executed by the community under the guidance of Sister Therese and with the technical support of personnel in Intsoy, the school of medicine at Ribeirao Preto, Brasil and the PNS, Brasil. The planning stage in the summer of 1974 and the project would begin in 1975.

8 Dec.

Flew to Champaign

Attachment C - Organizations and Persons Contacted

BRASIL

Instituto de Tecnologia de Alimentos (ITAL)
 Av. Brasil S/N
 Caixa Postal 139
 13,100 - Campinas SP, Brasil

Sr. Joao Shoshiro Tango, Director, Food Science Dept.
 Sr. Massami Shimokomaki, Biochemistry Section Leader
 Sr. Decio Travaglini, Drying Section Leader

Projeto Nacional da Soja
 Rua Botafogo, 965
Porto Alegre, RS, Brasil

Dr. Jardim Freire, Director
 Dr. Harry C. Minor, Ecologist

Dr. Alceu de Castro Romeu
 Superintendencia, CNAE/MEC (National School Lunch Program)
 Edificio Venancio II, S/116 fone 23-03-79
 70,000 Brasilia DF, Brasil

Sr. Luis Cesar Auvray Guedes
 Director, Departamento Ciencia e Tecnologia
 Instituto Nacional de Alimentacao e Nutricao (INAN)
 Edificio Ananguaia - SCS fone 24-48-44
Brasilia, DF, Brasil

Instituto de Nutricão
 Universidade Federal de Pernambuco
 50,000 Recife, Pe, Brasil

Dr. Alvaro Vieira de Mello, Director
 Renato Vieira, Tecnologia de Alimentos
 Ruy Basto de Medeiros, Professor Assistente,
 Departamento de Nutricao Aplicada.
 Edi Kahan Vainer, Engenheiro Quimico
 Depto. Nutricão Experimental.
 Carlos Pices de Freitas, Professor Assistente
 Tecnologia de Alimentos.

COLUMBIA

Centro Internacional de Agricultura Tropical (CIAT)
 Apartado Aereo, 67-13,
Cali, Columbia

Dr. Alberto Pradilla, M.D.
 Dr. Charles Frances, Maize Breeder
 Dr. David Franklin
 Dr. Eduardo Alvarez Luna, Director of Plant Sciences
 Dr. Per Pinstrup-Andersen, Lider, Seccion Economica.

Sr. Guillermo Varela,
Jefe de la Division Sociodemografica,
Depto. Nacional de Planeacion,
Edificio
Bogota, Columbia

Sr. Luis Humberto Camacho, Director .
Programma Nacional de Leguminosa de Grano y Oleaginosas Anuales
Instituto Colombiano Agropecuario (ICA)
Palmira, Columbia

Instituto de Investigaciones Tecnologias,
Avenida 30, no 52-A-77.
Bogota, D.E., Columbia fone 35-00-66

Sr. Daniel Diaz Delado, Sub-director, Investigacion
Sra. Teresa Salazar de Buckle, Chief, Special Research Projects

COSTA RICA

CARE
50 Varas Norte, fone 21-19-78
Corte Suprema, or Apartado 3571
Calle 19, Av 2 Y 6
San Jose, Costa Rica

Mr. Thomas W. Bentley, Director
Sr. Ronny Badilla, Sub-director

Instituto de Nutricion - INCAP
Carretera Roosevelt, Zona 11
Postal 11-88
Guatemala, C.A.

Dr. Ricardo Bressani, Lider, Div. of Agric. and Food Sciences
Dr. Mario R. Molina
Dr. Luiz G. Elias
Dr. Roberto G. Brenes

Ing. Juan J. Schildknecht; Gerenta (Manager of Incaparina plant)
Alimentos, S.A.
K 14 1/2 Carretera A
El Salvador
Guatemala, Guatemala C.A.

Mr. Paul Hartenberger, Director
CARE, Guatemala Phone 66392, 66497
Apto post 1211
6a Ave, 6-47, Zona 9,
Guatemala, Guatemala, C.A.

Sister Teresa Drummond
Graduate School of Nutrition
Savage Hall, Cornell University
Ithica, New York 14850.

Attachment D - Summaries of Possible Cooperative Projects on Direct
Utilization of Whole Soybeans for Human Foods

I. Use of Whole Soybeans in the Brazilian School Lunch Program

PURPOSE

To test the acceptability of soybeans as part of the diet in a school lunch program.

OUTLINE

Two types of soybean foods will be tested, roasted soybean cotyledons and cooked whole soybeans. Variations of the basic recipes will be tested to find those which are most acceptable to Brazilian tastes.

In general, the program will have the following format:

1. Training. Key personnel will be taught the basic methods for preparing soybean foods with the advice and assistance of Intsoy personnel.
2. Different recipes and/or flavorings and spices will be tested organoleptically by the project personnel to find those which should be most acceptable to Brazilian tastes.
3. The most acceptable products will be prepared and tested in two or three schools for acceptability to children participating in the program. Scale up tests and tests of the available equipment will be made during this period.
4. After evaluation of the results in stage 3, improvements in recipes and preparation methods will be sought. Further tests of the improved recipes and preparation methods will be made.
5. Program evaluation and report.

PERSONNEL (Brasil)

- 1 FTE - Project leader - Dietician or equivalent
- 1/2 - 1 FTE - Technical assistant
- 1/2 FTE - Non-technical assistant - secretary, hourly help, etc.

II. Acceptance and Nutritional Evaluation of Soybean Foods in the Diets of Children

PURPOSE

To test the nutritional quality and acceptability of soybean food in the diets of malnourished children.

PROJECT OUTLINE

Three types of soybean foods will be tested by the Institute of Nutrition (Recife) in the diets of malnourished children:

1. Whole cooked soybeans grown locally
2. Roasted soybean cotyledons
3. Drum dried whole soybean flakes, both alone and mixed with cereals, fruits or other locally available materials.

Variations of the basic formulations will be tested to improve the organoleptic and nutritional acceptability of the foods.

The general format of the program will be:

1. Training. Key personnel will be trained in the basic method of preparing the soybean foods with the assistance and advice of INTSOY (Utilization) personnel. This should include a short training period at the U. of Illinois of the person(s) who will actually prepare the drum dried flakes.

2. Sample preparation and testing. When facilities permit samples will be prepared in the Food Technology and Dietetics sections of the Institute of Nutrition. Intsoy will supply samples when necessary. Samples will be evaluated organoleptically and by chemical and animal studies when necessary by the Institute of Nutrition. The Institute of Nutrition will develop and test variations of the basic Intsoy processes and products, if necessary, to adapt the soybean foods to make them more suitable for local tastes.

3. The acceptable products in each category will be tested nutritionally in the Institute's nutritional centers.

4. A report will be prepared.

PERSONNEL (Brasil)

1/2 FTE - Food Technologist/Dietician/Nutritionist
1 FTE - Technical Assistant
1/2 FTE - Non-technical assistant - secretary, hourly wages, etc.

(Intsoy) - Projects I and II
1/4 FTE - Professional Staff - Project Advisor
1/2 FTE - Research assistant - for research and development on project problems.
1/4 FTE - Nontechnical assistant - secretary, hourly help, etc.

Attachment B - Meeting on the Nutritional Aspects of Common Beans
and Other Legume Seeds as Animal and Human Food

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Ribeirao Preto, Brazil, November 6-9, 1973

Tuesday, November 6, 1973

8:30 - Official opening
Opening remarks by Dr. Almiro P. de Azeredo, Vice-Director of the Faculdade de Medicina de Ribeirão Preto, Ribeirão Preto, Brazil.

9:15 - Coffee

Session 1. Legumes as Animal Feeding
Chairman: Horace Burr
Vice-Chairman: Célia A. Ferreira-Santos

9:30 - 1. Studies on the nutritive value of beans
Dr. José E. Dutra de Oliveira
Faculdade de Medicina de Ribeirão Preto
Ribeirão Preto, Brazil.

9:55 - 2. Utilization of legumes in poultry feeding
Dr. Manuel Cuca Garcia
Colegio de PostGraduados
Escuela Nacional de Agricultura
Chapingo, Mexico

10:20 - 3. Utilization of legumes in swine feeding
Dr. A. S. Shimada
Instituto Nacional de Investigaciones Pecuarias
Mexico, D.F.

10:55 - 4. Peas fractions as milk replacers for calves
Dr. J. M. Bell
Department of Animal Sciences
University of Saskatchewan
Saskatoon, Canada

11:15 - 5. Legumes in animal nutrition
Dr. James McGinnis
Department of Animal Health
Washington State University
Pullman, Washington

11:40 - Dynamics of the round table
Dr. José E. Dutra de Oliveira

Wednesday, November 7, 1973

Session 2. Storage, Processing and Nutritive Value of Legumes
Chairman: James McGinnis
Vice-Chairman: Judith Costa

8:00 - 1. Effect of storage on cooking qualities, processing and nutritive value of beans
Dr. Horace Burr
Western Regional Laboratory - USDA
Berkeley, California

8:25 - 2. Change in chemical composition and nutritive value of common beans and other legumes during house cooking
Dr. Roberto Gomes Brenes
INCAP
Guatemala, C.A.

- 8:50 - 3. Preparation and utilization of dry, canned and precooked dehydrated beans
 Dr. R. L. LaBelle
 New York Agricultural Experimental Station
 Cornell University
 Geneva, New York
- 9:15 - 4. Production of instant bean powder
 Dr. Fred Bakker-Arkema
 Agricultural Engineering Department
 Michigan State University
 East Lansing, Michigan
- 9:40 - 5. Effect of cooking and germination on the flatus inducing capacity of the legumes
 Dr. Kantha S. Shurpalekar
 Central Food Tech, Research Institute
 Mysore, India
- 10:00 - Coffee
- 10:15 - 6. Effect of maturation and germination on the nutritive value of common beans and other legumes
 Dr. Luiz G. Elias
 INCAP
 Guatemala, C.A.
- 10:40 - 7. Nutritive value of legume protein concentrates
 Dr. Mario Molina
 INCAP
 Guatemala, C.A.
- 11:05 - 8. Nutritional evaluation of protein concentrates from field peas and faba beans
 Dr. J. B. Bell
 Department of Animal Science
 University of Saskatchewan
 Saskatoon, Canada
- 11:30 - 9. Utilization of common beans and other legumes in the preparation of protein food for human consumption
 Dr. Antonio Bacigalupo
 Universidade Agraria La Molina
 Lima, Peru

Thursday, November 8, 1973

Session 3. Utilization of Common Beans and Other Legumes as Human Food

Chairman: Kantha S. Shurpalekar

Vice-Chairman: Luiz G. Elias

- 8:15 - 1. Toxic factors in beans and their practical importance
 Dr. Werner J. Jaffe
 Instituto Nacional de Nutricion
 Caracas, Venezuela

- 8:40 - 2. Genetics and plant breeding in relation to the nutritional quality of common beans and other legumes
· Dr. John F. Kelly
Vegetable Crops Department
University of Florida
Gainesville, Florida
- 9:05 - 3. Amino acid supplementation of common beans and other legumes
Dr. G. R. Jansen
Food Science and Nutrition
Colorado State University
Fort Collins, Colorado
- 9:30 - 4. Fortification and nutritification applied to common beans and other beans based foods
Dr. Paul Lachance
Department of Food Science
Rutgers University
New Brunswick, New Jersey
- 9:55 - 5. Experimental and clinical studies on common beans
Dr. Nelson de Souza
Faculdade de Ciências Médicas e Biológicas
Botucatu, SP
Brazil
- 10:15 - Coffee
- 10:30 - 6. Nutritive value of common beans and other legumes as infant and adult food
Dr. Antonio Pradilla
Universidade del Vale
Cali, Colombia
- 10:55 - 7. Digestibility and flatulence activity of beans in humans
Dr. E. H. Hellendoorn
Central Institute for Nutrition and Food Research TNO
Zeist, The Netherlands
- 11:20 - 8. The use of common beans and other legumes as human food in Tanzania
Dr. A. C. Mosha
Research and Training Institute
Ukiriguru, Mwanza
Tanzania
- † 11:45 - 9. Use of soybeans as human food
Dr. L. K. Ferrier
Department of Food Science
University of Illinois
Urbana, Illinois

Friday, November 9, 1973

8:30 - 10:00	Presentation of the concluding remarks
10:00 - 10:10	Coffee
10:10 - 10:40	Perspectives on the consumption and utilization of legume seeds as food and feeding Dr. José E. Dutra de Oliveira
10:40 - 11:10	Closing remarks
11:45	Farewell lunch