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POSTHARVEST INSTITUTE FOR PERISHABLES

ACTIVITIES REPORT

Postharvest Institute for Perishables
University of Idaho
Moscow, Idaho 83843

Cooperative Agreement AID/DAN-1323-A-00-5093-00

October 1, 1986 to September 30, 1987

University of Idaho

in cooperation with
United States Agency for
International Development

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Prepared for the

United States Agency for International Development

Harvey C. Neese, Acting Director

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EXECUTIVE SUMMARY

The purpose of the Cooperative Agreement between the University of Idaho and the U.S. Agency for International Development (USAID) is to increase the Postharvest Institute for Perishables' (PIP) resource base and collaboration with U.S. and LDC institutions, and to conserve postharvest perishables by improving LDC systems and strengthening their institutions and staff.

Through adaptive research, technical assistance, training, and an information center, PIP is able to implement programs towards these goals.

ADAPTIVE RESEARCH PROGRAM

Shrinkwrap: PIP has sponsored several tests on the use of shrinkwrap or filmwrap on individual tropical fruits to destroy insect eggs and larvae in the fruit. More testing is required to determine the viability of this method as an alternative to the hot-water bath treatment or irradiation in destroying fruit fly larvae.

Nutmeg Analysis: Nutmeg analysis work will be completed by December 1, 1987. It has been found that certain areas of Grenada produce nutmeg with a lower oil content than in other areas. This lower oil content may alter sizing and screening characteristics.

Postharvest Loss Assessment Methodology (PHLAM) Guidelines/Manual: With assistance from the ASEAN Food Handling Bureau and the Inter-American Institute for Cooperation in Agriculture (IICA), PIP has drafted a manual/guidelines for the Methodology. This systematic approach to loss assessment was field tested in India and the Eastern Caribbean and introduced to a postharvest loss course conducted in cooperation with the University of California, Davis. PIP plans to test the methodology several times in 1988.

Nutmeg Exports from Grenada: PIP is working with the Grenadan Nutmeg Association to increase their marketing of nutmeg directly to U.S. spice firms. Results of this project have been mixed due to a slow response by the Association. U.S. spice firms continue to cooperate with the project, but the project will terminate on December 1, 1987.

Hypoglycin in Ackee: A proposal was prepared for the Jamaica AID Mission on research needed to remove the FDA import alert status on ackee fruit. The Mission would like to assist Jamaica to increase exports to the U.S., but growers are unable to do so because of toxic compounds prevalent in the fruit.

TRAINING PROGRAM

PIP was involved in seven short term training courses on postharvest losses in Panama, Ecuador, India, and the U.S.

PIP is sponsoring one long-term Kenyan student studying for a Master's degree in extension and technology transfer.

TECHNICAL ASSISTANCE AND FIELD RESEARCH

PIP conducted technical assistance projects in Costa Rica (two), Thailand, Fiji (organizational advice), and Grenada. Subjects included strawberries, coconuts, cocoa, nutmeg, and refrigeration. Two other technical assistance programs in the Caribbean and Central American in which PIP is listed as a cooperating organization have not yet produced project work for PIP.

PIP INFORMATION CENTER

PIPIC continues to be a popular component of PIP. PIPIC's collection of technical douments now numbers 10,224. Since 1981, PIPIC has distributed 46,282 documents.

PIP REPORTS OR PIP SUPPORTED DOCUMENTS - FY87

PIP published or supported nine technical douments in FY87. In addition, six "PIP Tips," condensed versions of technical documents, have either been printed or are in preparation.

CONFERENCES AND MEETINGS

PIP personnel attended three conferences and made four program development trips in FY87. Conference topics were technology transfer, global information access, and solar energy. Program development trips were to England, Asia, Central America, South America, and the Caribbean.

PROPOSALS AND PROJECT POSSIBILITIES

PIP has had projects tentatively approved in Thailand (marketing), worldwide-AMIS (marketing), and Jordan (rapid appraisal). Several other projects are pending in the following countries: Grenada (moko disease/bananas), West Africa (tomato handing/exports), Southeast Asia (postharvest methodology training course), Malaysia (postharvest methodology training course), and Jordan (marketing training course).

NETWORKING

PIP and the Information Center continue to cooperate with the University of Idaho and with various national and international organizations. Several of these organizations contributed to PIP's cost-sharing component in FY 87.

POTENTIAL ECONOMIC SPINOFFS BENEFICAL TO U.S. AGRICULTURE

PIP is continuously attempting to develop economic spinoffs from foreign assistance work beneficial to U.S. agriculture. During this reporting period the following activities took place:

- Testing of shrinkwrap to destroy harmful insect larvae in fruit

- Rapeseed processing and marketing study
- Proposed workshop to develop economically beneficial programs for U.S. agriculture
- Postharvest processing and marketing program at the University of Idaho

COST SHARING OF PROFESSIONAL TIME TO PIP FROM EXTERNAL ORGANIZATIONS

During this reporting period, PIP secured over $100,000 of cost sharing time or funds from external organizations. Most were international organizations with which PIP had collaborative programs.

I. INTRODUCTION

This report is a review of activities by the Postharvest Institute for Perishables (PIP) for the period of October 1, 1986 to September 30, 1987. This is the second annual report of PIP activities under the second five-year Cooperative Agreement AID/DAN-1323-A-00-5093-00 for 1985 to 1990.

Budget reductions have continued to reduce PIP's effectiveness and capabilities during this reporting period. Adaptive research, training and travel have had to be reduced. PIP is attempting to retain the minimal staff necessary to continue to efficiently respond to USAID Mission requests.

Despite the budget constraints, considerable progress was made in two adaptive research projects: the Postharvest Loss Assessment Methodology, and the utilization of plastic shrinkwraps to destroy fruit fly eggs and larvae in tropical fruit.

PIP tested the Postharvest Loss Assessment Methodology (PHLAM) in India. As would be expected with the first test of a field methodology, some problems were identified with the PHLAM, and these are being corrected.

PIP collaborated with postharvest specialists at the University of California, Davis (UCDavis) in the development and presentation of a five-week course on the reduction of postharvest losses. PIP will continue to collaborate with UCDavis in other collaborative programs which are being developed.

Experiments were conducted at the USDA Agricultural Research Service Laboratory in Hilo, Hawaii to test whether shrinkwrapping papayas would lead to the death of fruit fly larvae. The experiments demonstrated that all larvae died within six days of being enclosed in the shrinkwrap. Thus far, PIP has not been able to identify prior research work utilizing shrinkwrap to destroy fruit fly larvae.

PIP is emphasizing longer-term involvement in projects as a means to both improve the capabilities of the University of Idaho (UI) in the international field and insure the effectiveness of the programs in developing countries.

PIP will be collaborating as a subcontractor to Abt Associates, Inc., in the implementation of the recently awarded USAID/S&T/RD Agricultural Marketing Improvements Strategies (AMIS) project. PIP will provide one full-time specialist to a three-person core team. The PIP specialist will initially be stationed in Washington D.C. PIP's responsibilities within the AMIS project will be for marketing and postharvest handling of perishable food commodities.

The PIP Information Center (PIPIC) continues to be a popular part of PIP. The strong demand for documents during the past year indicates the importance that developing countries place on this component of PIP.

The PIP core staff was comprised of the following personnel as of the end of this reporting period:

Harvey C. Neese, Field Director
Tom Dechert, Assistant Field Director
Paulette Foss, Information Specialist
Ivy Wingate, Program Assistant
Yvonne Sertich, Secretary/Records Manager

The University of Idaho supports PIP by providing other office staff, facilities, and the technical expertise of its faculty and staff.

PIP, an institute within the College of Agriculture of the University of Idaho, draws upon the resources and expertise of the University of Idaho and its "sister" universities in the Consortium for International Development, other universities such as UCDavis, and the private sector in both the U.S. and abroad.

II. PURPOSE, GOALS AND OBJECTIVES OF THE COOPERATIVE AGREEMENT

The purpose of the Cooperative Agreement DAN-1323-A-00-5093-00 between the U.S. Agency for International Development (USAID) and the University of Idaho is to increase PIP's resource base and collaboration with U.S., LDC and international institutions, to conserve perishables after harvest by improving LDC postharvest systems, and to strengthen LDC institutions and staff to implement economically sound and environmentally safe programs in this area.

The assistance is intended to strengthen PIP at the University of Idaho to:

1. Carry out adaptive research related to postharvest conservation of perishables.
2. Provide technical advice and assistance on postharvest perishable problems to LDC Missions.
3. Produce and selectively collect and distribute key materials on postharvest problems, and increase the capability of the Postharvest Institute for Perishables Information Center (PIPIC);
4. Train graduate students and conduct seminars, workshops and short courses in the U.S. and host countries.

The overall goals and objectives remain the same. These are to:

1. Increase the availability (without increasing production areas) of perishable commodities (fruits, vegetables, roots, tubers, spices, etc.) and enhance the basic diet of people in developing countries by reducing postharvest food losses.
2. Reduce the costs of perishable commodities by improving the efficiency of the various components of marketing systems.
3. Encourage the development of processing and other industries associated with perishable crops for domestic or export purposes.

III. PROGRAM DEVELOPMENT, IMPLEMENTATION AND MANAGEMENT

PIP is continuing to expand its collaboration with other institutions and organizations in program development and implementation. During the past year, PIP worked on programs with the FAO/Caribbean, the Inter-American Institute for Cooperation in Agriculture (IICA), the ASEAN Food Handling Bureau in Malaysia, the USDA Agricultural Research Service, the University of California, Davis, the Universidad Tecnica de Ambato (Ecuador), and the Indian Council for Agricultural Research (ICAR). In addition, many more contacts are made with international organizations through PIPIC.

PIP has not been successful in formulating programs with the Peace Corps as recommended by the Evaluation Team at the end of the initial five-year period. One reason is that PIP's activities are usually highly specialized. Requests by AID or other organizations are for specialists who are highly trained, and, increasingly, experienced in private sector work. The Peace Corps is on the other end of the spectrum. PIP is not involved in food production aspects with which Peace Corps agriculturists are more likely to be working within a village setting. Other organizations such as UCDavis, the ASEAN Food Handling Bureau in Asia, and the Inter-American Institute on Cooperation in Agriculture (IICA) in Latin America have filled the collaborative gap in the various regions. We do not envisage, at this point, specific areas in which we can work closely with the Peace Corps. However, PIP is alway searching for organizations that will help to achieve more impact from shrinking funds. If the Peace Corps can assist in this, PIP will most certainly consider collaborative efforts.

Program development, implementation, and management, within PIP's mandate, entails four categories that are outlined in this section and explained in more detail on the following pages.

1. ADAPTIVE RESEARCH PROGRAM

a. Preservation and Storage

Adaptive research projects supporting activites were:

Shrinkwrap to destroy fruit fly larvae/eggs

Chemical and physical analysis of nutmeg

b. Postharvest Loss Assessment Methodology (PHLAM)

Projects supporting activities were:

Development of methodology, manual and workshop for developing countries' personnel

Field testing of methodology in India

Integration of PHLAM concepts in PH short course

c. Marketing Research

Marketing research involves field investigations, usually under the Basic Ordering Agreement, and a contractual agreement between PIP and AID Missions.

Projects supporting activities were:

1. Nutmeg marketing from Grenada
2. Rapeseed marketing/processing
3. Research on marketing as related to rapid appraisals and the systematic approach

d. Food Science/Food Safety Research

Project proposal for removal of hypoglycin in ackee fruit in Jamaica.

2. TRAINING PROGRAM

a. Long-term Training: M.S. student studying technology transfer processes.

b. Short-term Training:

Postharvest Loss course in Panama

Study tour of processing facilities in Hawaii and California by two Thai Ministry of Agriculture officers

Postharvest workshop in India (see PH Methodology)

Reduction of Postharvest Losses in Perishable Crops short course, in collaboration with the University of California, Davis

Study tour on fruit and vegetable processing for food engineer from Saudi Arabia

3. TECHNICAL ASSISTANCE AND FIELD RESEARCH PROGRAM

The Basic Ordering Agreement (BOA) is a companion instrument to the Cooperative Agreement and provides financial support to the University's capabilities in research and development activities in postharvest perishable food systems. The primary sources of requests for technical assistance and field support are from USAID Missions.

Completed or on-going Technical Assistance projects are as follows:

- Strawberry handling in Costa Rica
- Coconut processing in Fiji and South Sea Islands
- Refrigeration and storage consultation in Thailand
- Grenada Nutmeg Marketing
- Review of Costa Rican Non-traditional Agricultural Export projects

4. PIP INFORMATION SERVICE PROGRAM

Information, documents and bibiliographies are all facets of harvesting, handling, storage, marketing, and processing related to reducing postharvest losses in perishable commodities. These documents are collected and distributed to developing country clients upon request.

IV. ADAPTIVE RESEARCH, DEVELOPMENT AND MANAGEMENT PROGRAM

PIP sponsored four adaptive research projects during the reporting period. Two projects have long term ramifications - the shrinkwrap process development and the Postharvest Loss Assessment Methodology.

A. Preservation and Storage

1. Shrinkwrap to destroy fruit fly larvae/eggs - Dr. Marc Klowden, Professor of Entomology, UI/PSES, and Kiran Shetty, UI postharvest physiology graduate student from India, conducted two tests on the shrinkwrapping process as a method of destroying insect larvae and eggs in soft fruit. The first test was conducted at the University of Idaho with Drosophyla fly larvae in mangoes and indicated destruction of the larvae within four to five days after shrinkwrapping.

   In the second test, Dr. Klowden, in collaboration with Dr. Eric Jang of the USDA Agricultural Research Service Experiment Station in Hilo, Hawaii, infested papayas with fruit fly larvae and eggs. The papayas were then shrinkwrapped. The same positive results were attained in this test. Currently, plans are underway to work with the USDA/ARS/APHIS on the development of full scale testing of the shrinkwrapping process. (However, PIP funding for this project is not likely at this time.) Active participation by the UI Experiment Station, the USDA/ARS/Hilo Station, and the UI Department of Plant, Soils, and Entomological Sciences is expected.

2. Chemical and Physical Analysis of Nutmeg - All of the nutmeg analysis work will be completed by December 1, 1987, the termination date for this project. A draft report by Dr. David Drown of the UI Department of Chemical Engineering has been submitted to major U.S. spice firms. This report is being reviewed and data checked prior to publishing the finished document.

B. Postharvest Loss Assessment Methodology (PHLAM)

1. Development of PHLAM manual, testing and workshop strategy - following the team trip to Southeast Asia in 1986 to develop the PHLAM manual, in

consultation with various ministries and organizations in that region, a draft of the manual was produced entitled, A Postharvest Methodology: Commodity Systems Approach for the Identification of Inefficiencies in Food Systems. The draft manual was produced as a collaborative effort of PIP, IICA, and the ASEAN/FHB/Horticulture Working Group. Over the course of this reporting year, the manual has been reviewed by numerous specialists from organizations around the world, and has been revised several times. It was decided that the PHLAM should be tested at least three times before publishing, to determine whether the concepts are sound and the method applicable to developing countries. The tests consist of workshops for the presentation of the concepts followed by collection of information, project formulation, and analysis of the results. As of the end of this reporting period, three tests of the PHLAM have been completed and the final one prior to publication is plannned for Malaysia in December, 1987.

2. India PHLAM Workshop and Test - A month-long field test of the Postharvest Methodology was conducted in India at the request of the Indian Council for Agricultural Research (ICAR). The commodity involved in the test was mangoes. Dr. Lou Riesenberg, Chairman, Agricultural and Extension Education Department, and Dr. Merle Menegay, an agricultural economist and marketing consultant, conducted the field test. Even though last minute changes were made in the scope of work by ICAR personnel, the field testing of the PHLAM revealed other limitations in the organization of the information gathering methods. The two specialists and the ICAR group did accomplish a substantial part of the workscope and formulated recommendations to reduce constraints in the ICAR system for implementing these types of projects. Evaluation of the test resulted in a clearer statement of the role of the PHLAM in marketing system evaluations, and development of a broader definition for information gathering and presentation methods.

3. Short Course on Reduction of Postharvest Losses in Perishable Crops - PIP, in collaboration with the University of California, Davis, presented a five week short course designed to use the systems approach of the PHLAM to integrate the material presented. One week of the course was dedicated to the workshop and project formulation format of the PHLAM. This exercise with commodity systems from the Eastern Caribbean resulted in

confirmation of the PHLAM as a tool which can be used by mid-level agriculturalists for problem identification, prioritization, and proposing potential solutions.

C. Market Research

1. Nutmeg Export Marketing from Grenada - PIP has been involved with a project to develop a more viable export market in the U.S. for Grenadan nutmeg. Traditionally, only about five percent of the five million pounds of nutmeg produced in Grenada has been exported directly to the United States.

   PIP and several U.S. spice firms have worked together on this project. Because of an apparent reluctance by the Grenada Nutmeg Association Board of Directors, PIP has not been able to complete its scope of work. The Board spent a great deal of time formalizing a pricing arrangement with Indonesia. Development of a U.S. market has not been given a high priority by the Board. PIP has endeavored to accomplish the project's goals despite Grenada's slow response.

   Recently PIP reached a tentative agreement with several U.S. firms to compare grinding characteristics of straight run nutmeg with selected nutmeg from various parts of Grenada with a lesser oil content. Adaptive research by the University of Idaho showed different levels of oil content in nutmeg harvested from selected sites in Greneda. If the Nutmeg Association can supply nutmeg for testing prior to December 1, 1987, there will still be an opportunity to develop a marketing program in the U.S. at the agreed-upon discount from the world market price.

2. A Comparative Analysis of Fruit and Vegetable Marketing in Developing Countries - Dr. Richard Schermerhorn, Chairman, UI Agricultural Economics Department, prepared a report for PIP to provide inputs to a USAID Project Paper on research and technical assistance in the area of fruit and vegetable marketing to promote agricultural development in low income countries. The report examines the role of marketing in agricultural development, the change processes which occur in fruit and vegetable marketing systems, and approaches for reducing problems arising from

changes in the marketing systems. The report is available as GTS Report PIP/Sigma One/November 86/No. 82.

D. Food Science/Food Safety Research

1. Proposal for Removal of Hypoglycin in Ackee - At the request of the USAID Mission of Jamaica, Dr. Jorg Augustin, UI Food Scientist, travelled to Kingston to prepare a proposal for research designed to provide the data necessary to remove the import alert status of ackee entering the U.S. Dr. Augustin's proposal, PIP/Jamaica/Feb 1987/No. 89, was presented to USAID/Kingston. The AID Mission, however, selected the University of Florida to do the project, primarily because of location, facilities, other Jamaican programs there, and the availability of ackee in Florida for the research.

V. TRAINING PROGRAM

PIP's training program consists of two areas of emphasis: 1) workshops, seminars or short courses presented in-country or in the U.S. and 2) sponsored students for degree or non-degree training at a U.S. university. During the period October 1, 1986 to September 30, 1987 PIP presented three workshops in-country, and three training courses or study tours in the U.S. Also, PIP sponsored one student, Christopher Obel Gor, for his Master's degree.

A. Workshops, Seminars and Short Courses

1. "Panama Postharvest Loss/Handling Training Course."
   Project: PIP/Panama/Oct 86/No.81.

Two PIP training consultants, William Bolton and Miguel Jimenez, conducted a three week postharvest course in Panama in Spanish. The USDA/OICD was the facilitating organization and USAID/Panama funded the program. Sixteen participants attended the course.

2. "Ecuador Postharvest Training Course on Apples."
   Project: PIP/Ecuador/March 87/No. 88

Dr. Mike Colt, UI Extension Horticulturalist, in collaboration with the Universidad Tecnica de Ambato, conducted a two week training course in Ambato, Ecuador for apple producers and agricultural officials. Dr. Colt travelled under the sponsorship of PIP, the International Trade and Development Office, and the Department of Plant, Soils and Entomological Sciences at the University of Idaho. The training course was offered under the auspices of the Cooperative Agreement between PIP and the Facultad de Ciencia y Ingenieria en Alimentos de la Universidad de Ambato.

3. "Postharvest Losses in Fruits and Vegetables in India."
   Project: PIP/India/May 87/No. 90

Two PIP consultants, Merle Menegay, and Lou Riesenberg, facilitated a three-week intensive workshop on Postharvest Losses in Fruits and Vegetables in New Dehli and Lucknow, India. The workshop focused on defining the various marketing systems for mangoes produced in the Lucknow region and identifying problems in the various systems. The India Council of Agricultural Research was the primary sponsor of the workshop. Most participants were either agricultural economists or plant pathologists.

4. "Food Processing Study Tour for Saudi Arabian Food Engineer."
Project: PIP/Saudi Arabia/Sept 87/No. 95

PIP collaborated with the USDA/OICD in the presentation of a study tour in Idaho, Washington, Oregon, and California for a Saudi Arabian food engineer. The three-week study tour concentrated on juice, dairy and date processing and postharvest loss reduction methods in fruits and vegetables.

5. "Californian and Hawaiian Processing Facilities Tour for Thai Ministry of Agriculture Officials."
Project: PIP/Thai Study Tour/Aug-Sept 87/No. 96

In collaboration with the University of California, Davis and the University of Hawaii, PIP facilitated a tour of fruit and vegetable processing and research facilities in Hawaii and California for two high-level Thai Ministry of Agriculture officials.

6. "Reduction of Postharvest Losses in Perishable Crops."
Project: PIP/UCDavis Short Course/Aug 87/No. 94

PIP, in collaboration with the University of California, Davis, presented the short course in California and Idaho. Along with UI and UCDavis faculty, five postharvest professionals from the UN Food and Agriculture Organization (FAO) and the Inter-American Institute for Cooperation in Agriculture (IICA) participated as instructors for the course. Postharvest technology theories and applications, postharvest management decision-making, and project development were presented in the framework of the PHLAM. Twenty participants from the Eastern Caribbean were funded by USAID/Barbados, FAO/Barbados, the World Bank/Grenada, and the Institute for International Education.

B. Degree and Non-degree Students

PIP wholly supported one developing country student during the period of this report.

1. Mr. Christopher Obel Gor (Kenya)
Department of Agricultural and Extension Education
University of Idaho

Mr. Gor expects to complete his M.S. degree in May of 1988 with his education costs supported by PIP. Thesis subject: "How do Farmers Access Information Sources on New and/or Innovative Farming Practices in Nez Perce County?"

2. PIP provided assistance to several students from developing countries who were studying for Bachelor, Master, or Ph.D. degrees at the University of Idaho under funds provided by USAID, UN/FAO, and other institutions. PIP assistance was principally in the form of staff time to orient the students and provide guidance as needed during the academic year. In this activity, PIP assists the UI by maintaining an international perspective on campus.

VI. TECHNICAL ASSISTANCE & FIELD RESEARCH PROGRAMS

As specified in the Cooperative Agreement, PIP provides technical assistance to USAID Missions for the solution of problems in the postharvest handling and marketing of perishable commodities. Under the current Cooperative Agreement, no core funds have been specified for this activity; however, PIP has a Basic Ordering Agreement by which Missions are able to contract PIP's technical assistance. In FY87, PIP provided the following technical assistance:

Postharvest Handling of Strawberries -- Costa Rica

USAID/Costa Rica requested assistance on the part of the Costa Rican Strawberry Growers Association to improve harvesting and postharvest handling of strawberries being exported to the U.S. during the winter season. A private sector strawberry grower and handler from California, Mr. Miguel Perez Ramos, made two trips to Costa Rica of about two weeks each to work with the growers there. He provided them with information and training on harvesting, labor management, grading, sorting, cooling, handling, packaging, and dealing with shippers. His conclusions and recommendations for strawberry harvest and handling in Costa Rica are summarized in GTS Report PIP/Costa Rica/February 1987/No. 84 for the growers and USAID/Costa Rica.

Refrigeration and Controlled Atmosphere Management -- Thailand

Karl Buehler, refrigeration specialist and PIP consultant, spent three weeks in Thailand at the request of the Thailand Ministry of Agriculture and USAID/Thailand. He worked with personnel from the Division of Plant Pathology and Microbiology on aspects of refrigeration and controlled atmosphere storage of fruits and vegetables. Specifically, he reviewed information and equipment and made recommendations for refrigerated trucks; prepared a document on various methods of precooling available; reviewed the refrigeration equipment at the postharvest pathology research laboratory and made recommendations on its use, upgrading, and maintenance; and made a presentation to specialists on the potential for controlled atmosphere storage. His observations and recommendations are included in GTS Report PIP/Thailand/May 1987/No. 91.

Non-traditional Agricultural Export Projects Review -- Costa Rica

USAID/Costa Rica requested the assistance of the PIP Assistant Field Director to review two projects in Costa Rica which have the goal of improving the production, postharvest handling, processing, and marketing of perishable

non-traditional agricultural export crops. Tom Dechert spent 10 days on a very short evaluation of the two projects (report in preparation). Both projects have the goal of increasing the incomes of some of the poorest people in Costa Rica through the improvement of the cacao postharvest handling and marketing system, and the development of an improved commodity system for tropical fruits and spices. Mr. Dechert evaluated the programs from a systems point of view to make recommendations on various aspects of postharvest handling, processing, management, and marketing that needed to be strengthened.

Coconut Processing -- Fiji

USAID/Suva requested PIP's services for consultation on postharvest problems of fish, tropical fruits, and vegetables. A phone call to USAID/Suva resulted in the identification of a more specific request for technical assistance on coconut processing. PIP suggested that USAID/Suva contact the major coconut processing organization in the South Pacific, the Asian Pacific Coconut Commission, and a world-wide coconut processing company, Cocotec, Inc. The suggestion was taken and the Suva Mission was better satisfied with this new arrangement. PIP will follow-up with USAID/Suva to meet other requests for technical assistance as USAID/Suva establishes its priorities.

ROCAP Non-traditional Agricultural Marketing Project -- Central America
High Impact Agricultural Marketing Project -- Eastern Caribbean

PIP was proposed as a collaborating organization on both of these projects which were awarded to Chemonics Inc., and Development Alternatives, Inc., respectively. There has been no project activity requested of PIP as of the end of this reporting period. Both consulting firms informed PIP personnel that they intend to call on PIP's services for the implementation of these projects, but to date there has been no indication of what or when this might be.

VII. PIP INFORMATION CENTER PROGRAM

This report provides a statistical summary of operations during the year and updates cumulative, statistical information. During the past year changes in personnel, quarters, and PIPIC's computer system have altered both the appearance and the operation of the Center. PIPIC's new quarters are 20% larger and thus able to accomodate the additional computer equipment.

Computers

PIPIC converted its operations to an IBM-AT microcomputer to allow greater flexibility in publishing operations. Document input into the new database management system has allowed output of a New Titles publication, but problems with the system have so far held up other publications.

Statistics

	This quarter (7/87-9/87)	FY 1987 (10/86-9/87)	Total (4/81 -)
Number of requests received:	128	630	
Number of new requesters:	8	46	942
Additions to collection (titles)	111	602	10,224
Number of persons served:	88	531	
Number of orders sent:	151	847	
Number of countries served:	34 (33 LDC's)	80 (74 LDC's)	121
Materials distributed:	1185	8678	48,506
Paper copies	990	6949	
Loaned from other lib.	46	218	
Microfiche copies	58	1190	
Total documents	1094	8357	46,282
In-house bibliographies	79	234	
Dialog bibliographies	12	87	
Total bibliographies	91	321	2,228
Average Size of order	7.2 docs	9.9 docs	

The PIP collection now consists of 10,224 documents. This is an increase of 607 documents during the last year. New additions were announced through two issues of New Titles which were sent to 554 regular clients in 80 countries. Another 200 were distributed to persons who have shown a one-time interest in PIPIC. With the new computer system, it has been possible to include complete citations to document and generate more extensive indexing. A survey of client preferences shows that the new extended format is favored.

Within the last 12 months, 8,357 documents were distributed to 531 clients in 74 countries. This is an average of approximately 700 monthly. Within the total, about 14% were microfiche and 3% were documents obtained on demand from other libraries. The total number of documents distributed during the second Cooperative Agreement was 17,021 and a grand total of 46,282 documents since 1981.

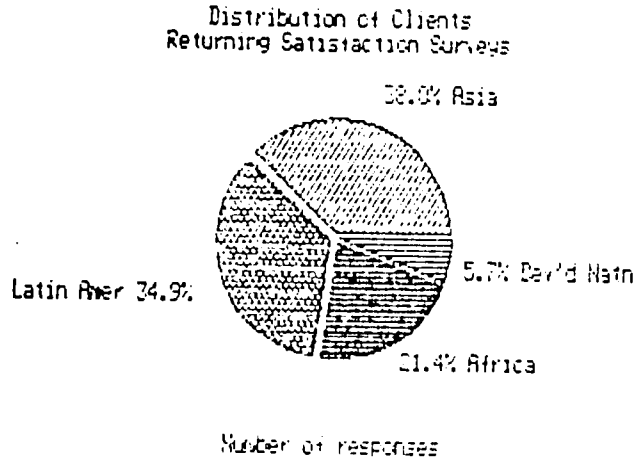
Bibliographies were envisioned by the Cooperative Agreement to be major printed documents distributed world-wide. PIPIC has published the following bibliographies since its inception in 1981: Roots and Tubers: A Postharvest Bibliography (1981), Export Marketing: A Bibliography (1983), Exotic Fruits: A Postharvest Bibliography (1983), EDB Alternatives for Perishables: A Bibliography (1985), and Storage of Potatoes, Onion and Garlic in the Developing World: A Bibliography (to be printed in 1988).

In addition, PIPIC has responded in a more personalized way to serve individual clients. Both the PIPIC database and many other commercially available databases are searched to create these individualized bibliographies. During the past year, 321 bibliographies were produced for a total of 961 during the second Cooperative Agreement and a grand total of 2,228 since 1981. The most frequently requested topics are solar drying and other methods of processing various perishable commodities.

The demand for PIPIC services continues to grow. During the year, 46 new permanent clients were added, including representatives from seven countries not previously served: Surinam, Afghanistan, Burma, Palau, Saipan, St. Kitts, and Antigua. (This makes twelve additional countries PIPIC has begun to serve since the beginning of the second Cooperative Agreement.) PIPIC also served over 200 other clients during the year on a single need basis. The total is now 942 clients from 121 countries during the life of the Center, 140 of them during the current Cooperative Agreement.

Feedback from clients about PIPIC services dropped dramatically this year. While the 189 Satisfaction Surveys returned this year is roughly the same as last year (184), this represents only 35% of the 541 sent compared to the

previous mailing of 350. Cards were returned from only 39 countries (54% of those served) and only 22% of the people who were sent cards. The following graph shows how the responses were divided geopgraphically:



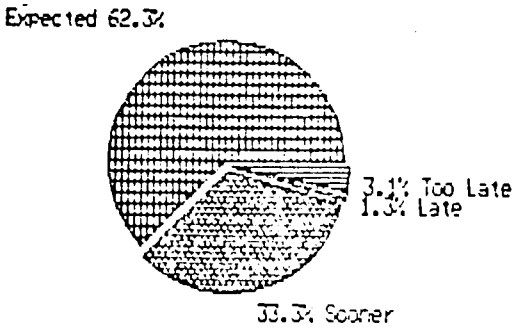
The primary issues of concern are adequacy of the individualized bibliographies, the time lag between order and receipt of the materials, and the quality of the materials received. The bibliographies were judged to be adequate 90% of the time even though the number of citations judged relevant was above three-quarters in only 65% of the cases. It should be noted that among the 16% of the searches judged to be inadequate, clients informed us that the request was not stated clearly in half of those instances. The percentage of searches judged either too general or too specific was just half as large this year as last.

Copy quality continues to be judged as adequate in 85% of the cases. The 11% commenting on poor, but legible, quality generally refer to photographic reproduction. Given the equipment PIPIC uses, there is no way to improve this. The illegible documents (which hold steady from year to year at just 3%) are usually microfiche. This involves replacing less than a dozen documents during the year.

During the last two years, PIPIC has begun to use surface mail to specific countries and in response to certain kinds of orders. Therefore, the timeliness of materials delivery was of concern. A third of the users still comment that arrival was sooner than expected and another 62% say arrival was

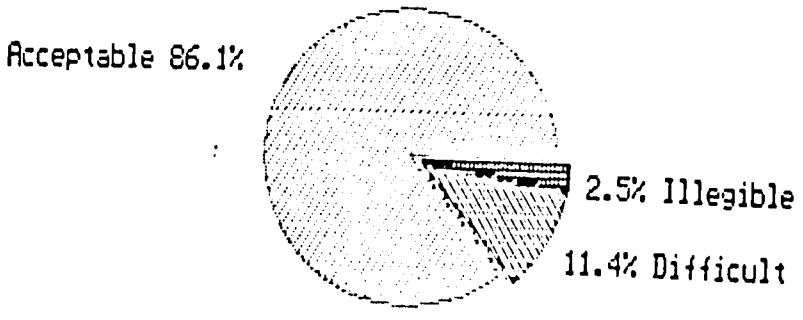
as expected. Five orders were "too late" for use, but this is well within acceptable limits (particularly since three of these were sent airmail and one was in the client's hands 22 days after PIPIC received the order). The following graphs show the distribution of the actual data regarding timeliness and copy quality.

When Documents Arrived



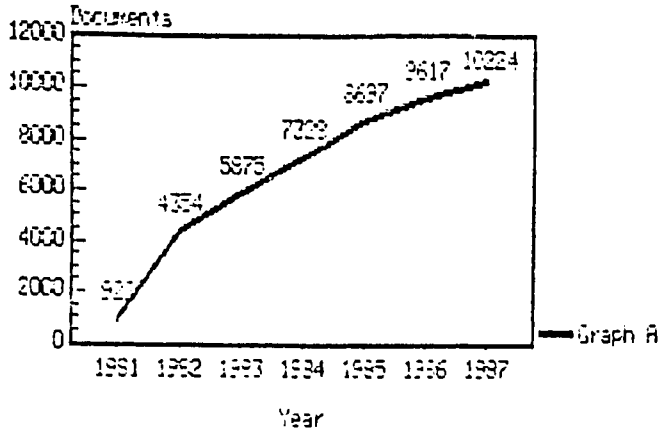
Arrival related to expectation

Document Legibility

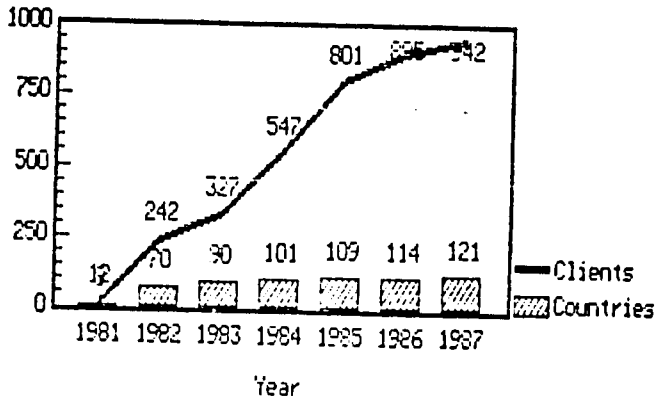


Ease of reading

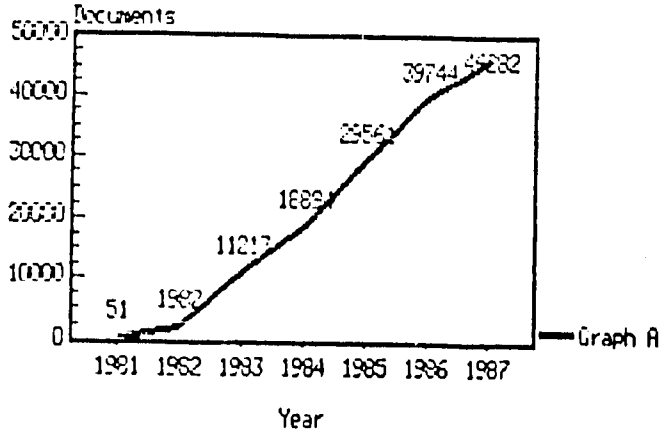
Documents in PIPIC Collection



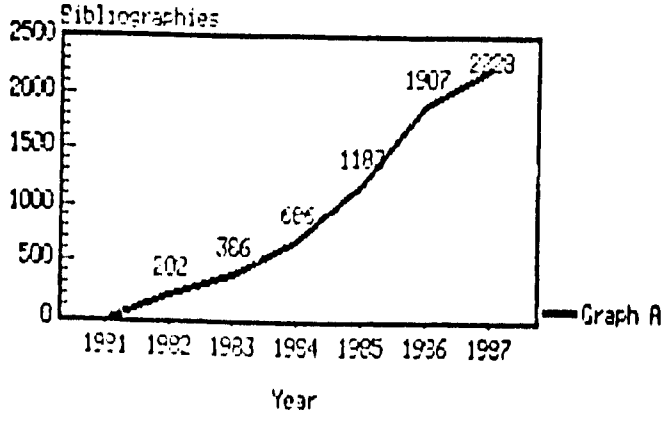
PIPIC Clientele



Documents Sent to Clients



Individualized Bibliographies
Sent to Clients



VIII. PIP REPORTS OR PIP SUPPORTED DOCUMENTS PUBLISHED IN FY 87

The following documents were published on PIP activities in FY 87:

1. "Report on Workshop: Reduction of Postharvest Losses." GTS Report PIP/Panama PH Course/Oct. 86/No. 81.

2. "A Comparative Analyses of Fruit and Vegetable Marketing in Developing Countries." GTS Report PIP/Sigma One/Nov. 86/No. 82.

3. "Postharvest Handling of Strawberries for Export in Costa Rica." GTS Report PIP/Costa Rica/Feb. 87/No. 84.

4. "Rapeseed Marketing Study." GTS Report PIP/CEDA Rapeseed/Dec. 86/No. 85.

5. "Report of Visit to Asia January 30 to March 2, 1987." Project Report No. 87

6. "Proposal for Removal of Hypoglycin in Ackee." GTS Report No. 89.

7. "Precooling of Harvested Vegetables." GTS Report PIP/Thailand /May 87/No.91.

8. "Postharvest Losses in Fruits and Vegetables in India." (in preparation) GTS Report PIP/India/May 87/No. 90.

9. "Adaptive Design of a Zeolite-Water Solar Refrigerator." Douglas Alan Asbe. Thesis Research Report No. 903.

PIP Tips

PIP Tips are usually an abbreviated version of applied research publications funded by PIP in the form of short, concise information bulletins. FY 87 was the first year in which PIP Tips were published. Publication stages are as follows:

1. "Monoclonal Antibody Production Against Colletotrichum gloeosporioides Penz: A Potential Tool to Diagnose Anthracnose in Mangoes." Report on research conducted by Carmen Calma Paterno. PIP Tip No. 8701. April, 1987.

2. "Aflatoxin Contamination in Grenadan Nutmeg." Report on research conducted by Dr. David Drown. PIP Tip No. 8706. (in press)

3. "The Use of Shrink Wrap to Extend Storage Shelf Life of Quality Potatoes." Report on research conducted by Kiran Shetty and Dr. Walt Kochan. PIP Tip No. 8702. (in preparation)

4. "Adaptive Design of a Zeolite-Water Solar Refrigerator." Report on research conducted by Douglas Asbe and Dr. David Drown. PIP Tip No. 8703. (in preparation)

5. "Comparative Analysis of Fruit and Vegetable Marketing in Developing Countries." Report on research by Dr. R.W. Shermerhorn for Sigma One Corporation. PIP Tip No. 8704. (in preparation)

6. "Gari Processing in Ghana." Report on research by Ross Kreamer. PIP Tip No. 8705. (in preparation)

IX. CONFERENCES AND MEETINGS

PIP personnel attended three conferences and made four program development trips in FY87.

1. The Association for International Agricultural Education Annual Conference
   National 4-H Center, Chevy Chase, Maryland
   April 24 - 26, 1987
   Attended by Christopher Obel Gor

   At this conference, Mr. Gor presented a paper entitled, "A Discussion of Strategies for Appropriate Technology Transfer to Developing Countries." The problems addressed in his paper were the meaning of technology transfer, its role in development, and means of strengthening its role and/or effectiveness.

2. Annual Conference of the Special Libraries Association: Global Information Access"
   Anaheim Convention Center, Anaheim, California
   June 6 - 11, 1987
   Attended by Paulette Foss

   Ms. Foss networked with several international library personnel and as a result PIPIC may have the opportunity to provide consulting services within the U.S. to various libraries.

3. "Solar '87: 12th National Passive Solar Conference"
   Portland, Oregon
   July 12 - 16, 1987
   Attended by David C. Drown

   Dr. Drown presented a paper at the conference entitled, "Adaptive Design of a Zeolite - Water Solar Refrigerator." This paper was a result of PIP-sponsored work by Douglas Asbe, University of Idaho M.S. student, and Dr. Drown.

4. Tropical Development Research Institute (TDRI)
London, England
August 6, 1987
Attended by Ivy Wingate

While in London on other business, Ms. Wingate visited TDRI headquarters in London and met with the Directors and Plant Food Commodities staff to discuss TDRI - PIP collaborative possibilities.

5. Trip to Guatemala, Honduras, Costa Rica, Peru, Ecuador, Jamaica, Haiti.

From November 22, 1986 through December 23, 1986, Tom Dechert travelled to the following countries at the request of the USAID Missions or other institutions:

Guatemala - met with USAID/ROCAP and Chemonics, Inc., officials on the implementation of the Non-traditional Agricutural Export Support project;
Honduras - met with USAID and Fundacion Hondureno de Investigaciones Agricola officials regarding potential PIP technical assistance and research activities;
Costa Rica - met with USAID about potential technical assistance on the non-traditional agricultural export projects and with IICA officals about the development and testing of the PHLAM;
Peru - met with scientists at the International Potato Center about PIP collaboration on extension activities in the postharvest area;
Educador - met with the Dean and Faculty at the Universidad Tecnica de Ambato to plan collaborative programs;
Jamaica - met with USAID officials to discuss the ackee proposal and other potential collaboration including training; and
Haiti - work with the Agricultural Producers Association and USAID in the design of a project for production, postharvest handling, and export of winter vegetables.

6. Trip to Asia

The Field Director made a five week trip during this reporting period to visit the following countries in Asia: Japan, Philippines, Singapore, Malaysia, Thailand, Bangladesh, and India. Discussions with AID Missions, private sector firms and postharvest organizations were included in the

agenda. Several projects in Thailand and India resulted from this trip. In addition, potential project work is pending in several other countries.

7. Trip to the Caribbean

The Field Director visited Barbados and Grenada in the Caribbean during the reporting period. The purpose of the visit was to discuss on-going project work and potential projects for the future. The trip led to the funding of ten participants by the FAO to the postharvest short course sponsored by PIP and UCDavis.

X. PROPOSALS AND PROJECT POSSIBILITES

This section entails proposals and project possibilities that may be in proposal form or verbal approval has been obtained.

1. Agricultural Marketing Improvement Strategies (AMIS)

The Agricultural Marketing Improvement Strategies (AMIS) project, a five-year USAID-funded project, has been awarded to Abt Associates, Inc. PIP will be a sub-contractor with a significant part of the project. PIP will provide a full-time marketing advisor and short term consultants. PIP will coordinate the project's work with perishable commodities. Part of the funding for the project will come from AID Mission buy-ins.

2. Jordan Rapid Appraisal Marketing Project

The Jordan Rapid Appraisal Marketing project will focus on domestic and export marketing of tomatoes. PIP has been contacted to direct the project which is to begin in early 1988.

3. Marketing/Processing/Handling Fruits and Vegetables in Thailand

PIP will assist both governmental agencies and the private sector in Thailand in the development of a long-term quality control and perishable handling program. Two PIP specialists will be assigned to the project. According to the AID Mission, the project has been approved by AID and the Ministry of Agriculture.

4. Postharvest Short Course in Asia

PIP plans to present a short course on postharvest losses in Southeast Asia similar to the one given in cooperation with the University of California Davis. Currently PIP is working with various donor organizations and government agencies to determine whether appropriate workshop participants can be funded.

5. Postharvest Loss Assessment Workshop/Field Test in Malaysia

PIP, with assistance from the ASEAN Food Handling Bureau and IICA, has proposed to conduct a PH Methodology field test on pisang emas (golden bananas) in Malaysia. PIP has sent a formal proposal to the Malaysian Agricultural Research and Development Institute (MARDI) and is waiting for a response.

6. Moko Disease in Bananas

The Windward Island Banana Association (WINBAN) in St. Lucia/Eastern Caribbean, has requested assistance in developing a bio-tech solution for the most serious disease in bananas in Grenada - moko disease. A University of Idaho scientist with experience in the disease is currently under consideration as a consultant to WINBAN to work on this potential project.

7. Pre-feasibility Study on the Processing and Packaging of Tomatoes and Fruits in West Africa

The Economic Community of West African States (ECOWAS) is requesting a pre-feasibility study on the processing and packaging of tomatoes and fruits in West Africa. PIP has submitted an expression of interest in conducting the study.

This section lists those proposals that PIP applied for but were not awarded.

1. Bangladesh Potato Processing/FAO

The Food and Agriculture Organization of the United Nations (FAO) requested that PIP submit the name of a potato processing specialist to assist in developing new markets for fresh and processed potatoes produced in Bangladesh. PIP submitted the resume of Ray Kueneman, previous Director of Research, Production Manager, and Vice President of R & D for J.R. Simplot & Company.

2. Guatemala Apple Storage/USDA/OICD

The USDA/OICD requested an individual to travel to Guatemala and work with an AID marketing advisor to develop norms for the classification of fruits and to review the existing procedures for classification. PIP submitted the name of Dr. Kenneth Olsen, apple storage specialist.

3. Rural Private Enterprise Development and Employment Generation/Haiti

PIP proposed to subcontract to Development Alternatives, Inc. to provide short term technical assistance for the implementation of the components of the project related to postharvest handling and marketing of fruits and vegetables.

4. Technical Assistance for Short Term Storage/St. Vincent

USAID/Barbados requested a marketing management specialist to interact with St. Vincent authorities and the private sector to develop a concensus on the management plan for a trafficker marketing facility and the type of facility to be constructed.

5. Proposal for Removal of Hypoglycin in Ackee/Jamaica

Dr. Jorg Augustin, PIP consultant and Food Scientist, prepared a proposal which was funded by the AID Mission on the research necessary to remove the import alert status of ackee entering the U.S. However, the USAID Mission/Kingston selected the University of Florida to carry out the project, primarily because of location and facilities available at the University of Florida.

XI. NETWORKING

PIPIC has been able to cooperate on various projects during the year with organizations ranging from those within the University, to local, national and various international organizations. These are summarized in part below:

Organization	Level	Activity
University of Idaho (UI) College of Agriculture	local	Train staff in database searching techniques
UI Federal Credit Union	local	*Microfilming
US Forest Service	local	*Microfilming
UI Dept. of Agricultural Engineering	local	*Microfilming
UI Library (Interlibrary loans)	local	*Microfilming
Idaho State Library	state	Consult on automation and networking
Washington State University Libraries	internat'l	Consult on database software & design
Washington State University Libraries	internat'l	Conference workshop on RFTP responses
Center for the Development of Industry (Brussels, Belgium)	internat'l	Document exchange and client service
Development Resources (DEVRES) (Miami, Florida)	internat'l	Audiovisual material development
Postharvest Documentation Service (Kansas State University)	internat'l	Client service and document exchange
ASEAN Food Handling Bureau (Kuala Lumpur, Malaysia)	internat'l	Client service and document exchange
ASEAN Postharvest Training & Research Center (Los Banos, Philippines)	internat'l	Client service and document exchange
Tropical Development & Research Institute (London, UK)	internat'l	Client service and document exchange
Project SUSTAIN/US Agency for International Development	internat'l	Client service and document exchange
International Trade Center of UNCTAD/GATT (Geneva, Switzerland)	internat'l	Client service and document exchange
League for International Food Education (Washington D.C.)	internat'l	Newsletter publication
United Nations Industrial Development Organization (Vienna, Austria)	internat'l	Client service and joint database input on Micro-ISIS

XI. PIP TECHNICAL ADVISORY GROUP (PIP TAG)

PIP is utilizing personnel from the University of Idaho for its Technical Advisory Group as specified in the second Cooperative Agreement. No funding is available at this time to pay for travel and per diem for off-campus advisors. The advisory group meets on a weekly basis to discuss PIP activities as well as other international programs in the College of Agriculture.

The personnel in the PIP TAG are:

Dr. A. Larry Branen, Dean, College of Agriculture
Dr. Al Lingg, Associate Dean and Director of Resident Instruction
Dr. Ron Curtis, Director, International Trade and Development Office
Dr. Richard Schermerhorn, Chair, Agricultural Economics Department
Mr. Robert Haggerty, Training Officer, Pakistan IRM Project
Dr. Del Fitzsimmons, Campus Coordinator, Pakistan IRM Project

XIII. POTENTIAL ECONOMIC SPINOFFS FOR U.S. AGRICULTURE

This section lists PIP-supported projects which, if developed to fruition, may have positive economic benefits for Idaho and U.S. agriculture.

1. Shrinkwrap

PIP is sponsoring continued testing of shrinkwrap on mangoes and papayas to determine if fruit fly larvae and other harmful insects can be totally destroyed by the wrapping process. Initial tests indicate that fruit fly eggs and larvae are killed when the fruits are shrinkwrapped. Should shrinkwrap prove to be a successful control method for fruit flies, the results could have far reaching consequences for the fruit industry, especially since the technology is relatively simple and could be applied in developing countries as well. This research, conducted by the Department of Plant, Soil and Entomological Sciences, in collaboration with the USDA/ARS/Hilo Research Station, is currently in the planning process for the next stage.

2. Postharvest Processing and Marketing Program (PPMP)

The all-college PPMP Working Group is partially based on PIP's concept of providing technical assistance and research expertise in response to requests from clients. PIP personnel will participate in the group activities.

3. Rapeseed Processing and Marketing Study

PIP coordinated a feasibility study on rapeseed processing and marketing in Northern Idaho and Eastern Washington. Federal and State of Idaho organizations provided funding for the project. A PIP consultant, Michael Harker, travelled and interviewed private and public sector officials in the U.S. and Canada. A consulting committee made up of faculty members from the Colleges of Agriculture at the University of Idaho and Washington State University provided technical oversight.

4. Proposed Workshop to Develop Economic Spinoffs for U.S. Agriculture

PIP has submmitted a proposal to USAID/Private Sector Office for sponsorship of the development of a workshop on promoting economic spinoffs for U.S.

agriculture from foreign assistance projects. Proposed participants would be drawn from foreign assistance organizations, U.S. farm organizations, commodity commissisons, and academic institutions.

XIV. COST SHARING OF PROFESSIONAL TIME TO PIP FROM EXTERNAL ORGANIZATIONS

The following are estimated amounts of time donated to PIP by various organizations.

1. Inter-American Institute for Cooperation in Agriculture (IICA)

   A. Project: Asian study to develop initial draft of Postharvest Methodology.

   Estimated Time: 30 days

   Cost of Consultant Time: 30 days X $153/day = $4,590

   B. Project: Postharvest short course in California/Idaho for Caribbean participants.

   Estimated Time: 45 days

   Cost of Consultant Time: 3 persons X $153/day X 15 days =$6,885

SUB-TOTAL $11,475

2. Food and Agricultural Organization (FAO) - Eastern Caribbean

   A. Project: Postharvest Loss Short Course in California/Idaho for Caribbbean Participants

   Estimated Time: 30 days

   Cost of Donated Time: 2 trainees X $173/day X 15 days = $10,384

   Course Participants: 10

   Cost of Training Course: 10 X $6,660 = $66,000

SUB-TOTAL $76,384

3. ASEAN Food Handling Bureau/Southeast Asia

   A. Project: Asian Study to Develop Initial Draft of Postharvest Methodology

   Estimated Time: 42 days

   Cost of Consultant Time: 42 days X $150/day = $6,300 $6,300

4. World Bank

A. Project: Postharvest Loss Short Course in California/Idaho for Caribbean Participants

Course Participants: 1

Cost of Training Course: 1 X $6,600 = $6,600

SUB-TOTAL $6,600

5. Institute for International Education

A. Project: Postharvest Loss Short Course in California/Idaho for Caribbean Participants

Course Participants: 1

Cost of Participation: 1 X $6,600 = $6,600

SUB-TOTAL $6,600

6. University of Ambato, Ecuador

Project: Ecuador Postharvest Training Course on Apples

Cost of Consultant Time and Facilities: $1,771

SUB-TOTAL $1,771

7. Indian Council for Agricultural Research

Project: Postharvest Losses in Fruits and Vegetables in India

Estimated Time: 17 days

Cost of Specialists Time: 9 persons X $12.69/day X 17 days = $215.73

1 person X $16.15/day X 17 days = $275.55

SUB-TOTAL $491.28

TOTAL COST SHARING FROM OTHER INSTITUTIONS $109,611

XV. PIP STAFF TIME RELATED TO PROGRAM COMPONENTS

There were approximately 62.5 person months of staff time, including professional and non-professional, during the reporting period from core grant funds. It should be noted that the estimated amount of staff time spent for each program component is not necessarily indicative of the percent of the budgetary funds utilized. The reason is that staff time only is calculated and is not weighted according to salary levels. The staff time is estimated below for five program components which covers PIP activities funded by the core grant.

A. Program: Adaptive Research
   Estimated Staff Time: 10 person months

B. Program: Training
   Estimated Staff Time: 11 person months

C. Program: Technical Assistance and Field Research
   Estimated Staff Time: 11 person months

D. Program: PIP Information Center
   Estimated Staff Time: 26.5 person months

E. Program: General Administration (does not include administrative time for each of the program components)
   Estimated Staff Time: 4 person months

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