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TRIP REPORT - PHILIPPINES

Date Submitted: March 13, 1975

NAME: D. K. Whigham

TITLE: Agronomist

DIVISION: INTSOY

ITINERARY: See Attachment A. Attachment used to include details of itinerary with the time schedule.

PURPOSE:

1. To discuss past results of INTSOY trials and plant future cooperation between INTSOY and the University of the Philippines at Los Banos (UPLB) and the Bureau of Plant Industry (BPI).
2. To develop a soybean evaluation trial jointly between INTSOY and the Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA).
3. To discuss plans for the Asia Soybean Conference with interested scientists.
4. To become acquainted with the soybean research activities of the International Rice Research Institute (IRRI).

ORGANIZATIONS AND PERSONS CONTACTED:

Officials of the UPLB College of Agriculture, Bureau of Plant Industry, SEARCA, IRRI and the USAID Mission. (see Attachment B for detailed listing).

RESULTS/ACCOMPLISHMENTS:

1. Discussed soybean yield results with Mr. Ballon and Mr. Legaspi at the Bureau of Plant Industry (BPI) in Los Banos. Locally developed varieties are popular with farmers. Clark 63 is the most promising introduced variety. BPI requested continued cooperation with INTSOY.
2. Was informed about the activities of the Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA) by Dr. Saguiquit. SEARCA has its headquarters on the University of the Philippines at Los Banos Campus and serves eight countries.
3. Organized a cooperative INTSOY/SEARCA soybean variety trial for evaluating early maturing material at nine locations in Southeast Asia. INTSOY will provide eight varieties, the inoculant, instructions, data collection material and analysis of the data. SEARCA will provide nine varieties, site visitation and close communication with the cooperators. All varieties are expected to mature in less than 100 days throughout the Region.

Reference: Room 1686 43

4. Discussed results of INTSOY trials and national trials with Dr. Lantican. The University of the Philippines at Los Banos College of Agriculture (UPLBCA) started a soybean breeding program in 1968. Several CES lines (developed at UPLBCA) are now being evaluated for release. UPLBCA desires continued cooperation with INTSOY in all phases of soybean research.
5. Visited the Food Science Department at UPLBCA and learned of their soybean milk product "Philsoy." The product is being prepared for test marketing and possibly release as a commercial product. The product was quite acceptable even though a "grassy flavor" was evident.
6. Visited the International Rice Research Institute (IRRI) and learned where soybeans fit into the Multiple Cropping Program. Variety evaluation of soybeans has indicated that Multivar 80 (introduced from U.S.) and a local variety CES-16-203 were the highest yielding in a short season. IRRI does not plan to develop soybean varieties. However, locally developed and introduced varieties will continue to be evaluated for adaptation to rotation with rice. The Multiple Cropping Section will soon begin variety evaluation of all crops which fit into a rice cropping system at 12 locations in six Southeast Asian countries.

FOLLOW-UP ACTION REQUIRED:

1. Send one trial to Dr. Lantican and one to Mr. Legaspi for testing in different environments during 1975.
2. Send seed, inoculant and instructions to cooperators for testing the INTSOY/SEARCA early maturing soybean trial.
3. Inform SEARCA of INTSOY's cooperator in Vietnam so they can establish a contact for legume testing in that country.
4. Inform UPLB, SEARCA, BPI, IRRI, and USAID/Philippines about plans for the Asia Soybean Conference being planned for 1976.

OTHER REMARKS:

The cooperation and interest shown by BPI, UPLB, SEARCA and IRRI is greatly appreciated. A special thanks to Dr. Lantican who arranged my schedule.

ATTACHMENTS:

- A - Detailed itinerary and schedule of activities.
- B - Organizations and persons contacted.

DISTRIBUTION:

AID/Washington - 5 copies (Attn. G. K. Parman)  
 University of Illinois - 15 copies (internal distribution)  
 USAID/Philippines - 5 copies (Attn. Frank Sheppard)

ATTACHMENT A - Detailed Itinerary and Schedule of Activities

February 4, 1975:

Flight - Taipei to Manila

Met at the airport by Dr. Lantican and drove to the Manila USAID Mission. Discussed the AID agriculture program in the Philippines and the importance of soybeans. Soybean hectareage is still only 15,000 ha/year but the government support price to farmers is P 2.40/Kg (\$9.56/bu). However, the incentive has not been great enough for farmers, as their yields are low (500 Kg/ha), transportation and marketing are difficult and seed storability is poor. Travelled to Los Banos by car.

February 5, 1975:

Visited the Bureau of Plant Industry Economic Garden at Los Banos. Observed soybean lines which were developed by Mr. Ballon and Mr. Legaspi. Variety L-114 was developed at the Economic Garden and is now a popular commercial variety. Variety Williams has a good yield potential during the wet season (long days), but is very short (30 cm) when grown in the dry season (short days). Williams is also susceptible to rust. Some Taiwan varieties and other sources are being used to develop rust resistance in locally adapted material. The Economic Garden has been an INTSOY test site for the past two years and has requested continued cooperation. Insects are a serious problem at the Economic Garden and insecticides are used frequently. After lunch the University of the Philippines at Los Banos, College of Agriculture (UPLBCA) programs were explained by Dr. Quebral. Three UPLBCA staff have requested permission to attend the World Soybean Research Conference at the University of Illinois in August, 1975. The UPLBCA will also be represented at the soybean production training course at the University of Illinois this summer, as one of the three Philippine candidates is Mr. Bartolome of the Agronomy Department. Dr. Saguit was also visited at the Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA) headquarters on the UPLB campus. SEARCA activities were discussed with special reference to the soybean variety evaluation program.

February 6, 1975:

Met with the Chairman of the Agronomy Department at UPLB and was briefed on departmental research and teaching activities. The department consists of 20 Ph.D. and 11 MS staff members, 70 graduate students and 45 undergraduate students. The department works closely with IRRI. Dr. Lantican and his staff explained their activities in the Field Legume Section which consists of soybean, mungbean and peanut. Soybean variety CES 434 was developed by Dr. Lantican and is currently a popular variety among farmers. Several other CES lines are now being tested. Major emphasis is being placed on breeding for rust and pustule resistance. The Food Science Department was visited and Mr. Escueta explained their plans to test market soy-milk in the near future. The product was sampled and found to have a slight "grassy" taste. The soymilk contains: 3% protein; 1% fat; 7% sugar, and 12% solids. Both chocolate and plain flavors were being made. Philsoy will be the product name when marketed. After lunch Drs. Quebral and Rejesus explained the pathology and entomology programs for soybeans. Soybean rust and bacterial pustule are the most serious diseases. Downy mildew is serious in some seasons. The beanfly is the most

damaging insect to soybeans. A total of 12 diseases and 10 insects have been identified as damaging to soybean development. Since SEARCA and INTSOY distribute soybean variety evaluation trials in Southeast Asia, a joint plan was developed. All locations served by the early maturing SEARCA trials in the past will receive the following entries from the indicated source in 1975:

<u>INTSOY</u>	<u>SEARCA</u>
Altona	Clark 63
Swift	Lincoln
Amsoy 71	Multivar 80
Beeson	CES-16-103
Calland	CES-16-23
Williams	CES-16-17
Bonus	TK-5
Forrest	Orba
	SJ-1

INTSOY will provide the inoculant, trial design, instructions and data booklet. Results of the trials will be shared by both organizations. Most of the trial supervision and visitation will be done by SEARCA.

February 7, 1975:

The International Rice Research Institute (IRRI) was visited. A slide-video orientation of IRRI was observed before touring the facilities. Soybeans are one of many crops being tested by the Multiple Cropping Section to see how they might best fit into a rice farming section. Some variety evaluation has been done by IRRI but they do not plan to do soybean variety development. IRRI will depend on UPLB and other agencies for new material. Cultural management is the current research emphasis on soybeans by the Multiple Cropping group. However, in cooperation with UPLB they will soon begin variety evaluation of all crops which may fit into the rice cropping system. The testing will be conducted at 12 locations in six Southeast Asian countries.

February 8, 1975:

Travelled to Manila and flew to Bangkok.

5

ATTACHMENT B - Organizations and Persons Contacted

Bureau of Plant Industry

1. B. S. Castillo  
Director - Manila
2. F. B. Ballon  
Chief, Vegetables and Field Legumes - Manila
3. B. M. Legaspi  
In-Charge, Legume Research Project - Los Banos
4. R. R. Virtucio  
Superintendent of Economic Garden - Los Banos

Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA)  
(SEARCA)

5. G. F. Saguiguit  
Assistant Director - Los Banos

University of the Philippines at Los Banos

6. R. M. Lantican  
Professor of Agronomy
7. F. C. Quebral  
Plant Pathologist
8. R. S. Rejesus  
Entomologist
9. N. Mamiopic  
Chairman of Agronomy Department
10. J. Walawala  
Experimental Investigator - La Granja
11. C. R. Bartolome, Jr.  
Senior Research Assistant
12. E. E. Escueta  
Food Scientist

International Rice Research Institute (IRRI)

13. M. R. Vega  
Assistant Director
14. R. W. Herdt  
Agricultural Economist
15. R. R. Harwood  
Agronomist - Multiple Cropping
16. V. R. Carangal  
Cropping Systems Network Coordinator
17. T. R. Hargrove  
Associate Editor - Information Services
18. S. Masajo  
Information Office

U. S. Agency for International Development (USAID)

19. N. Ulsaky  
Economist

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## TRIP REPORT - THAILAND

Date Submitted: March 21, 1975

NAME: D. K<sup>th</sup> Whigham

TITLE: Agronomist

DIVISION: INTSOY

ITINERARY: See Attachment A. Attachment used to include details of itinerary.

PURPOSE:

1. To discuss and evaluate the results of INTSOY trials with cooperators and to observe present INTSOY trials in the field.
2. To observe soybean production techniques used by their farmers.
3. To discuss the possibility of Thailand being the host country for an INTSOY sponsored Asia Soybean Conference in 1976.
4. To arrange shipment and distribution procedures for INTSOY trials requested by researchers in Thailand.

## ORGANIZATIONS AND PERSONS CONTACTED:

Officials of the Ministry of Agriculture, Kasetsart University, Chiangmai University, Khon Kaen University, Rubber Research Institute, Institute of Food Research and Development, Rockefeller Foundation and the U. S. Agency for International Development.

## RESULTS/ACCOMPLISHMENTS:

1. Observed INTSOY trial and other soybean research at the Mae Jo Agricultural Experiment Station. Discussed results of previous soybean trials. The local variety, 3J-2, produced the highest yield.
2. Visited the Chiangmai University Faculty of Agriculture and discussed their soybean breeding and multiple cropping programs. Results of the wet season INTSOY trial were discussed. Williams variety was highest yielding.
3. The Faculty of Agriculture at Chiangmai University volunteered to be a host for the Asia Soybean Conference if held at Chiangmai.
4. Observed INTSOY trial and other soybean research at the Chainat Rice Experiment Station. At this station soybean research is conducted during the dry season and rice research during the wet season. No-tillage planting techniques are used to seed soybeans after rice.

5. Observed INTSOY trial and related work at the National Corn and Sorghum Research Center at Farm Suwan. Varieties Improved Pelican (2430 Kg/ha) and Calland (2473 Kg/ha) have produced the highest yields in the wet and dry seasons, respectively.
6. Discussed results of past INTSOY trials with staff of the Northeast Agricultural Center (NEAC). Low yields are attributed to low fertility, low rainfall, insect damage and unadapted varieties. The variety Hardee produced a top yield of 619 Kg/ha during the wet season and Davis produced 1033 Kg/ha during the dry season.
7. Observed the INTSOY trial being tested at Khon Kaen University and discussed the influence of short days on the development of soybean varieties. Khon Kaen University is a regional center for the national program on soybean improvement.
8. Presented a seminar "Results of Soybean Variety Evaluation," to staff members of the NEAC and Khon Kaen University.
9. Arranged to ship all INTSOY trials to the Agricultural Office of the USAID Mission. Dr. Arwooth will collect and distribute the trials. Seven trials have been requested for testing in Thailand during 1975.
10. Dr. Arwooth suggested that the Asia Soybean Conference be held at Chiangmai in February, 1976.
11. Discussed the role of soybeans in new rubber plantations. Dr. Templeton is promoting the use of soybeans intercropped with rubber trees during early tree growth. An INTSOY trial was requested to evaluate varieties in southern Thailand.
12. Presented a seminar, "International Soybean Variety Evaluation," to scientists from Kasetsart University, Rubber Research Center and the Rockefeller Foundation.
13. Visited the Institute of Food Research and Product Development and observed soybean products. Several soybean products from the Institute are being marketed throughout the country.

FOLLOW-UP ACTION REQUIRED:

1. Analyze INTSOY data from 1974 trials and return results to local cooperators.
2. Send 1975 INTSOY trials as requested.
3. Asia Soybean Conference Committee to communicate with Dr. Arwooth and Chiangmai University to make arrangements for the Conference.
4. Provide commercial inoculant samples to Dr. Dawson for evaluation at Chiangmai.

OTHER REMARKS:

The cooperation and interest shown by the Ministry of Agriculture; Kasetsart, Chiangmai, and Khon Kaen Universities; Rockefeller Foundation and USAID is greatly appreciated. Special thanks go to Dr. Renfro and Mr. Udom for arranging my schedule and accompanying me up country.

ATTACHMENTS:

A - Detailed itinerary and schedule of activities.

B - Organizations and persons contacted.

DISTRIBUTION;

AID/Washington - 5 copies (Attn. G. K. Parman)  
University of Illinois - 15 copies (internal distribution)  
USAID/Thailand - 5 copies (Attn. Dr. Fletcher Riggs)

ATTACHMENT A - Detailed Itinerary and Schedule of Activities

February 8, 1975:

Flight - Manila to Bangkok

February 9, 1975:

Flight - Bangkok to Chiangmai

February 10, 1975:

Toured facilities and observed soybean research at Mae Jo Agricultural Experiment Station located about 20 miles north of Chiangmai. Japan has two soybean exports located at the station as part of the Thai-Japan Soybean Improvement Project. An INTSOY trial was planted on January 2. All varieties had flowered except Jupiter. The varieties displaying the most vegetative growth were Jupiter, Bossier and SJ-1 (local entry). During the wet season (June-Sept.) variety SJ-2 produced the highest yield (3000 Kg/ha) followed by Improved Pelican and Hardee. Soybean rust is a serious problem during the wet season, but less during the dry season. The breeding program plans to release a rust resistant variety in 1976. Rhizobium strains were being evaluated. The seed certification program produces between 13 and 14 ton of the local varieties (SJ-1 and SJ-2) each year. Seed storage is a serious problem and is being studied at the station. The variables of the storage experiment are: time of harvest; drying temperature; length of storage period; method of storage; and percent germination. Visited the Faculty of Agriculture at Chiangmai University. The Dean volunteered the faculty to serve as host for the Asia Soybean Conference in 1976 if the planning committee decides on Chiangmai as the conference site. Soybean research activities were observed and the program was discussed. Breeding for better adapted varieties and multiple cropping systems which include soybeans are their primary objectives. Results from the 1974 INTSOY trial were collected. Variety Williams produced the highest yield (2200 Kg/ha) in the wet season. Conference facilities in Chiangmai were examined and found to be adequate for the soybean conference. Accompanied on Chiangmai trip by Dr. Renfro.

February 11, 1975:

Flight from Chiangmai to Bangkok and drove to the Chainat Rice Experiment Station with Mr. Udom. Soybeans are planted in the area following paddy rice with no tillage. Three to four seeds are placed in a hole adjacent to each rice hill. The plants are harvested when the pods are filling, leaves and roots are removed and marketed with the pods still on the stem. The green soybeans are marketed in the Bangkok area for human consumption. The INTSOY trial was planted on December 24, 1974. SJ-2 and Improved Pelican appear to have the best growth at the present stage. Replications 2 and 3 of the trial had identical randomizations. Approximately 400 introduction lines and 147 elite lines and 14 populations from the Asian Vegetable Research and Development Center were being evaluated at the station. Fertilizer/inoculant trials were also being conducted. Soybeans are only grown during the dry season since rice is the major crop on the station. Travelled to the National Corn and Sorghum Research Center at Farm Suwan.

February 12, 1975:

Toured the facilities at Farm Suwan and observed the INTSOY trial which was planted January 8, 1975. Row width was changed from the recommended 60 cm to 75 cm so mechanical operations could be used. The plant population was adjusted to 400,000 plants per hectare. Results from the January, 1974 (dry season) trial indicates that varieties Improved Pelican, Bonus, Bragg and Davis produced yields of 2430, 2279, 2187, and 2132 Kg/ha, respectively. During the rainy season of 1974 Calland produced 2473 Kg/ha followed by Davis and Hardee. Leafhopper damage is severe during some seasons, therefore an insecticide spray is applied once per week on a regular basis. Travelled on to Khon Kaen by car. Visited the Northeast Agricultural Center (NEAC) at Tha Phra. Had an informal discussion with the staff who work with soybeans. Leaf miner, pod borer and beanfly are the most serious insect pests at the NEAC. Soybean rust reduces yield during the wet season. The sandy soils are low in fertility and inoculant is not available on a continuous basis. Results from the INTSOY trials tested in 1973 indicate yields are low. The June planted trials produced a maximum yield of 619 Kg/ha with variety Hardee. Davis produced 1033 Kg/ha when planted in November. The University of Kentucky AID contract team will close out their program at the NEAC in June, 1975.

February 13, 1975:

Visited Khon Kaen University which is a regional center for the national program on soybean improvement. The 1974 INTSOY trial was planted on November 20. Replications 1 and 2 were not randomized because of a misunderstanding of the instructions. All varieties were affected by the short days and were shorter than normal. Previous trials at the University have indicated that varieties SJ-2, Taichung 12, Acadian, Improved Pelican, Hill and Chungshing are best adapted in the wet season. During the dry season Davis, Geduld and Alanea produce the best yields. Inoculant research is also being done at the University. Rhizobium strains are evaluated on several varieties. Returned to the NEAC and presented a seminar "Results of Soybean Variety Evaluation" to 40 staff from the Center and Khon Kaen University. Return to Bangkok by air.

February 14, 1975:

Visited the Department of Agriculture and discussed future cooperation between Thailand and INTSOY with Dr. Arwooth, leader of the national soybean program. We agreed that all trials for Thailand be sent to Dr. Arwooth's office for distribution to cooperators at research stations. The following locations have requested INTSOY trials for 1975:

<u>Organization</u>	<u>Location</u>	<u>Planting date</u>
Dept. of Agriculture	Sukhothai	May
	Prabubhaboth	July
	Chainat	November
Univ. of Chiangmai	Chiangmai	June
	Hill Farm Project	June
Rubber Research Centre	Hatysi	April
Khon Kaen University	Khon Kaen	June

In addition to the above trials, one INTSOY/SEARCA will be tested during the dry season. The Asia Soybean Conference was discussed with Dr. Arwooth and he suggested Chiangmai be the conference site and that late February, 1976 would be a good time. The Office of Agriculture of USAID was visited and details of seed shipment and the conference were discussed with Dr. Riggs. INTSOY trial materials will be shipped to the Office of Agriculture and transferred to Dr. Arwooth for distribution. Several helpful suggestions about the conference were made by Dr. Riggs. Discussed INTSOY involvement in Southeast Asia with Mr. Gaul and Mr. Smail of the Southeast Asia Regional Economic Development Office. INTSOY was encouraged to expand cooperation with the Asian Vegetable Research and Development Center (AVRDC) in Taiwan and the Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA) in the Philippines. Met with Dr. Templeton and Mr. Prawit from the Rubber Research Center in Southern Thailand and discussed their interest in soybeans. A major program, supported by FAO, is underway to replace old rubber plantations with new plantings throughout the rubber producing area of Thailand. At the present time there are 1.6 million hectares of rubber in the country, When new plantings are made the rows are 8 meters apart and 2.5 meters between plants. Until the trees are two years other crops can be intercropped. During the wet season (Sept.-Dec.) rice is grown as an intercrop. Soybean, mungbean and sweet corn can be grown between May and August. Soybean variety trials have been tested in recent years using local varieties, however, exotic varieties have not been evaluated. An INTSOY trials was requested for the 1975 season. Met with the Kasetsart University soybean group and discussed their current research activities and future plans. Mutation/irradiation breeding, variety evaluation and pathology are receiving the most attention in research. Presented a seminar, "International Soybean Variety Evaluation," to an audience of eight staff and guests. Visited the Institute of Food Research and Product Development on the Kasetsart University campus. Observed several soybean products developed by the Institute, including: milk concentrate; defatted soy flour; high protein snack foods; soy baby foods; textured protein; whole soy cookies; and Kaset noodles (wheat and soy flour).

February 16-17, 1975:

Flight -- Bangkok to Champaign via Hong Kong/Tokyo/San Francisco/Chicago.

ATTACHMENT B - Organizations and Persons Contacted

Department of Agriculture

1. Dr. Arwooth NaLampang  
Leader of Oil Crop Project
2. Mr. Amnuay Tongdee  
Agronomist
3. Mrs. U. Ekasingh  
Engineering Division

Chainat Rice Experiment Station

4. Mr. Saraniti Sa-ngaunsaj  
Chief of Station
5. Mr. Amnat Chinchest  
Chief of Cultural Improvement and Seed Storage Section

MaeJo Agricultural Experiment Station - Chiangmai

6. Mr. Rangsak Keereetaveep  
Agronomist
7. Mr. Viroon  
Agronomist
8. Mr. Kouichi Sasaki  
Soybean Breeder: Thai-Japan Soybean Improvement Project
9. Mr. Koji Hashimoto  
Agronomist: Thai-Japan Soybean Improvement Project

Northeast Agricultural Research Center - Tha Phra

10. Dr. Verne Finknor  
Agronomist - University of Kentucky AID contract
11. Dr. Richard Thurston  
Entomologist - University of Kentucky AID contract
12. Dr. Vichit Benjasin  
Director
13. Dr. Suebsak Sontirat  
Plant Pathologist
14. Mr. Withoon Wardhanabhuti  
Agronomist

- 15. Somchai Patiyuth  
Soil Microbiologist
- 16. Chainat Hong-Ngom  
Agronomist
- 17. Tawachai Na Nagara  
Soil Scientist
- 18. Wisuthi Amaritsut  
Entomologist
- 19. Tawatcjao Sitchawat  
Entomologist
- 20. Somchai Kanlong  
Plant Pathologist
- 21. Aunee Wongkokrat  
Entomologist
- 22. Weerawroth Katangubul  
Entomologist
- 23. Dumre Roongsook  
Entomologist

National Corn and Sorghum Research Center - Farm Suwan

- 24. Mr. Apinan Kamnsbrut  
Agronomist - Kasetsart University

Kasetsart University - Bangkok

- 25. Mr. Udom Pupipat  
Plant Pathologist
- 26. Dr. Sumin Smutkupt  
Plant Breeder
- 27. Mr. Chairerg Maneepong  
Agronomist
- 28. Mr. H. C. Phatak  
Advisor on Seed Pathology - Plant Protection Services

Chiangmai University

- 29.. Dr. Boonyawart Lumpaopong  
Dean, Faculty of Agriculture
- 30. Dr. Damrong Tiyawalee  
Head, Department of Plant Science
- 31. Dr. M. D. Dawson  
Agronomy Consultant - Multiple Cropping Project, Ford Foundation

32. Paibool Wivutvong Vana  
Soil Scientist
33. Mawee Wivutvong Vana  
Horticulturist
34. Dr. Frederick D. Pettem  
FAO Agronomy Planner attached to the Department of Agriculture,  
Vientiane, Laos
35. Dr. Godfrey Dean  
Entomologist attached to British Embassy, Vientiane, Laos

Khon Kaen University

36. Dr. Terd Charoenwatana  
Chairman, Department of Plant Science

Rockefeller Foundation - Bangkok

37. Dr. Bobby Renfro  
Plant Pathologist

Rubber Research Center - Hatyai

38. Dr. J. Keith Templeton  
Senior Agronomist - FAO/UNDP  
Rubber Development Project
39. Mr. Prawit Wongsukon  
Agronomist

Institute of Food Research and Development - Bangkok

40. Dr. Prateep Patchpatyakom  
Assistant Director

U. S. Agency for International Development (USAID)

41. Dr. Fletcher Riggs  
Assistant Director for Agriculture
42. Mr. Robert W. Smail  
Regional Education Advisor
43. Mr. Robert E. Gaul  
Regional Development Advisor