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SEMIANNUAL REPORT

Ecuador: Nontraditional Agricultural Exports Project

May 1 - October 31, 1986

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ECUADOR SEMIANNUAL REPORT
May 1 - October 31, 1986

I. SUMMARY OF THE PROJECT TO DATE

A. Background

The implementation of USAID project, Ecuador: Nontraditional Agricultural Exports, was initiated June 12, 1985, between the Agency for International Development (AID) and Devres, Inc., in collaboration with FEDEXPOR (the Ecuadorian Federation of Exporters). The objectives of this project are to increase the level of nontraditional agricultural based exports and to increase investment in productive, export-oriented agribusinesses. Devres, working with FEDEXPOR, is in the process of providing Ecuadorian nontraditional agribusiness exporters with: access to US market and technology information; assistance in the provision of support services to export-oriented agribusinesses to include distribution and marketing; promotion of planning that favors export development; and assistance in the identification of export opportunities. Carrying out these objectives successfully is leading to increased export of new products; development of new markets; expansion of contacts between individual exporters and importers; and strengthening of the institution of FEDEXPOR, through expanded membership, revenues, information, data base capabilities and knowledge of international export market potential.

Activities during the first half of the project have concentrated on the identification and evaluation of commodities which could be produced in Ecuador and exported competitively to foreign markets. At the same time several missions to trade fairs have been planned and implemented, giving the Ecuadorian producers first hand knowledge of the U.S. market and its requirements. Concurrently, data base capabilities have been installed in both Quito and Guayaquil, and the operators are being trained in the utilization of these modern computers. The institution of FEDEXPOR has been strengthened. A new administration is in place, with marked increases in membership and participation. Work continues in the area of investment; various individuals and institutions have been contacted by Devres and they are evaluating opportunities in Ecuador.

B. Experiences to date

1. Successes

Devres project management has continued implementation of these activities during the first semester of the second project year. Examples of the successes and valuable experiences gained through this semester include the following:

- o Planting of haricots verts (French string beans) for export to New York markets;
- o Planting of snow peas;
- o Miami office opened for business, to be more responsive to trading needs of FEDEXPOR members;
- o New Project Director hired, oriented to project in Ecuador and trained in Washington DC before relocating to Miami;
- o Additional investment contacts established;
- o FEDEXPOR'S monthly newsletter produced and distributed; and
- o New members added to the Federation, strengthening it as an institution.

2. Problems/Constraints

- o Government regulations prohibited the importation of snow peas from Ecuador due to an alleged pest problem. Despite the efforts of Devres, the Ecuadorian Embassy, USAID/Quito, and others, APHIS (the Agricultural Plant Health Inspection Service) limited importation of snow peas to North Atlantic ports and required methyl bromide fumigation at port of entry;
- o Expenditures incurred in the organization of the Presidential Conference and the opening of the Miami office will limit funds available for certain future project activities; and
- o Devres has been pre-paying--for FEDEXPOR's account--some expenses such as airfare for technical assistance, subscriptions for publications, trade fair expenses, etc. These expenses are then invoiced to FEDEXPOR. Payment has been very slow, in some cases dragging out for months.

II. ACTIVITIES DURING THE PERIOD

A. General

1. New Project Director joins Devres team

Mr. Villaseñor joined Devres as Project Director for the Ecuador Nontraditional Agricultural Exports project in June of 1986. His expertise is as a produce marketing specialist with over 14 years experience in the fresh fruit and vegetable industry. He has extensive work experience in Latin America in marketing and promotion of produce exports and imports. Mr. Villaseñor has established and organized corporate offices for marketing of fresh fruit from Latin America to North American markets, working with individual growers and exporters in Latin America to package, ship and obtain export and import permits. His extensive expertise in US sales has given him strong command of US market outlets including wholesalers, retailers, jobbers and trading companies. He has worked at all levels of production, post harvest handling and marketing of perishable commodities. Mr. Villaseñor speaks fluent Spanish.

After an orientation period in Ecuador where Mr. Villaseñor was interviewed by officials at USAID/Quito and at the offices of FEDEXPOR, he was formally accepted as Project Director. Devres is pleased that Mr. Villaseñor has taken immediate and active command of this project.

2. Opening of Project Office in Miami, Florida

A key point in the Ecuador project is that Devres has moved the Project Office to Miami, Fla., where the staff is more actively in touch with the commercial aspects of the export/import activities. This location, placed at the hub of travel, communications and finance linking the Caribbean, Central and South America with the rest of the world, is providing many additional trading opportunities.

3. Project administration and records

The move from Washington to Miami has had a two fold impact on project administration and records. First, the move has delayed the accomplishment of certain deliverables (e.g. this report). Second, project administration has been reorganized. Contract administration and oversight will remain the purview of the Washington office while Miami will have full day-to-day responsibility for project administration.

Invoices #18 to 25 were submitted to USAID/Quito for payment and payment was received for invoices #13, and 15 - 21. Project expenditures to date have followed very closely a straight time-expenditure line for the life of the project. This is indicative of

the fact that although the spending patterns have varied considerably from original project budget figures, overall spending has been kept within the original limits. (See FIGURE I.)

For a listing of major activities during the period, please consult TABLE I.

B. Task related activities

1. Planning

Review and comment on the work plan for the third semester was completed at a meeting in Washington between Devres, USAID/Quito and FEDEXPOR. This work plan was then revised in Quito, Ecuador in July after orientation and approval of Mr. Villasenor as the new project director. The finalized version of this work plan, covering the last six months of 1986, is included in this report. (See TABLE II.)

2. Trade Mission

a. New Jersey, Asparagus

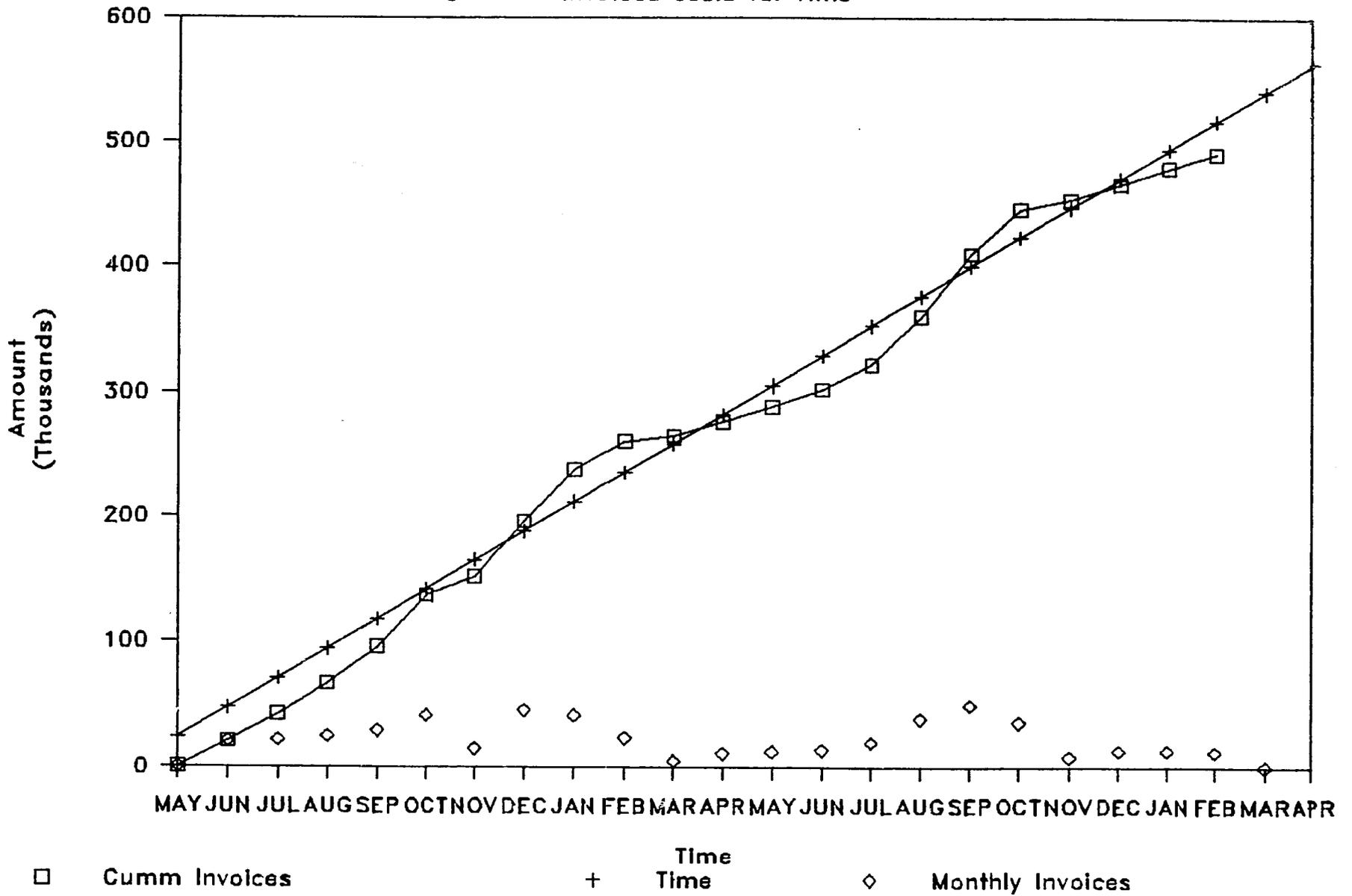
On September 12-13, a trade mission was conducted on Asparagus Breeding with Professor J. Howard Ellison, Ph.D. of Rutgers University. Professor Ellison has worked in this capacity at Rutgers, the State University of New Jersey, for 33 years. His main expertise is in the selection of varieties for propagation. He is expert in production, and knows all the parameters involved in successfully producing asparagus on a commercial basis. His work has taken him around the world, where he has seen asparagus cultivars under varied conditions.

Participating in this Trade Mission were Remigio Davalos and Dr. Jaime Vergara from Quito, and Alfredo Rodriguez and German Orazaba from Guayaquil. These individuals are part of the group of producers now in Ecuador who want to initiate an asparagus export business.

The results of the Trade Mission were very positive, with participants concluding that Ecuador should be a logical site for the establishment of an asparagus industry. It was suggested that arrangements be made to have Professor Ellison visit Ecuador as soon as possible to assess the particular conditions of each prospective production zone and make recommendations as to the proper varieties and growing techniques for each zone. (see appendix I for a more detailed report).

ECUADOR NONTRADITIONAL EXPORT PROJECT

Figure I: Invoiced costs vs. Time



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ECUADOR: NONTRADITIONAL AGRICULTURAL EXPORTS PROJECT

Table I: Activities During the Period
July 1 - October 31, 1986

| <u>Date</u> | <u>Major Activity</u> |
|--------------------|--|
| June 12-18 | Meeting of USAID/Devres/FEDEXPOR at Devres offices in Washington to review project to date and plan for future |
| July | EAV Joins Devres Team. |
| July 22 - Aug 2 | EAV and DHW to Ecuador for New Project Director orientation and project planning and development |
| August | EAV trip to Miami to evaluate feasibility of opening project office |
| August 21-28 | Edward S. Minnifee Technical Assistance trip to Ecuador for Ginger root production and harvesting. |
| September 2-6 | CBI Convention in San Juan, Puerto Rico |
| September 10-12 | NYC Trade Mission--Asparagus |
| September 27-Oct 4 | EAV in Ecuador to develop commodities for export and for institutional development of FEDEXPOR |
| September | Ted Elsasser technical assistance in Snow pea production. |
| October 2-15 | Michael Castagna travels to Ecuador to conduct prefeasibility study on mollusk aquaculture. |
| October | Devres Staff to Miami to open project office |

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Table II: Proposed Activities for June to December, 1986

| GENERIC TASK | JUNE | JULY | AUGUST | SEPTEMBER | OCTOBER | NOVEMBER | DECEMBER |
|------------------------|--|---|---|---|---|--|----------------------------------|
| 1. PLANNING | Preparation of workplan to end of 1986 One year review of project and planning meeting with AID Devres and FEDEXFOR to discuss implementation of subsequent project goals June 11-13, Washington DC | New Project Director travel to Ecuador for approval and orientation July 14, 1986 | Preparation of Quarterly Report #4 New Project Director Orientation at Devres, Washington, DC | Open office in Miami, FL with New Devres Project Director | New Project Director to travel to Ecuador for extensive planning and training to include: o trade contacts o publications o membership development strategies o systems implementation o evaluation criteria | -----> Preparation of Quarterly Report #5 | Preparation of workplan for 1987 |
| 2. TRADE MISSIONS | | | Trade missions for specific winter window commodities--exporter/customer contacts, on as needed basis | | | | |
| 3. TRADE FAIRS | Provide recommendations for participating in trade fairs for 1986-87 | Food Fancy Show, Devres Staff to participate, and provide recommendations New York | | Begin preparations for the UFFAVA convention and exhibition in Orlando, FL--February 1987 | Participate in FMA Trade Fair in San Antonio (no exhibit) | | |
| 4. INFORMATION SYSTEMS | Approval of design for product/customer database Implementation of request/response system | Investigate methods and trials for data transmission on-line; US-Ecuador-US | Implementation of Product/Customer database Collect and load data. on-going -----> | Project Director work with Fedexpor to develop: o regular newsletters and other service to members o on-line computer access o special mailings o special outreach to small scale and first-time exporters on-going -----> | | | |
| 5. INVESTMENT MISSIONS | | Identify potential investors, plan investment missions as investors are available | | | | | |
| 6. SEMINARS | | Technical assistance seminar--Snow pea agronomist, Louie Valenzuela | | FDA Seminar: Regulations in canning and food technology--Puerto Rico | Prepare for Seminar on Quality Control, Packaging, product standards, shipping for January, 1987 -----> | | |
| 7. COMMERCIALIZATION | Completion of AIMMA brochure Completion of additional commodity profiles Response to technical and trade inquiries (on-going) -----> | Revise and expand current commodity profiles, include information from field trials in Ecuador (on-going) | Assist in sales contacts and consumation of trade deals on-going -----> | | | | |
| 8. TRAINING | Locate and facilitate training programs (on-going) -----> | | | | | | |

3. Trade Fairs

a. Produce Marketing Association

Planning originally called for participation in the Produce Marketing Association Convention. This annual convention was scheduled for San Antonio, Texas. Due to budget constraints and lack of preparation, convention attendance was cancelled and efforts were redirected toward preparation for the United Fresh Fruit and Vegetable Association Convention in Orlando, Florida., February 1987.

b. Caribbean Basin Initiative Convention

The Caribbean Basin Initiative convention was attended by E.A. Villaseñor, Project Director, Giovanni de Choudens of USAID/Quito, Fernando Correa of FEDEXPOR, and several Ecuadorian producers and processors. Positive results of the three day meeting included:

- o The creation of a commercial relationship with Casera Foods, a Campbell Soup subsidiary which expressed an interest in purchasing Ecuadorian-produced raw materials for their canning operations;
- o Meetings with several potential investors such as Herbert Fiss of Groves Marketing, Bradenton, Florida. Mr. Fiss wants to offer a joint venture to an Ecuadorian producer of citrus fruit segments; and
- o Development of a working relationship with Dr. Noemi Diaz and the staff of the Agricultural Research Center of the University of Puerto Rico. This organization expresses a willingness to assist in the development of a modern canning/processing industry in Ecuador. Dr. Diaz and her staff will collaborate in the organization of an FDA canning seminar in Manta, Ecuador in November of this year.

4. Information System

a. Communication traffic and information flow

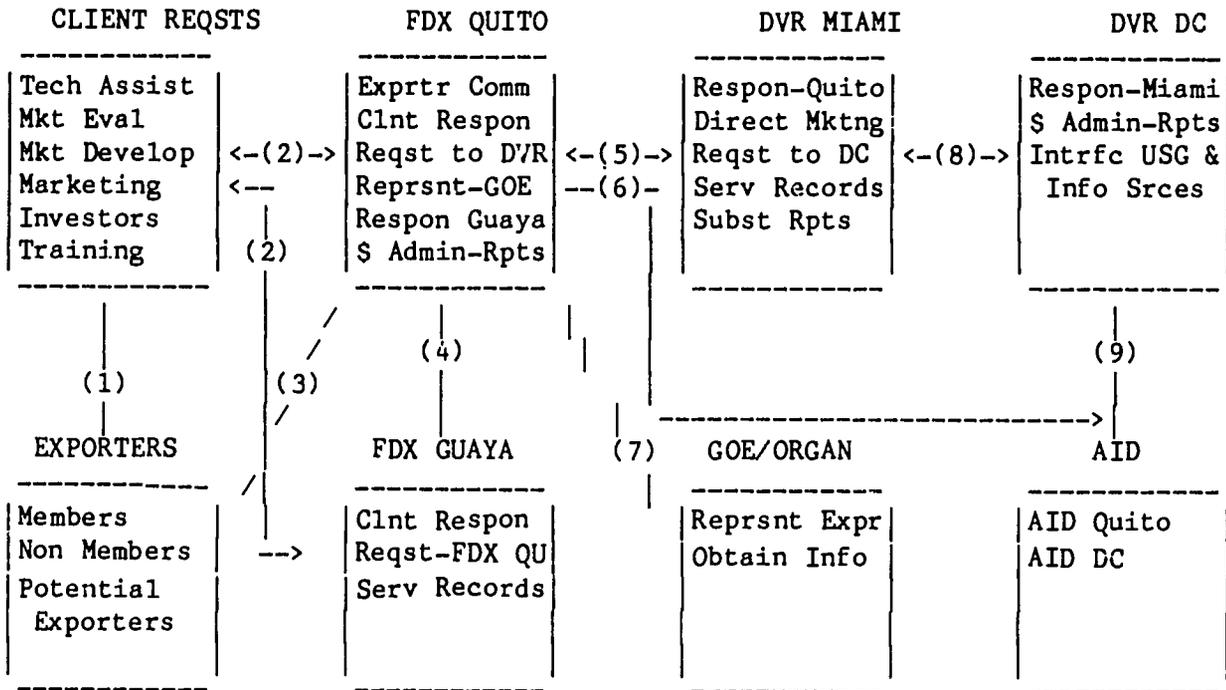
As a result of the move from Washington to Miami, a new information flow model and proposal for communication traffic between the various entities of the project was advanced. Paul Hoover, information systems specialist, proposed an information flow model and a communication traffic flow model which was implicitly accepted by all participants. (See TABLES III and IV.)

b. Data Transmission to Ecuador

Since the beginning of this semester, regular transmission of product prices and other market information has

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Table III: Information Flow Model



- (1) Exporters have information and assistance needs which generate specific
 (2) requests to FDX in both Quito and Guayaquil for:

Technical Assistance—production, processing, packing, equipment.
 Marketing—quality, standards, shipping, financing, regulations, negotiations, brokers, payment.
 Market Evaluation—profile, market study, prices, sources, competition.
 Market Development—trade fares, catalogs, samples, buyer identification, negotiation.
 (Product Development)—growing/production requirements, cost analysis, capital requirements, training/skill needs.
 Investors—joint ventures, technology transfer.
 Training—marketing, production, management, regulations, standards.

- (3) FDX Quito generates regular newsletters and bulletins to all or to groups of exporters which provide information and promote FDX services.
 (4) Voice and data communication between Quito and Guayaquil.
 (5) Voice, TELEX, and data communication between Quito and Miami.
 (6) FDX reports to AID.
 (7) FDX communication with GOE representing exporter interests and data from government agencies relevant to exporter's needs.
 (8) Voice and data communication between DVR Miami and DVR DC.
 (9) Devres reports to AID.

ECUADOR: NONTRADITIONAL AGRICULTURAL EXPORTS PROJECT

Table IV: Communication Traffic Flow

| FDX GUAYA | FDX QUITO | DVR MIAMI | DVR DC |
|---------------------|----------------------|----------------------|---------------|
| Service data --W--> | Support Rqsts --D--> | Support Rqsts --D--> | |
| Support Rqst --D--> | DB updates --W--> | Service Rpts --M--> | |
| | Service data --M--> | | Support Resps |
| | <--W-- DB updates | | Finan rpts |
| | <--D-- Support Resps | Expense Rpts --W--> | |
| | | Support Resps | |
| | | <--D-- DB updates | |
| | | <--W-- | DB updates |

Responsibility for maintaining DB's

| FDX GUAYA | FDX QUITO | DVR MIAMI | DVR DC |
|-----------------------|---|--|---|
| Guaya Serv Records | - Exporters Exprt Prods F Exprt Codes D Exprt Regs X Exprt Transp - Exprt Activity Ecu Consultants Client Serv Rcrds | Buyers/Brokers Prices/Quantity Import Regs Promotion Marketing Comm Records | US Consultants Equipment Profiles |

Distribution of Equipment/Software

| FDX GUAYA | FDX QUITO | DVR MIAMI | DVR DC |
|-----------------------------------|---|--------------------------------------|---|
| IBM XT 10M MODEM 160 c/s DM | IBM AT 52M IBM XT 10M 200 c/s DM MODEM (LQ printer \$1300) | (XT Comp 20M 160 c/s DM MODEM) | IBM PC + CORVUS MODEM DM & LQ (20M HD - \$450) |
| WRD PERF Rbase 5K XTalk | WRD PERF Rbase (Sys V \$ 90) XTalk EZLAN (Accting \$100-2000) | (WRD PERF Rbase 5K XTalk) | WRD PERF Rbase 5K XTalk |

continued on a weekly basis to Ecuador. This transmission has been accomplished through INFORDE, an organization which is located in the same building as FEDEXPOR. The absence of a dedicated telephone line has made direct transmission to FEDEXPOR offices prohibitive. Devres has made the recommendation that FEDEXPOR install a dedicated line for telecommunications.

c. Accounting System

The various accounting systems recommended to FEDEXPOR have not been purchased or installed to date.

d. Request/Response System

The request/response system (RRSYS) was completed and the first reports generated from this system. Although this reports proved to be very useful, the system has not become fully operational due to difficulties in inputting data into the system. Changes have been proposed to ameliorate this problem so that the system will be used.

e. Commodity profiles in Rbase

The proposal to transfer data from the commodity profiles to RBASE 5000 system V was tabled due to concerns for cost-effectiveness.

f. Product/Customer database

Information for the customer and product database is currently being loaded into a WordPerfect Library software program called Notebook. The difficulties which surfaced regarding inputting information into the RRSYS lead project staff to this alternative method for capturing data. A method for converting this information into RBASE data tables is currently under consideration, since Rbase has a much greater facility for manipulating data and generating reports.

5. Investment Missions

Contacts were made with the following firms:

- o Groves Marketing, Bradenton, Florida--Joint venture for the production of chilled citrus segments;
- o Casera Foods, Puerto Rico--Contract for production and purchase in Ecuador of raw materials (beans) for processing and canning in Ecuador;
- o Copex Trading, Idaho Falls, Idaho--Contact for possible investment and export of Ecuadorian potatoes to the

Caribbean. Investment mission was organized with Mr. Kosglow and partners of Copex, later cancelled due to lack of travel authorization; and

- o Kidder Peabody, Miami, Florida-General interest developed in Ecuadorian agribusiness.

6. Seminars

Devres collaborated with USAID/Quito and FEDEXPOR in planning for a conference on Food Processing to be held in Manta, Ecuador, in November, 1986. Arrangements were made to bring an FDA (Food and Drug Administration) official to Ecuador for the conference so that participants could receive approval for exporting. A team of professionals from the University of Puerto Rico was contacted for the Seminar on Food Processing.

The conference is expected to generate good publicity for FEDEXPOR as well as being a source of revenue for the Federation.

7. Commercialization

Ecuador, due to its location on the equator and its varied geography, has a wide range of micro-climates and soil types. This variety of agricultural environments will enable the country to produce many commodities "out of season" with their traditional markets, giving the Ecuadorian exporters a competitive advantage. The following is a brief outline of the work being done in specific commodity areas through the project. Activities range from profiles and studies through actual planting, shipping and marketing.

a. Angora Wool

We have determined that the Sierra in Ecuador is an ideal habitat for raising Angora rabbits. We have identified sources for technology and breeders with the appropriate strains. We contacted one of the leading authorities on the production of angora and he has agreed to furnish us with a report of his findings on a mission that is currently going on in China. China is the world's leading producer of this wool. After evaluating the report, production trials could be initiated. We have contacted several importers of Ecuadorian wool products, and they agree that the volume would expand rapidly if the producers included angora in their wool blends. We have identified markets on the East Coast and in the upper Midwest for these angora wool products, ranging from simple sweaters and coats to high fashion garments.

b. Aquaculture

Devres and Fedexpor recently sent Professor Michael Castagna of the School of Marine Science from William and Mary College to Guayaquil to do an evaluation of the potential for the culture

marine species other than shrimp. His report was not too favorable for clams and bivalves, but found that a commercial crab culture could be established. (See Annex 3 for more details.) Several producers in Guayaquil have indicated an interest in the professor's findings and we expect to see some work done soon.

c. Artichokes

This popular vegetable grows very well in the Sierra. Devres has done a product profile for the fresh artichoke market, in which a competitive "window:" exists. Producers have been identified and affiliated with Fedexpor. Fisher South America, a subsidiary of Fisher Bros. USA has agreed to provide some plants (which are difficult to obtain) to initiate plantings.

d. Asparagus

Extensive effort is being dedicated in this area. Our product profile indicates a very good "winter window" for fresh asparagus. Ecuador has the capability of producing asparagus year-round. A trip was made to Rutgers University to visit Professor J. Howard Ellison and the Rutgers tissue culture lab (See Annex II). Seed was returned to Ecuador and is currently being planted. At the same time, Fedexpor has organized an Asparagus Producers Association. This group has members with extensive production experience. Devres has made marketing contacts with wholesalers and retailers in Miami, Philadelphia, New York, Chicago and Toronto. These firms will distribute the asparagus once production is initiated. Devres also has a study underway to pave the way for the establishment of a freezing/canning operation to go along with the fresh exports. Devres has also made contact with representatives of an English firm, for the marketing and distribution of white asparagus. Professor Ellison is scheduled to make a visit to Ecuador sometime in March of 1987 to critique the plantings underway and provide further technical assistance.

e. Beans

A group has been organized in Cuenca to plant pink beans, pinto beans, kidney beans and small white beans. A relationship has been established with Casera Foods in Puerto Rico (a Campbell Foods subsidiary). These beans will be produced in Ecuador and shipped to Puerto Rico for processing in Casera labels, or processed directly in Ecuador and shipped to eastern markets under Casera's private labels. Contact has been made with Rogers Seed Company in Idaho for the exportation of hybrid varieties to Ecuador. Furthermore, Mr. Roald Waraas, Agriculture Director for the Campbell Soup Company has agreed to provide assistance in sourcing and planting the proper bean varieties for production trials in Ecuador.

f. Berries

f. Berries

Once again FEDEXPOR has organized a group of producers. This group, the Berry Producers Association, is located in Ambato and numbers 25 growers. They will produce blackberries and raspberries for export both fresh and processed. They have committees in place to handle production, processing, and marketing. Devres has sourced plants in the US, from both tissue culture and conventional nurseries. Devres has also identified technological assistance available from either Colorado State University or the University of Maryland. This assistance is scheduled for early 1987, once the plants are set. The profit potential, according to our product profiles, is excellent for these commodities.

g. Cardamon

Devres has assisted the cardamom producers with market information. Once production is firmly established, Devres will assist in creating marketing contacts or in actual trading of cardamom through spice brokers and remanufacturers.

h. Flowers

Ecuador has a rapidly expanding flower industry. The climate and geography of the Sierra are ideal for the production of roses, carnations, chrysanthemums, pom-poms, statys and other fresh cut flowers. As exports have increased, so have the problems encountered in transportation, marketing and distribution. The flower exporters claim that; the airlines are not properly handling their product, giving preference to bigger producers, often leaving Ecuadorian flowers outside, away from protective refrigeration; the coolers handling Ecuadorian flowers are too small, often giving preferential treatment to more important customers; transfer services are poor, with the flowers not being transferred rapidly and often incorrectly documented; the exporters are not confident with their commercial relationships, they feel that they are not getting fair returns from the brokers and would like some assistance in obtaining better results; often there is no proof for discounts and damage claims; price information is slow and inaccurate; finally, Ecuadorians have been approached by agents in the US looking for flowers to sell, but the Ecuadorians have no means to value the importing firm.

In response to the needs expressed above, Devres' Miami office has offered to provide the following services to the flower exporters:

1. Accurate price information from official and unofficial sources transmitted via data link to Ecuador.
2. Accurate description of marketing conditions and trends transmitted to Ecuador via data link on a daily basis.

3. Assistance in the expediting and handling of incoming shipments to assure that the flowers are being promptly cleared and efficiently transferred.
4. Possible assistance in actually preparing documents for clearance: For example, entering all incoming shipments from one plane on one set of documents incurring one cost instead of having many sets, each creating a separate expense.
5. Providing representative membership for the exporters through the Miami office in the Association of Flower Importers.
6. Providing subscriptions to trade publications such as Floral and Nursery Times and Flower News, sending copies to Ecuador via pouch on a regular basis.
7. Assisting when necessary in collecting account sales liquidations from importers. Providing service in depositing these funds if requested.
8. Providing quality control information and the relative position of Ecuadorian flowers in the market.
9. Begin the analysis and preparation for a full-scale receiving-marketing-shipping operation.
10. Promotion of flowers from Ecuador to include assistance at trade fairs, publicity in trade publications, etc.

i. Garlic

There is a group of producers in the Ambato area that will be sending samples in November for marketing in the US. They have a production of 30 metric tons per month. Devres has already provided the group with market information and import requirements.

j. Ginger

Devres has recently sent Mr. E.S. Minnifee, a Jamaican ginger producer and agricultural extension agent, to Ecuador. Mr. Minnifee spent ten days in Ecuador visiting growers and furnishing technical assistance for the establishment of a ginger-exporting industry. The trip was successful, and as a result there are new plantings of ginger on the coast, which will be harvested sometime in 1987. (See Annex 1.) Preliminary contacts have been made with Eastern

distributors, such as Prevor Marketing, USA Trading and the Auerbach Co.

k. Honeydews

During the 1985-1986 "winter window" Devres provided technical and marketing expertise for Ecuadorian honeydew producers. Exports totalled 250,000 cartons, which were shipped primarily to eastern ports. Devres brokered a marketing agreement between Cal-Fruit Summa and Agrifim. This year Devres assisted in the marketing agreement made by Agrifim with Dole Fruit Co., a Castle & Cooke subsidiary. Shipments are underway, and the prices being received for Ecuadorian melons currently in the New York terminal market range from \$12.00 to \$13.00, a very profitable figure. Several other groups have asked Devres to assist in marketing. They will be initiating exports within the coming weeks. Receivers such as Prevor Marketing, D'Arrigo Bros. and Jacobsen Produce in New York, Mutual Brokers in Toronto and C.H. Robinson Co. of Minneapolis, to name a few, are ready to purchase this production when it comes to market. Devres has contacted these buyers, all firms with long-standing reputations, and they are ready to receive product.

l. Mushrooms

A canning group through Fedexpor has requested information regarding the feasibility of constructing a mushroom canning operation in the Sierra. Devres is currently offering a proposal for a prefeasibility study.

m. Okra

The 1985-1986 season saw the first shipments of okra to the United States. Devres provided technical production and marketing assistance. This year the acreage is up from 5 Ha. to 45 Ha. The production will be marketed directly by the Devres Miami office, offering product to Jacobson Produce in New York and FG Lister Co. in Toronto. Packages shipped last year amounted to about 5,000 crates. This year the volume should approach 40,000 crates.

n. Pigeon Peas

Known in many under-developed countries as the "plant that always produces a crop", pigeon peas are being successfully grown in Ecuador. A test planting was made earlier this year in Portoviejo through the collaboration of Devres, Fedexpor and USAID/Quito. The results were extremely encouraging, in spite of being a first effort. The yields achieved were excellent, and the production costs very competitive. Pigeon peas will again be planted in Portoviejo this season. In addition, there will be test plantings in the Yungilla Valley near Cuenca. More importantly, however, Devres has made the necessary marketing contacts to assure that these peas will have a market when brought into full production. Casera Foods in Puerto Rico

has expressed an interest in a joint venture enterprise with the Ecuadorian producers. Casera could use up to 200,000 cases of canned pigeon peas annually. There also exists an active market for these peas in frozen form. There are various other potential customers for this production, such as Goya in Puerto Rico.

o. Pineapple

Devres assisted Frutex, an Ecuadorian producer in the marketing and distribution of fresh pineapple during the 1985-1986 season. The pineapples were sold through Kendall in Florida, Publix in Florida, and Prevor in New York. Results ranged from excellent to poor. This variance was due to the irregularity of supervision at shipping point. Devres has consulted several times with Ecuadorian producers, visiting the plantations and discussing the pineapple business. This year Ecuadorian pineapples from two producers will be marketed by Devres in the US. The fruit will be both air-shipped ("jet-fresh") and ocean-freighted. One firm will be shipping the native Ecuadorian fruit, which is white-fleshed, while the other will be shipping both the native fruit and a Hawaiian smooth Cayenne variety. The shippers already have cartons in inventory for export. Devres will market this production with various wholesalers, jobbers and retailers to include Prevor Marketing, D'Arrigo Bros., Goode Brand, Quaker City Produce, Mutual Brokers, Tavilla Marketing, J.R. Freni, Malone and Hyde to name a few. Ecuadorian pineapple, when properly produced and handled, is of very high quality, having a high sugar-acid ratio along with a long shelf life.

p. Potatoes

Although potatoes are a traditional commodity in Ecuador, they are not traditionally exported. Devres has established a relationship with a firm that has marketing and distribution potential in the Caribbean. Samples were sent to a buyer in Trinidad, and were very well received. Currently Devres is assisting the Ecuadorian producers in obtaining competitive transportation to the Caribbean. The potential market in the Caribbean is from 20,000 to 50,000 tons annually based on current marketing contacts. These same marketing contacts have expressed an interest in the European market, which does not have fresh potatoes in the months of June, July and August.

q. Quinoa

This product is a grain native to the Andes and produced nowhere else. Quinoa is very high in protein and certain essential amino acids. Marketing relationships are being established with Quinoa Corp. and Arrowhead Mills for sale and distribution of Ecuadorian quinoa. Ecuador produces a bitter variety, which must be washed to remove the "sapolina" before being sold. There is, however, some seed available of the sweeter Bolivian variety, which is now being planted. This should give enough seed to produce a commercial crop the next

growing season. Fedexpor has organized two production groups which are receiving technical and marketing assistance through the project.

r. Snow Peas

Snow peas were one of the first commodities identified as having a competitive market and good production potential. Devres has provided technical and production assistance from both California and Guatemala. Mr. Luis Valenzuela, with extensive experience in California, visited Ecuador and gave technical assistance. Based on his report, trial plantings were made, which were later critiqued by Mr. Ted Elsasser, a prominent Guatemalan producer. As a result of these efforts, a group of producers has been organized, plantings have been made, and exports will be underway starting Nov. 26th. Devres will assist in marketing the production, amounting to approximately 1000

10 lbs. cartons per week to clients on the East Coast and Canada. Due to APHIS restrictions, this product must be sold in the northern tier of states, somewhat limiting the market. A sample shipment was made to New York and the product arrived in good condition. The shippers in Ecuador have received their cartons, "Galapagos" brand, so all is ready for the winter season.

s. Strawberries

Ecuador experienced a "boom" and then a "bust" in the strawberry business. As a result of Israeli technology over 200 Ha. of strawberries were planted and a very large and modern freezing/processing plant was constructed. There seem to be however, grave production problems with strawberries. The varieties imported by the Israelis have not done well since they were developed more for a desert climate than the cool Ecuadorian climate. Also, the irrigation system sold by the Israelis (aspersion), does not work well. Devres and Fedexpor are attempting a reorganization of the strawberry producers and will solicit technical assistance from California through UC Davis and private sector sources. E.A. Villasenor, Devres Project Director has extensive experience in strawberry production in marketing from both Mexico and California. Strawberries, once the production problems are resolved and the right varieties planted, should be one of the most profitable crops in Ecuador.

The Ecuador project is now at a point where research and theory are becoming practice and reality. Development of these selected commodity areas is now under way in the field, not in the board room. Devres developmental and marketing skills, combined with USAID/Quito funding and support, are creating new export business activities in Ecuador.

III. PLANS FOR THE NEXT SEMESTER (November, 1986 to April 1987)

A. General

Devres is in the process of preparing an amendment to the project budget to allow for adjustments in line items beyond the 15 percent limitation. Devres has been very responsive to AID/Quito requests for adjustments in work activities. The result in budget terms is much heavier spending in the area of Other Direct Costs, and reduced spending for subcontractors, than originally anticipated.

B. Task Related Activities

1. Planning

A Plan of Action for the first 6 months of 1987 is included in this report (See TABLE V.) Major activities will be in the areas of Trade Fairs (UFF&VA in Orlando, February) and intensified commercialization efforts.

2. Trade missions

A Trade Mission is anticipated in conjunction with the United Fresh Fruit and Vegetable Association Exhibition and Trade Fair in Orlando in February.

No other specific Trade Fairs are planned at this time, though project staff remain available on an as needed basis to conduct trade missions elsewhere.

3. Trade fairs

Plans are progressing for FEDEXPOR to be an exhibitor at the United Fresh Fruit and Vegetable Association Exhibition and Convention in Orlando, Florida February 14-18, 1987. The FEDEXPOR booth is expected to be constructed in Ecuador of Ecuadorian hardwoods which will enhance the display of fresh and processed fruit and vegetable export products.

In addition, plans for participation in the Produce Marketing Association Convention will be initiated during the next semester. This major trade fair will take place in Anaheim, California during the month of October, 1987.

4. Information system

Efforts will continue to compile data for product and customer databases.

EQUADOR NONTRADITIONAL AGRICULTURAL EXPORTS PROJECT

Table IV: PLAN OF ACTION — JANUARY TO JUNE OF 1987

| | JANUARY | FEBRUARY | MARCH | APRIL | MAY | JUNE |
|-----------------------------|--|---|---|--|-----------------------------------|---|
| PLANNING/ ADMINISTRATION | Interview secretaries Submit budget amendment Assessment of project deliverables Resolve Miami costs with AID-FEDEXPOR Monthly Product status development report | | | Project Director to Ecuador | Preparation of Semi-annual report | |
| TRADE MISSIONS | Exporter/customer contacts on an as needed basis | Organize trading contacts concurrent with UFF&VA convention | | | | |
| TRADE FAIRS | Continuation planning for UFF&VA convention in Orlando, FL | Attend exhibit at UFF&VA convention | Follow-up results of convention activity and trade contacts | | | Plan attendance/exhibit at FMA convection for October |
| INFORMATION SYSTEMS | Pronet) Flower prices) | (data transmission) (data transmission) | | | | |
| | Implementation of RRSYS (redesign of inputting procedures) | Initiate customer and product databases | | Information system evaluation Devres, AID, FEDEXPOR in Quito | | |
| SEMINARS | Prepare technical assistance for Asparagus and berries | | Technical assistance in the field | Evaluation of Technical Assistance Reports | | |
| COMMERCIALIZATION | Assist in sales contacts and consumation of trade deals | (on-going) | | | | |
| | Identify/ analyze current US/ Ecuador trading relationships | (on-going) | | | | |
| INVESTMENT MISSIONS | Continued work in identification of investors | (on-going) | | | | |
| TRAINING | Locate and facilitate training programs | (on-going) | | | | |

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An integrated Export Marketing Information System will be established in Ecuador by Mid 1987.

Continued implementation of RRSYS (request/response system) is projected through the next six months with increased utilization at FEDEXPOR offices in Quito and Guayaquil.

5. Investment missions

Investment missions will be organized and consummated at approval of USAID/Quito. Areas of potential investment include the following:

- o Strawberry processing;
- o IQF freezing facilities; and
- o Asparagus production.

6. Seminars

Preparation for the Processed Food Seminar will be concluded at the beginning of this semester. Devres will assist in coordinating US logistics for the Manta Conference.

7. Commercialization

The following activities will be realized during the next six months of the Project:

- o Continue sending daily produce prices to Ecuador via modem;
- o Continue product development and marketing strategies (see above)
- o Continue rapid response to requests from FEDEXPOR;
- o Intensify marketing efforts for products;
- o Assist FEDEXPOR in conducting a major membership drive;
- o Continue Training of FEDEXPOR/Devres Liaison; and
- o Follow-up on contacts with potential buyers and investors.

IV. PLANS TO THE END OF THE PROJECT

The following table and figure (See TABLE VI and FIGURE II) summarizes the level of effort expected, broken out by generic task or function to the end of the project. The level of effort expected to the end of the project is based on experience to date. One will note from the graph that project years one, two and three follow a similar pattern. There has been some shift in level of effort due to impact of budget constraints on overall resources. However, this will have little impact on the whole.

The following project deliverables are not expected to be realized due to a mutually-agreed-upon shifting in priorities by USAID/Quito, FEDEXPOR, and Devres:

1. Export Market profiles.

No further profiles are planned for the remainder of the project beyond the current 27 profiles. Updates and revisions will be performed on an as needed basis where practical and cost-effective.

2. Trade Missions to the US.

The 27 trade missions to the US is an optimistically high figure. Costs incurred by the Ecuadorian exporters have escalated to the point of placing severe limitations on achieving this goal.

3. Investor and Buyer missions to Ecuador

Total of proposed investor/buyer missions are not expected to be realized. Investor contacts have been made which could have led to investment missions. However, plans were cancelled due to cost constraints.

4. Cost recovery procedures for FEDEXPOR

Revenues generated by the Miami office are expected to fulfill this objective.

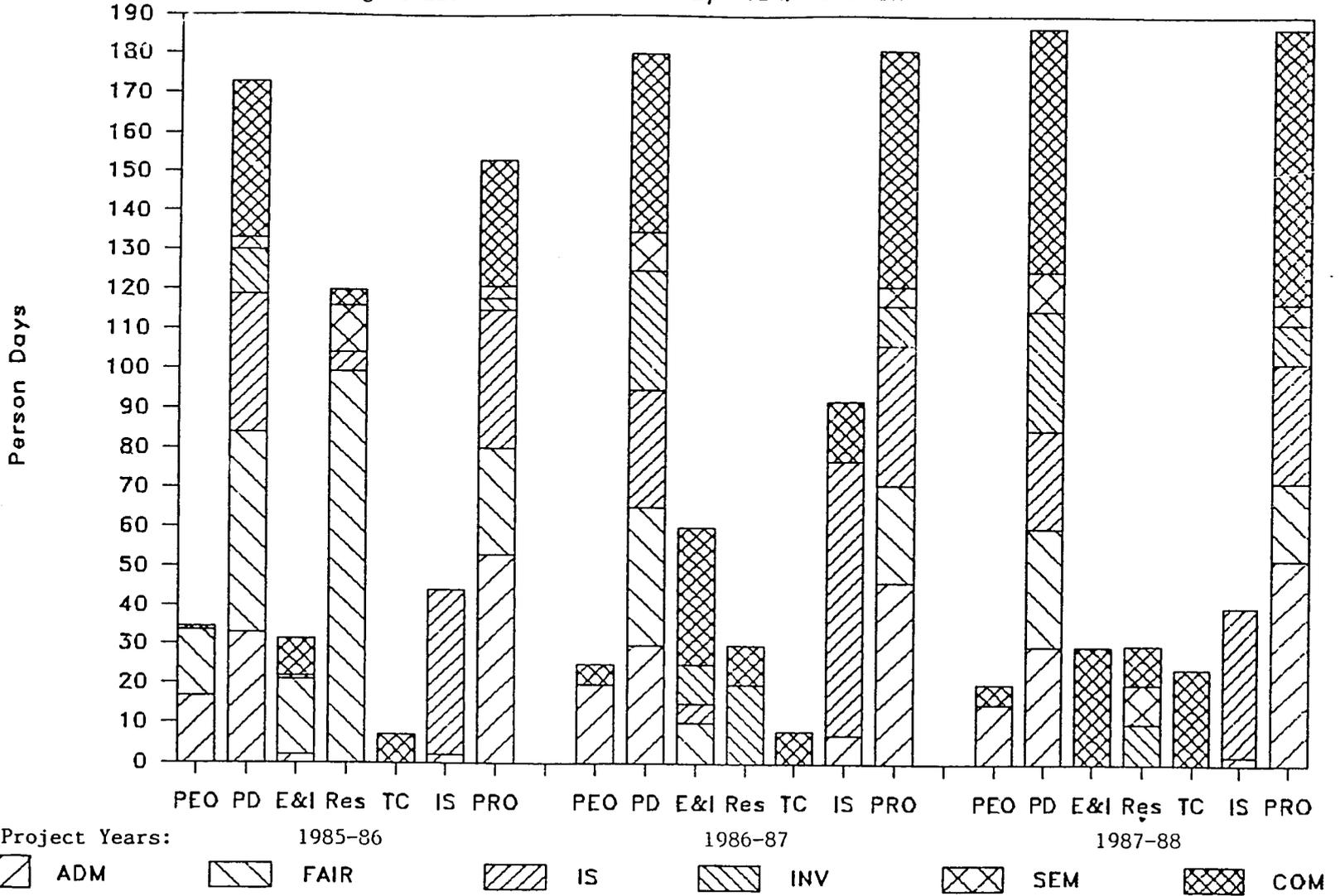
5. Computerized database

Database input and management have been proceeding at a rate slower than anticipated. However, a more useful, user-friendly, targeted and focused database is being created which should serve the needs of FEDEXPOR effectively.

ECUADOR NONTRADITIONAL EXPORTS PROJECT

Figure II: Level of Effort by Task/Function

- KEY**
- ADM = Administrative
 - FAIR = Trade Fairs & Trade Missions
 - IS = Information Systems
 - INV = Investment Missions
 - SEM = Seminars
 - COM = Commercialization
-
- PEO = Project Executive Officer
 - PD = Project Director
 - E&I = Export and Investment Group
 - RES = Resource Group
 - TC = Trade Consortium
 - IS = Information Systems Specialist
 - PRO = Project Research Officer



ANNEX I

Report of Ginger Production Specialist
Assessing Production Potential in Ecuador

TO WHOM IT MAY CONCERN

I am pleased to present the following report as a Ginger Specialist from the findings on my recent visit to the Republic of Ecuador.

I meet and visited Farms and Farmers in the Santo Domingo, Esmeraldas and Quevedo areas. They were very enthusiastic and keen farmers. The country is lacking Agricultural Extension service and so each farmers has to depend on his own initiative and what he gleans from the very little literature^{AVAILABLE} internationally.

The soil is of the Sandy Loam type, easily prepared and is well drained. It goes to a very deep depth and is very rich in organic matter. The Rainfall is adequate, and because of the light nature of the soil mulching will have to be practised. Bagasse, grass, wood shaving and sawdust can be used. The latter two are very difficult to break down and should be avoided if possible. Mulching will also assist in weed control.

The Ph of th areas varies between 6-7 and is ideal for the cultivation of ginger. Ginger likes a heavy application of organic manure and so chicken droppings which I understand is in abundance supply is ideal for the crop.

A work shop was held, and practical demonstrations on planting techniques, peeling and drying, and washed split and drying.

I have meet two practising ginger farmers and their total production for 1986-87 should be about 50,000 lbs. . Both farms produce the same quality ginger, which was most likely originated in the Christiana Hills of Jamaica. It is less pungent than what is produced in Jamaica. Because of its thickness it is very difficult to dry and is usually sold as fresh green ginger. They are the Royal Blue and the Jamaican Yellow ginger.

FARM NO. 1:

The quality and yield on this farm was of a very high standard. It was much larger than what is produced in Jamaica when the ginger was peeled and dried the result was very dissappointing. One reason is that it was not fully matured. For the dry ginger market and for planting material it was harvested about 60 days too early. The quality when dried resembles the Jamaican peeled, washed and dried ratoon ginger. Ginger of this quality is graded 3rd. on the London Ginger market and fetbhes a lower price.

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V. PENDING ISSUES

1. Operating Budget for Miami Office

Miami office expenses will run in excess of 2,000 US dollars per month.¹ In agreement with USAID/Quito, FEDEXPOR and Devres, these expenses are to be covered by FEDEXPOR. However, no facility has yet been established to cover these expenses on a regular basis. If the Miami office is to remain open, some mechanism must be established to cover monthly costs.

2. Budget amendment

A budget amendment will be submitted early next semester. The two primary reasons for the proposed changes are increased personnel, equipment and materials costs associated with opening the Miami office, and increases in indirect costs. Other Direct Costs have increased in the contract beyond the 15% limitation. However, total budgeted costs have not changed. Prompt review and approval will be requested so that no delays in achievement of project goals will be necessary.

¹A breakdown of expenses is as follows:

| | |
|--|----------------|
| Rent and Utilities | 300.00 |
| Telephone equipment lease | 135.00 |
| Long Distance Telephone--Domestic | 400.00 |
| Telex | 300.00 |
| Telephone--Basic Charges | 300.00 |
| Long Distance Telephone--International | 700.00 |
| Subtotal | <u>2135.00</u> |
| FEDEXPOR share @ 80% | 1708.00 |
| | ===== |

This ginger is ideal for the fresh ginger market. The use of Nemateside, insecticide and pesticides were absent. Field Sanitation was poor and this will impede good harvesting. Planting distance, depth and position was not observed neither was inter tillage. Mulching was done. Irrigation was not necessary, but the facilities were available. All these faults were pointed out to the farmer and practical demonstrations were done. This farmer exported ginger the previous year and lost on the deal and this is probably why he went lax in his techniques.

FARM No. 2:

This farmer made similar mistakes as Farmer No. 1 He started inter-tillage too late. Irrigation was done, but was kept on too late. Field sanitation was poor, the sets were placed too far apart and mulching was not practised. The plants were very exposed.

On both farms I have observed that land preparation was well done.

If proper cultural and agronomic practices are observed I have no reservation in saying that the planting of ginger could prove to be a ^A ~~available~~ project in the Republic of Ecuador.

The following are recommendations that I have made.

RECOMMENDATIONS:

- (1) The 1986-87 Ginger crop in Ecuador is estimated to be about 50,000 lbs. The remainder to be reaped can be purchased and distributed to interested farmers.
- (2) Ginger that has been reaped already will not be suitable for planting material because they were not fully matured.
- (3) The importation of 5,000 lbs. of Jamaican ginger to plant two Hectares. The return crop can be used as peeled dry ginger.
- (4) The Importation of 6,250 lbs. of Hawaiian Ginger (Lenggong Petak) to plant two hectares for the fresh market.
- (5) The introduction of the use of ginger on the local market i.e. Ginger Beer, Ginger Ale, Ginger Tea, Ginger Bun, Ginger cake, Ginger wine, Ginger Licquer, Ginger sweets and the use of Ginger in the preparation of food.
- (6) Markets should be sought in N. America E.E.C. other European countries and Saudia Arabia for possible markets for concentrated Ginger Juice, powdered ginger, peeled dry ginger washed and split dry ginger, fresh washed green ginger.
- (7) The introduction of farm demonstration plots for the transfer of production technology.
- (8) Washed peeled and washed split ginger can be successfully dried in the plants used for the drying of Cardiman

- (9) Ginger can be used to intercrop Cardiman and Palm for about Three years. This will assist in the proper control of weeds.
- (10) Because of the regular fluctation in price and demand very large acreages should be avoided unless guranteed markets are available.
- (11) If the market colapses for a period the plant can remain in the soil. Weeding, fertilising and moulding will be necessary. This will be a ratoon ginger and the quality will not be of a high standard.
- (12) Specialist Supervision Should Be Available For The First Year Of Production In:-
 - (a) Planting and Fertilising Techniques.
 - (b) Intercropping Techniques and Fertilising.
 - (c) Harvesting and Preparation for market.

E. S. Manoj

ANNEX II

Report on Trade Mission to New York on Asparagus

REPORT ON TRADE MISSION TO NEW YORK ON ASPARAGUS

On September 12-13, a trade mission was conducted on Asparagus Breeding with Professor J. Howard Ellison, Ph.D. of Rutgers University. Professor Ellison has worked in this capacity at Rutgers, the State University of New Jersey, for 33 years. His main expertise is in the selection of varieties for propagation. He is expert in production, and knows all the parameters involved in successfully producing asparagus on a commercial basis. His work has taken him around the world, where he has seen asparagus cultivars under varied conditions.

Participating in this Trade Mission were Remigio Davalos and Dr. Jaime Vergara from Quito, and Alfredo Rodriguez and German Orazaba from Guayaquil. These are part of the group of producers now in Ecuador who want to initiate an asparagus export business.

Professor Ellison said that the best conditions for growing asparagus are those in which there is a generally temperate climate, one in which the temperature does not go to high extremes. Asparagus does not require a lot of moisture, but under the conditions found in the Sierra it would probably have to be irrigated. Asparagus grows best on light, sandy, well-drained soils. The drainage, he said, is

critical, for asparagus does not like to "have its feet wet". Too much moisture in the root system fosters disease, particularly a very destructive form of fusarium specific to asparagus. Asparagus is not daylight sensitive, but prospers under conditions where it receives a lot of sun. Asparagus is a fern, with a large, tuberous extensive root system. The root system stores nutrients and energy synthesized by the leaves of the fern. When the fern is cut to ground level just above the crown, the plant produces a spear right away. This spear is harvested and shipped. The plant will continue to produce spears as long as the root system has the energy to do so. It is important to time the cuttings so that the overall health of the plant is not damaged by over stressing the root system. In other climates, asparagus is harvested once a year, generally in the spring and early summer. The root system is then allowed to rest, and generally will go dormant in the winter. In Ecuador, however, due to the peculiar weather, Professor Ellison believes that asparagus can be harvested year-round. The plants would be harvested for a period of two to four weeks, and then allowed to rest for five months, whereupon the harvest would commence again. This work could be staged so that there would be a constant harvest of product for commercialization in either fresh, frozen or canned form. The commercial potential is excellent.

In the afternoon Professor Ellison took us on a tour of several experimental blocks under study, explaining the reproduction of the plant and its particular characteristics. He demonstrated some clones that have shown production potential far above what is now being

commercially grown. He also explained to the growers that it was a bad practice to fumigate soils prior to asparagus planting, because the fumigation killed all other flora and fauna present in the soil, making less competition for fusarium. At that point Professor Ellison went into detail on the diseases and pests particular to asparagus, and the usual treatment for their control.

After touring the experimental blocks, we were taken back to Blake Hall and introduced to Dr. Chen, a colleague of Professor Ellison, who specializes in tissue culture (meristematic reproduction). He is using these cloning techniques to propagate potentially productive examples for testing on a more rapid basis. He demonstrated the cloning techniques in his lab and detailed what would be required to start such a lab in Ecuador. The cost of the equipment is approx. \$50,000. The work is extremely labor intensive, and would require one college trained manager with a degree in tissue culture to operate. The consensus of the two professors was that a commercial venture could be started right away utilizing current commercial varieties. From a large population of plants the sturdiest most productive specimens would be selected and these would be reproduced meristematically. Over a period of time this would result in the establishment of clones particularly well suited to their growing conditions. At first they would be willing to work with and train Ecuadorians in the tissue culture techniques. There could be agreements worked out with the University for the establishment of "working agreements".

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On Friday, September 12, we traveled to Rutgers, picked up the Professor and proceeded to south Jersey, near Elmer, where we met the Walker Brothers. They are commercial farmers and shippers and close friends of the Professor. They took us to one of their asparagus fields. This field was planted in a Rutgers-developed variety, Jersey Giant. The Walker brothers explained their general farming techniques to the visitors, space between plantings, materials applied for insect and pest control, labor needs, etc. From there the Professor took the delegation to another experimental farm where he demonstrated the effects of poor weed control and excessive fusarium on asparagus cultivars. Once back at Rutgers that evening he furnished us with some materials for planting and comparing varieties. Messrs. Vergara and Davalos each bought one pound each of two different varieties, enough to plant one acre of each variety apiece. They also took samples of 100 seeds each of six other varieties for field tests.

In conclusion, after discussing the production requirements of asparagus with the Professor and comparing them to the conditions available in Ecuador it seems that Ecuador should be a logical site for the establishment of an asparagus industry. It was suggested that arrangements be made to have Professor Ellison visit Ecuador as soon as possible to assess the particular conditions of each prospective production zone and make recommendations as to the proper varieties and growing techniques for each zone. Devres will write Professor Ellison and follow up the activities of the producers in Ecuador.

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ANNEX III

Report of Trip to Ecuador to Evaluate
Possibility of Mollusk Culture in Shrimp Farms

REPORT OF TRIP TO ECUADOR TO EVALUATE POSSIBILITY OF MOLLUSK CULTURE IN SHRIMP FARMS.

Itinerary

- 10/2/86 Left office at 12:30 P.M. and drove to Norfolk Airport. Flew to D.C. for briefing with Tim Yeaney and then to State Plaza Hotel at 9:30 P.M.
- 10/3/86 Flew from D.C. to Miami to Guayaquil to Quita, Ecuador where I was met by E. C. Villas Senior III.
Had dinner and further briefing at the hotel.
- 10/4/86 Flew to Guayaquil the next morning for a meeting with group of shrimp growers and Fed ExPor personnel. Discussed generally how mollusk culture was done. A schedule was then established for visits and appointments with the industry. About 12 to 15 people attended the meeting (Senior Villas has list).
- 10/5/86 Met with Carlos Casal W president of "Capasa" at 7:30 and drove 200 KM to his farm. This farm is in a wet tropical district. Miles of banana and cocoa trees along the road to the farm. He sometimes has problems from the pesticide spray on the fruit plantations running off in his Estero. He has 247 hectares of ponds which range in size from 1.8 to 35 hectares. The ponds range from 1 to 1.5 M deep. He has about 20-23 employees. He was building some new levees to reduce the size of his two largest ponds down to 17 hectares. Smaller ponds can be better controlled and give better yields per hectare. Water is pumped from the Chaguana river which has low salinity during the wet season. Plans are being made to take water from another nearby

river to ameliorate the salinity problem. The ponds on this farm are loaded with minnows, Talapia, grass shrimp, and a portunid crab that looks identical to the Maryland blue crab Callinectes sapidus. This crab is utilized and sold as Hiba. I suggested that a trap fishery for this species would be ideal. It is a shrimp predator so should be removed and it could yield some profit. Since there is an excellent U.S. market for the picked meat, it has export potential. The salinity regime of this farm runs from 43 o/oo in the dry season to 0 o/oo in the wet season, which often stays for weeks at a time. I know of no commercially useful species that can survive here. I found no evidence of native mollusks in the ponds, reservoir or canals. To summarize, this is a well-run shrimp farm, obviously turning an excellent profit, but with no potential for mollusk culture. However, there is excellent potential and need for a blue crab fishery.

10/6/86

Met with Juan Gonzalez and Lois Placa (sp?) and Ronnie Dunn, Sr. Roberto, Carlos Casal (and one or two others) for trip to Culdemar shrimp farm at 0800. Drove 150 KM to the farm. This farm was in an arid area. It contains 247 hectares of ponds. I was told by more than one shrimp grower that this was probably the best shrimp farm in the area. This area had mangrove oysters in great number along the Estero, heavy sets of small mussels Mytilus sp. throughout the area, and heavy set of a short razor clam similar to Tagelus plebeius in the reservoir. Again found a good population of large-sized blue crabs. Salinities here were remarkably variable, peaking to

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55 o/oo. This was a good trip since we all sat down and compared problems and discussed the ecology of shrimp ponds and the best way to solve some of the predator problems. Met with the owners for dinner and summarized some of the findings. This farm has some potential for raising salinity tolerant species such as oysters in the reservoir.

10/7/86 Went to the National Institute of Fisheries, accompanied by Lois Placa from "Culdemar", Lincoln Peredes and Judy Cardenas from Fed ExPor. We met with Doctor Maria del Bano. She is a fisheries biologist who works with mollusks. She had an excellent shell collection of the local mollusks. Most of the best species apparently come from farther down the delta where there is less salinity and temperature fluctuations. After a discussion of the species, it was apparent that most would not be commercially viable due to the size or species. We agreed that none of the small mussels and clams were worthy of consideration, and the blood clams were not exportable to the U.S. We agreed that only the scallop Argopecten circularis and two species of oysters had commercial potential. Had dinner that evening with Juan Gonzalez, of "Culdemar", where we further discussed mollusk farming and blue crab fishing.

10/8/86 Met at 7:30 with Dr. Bruce Sharpstein who is part of Larifica, a hatchery for shrimp that is part of Carlos and Gabriel Perez's shrimp farm "Langomorro Cia Ltd". This is somehow part of Blue Point Co. of N.Y. This is the largest farm I visited with about 300 hectares but will be enlarging. They have one farm on

Mondragon Island and one on Emporia Island. The combined totals will be about 1000 hectares. Saw about the same fauna as the previous farm. This farm has better potential because of the more constant salinity and temperature regimes. After visiting the farm we returned and met with the Perez brothers. Then had a meeting with Lincoln Peredes to reconcile my schedule. Had dinner with Gabriel Perez and Sharpstein to discuss the potential for oysters at their farm. This farm could grow oysters in the reservoir but not scallops due to the wet season salinity lows.

10/9/86

Met with Senor Placa at Fed Expor office. He owns land for a farm on Rio La Juntas. He has not started any of his ponds and had no data regarding salinity, temperature, etc. We discussed some of our observations from the Culdemar farm that is located near his area.

Later in the afternoon I flew to Quito for a meeting with Fernando Correa Ponce of Fed ExPor. We had a thorough discussion of my observations and suggestions.

10/10/86

Spent this day reviewing notes and writing a report.

Observations

Shrimp farms in this area are very efficient, averaging 2.86 crops per year. The ponds have a wide fluctuation in salinity and generally relatively high temperatures. The substrate of most of the ponds I observed had a high clay content and often an accumulation of H_2SO_4 . Neither of these conditions is good for mollusks. The associated fauna including predators was high but not too varied. The water was obviously rich in phytoplankton.

Possible culture with mollusks

Polyculture within the shrimp ponds would not be practical even if the physical parameters were optimum, which they are not. I know of no commercial mollusk which grows to a marketable size at the rate of shrimp. The multiple harvests and the drying of the ponds in between crops preclude mollusk culture. However, in some cases it would be possible to use the reservoir. The high pumping rates, often at high tide, should furnish adequate food for grow out of intensively cultured mollusks. Some of the farms have too low a salinity for too long a period. Candidate species and the grow out density of each species will need to be explored. Off-bottom culture may be needed because of the clay substrates.

Mollusk farming in general

Aside from attempting mollusk culture in this estuary in conjunction with shrimp farming, there appears to be good potential nearer the mouth of this delta and along the coast. This too should be explored. The species I looked at were apparently fast growing. Especially the oysters and scallops appeared promising.

Miscellaneous

All the shrimp farms had a high population of blue crabs, a portunid crab that appeared to be either the same or similar to Callinectes sapidus. This could and should be exploited. A fishery using traps should be started and small picking plants established. The hand-picked meats could be marketed through existing distributors such as the Handy Co., Crisfield, Md. At a later date crab shedding could be introduced to furnish soft crabs to U.S. markets in the winter when they are not available.

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