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POST-HARVEST INSTITUTE FOR PERISHABLES

A DETAILED OVERVIEW OF PIP ACTIVITIES

JUNE, 1987

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University of Idaho

in cooperation with
**United States Agency for
International Development**

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A DETAILED OVERVIEW OF PIP
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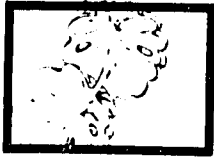
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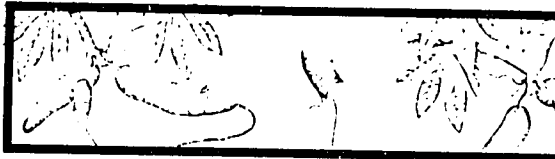
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POSTHARVEST INSTITUTE FOR PERISHABLES



**TECHNICAL ASSISTANCE
AND TRAINING TO REDUCE
POSTHARVEST LOSSES
IN PERISHABLES**



University of Idaho
College of Agriculture

in Cooperation with the United States Agency
for International Development

The Postharvest Institute for Perishables (PIP) was established because of concern with perishable food losses from harvest to consumption in developing countries.

POSTHARVEST ASSISTANCE

PIP is prepared to provide assistance to developing countries in a variety of ways, including, but not restricted to:

- Determine causes of postharvest losses and recommend reduction measures.
- Assess postharvest losses from harvest to consumption.
- Prolong the storage life of perishable commodities through improved harvesting, handling, pest control, storage design, cooling, refrigeration, processing or marketing systems.
- Conduct feasibility studies on processing perishable crops.
- Assist in promoting/marketing of fresh or processed perishable commodities to domestic or international markets.
- Analyze and provide suggestions for governmental policies affecting marketing and export of fresh and processed commodities.

The Institute was founded in October, 1980 at the University of Idaho, Moscow, Idaho, by means of a Cooperative agreement with the U.S. Agency for International Development. PIP cooperates with other international donor groups, the U.S. Peace Corps, the private sector and others in its efforts to reduce postharvest losses of perishable commodities.

The goals and objectives of the Postharvest Institute for Perishables are:

- To increase the availability (without increasing production areas) of fruit, vegetable, root, tuber, spice, nut and oilseed crops, and to enhance the basic diet of people in developing countries by reducing postharvest food losses.
- To reduce the costs of perishable commodities by improving the efficiency of the various components of a marketing system.
- To encourage the development of processing and other industries associated with fruit, vegetable, root, tuber, spice, nut and oilseed crops for domestic or export purposes.

- Conduct adaptive research in selected postharvest areas to reduce losses in harvesting, packaging, storing, preserving and processing of perishable food crops and sharing results of the research with developing countries.
- Collaborate with developing country institutions to assist them in developing curricula and extension aids for assessment and prevention of postharvest losses.
- Provide literature and information related to postharvest technology through the Postharvest Institute for Perishables Information Center.
- Place developing country students in U.S. universities for Master's degrees or non-degree programs relevant to assessment, reduction and prevention of postharvest losses in perishable commodities.

TECHNICAL ASSISTANCE TEAMS

PIP can provide experienced technical assistance teams for consulting work in response to requests from developing countries. A limited amount of consulting time may be sponsored by PIP if it relates to increased future project involvement.

Upon request, postharvest experts — economists, marketing specialists, engineers, entomologists, food technologists, horticulturists, plant pathologists, and others — are available for direct technical assistance to USAID Missions, host countries, private sector firms or other donor organizations. PIP strives to send specialists with relevant developing country experience.

SHORT COURSES, WORKSHOPS AND SEMINARS

PIP can provide training services for appropriate postharvest technologies such as harvesting, handling, grading and quality control for export, packaging, storage, refrigeration, processing or marketing. This training is most appropriately given in the host country and is financed by the host government, USAID Mission, private firms or other international donor organizations.

SPECIALIZED TRAINING

Training may be provided by PIP for degree or non-degree programs designed to assist qualified developing country personnel to study postharvest problems of perishable commodities. Students sponsored in degree programs will usually study at a U.S. university for one or two years for a Master's degree. Non-degree special programs may be of shorter duration and tailored to a specific need.



COST

Funds for PIP to provide short-term technical assistance, short courses, workshops or seminars for developing countries are normally provided by USAID Missions through a Companion Ordering Contract. Other international donor organizations may also assist in the funding of projects. Under certain conditions PIP may provide limited funds for technical assistance.

INFORMATION SERVICES

Information, documents and bibliographies on all phases of harvesting, handling, storage, marketing and processing related to reducing postharvest losses in fruit, vegetable, root, tuber, nut, oilseed and spice crops are available from:

Postharvest Institute for Perishables
Information Center
314 University of Idaho Library
Moscow, Idaho 83843 USA
Telephone (208) 885-7059

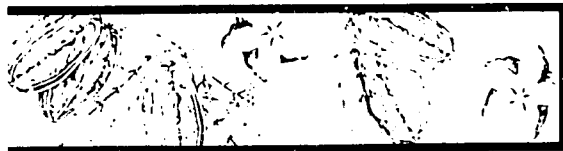
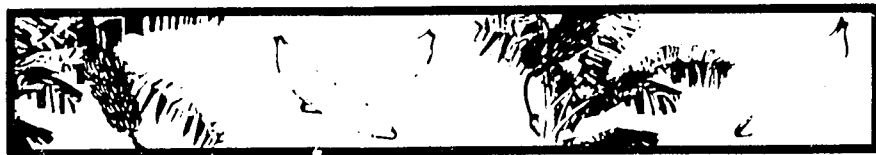
HOW TO APPLY

Host country institutions and agencies desiring technical assistance or training may request such assistance through their USAID Mission. The Mission will submit the request through:

Dr. Harvey J. Hortik
S&T/AGR/AP 413A, SA-18
Agency for International Development
Washington, DC 20523
Ref: Project No. DAN-1323-A-00-5093-00
Pass cable to: Dr. Harvey Hortik
S&T/AGR/AP 413A, SA-18

Other donor organizations or private sector firms may obtain additional information by writing to:

Postharvest Institute for Perishables
College of Agriculture
103 Morrill Hall
University of Idaho
Moscow, Idaho 83843 USA
Telephone: (208) 885-6791
Telex: 510 776 0923 UI CID MOCW



Requests from developing countries will be answered free. Others will be assessed a nominal fee. Printed material can be provided in microfiche or paper copy. Any requests for this service should be as specific as possible.



**Monoclonal Antibody Production Against
Colletotrichum gloeosporioides Penz.**

**A Potential Tool To Diagnose
Anthracnose in Mangos**

Report on Research Conducted
by Carmen Calma Paterno



PIP Tip No. 8701

April 1987



in Cooperation with the
United States Agency for International Development

Monoclonal Antibody Production Against *Colletotrichum gloeosporioides* Penz.

A Potential Tool To Diagnose Anthracnose in Mangos

Report on Research Conducted
by Carmen Calma Paterno

Background

The mango is one of the important commercial fruit crops of the world. In recent years its excellent flavor, color and nutritional value have increased its popularity and extended its markets beyond the tropics where it is grown. The major producing countries are India, Brazil, Mexico, Pakistan, the Philippines and Haiti.

In the fresh produce trade, decay produced by microorganisms is possibly the greatest cause of losses. Decay is usually initiated by one pathogen and followed by a broad spectrum of biodegraders. Microbial decay of mangos has caused losses of up to a third of the exported fruits. One major type of microbial decay is anthracnose, a fungal disease that is widespread in tropical and subtropical fruits and vegetables. Specific studies have shown anthracnose to cause significant losses in the Philippines and the Dominican Republic. In mangos the disease is caused by the fungus *Colletotrichum gloeosporioides* Penz. and is characterized by sunken, necrosed lesions. Symptoms on citrus, mango and avocado begin as sunken spots which are initially orange in color turning to cinnamon and then to black as the disease progresses.

The fungus attacks most of the aerial parts of the plant except the bark of the main trunk. On various parts of the plant, it causes leaf spot, leaf blight, peduncle blight, blossom blight, fruit stain and premature fruit abortion or any combination of these.

Assurance of premium quality mangos for export is uncertain because of the manner in which the disease develops: the organism causes "latent infections" in the fruit where the causal agent penetrates early in the fruit developing stage but becomes visible only in the ripening stage. Since mangos are shipped at the green mature stage, the possibility of packing unblemished but diseased fruits is always present.

This condensed report was prepared by Paulette Foss George as a summary of the Master of Science thesis by the same title written by Miss Carmen Calma Paterno, a Philippine student financially supported by the Postharvest Institute for Perishables. The entire thesis, written in 1986, is 60 pages in length and is available on microfiche from the PIP Information Center, University of Idaho, Library Room 314, Moscow, Idaho 83843, USA.

Prevention of postharvest decay requires an integrated approach which includes field and packinghouse treatments. Timely fungicidal sprays can prevent infection of the plant parts in the field and conidia on the fruit surfaces can be washed off. Nonetheless, even with these combined measures, complete anthracnose control is difficult.

Early detection of the anthracnose in the mango fruits would benefit local and foreign traders, would assist international efforts to prevent disease outbreaks and provide reliable evidence of the need for quarantine measures without penalizing healthy fruit.

Objective

The objective of this study was to develop a standardized reagent, a monoclonal antibody, which would diagnose the presence of anthracnose in mangos.

Materials and Methods

The production of monoclonal antibodies requires several very detailed procedures, most of which have been developed only within the last decade. Monoclonal antibody production uses tumor cells to massively and uniformly replicate the desired characteristics of other cells to which they are fused.

In this experiment four different *Colletotrichum gloeosporioides* cultures were grown at 25°C. for 3 weeks. Spore, mycelia and whole organism inoculants were then prepared. White female New Zealand rabbits, chosen to produce the quantity of serum required for volume testing, were inoculated with these preparations in order to produce antibodies. After 46 days the rabbit blood was removed and centrifuged to separate serum and coagulated cell fraction. The serum was used in slide agglutination tests and cross-reaction tests between antigens (the inoculants) and antisera. These tests were performed to select the antigen with the strongest response.

Because the immunized animal should be of the same species as the tumor (myeloma), 6-week-old female BALB/c mice were immunized with the selected antigen. After 36 days the mouse with the highest antibody activity was sacrificed and the spleen was aseptically removed.

The spleen was then teased through a mesh screen to make a cell suspension. Polyethylene glycol (PEG) was used to fuse the spleen cells with the myeloma (tumor) cells as a fusing agent. ELISA (enzyme-linked immunosorbent assay) was used to screen the resulting spleen-myeloma hybridomas and isolate those that consistently had a strong binding reaction to the *C. gloeosporioides* antigens. Antibodies were also produced in ascitic fluid. The biochemical nature of the antigen was then determined.

Results and Conclusion

Two of the hybridomas produced antibodies which gave positive reactions to *C. gloeosporioides* Penz. These were identified as cell lines 3X₄C₅ and 3X₈F₈. The cross-reaction tests with the available C

PIP ACTIVITIES AND POTENTIAL BENEFITS TO U.S. AGRICULTURE

1. Domestic Postharvest processing and marketing

The College of Agriculture at the University of Idaho is using PIP as a model for a new program to assist the State's agricultural sector. This program would include a pool of faculty specialists, from all areas of postharvest activities, who would be available to solve technical problems submitted by the State's agricultural industry. A facilitating center, similar to PIP, would be responsible for receiving requests for assistance and interacting with the specialist pool to develop proposals and implementation plans to solve clientele problems.

2. Potato Shrinkwrap Adaptive Research

A potential marketing tool for Idaho potatoes developed from an adaptive research project to prolong the shelf life of potatoes. By using shrinkwrap (a plastic, saran type wrap) on small packs of 2 to 4 and 6 counts of premium potatoes, and printing the Idaho label on the wrapping, a potential means to identify and market small lots of potatoes might be feasible. Several Idaho marketing organizations have shown interest in this process.

3. Shrinkwrap and tropical fruit flies

Two separate laboratory tests have shown that shrinkwrap has destroyed larvae of Drosophila flies in mangoes. Tests will soon be initiated by PIP, in collaboration with the USDA Experiment Laboratory in Hawaii, using fruit fly larvae. If shrinkwrapping is found to consistently destroy fruit fly larvae, this process could have wide positive ramifications for U.S. and developing countries agriculture.

4. Organization of State Studies

PIP was requested to oversee an Idaho study on processing and export potential of rapeseed produced in Idaho. The study was fully funded by several State agencies. PIP was offered the project because of its experience in managing project studies.

5. Nutmeg Oil distillation facility in Grenada

The Grenada Nutmeg Association plans to construct a nutmeg oil processing facility in the near future which is to be financed by a European bank loan. The Nutmeg Association has been requested to allow non-European firms to bid on the project. A large international engineering firm in Idaho, with experience at constructing processing plants, may be interested in bidding on the project.

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PIP'S MANDATE AS IT APPLIES TO
AID'S NEW FOCUS IN AGRICULTURE & RURAL DEVELOPMENT

USAID's new focus relates to the increase of incomes to the poor, expanding the availability and consumption of food in nutrition enhancement, and conservation of the natural resource base.

The above points have been a focal point of PIP since its inception in 1980. PIP's Project List headings, which have been used to categorize PIP projects reads as:

- "Increase availability of fruit, vegetable, root and tuber crops."
- "Enhance basic diets of people in developing countries."
- "Reduce costs of perishable commodities by improving market efficiency."
- "Encourage development of fruit, vegetable, and root and tuber crops, spices, its industries and processing."

PIP's brochure has the following quotes:

"To increase the availability (without increasing production areas) of fruit, vegetables..."

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THE FOLLOWING PROJECTS ARE BEING DEVELOPED AND MANAGED BY PIP AT THIS TIME:

<u>On-Going</u>	<u>Funding Source</u>
1. Grenada Spice Analysis	USAID/Grenada
2. Grenada Spice Mkt/U.S.	USAID/Grenada
3. Thailand Refrigeration of Tropical Fruits & Vegetables	USAID/Thailand
4. Costa Rica Cacao Assessment Study	USAID/Costa Rica ATI
5. India Postharvest Loss Assessment Methodology Workshop/Study	USAID/India ICAR (Indian Council for Agricultural Research)
6. Shrinkwrap Adaptive Research to prohibit fruit fly infestation of U.S.	PIP Core Budget USDA/Hawaii Exp. Lab
7. Postharvest Loss Assessment Methodology Workshop. PIP/U. of California at Davis for Eastern Caribbean area	USAID/Barbados FAO/Barbados IICA (Inter-American Institute for Cooperation in Agriculture) World Bank (Possibly)
8. Training/Tech. Assistance under ROCAP Non-Traditional Exports of Agricultural Products.	USAID/Chemonics/ ROCAP
9. Training (Postharvest Activities) Various groups from developing countries in different disciplines.	USAID (Primarily)
10. High Impact Agricultural and Marketing Project/Caribbean (HIAMP)	USAID/PIP Cooperating with Development Alternatives, Inc. in some aspects of the project
11. Rapeseed Processing/Marketing Study (Coordinated by PIP for State of Idaho)	Economic Development Assoc. Idaho Research Foundation Idaho Dept of Agriculture

Pending (Based on submission of proposals or pre-proposals)

<u>Pending</u>	<u>Potential Funding Agencies</u>
1. Jamaica Dasheen Research/Mkt Project	IDB/World Bank
2. Bangladesh Fresh Vegetable Handling for Exports/Europe/Mid-East	USAID/Bangladesh
3. PH Loss Assessment Methodology Workshop/ Study-Philippines	PCARRD PIP Core Fund
4. PH Loss Assessment Workshop-Asia area (PIP in collaboration with AFHB and U. of California at Davis)	USAID Missions ASEAN Food Handling Bureau
5. Thailand Marketing Project	USAID
<u>Other Inquiries</u>	
1. Fiji Postharvest Work (Information gathering trip in planning stage)	PIP Core Fund
2. PH Loss Assessment Methodology Workshop -- Zimbabwe, Indonesia, St. Lucia Banana Growers Assoc., MARDI/Malaysia	Various Funding Agencies
3. Agricultural Marketing Improvement Strategies (AMIS) A five year program to develop strategies to improve marketing in developing countries.	USAID

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POSTHARVEST INSTITUTE FOR PERISHABLES

QUARTERLY ACTIVITY REPORT

January 1, 1987 to March 31, 1987

GENERAL

Project activities and possibilities have continued to increase this quarter. A field trip was made to Asia by the Field Director, Harvey Neese, visiting seven countries in a five week period. Concept papers or pre-proposals were presented in four countries on the trip. Two of these (India, Philippines) have progressed into proposals and another AID Mission (Thailand) has asked for two proposals. AID/Bangladesh has informed PIP that as soon as a budget supplement has been approved, it would be interested in a fresh fruit and vegetable project thru PIP.

AID Missions in Asia are specifically requesting more collaboration with the private sector in project work. Mission personnel feel commercial experience is becoming more relevant in Asia where countries are becoming more market oriented and concentrating on increased processing and exports of agricultural commodities. Previous research work in these countries appears to have been successful and the next logical step of taking economic advantage of the information is now beginning to take shape.

Several activities that PIP has been involved in are showing promise of offering broad, positive ramifications in developing countries as well as favorable publicity and prestige for the University and possible economic benefits for the State. These include research on shrinkwrap as a control mechanism of harmful insects entering the U.S. in tropical fruit, shrinkwrap as a means to lengthen shelf life of potatoes (and as a packaging material to

market premium Idaho baking potatoes), and the postharvest methodology to identify and solve losses in perishable commodities through a systematic approach. These PIP activities are somewhat unique and enterprising and could give increased recognition to the University in the international arena.

The USAID office that oversees the publication of "Frontlines", the agency's official newspaper, has indicated a willingness to consider a publication on how PIP's activities have potential impact on domestic agriculture.

Guidelines have been sent to PIP.

ON-GOING ACTIVITIES

ADAPTIVE RESEARCH DEVELOPMENT AND MANAGEMENT

Postharvest Methodology (Worldwide)

Interest has continued to increase in the combination adaptive research/training program that PIP is developing in cooperation with the ASEAN Food Handling Bureau (Asia) and International Institute for Cooperation in Agriculture (Caribbean/Central America). Three workshops/training courses for field tests are planned in India, Philippines and the Caribbean/Latin America areas which will concentrate on a systematic approach to identify postharvest losses and solutions. Final approvals for the workshop are pending in India and the Philippines. It is felt that some changes will be needed to improve the methodology, as parts of it are still unclear as to the desired end results.

Perishables Market Research

After submission of a market research paper for PIP on perishables by Dr.

Schermerhorn to AID/Washington, a project paper is now being prepared by AID/S&T/RD of which one component will be involved with rapid appraisal market research of perishable commodities. PIP is being considered as the organization to coordinate the perishables market component in a sub-contract with the primary contractor that would be awarded the project. In the event this program comes to fruition, AID Mission buy-ins are also expected in addition to the longer-term contract.

Shrinkwrap

As a spin-off to work on shrinkwrap to lengthen self life of potatoes, interest is increasing in utilizing shrinkwrap as a tool to market 2, 4, and 6 pak sizes of Idaho baking potatoes to targeted consumers. The Pillsbury Company requested Kiran Shetty, who conducted the shrinkwrap research under a PIP training grant, to wrap samples of potatoes. The Idaho Potato Commission is now reportedly considering shrinkwrap as an optional marketing method for identifying small packs of baking potatoes as produced in Idaho.

In addition to the marketing aspects of shrinkwrap, UI entomologist Dr. Marc Klowden has completed for PIP the first simulated test of determining whether insect eggs/larvae are adversely affected by shrinkwrapping mangoes. The drosophila fly was utilized in the initial test. It was found that the fly larvae in mangoes died after shrinkwrapping. More replications of the test are now being planned to determine with more certainty the effect of shrinkwrap on fly larvae. When these follow-up tests are concluded, similar experiments will be attempted with the USDA laboratory in Hawaii, using fruit and melon fly larvae.

Grenada Nutmeg Analysis

Analysis of the last samples of Grenada nutmeg by Dr. David Drown and Jack Matthews, UI/College of Chemical Engineering, should be finished in May. A report will be prepared by the principal investigator and research students involved in this project.

Grenada Nutmeg Marketing

PIP's spice marketing specialist, Dr. Wayne Henry, will travel to Grenada in April to initiate this project involving market research and promotional work in the U.S. for Grenada nutmeg.

Rapeseed Marketing and Processing Research (Northwest U.S.)

This project was officially awarded to PIP as the coordinating organization to assess the markets for edible rapeseed grown in Idaho and outlying areas. Mike Harker, an agricultural economist and former rapeseed grower, is the project leader. He is assisted by another agricultural economist, Manfred Heim, formerly with the IMPACT Center at Washington State University, and a group of UI faculty. The project is being fully funded by the Clearwater Economic Development Association, the Idaho State Department of Agriculture and the Idaho Research Foundation affiliated with the University of Idaho. All PIP staff and clerical time are also paid for through this project.

Jamaica Ackee Fruit

The Jamaica AID Mission requested PIP to send a food scientist, Dr. Jorg Augustin, to Jamaica to examine the problem of hypoglycine A & B in ackee, the national fruit of that country. These two compounds are toxic and have reportedly caused the deaths of a number of people who have eaten unripe

ackee. Base levels of hypoglycin A & B in ripe, unripe, and canned ackee have not been established, nor have tolerance levels for human consumption. Dr. Augustin travelled to Jamaica to gather sufficient information to prepare a proposal on how the two toxic compounds may be removed and the import ban by the FDA lifted. The proposal will be sent to the Jamaica AID Mission in early April.

Solar Refrigeration

The initial research work on solar refrigeration has been finished. PIP is awaiting completion of the Masters' thesis by Doug Asbe, UI/ChE, on the research. After the thesis is finished, the project will be evaluated to determine if it is worthwhile to proceed and how. A proposal has been submitted to the Island of Truk for further adaptive research on solar refrigeration. A post-session on the results of the project will be presented in July at the 12th National Passive Solar Energy Conference in Portland, Oregon by Dr. Drown and Doug Asbe.

TECHNICAL ASSISTANCE

Costa Rica

Postharvest handling/training of strawberry techniques, funded by the Costa Rica AID Mission, was directed at improving handling and marketing of fresh strawberries for export to the U.S. during the winter season. Strawberry specialist, Miguel Ramos, a private grower and postharvest handling specialist from California, was contracted by PIP to make two trips to Costa Rica. The project was completed with on-the-spot training, some new innovations introduced, and a report including recommendations to improve the quality of the exported commodity thru cooperative marketing.

TRAINING

PIP/U. of California Postharvest Methodology Loss Assessment Course

This training course is planned for this August/September period by PIP and the U. of California at Davis. The course is being offered both through a proposal to the USDA/Office of International Cooperation in Agriculture and by direct advertisement through PIP and UC/Davis. The FAO/Caribbean office in Grenada has asked to reserve places for eight participants. Optimum number of participants is 15 with a maximum of 20 acceptable. The five-week program is unique in that the initial two weeks will concentrate on the systematic examination of marketing systems and the last week will involve assistance in setting up loss assessment programs with the participants, directed at specific commodities and problems in the participants' home countries. There is a possibility that the International Institute for Cooperation in Agriculture (IICA) may participate in the course to assist with developing programs with participants from the Caribbean and Latin American countries that they can follow up after the course is over.

Panama Postharvest Loss/Handling Training Course

Two PIP training consultants, Bill Bolton and Miguel Jimenez, conducted a three week postharvest course in Panama in Spanish. The USDA/OICD was the facilitating organization and AID/Panama funded the program. There were 16 participants attending the course.

Ecuador Postharvest Training Course on Apples

Dr. Mike Colt, UI extension horticulturist, completed a successful two week training course in Ecuador for apple producers and agricultural officials. Dr. Colt travelled and worked under the auspices of PIP, ITAD, and the

Department of PSES at the University of Idaho. It is possible that future work on the program will be funded under the Partner's Program.

Graduate Training

PIP continues to support financially the Master's program of Kenyan, Mr. O.C. Gor, in the Department of Agricultural Education. Mr. Gor will travel to Washington, D.C. in April, 1987, to present his paper "A Discussion of Strategies for Appropriate Technology Transfer to Developing Countries" to the national meeting of the Association for International Agricultural Education.

PROPOSALS AND PROJECT POSSIBILITIES

Jamaica

A proposal has been prepared by PIP for the Jamaica AID Mission on research that would be conducted at the UI. This research would provide data to convince the Food and Drug Administration to remove the import alert ban on ackee, the national fruit of Jamaica. The project, if approved, could result in a longer term involvement of Dr. Jorg Augustin, UI/B&B, and other researchers in food science and human toxicology.

PIP/International Potato Center (CIP) On-Farm Potato Extension Publications

The CIP representative in Thailand, Dr. Siert Wiersema, suggested collaboration on preparation of on-farm potato storage bulletins to be distributed through PIPIC. CIP/Peru will have to approve this project which is also being considered by PIP.

India Council for Agricultural Research (ICAR)

ICAR and the India AID Mission have requested PIP to develop a proposal for an

initial field test of the postharvest methodology in India for Indian conditions. A proposal has been submitted to ICAR which includes PIP involvement in a three week workshop, a mid-course evaluation, and two weeks of analysis on the information collected. The project, if finally approved, is scheduled to begin in May.

Philippine Council for Agricultural & Resources Research & Development (PCARRD) and the ASEAN Food Handling Bureau

PCARRD and the ASEAN Food Handling Bureau have requested PIP to assist in setting up an initial field test of the postharvest loss assessment methodology in the Philippines. The commodity selected to be studied in the field test is a variety of small bananas in the Philippines. PCARRD and the ASEAN Food Handling Bureau will handle expenses incurred by these two organizations including information collecting costs. PIP will collaborate in much the same mode as mentioned for India above.

Thailand Systematic Approach to Developing Market Potentials for Fruits and Vegetables in Thailand

The Thailand AID Mission has requested PIP to generate a proposal to transfer postharvest technology for perishables to exporters and assemblers primarily and on harvesting and handling techniques to farmers secondarily. Main emphasis would concern extending the shelf life of commodities produced to supply specific overseas markets.

Postharvest Assistance to Bangladesh

A concept paper was presented to USAID Bangladesh to assist a quasi-government marketing organization and fruit and vegetable exporters in on-farm storage techniques for potatoes, food processing, refrigeration and packaging for

perishable exports. USAID Bangladesh responded to the concept paper by stating its interest in a project as soon as a supplemental budget allocation is approved.

Jamaica Dasheen Research

Dasheen (aka taro) is a tuber produced in Jamaica and other tropical countries. It has been observed that during harvesting and handling operations, most of the tubers are injured and these wounds serve as points of entry for postharvest pathogens which also stimulates physiological changes in the corms. Although some dasheen have been exported from Jamaica, it is not known where the best market potential exists or if the storage and transportation problems can be solved. A project proposal was requested some months ago by the Storage and Infestation Division of the Ministry of Foreign Affairs, Trade and Industry. It was thought that this organization had already contracted another organization to do the project. Recently, the Storage and Infestation Division requested more information and indicated PIP was still being considered to oversee the research funded by the World Bank.

Honduran Agricultural Research Foundation (FHIA)

A pre-proposal was submitted to FHIA outlining potential areas of research collaboration and information exchange between PIP and the FHIA. A response was received from the Assistant Director of the FHIA to the effect that he had reviewed the pre-proposal and thought there were excellent opportunities for collaboration, but his organization was in the middle of an annual review and would not be able to respond formally until after the review. The pre-proposal indicated that Kiran Shetty, Maury Wiese, Dick Heimsch, or Bob Skiles might be available to travel to La Lima, Honduras to begin developing collaborative research programs.

TRAVEL DURING THE QUARTER

The Field Director travelled to seven countries in Asia over a five week period. The countries were: Japan, Philippines, Singapore, Malaysia, Thailand, Bangladesh and India. Project possibilities from five of the countries surfaced during the extended trip.

PIPIC

Activities

Change is certainly the theme of the quarter. Many desired changes finally happened, as well as another, long-feared.

Personnel

In late January PIPIC's microfilming technician and friend, Joseph Dvorak, died of heart failure. We still sorely miss his knowledge, wisdom, kindness and his tinkering abilities. In evaluating the requirements for a new staff member, we found we had two different jobs to be done. Jack Cammack was hired to fill some hours Kris Gould gave up (due to changed academic commitments) as well as some of the microfiche document copying done by Dvorak. Jack Cammack works 6-10 hours per week, depending on the incoming work load. In mid-March, Craig Thorsen was hired to prepare and microfilm new documents. He will be working 12-15 hours per week.

Quarters

Following long delays and a confrontation with the expensive procedures required by UI Physical Plant for minor remodeling, the PIPIC operations

were moved into the previous typing room on February 17th. Though we are still getting used to the new quarters, the general feeling is one of vastly increased space and a real connection to the outside world, since we now have windows! The copying operations were shifted into PIPIC's previous office and room 313 was returned to the library. Everyone involved is pleased with the exchange.

Computers

Nearly all of PIPIC's new micro-based computer system arrived a week and a half after our move. Some initial delays in initializing the system stemmed from receiving a chip we did not order which made both the printer and modem inoperative. Once the uninvited chip was removed, the basic system, functions well and is now being prepared for software tests. The installation of the Bernoulli Box Plus system is waiting the arrival of the RAMpage board. We expect serious input of new materials into the IBM-AT system to begin within two weeks. Details of the conversion from the mainframe computer are being finalized. With the imminent demise of the archiving system on the mainframe system, PIPIC is in a greater rush to get the system converted than was initially expected. All of this must be accomplished during the next quarter.

PIP Tips

The long-discussed series of brief information bulletins called "PIP Tips" has taken on reality. A cover and general stylesheet has been designed for the series in cooperation with Jerry Adams in Agricultural Communication. PIPIC is able to directly interface its word processor with the typesetter which makes the entire process relatively quick and inexpensive. Paulette George is in charge of the series, and has done all of the writing to date.

"PIP Tips" in the process are: Carmen Paterno's research on monoclonal antibodies to detect mango anthracnose; Kiran Shetty's research with shrinkwrapping potatoes; the condensation of a report by Dr. R.W. Schermerhorn on market improvement priorities for developing countries, and a description of Ross Kremer's research on entrepreneurship and technological change among the gari (cassava) processors of Ghana.

Further "PIP Tips" are still being determined. A joint effort with the International Potato Centre (CIP), FAO, the Dutch Institute for the Storage and Processing of Agricultural Produce (IBVL), and PIP is being considered. The idea is to produce both table potato and seed potato storage brochures. PIP is considering the project and is waiting for the CIP and FAO decisions. There are still five other research projects which PIP has sponsored which are being considered for condensation and publication in the series. A time table for publication of these will be determined during the next quarter.

Other Publications

The bibliography on the "Storage of Potatoes, Onions and Garlic" will be the first major output from our new microcomputer system. It is long enough to give both the software and the staff a good test. Brief experiments with PIPIC's new output software are exciting. We should have both a more professional looking document and one which requires less space to print. This would provide a companion document to the CIP/FAO/IBVL/PIP documents previously mentioned.

PIP consultant Miguel Jimenez has recently returned from a training course in Panama. He sent PIP the printed training materials along with the suggestion that PIP publish a manual that incorporates these Spanish-language materials.

Discussions are being held to determine what can be done with the material.

Etc.

Karri Meister received formal training on the Dialog retrieval system in Spokane on March 17. This is permitting her to do more of the bibliography requests which are arriving in increasing numbers. On the lighter side, PIPIC worked with the Science Library staff and those in Special Collections to increase the awareness of the entire library about poisonous foods as part of a special staff coffee break during Poison Prevention Week. It served as a learning process for us as well. An example was the discovery that common beans (Phaseolus vulgaris) eaten raw are poisonous in large quantities. It was a rare chance to show others the useful side of the work we are doing. PIPIC staff are brainstorming the idea of using this theme for the College of Agriculture's public "Ag Days" display in the fall at a local shopping mall.

Statistics

	<u>This Quarter (1/87-3/87)</u>	<u>FY 1987 (10/86-)</u>	<u>Total (4/81-)</u>
Number of requests received:	190	338	
Number of new requesters:	13	28	923
Size of collection (titles):		264	9,886
Number of persons served:	123	292	
Number of orders sent:	209	454	
Number of countries served:	54*	65**	117
Materials distributed:	2834	5123	44,955
Paper copies	1990	3883	
Loaned from other lib.	23	90	
Microfiche copies	<u>723</u>	<u>981</u>	
Total documents	2736	4954	42,879

In-house bibliographies	72	108	
Dialog bibliographies	<u>26</u>	<u>61</u>	
Total bibliographies	98	169	2,076
Average size of order	13.1 docs	10.9 docs	

- * 50 LDC's
- ** 58 LDC's

Discussion

The three new countries PIPIC is serving are Afghanistan, Burma and Palau. More than a quarter of the documents sent this quarter were on microfiche. This seems to be a result of having more users capable of using microfiche. If this trend continues, it could save PIPIC both postage and staff costs.

The size of orders seems to be increasing. This quarter, the average was 43% above the last one and 64% above the average order in FY 1986. PIPIC is apparently adding more relevant documents to the collection, but this may be a disturbing trend as PIPIC costs increase with increases in demand.

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POSTHARVEST INSTITUTE FOR PERISHABLES

PIP PROJECT LIST



<u>Reduce postharvest loss to:</u>	Reduce costs	Encourage develop-
increase availa-	of perishable	ment of fruit, vege-
bility of fruit,	commodities	table, root and tuber
vegetable, root	by improving	<u>crops, spices, etc.</u>
and tuber crops	marketing	indus-
	efficiency	processing
		tries

1. Paraguay/May 81. CREDICOOP LTDA Refrigeration facility	X		X	X
.Estimate refrigeration requirements for strawberries, tomatoes, bananas for export				
.Provide specifications for bids				
2. Barbados/Oct 81. Perishable Postharvest Losses in Selected Eastern Caribbean Countries	X	X	X	
.Identify losses in handling, packing, transport, storage and distribution of perishables in Antigua, Dominica, St. Lucia, St. Vincent and Barbados				
.Determine feasibility of loss reduction interventions.				
3. Dominican Republic/Nov 81. Methods of Reducing Storage Losses of Potatoes and Onions.	X	X	X	
.Evaluate facilities and recommend modifications				
.Make recommendations for alternatives or improved functions in perishable marketing				
4. Nicaragua/Dec 81. Seminar and Workshop on Food Technology in Nicaragua	X	X		X X
.Food plant management for sanitation				
.Microbiological analyses of food				
5. Nicaragua/Jan 82. Seminar and Workshop on Sensory Evaluation of Food in Nicaragua	X	X		X X
.Develop standards and operating procedures for new equipment				
.Train staff in operation of equipment				



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PIP PROJECT LIST

	<u>Reduce postharvest loss to:</u> increase availability of fruit, vegetable, root and tuber crops	enhance basic diets of people in developing countries	Reduce costs of perishable commodities by improving marketing efficiency	Encourage development of fruit, vegetable, root and tuber <u>crops, spices, etc.</u> indus- processing tries	
6. Thailand/Apr 82. Project Identification at the Thailand Institute for Scientific and Technological Research .Formulate project proposal for AID funding in food industry needs .Recommend essential facilities for postharvest handling and distribution system, and laboratory and research designs	X	X	X	X	
7. Bangladesh/Apr 82. Potato Processing for Bangladesh. .Recommend low-cost methods for processing potatoes to prolong storage life .Study non-refrigerated storage and potato variety responses to storage	X	X		X	X
8. Pakistan/Apr 82. Project Identification Study of Fruit and Vegetable Production and Marketing in Northwest Frontier Province. .Design program to strengthen horticulture research, extension, training .Recommend principal facilities for accomplishment .Recommend personnel needs .Design market information system and potential export markets .Recommend cooperatives and food processing potentials	X	X	X	X	X
9. Thailand/Apr 82. Thailand: Assessment of Agro-Industry Investment opportunities .Analyze investment opportunities .Recommend specific opportunities			X	X	X

PIP PROJECT LIST

	<u>Reduce postharvest loss to:</u> increase availa- bility of fruit, vegetable, root and tuber crops	enhance basic diets of people in developing countries	Reduce costs of perishable commodities by improving marketing efficiency	Encourage develop- ment of fruit, vege- table, root and tuber <u>crops, spices, etc.</u> indus- processing tries	
10. India/Sept 82. Research and De- velopment Requirements for Postharvest Technology of Fruits and Vegetables .Identify postharvest problems and research needs in 4 Indian states .Prepare 5-year research program with facility and personnel needs described.	X	X			
11. Paraguay/Oct 82. Short Course on Cold Storage Management of Perishable Crops in Paraguay .Train personnel in cold storage management for nationwide program	X	X	X		
12. Jamaica/Oct 82. Assembly and Grading Stations for Agricultural Development Project .Advise on suitability or re- write specifications for equipment for 25 assembly and grading stations .Equipment must be capable of pre-cooling, washing, drying dipping, waxing, grading and storing	X		X	X	X
13. Thailand/Nov 82. Marketing Survey of Thai Processed Fruits and Vegetables .Assess export market potential for 14 processed fruits and vegetables produced in Thailand .Identify market channels and recommend export market develop- ment in Hong Kong, Singapore, Japan and U.S.	X		X	X	X

PIP PROJECT LIST

PIP PROJECT LIST	Reduce postharvest loss to:		Reduce costs of perishable commodities by improving marketing efficiency	Encourage development of fruit, vegetable, root and tuber crops, spices, etc. <u>indus- processing tries</u>	
	increase availability of fruit, vegetable, root and tuber crops	enhance basic diets of people in developing countries			
14. Pakistan/Dec 82. Design for Fruit and Vegetable Component of Agricultural Production, Distribution and Storage Project in Pakistan .Design components for extension, research, education, markets and marketing systems, potato production, and fruits and other vegetables.	X	X	X		
15. Panama/Jan 83. Appropriate Technology for the Postharvest Handling of Agricultural Products in Latin America. .Training sessions for governmental, banking, cooperative and marketing personnel	X	X	X	X	
16. Ecuador/Feb 83. Workshop on Post-harvest Handling and Processing of Apples .Short course on postharvest physiology, handling, management, storage, quality, pre-processing of apples	X	X	X	X	X
17. Thailand/Mar 83. Handling and Packaging Fresh Tropical Fruits for Export .Identify packaging needs and modifications .Make recommendations for research projects to meet local packaging needs	X		X	X	X
18. Yemen/Apr 83. Postharvest Losses of Perishable Horticultural Foods in the Yemen Arab Republic .Assistance in postharvest handling, transportation, storage and marketing .Identify causes of losses and make recommendations for appropriate training and projects to encourage exports	X	X	X	X	

A.

PIP PROJECT LIST

	<u>Reduce postharvest loss to:</u> increase availability of fruit, vegetable, root and tuber crops	enhance basic diets of people in developing countries	Reduce costs of perishable commodities by improving marketing efficiency	Encourage development of fruit, vegetable, root and tuber <u>crops, spices, etc.</u> indus- processing tries
19. Haiti/May 83. Assessment of Coffee Processing Equipment Requirements for Haiti's Central Coffee Processing Facility .Evaluate bids for installation of coffee processing equipment .Recommend structural or specification changes to meet needs for export			X	X X
20. Yemen/May-June 83. Workshop on Postharvest Handling, Storage, Transportation and Marketing of Fruits and Vegetables in the Yemen Arab Republic .Train government people in broad aspects of postharvest management	X	X	X	
21. Thailand/June 83. Workshop on Transportation and Handling Techniques for Horticultural Produce. .Workshop for ASEAN students from Indonesia, Malaysia, Philippines, Singapore, Thailand .Postharvest techniques for fruits and vegetables	X	X		
22. Thailand/July 83. Workshop on Commercial Postharvest Practices of Fruits and Vegetables .Factors affecting postharvest life .Methods of delaying fruit ripening	X	X		
23. Thailand/Aug 83. Extension needs in Low-Cost Technology .Workshop for training future trainers	X	X		

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PIP PROJECT LIST

	<u>Reduce postharvest loss to:</u> increase availability of fruit, vegetable, root and tuber crops	enhance basic diets of people in developing countries	Reduce costs of perishable commodities by improving marketing efficiency	Encourage development of fruit, vegetable, root and tuber <u>crops, spices, etc.</u> indus- processing tries
24. Philippines/June-Aug 83. Training Course on Preservation of Tropical Fruits and Vegetables by Solar Drying with Supplemental Heat .Teach construction and use of dryer .Teach adaptability of dryer to local food preservation problems.	X	X		X
25. Indonesia/May 83. Postharvest Planning for Perishable Crops. .Plan assessment of postharvest losses of fruits and vegetables .Plan production increases for export .Plan postharvest management in cooperatives	X	X	X	X
26. Taiwan/Sept 83. An Integrated Approach to the Study of Postharvest Problems in Tropical Countries: A Case Study in Taiwan .Initiate development of a loss assessment methodology for perishable crops that could be further refined for use in developing countries	X	X	X	
27. Indonesia/Sept 83. Workshop on Postharvest Handling of Tropical Crops. .Train government personnel in handling and processing of cassava	X	X		X
28. Jamaica/Oct-Nov 83. Evaluation of Marketing System Components of Agricultural Marketing Project .Evaluate components for upgrading marketing infrastructure .Especially, evaluate network of 25 assembly and grading stations for fruits and vegetables	X	X	X	X

PIP PROJECT LIST	<u>Reduce postharvest loss to:</u> increase availability of fruit, vegetable, root and tuber crops		enhance basic diets of people in developing countries	Reduce costs of perishable commodities by improving marketing efficiency	<u>Encourage development of fruit, vegetable, root and tuber crops, spices, etc.</u> indus- processing tries	
29. Seychelles/Nov 83. Feasibility Study for Cinnamon Processing in the Seychelles .Study feasibility of processing cinnamon for export	X			X		X
30. St. Vincent/Nov 83. Preshipment Market Preparation and Storage Facilities. .Assist in improving facilities for handling and storage of sweet potatoes .Design specifications for storage including equipment	X		X	X	X	X
31. Guatemala/Nov 83. Small Farmer Marketing Project: Fresh Vegetable Exports .Develop designs for construction or upgrading of small farmer cooperatives packing and storage facilities	X			X		X
32. Honduras/Nov 83. Vegetable and Citrus Projects Developments with Emphasis on Export .Identify potentials for exporting vegetables, citrus, cocoa .Recommend facilities required or modifications for increased exports	X			X	X	X
33. Indonesia/Nov-Dec 83. A Solar Dryer with Supplemental Heat for Food Preservation .Teach construction and use of dryer .Teach adaptability of dryer to local food preservation problems	X		X			X

PIP PROJECT LIST

	<u>Reduce postharvest loss to:</u>		Reduce costs of perishable commodities by improving marketing efficiency	Encourage development of fruit, vegetable, root and tuber <u>crops, spices, etc.</u> indus- processing tries	
	increase availability of fruit, vegetable, root and tuber crops	enhance basic diets of people in developing countries			
34. Belize/Jan 84. Technical Assistance to Belize Cantaloupe Production .Assist in grading, packaging and transportation of melons for export	X		X	X	
35. Jamaica/Feb 84. Regional Workshop on Appropriate Postharvest Technologies and Export Strategies for Perishable Caribbean Crops .Identify crops, export strategies, quality standards, quarantines and other factors for export under CBI			X	X	X
36. Mali/Feb 84. A Survey of Crop Production and Marketing Practices of Irrigated Perimeters in the Cercle of Kayes, Mali .Analyze structure of perimeters .Analyze fresh crop storage and marketing problems .Recommend improvements	X	X	X		
37. Ecuador/Feb 84. Postharvest Program in Ecuador. Preliminary Examination .Analysis of marketing systems .Determine feasibility of AID support of storage facilities and small agro-industries	X	X	X	X	X
38. Panama/Mar 84. Tropical Fruits: A Postharvest Short Course .Teach University of Panama and other personnel from Ministry of Agriculture the principles of postharvest handling, storage, management	X	X			X

PIP PROJECT LIST	<u>Reduce postharvest loss to:</u> increase availa- bility of fruit, vegetable, root and tuber crops		enhance basic diets of people in developing countries	Reduce costs of perishable commodities by improving marketing efficiency	Encourage develop- ment of fruit, vege- table, root and tuber <u>crops, spices, etc.</u> indus- processing tries	
39. Caribbean/Feb-Mar 84. Report of USAID Fact-Finding Team on Ethylene Dibromide Quarantine Program Uses on Tropical Fruits in CBI Countries. .Assess effects of EDB cancellation on country exports .Determine research to be done to explore alternative treatments	X			X	X	X
40. University of Idaho/PIP/Sept-Oct 84. Short Course on Postharvest Loss Prevention of Perishable Crops .Teach students from developing countries .All aspects of postharvest technology	X		X	X		X
41. Panama/Mar 84. Recommendations for Onion Production, Drying and Storage in Panama .Analyze onion management systems .Identify problem areas .Recommend loss reduction measures	X		X	X		
42. Indonesia - Cancelled by Mission						
43. Niger/April 84. Vegetable Marketing in Niger - An Assessment and Over- view. .Identify areas of constraint in- country .Identify and recommend inteventions for market system improvement .Identify possible area of oportunity for exports	X		X	X	X	

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PIP PROJECT LIST

	<u>Reduce postharvest loss to:</u> increase availability of fruit, vegetable, root and tuber crops	enhance basic diets of people in developing countries	Reduce costs of perishable commodities by improving marketing efficiency	Encourage development of fruit, vegetable, root and tuber <u>crops, spices, etc.</u> indus- processing tries	
44. Peru/July 84. A Survey of Traditional and Nontraditional Fruits and Spices for Potential Commercialization in Peru. .Identify crops grown in jungle area that could be developed for export .Develop initial program for development; infrastructure and personnel needs.	X		X	X	X
45. Costa Rica/May 84. Analysis and Recommendations for Coopetalamanca with Emphasis on Yam Postharvest Practices and Marketing .Identify market problems in yam production, handling and marketing .Make appropriate recommendations for interventions	X	X	X	X	
46. Honduras/May-June 84. Export Development and Services Project .Assist Mission to write PP on export development of vegetables, fruits, cocoa .Identify programs to increase export quality and quantity	X		X	X	X
47. Honduras/Apr 84. Export Promotion and Services. Recommendation for Project Design Activities .Assist Mission to identify crops for increased export production .Identify measures to increase export quality and quantity	X		X	X	X

PIP PROJECT LIST

	<u>Reduce postharvest loss to:</u> increase availa- bility of fruit, vegetable, root and tuber crops	enhance basic diets of people in developing countries	Reduce costs of perishable commodities by improving marketing efficiency	Encourage develop- ment of fruit, vege- table, root and tuber <u>crops, spices, etc.</u> indus- processing tries
48. Guatemala/Apr 84. Potential Services of the Postharvest Institute for Perishables to USAID/Guatemala .Identify areas of postharvest losses .Recommend assistance from PIP for fruit and vegetable cooperatives	X	X	X	X X
49. Ecuador/Apr 84. Potential Services to AID/Quito from the Postharvest Institute for Perishables .Identify areas of postharvest losses .Recommend assistance from PIP for fruit and vegetable management .Investigate university linkage	X	X	X	X X
50. Indonesia/July 84. Indonesia's Vegetable Marketing System, Exports and Postharvest Losses .Improve a model for measuring postharvest losses .Identify major problems in exporting vegetables .Identify technologies or activities to reduce losses	X		X	X
51. Guatemala. Analysis of Market Systems for Small-Scale Producers. Project postponed by Mission.				
52. Guatemala/Sept 84. Evaluation of On-Farm Harvesting and Storage .Evaluate small-scale farm harvesting and storage practices and systems .Recommend improvements or changes	X	X	X	X X

PIP PROJECT LIST

	<u>Reduce postharvest loss to:</u> increase availa- bility of fruit, vegetable, root and tuber crops	enhance basic diets of people in developing countries	Reduce costs of perishable commodities by improving marketing efficiency	Encourage develop- ment of fruit, vege- table, root and tuber <u>crops, spices, etc.</u> indus- processing tries
52. (Part 2). Guatemala/Mar 85. A short course on harvest and storage of vegetables and fruits in the highlands of Guatemala. .Teach principles of harvesting and postharvest management of perishable crops for small-scale farmers.	X	X	X	
53. Grenada/July-Oct 84. Export Marketing of Nutmeg, Cinnamon and Cloves Produced in Grenada .Identify production and export capabilities and systems .Assist in identifying export markets			X	X X
53.2 Grenada/July 85. Interviews with U.S. spice firms to establish a marketing plan for Grenadian nutmeg. .Seek U.S. processors to buy Grenadian nutmeg. .Arrange processing tests to open new markets for Grenadian nutmeg.	X		X	X X
53.3 Grenada/July 86. Composition of fresh and processed Grenadian nutmeg analysis conducted at the Univ of Idaho and two spice processing firms (Three Reports).			X	X X
53.3 Grenada/Aug 86. Study of nutmeg and cocoa by-products as a possible energy or feed source.	X			X X
53.3 Grenada/Sept 86. Investigation of aflatoxin contamination in nutmeg to assist marketing of Grenada nutmeg to West Germany.				X X
53.4 Grenada/Jan 86. Increasing the exports of Grenada nutmeg to U.S. spice processors.			X	X X

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PIP PROJECT LIST

PIP PROJECT LIST	<u>Reduce postharvest loss to:</u>		Reduce costs of perishable commodities by improving marketing efficiency	Encourage development of fruit, vegetable, root and tuber <u>crops, spices, etc.</u> processing industries	
	increase availability of fruit, vegetable, root and tuber crops	enhance basic diets of people in developing countries			
54. Caribbean/Aug-Oct 84. Production and Export of Selected Perishable Crops in the CBI Countries Requiring Quarantine Treatment for U.S. Entry. .Identify export production for 8 CBI countries .Identify quarantine treatments needed .Develop a projection for effects of EDB ban on production projections	X		X	X	X
56. Burundi/Nov. 84. Training Program in Food Preservation by Solar Drying with Supplemental Heat .Train students from Burundi, Zaire, Madagascar, Mali, Chad, Togo, Senegal in construction and use of dryer .Train students in storage of dehydrated food and reconstitution for consumption	X	X			X
57. Cancelled.					
58. Taiwan/Jan-June 85. Collaborative research, development, education & information exchange between PIP, UI, and the Asian Vegetable Research & Development Center (AVRDC) to develop postharvest loss methodologies.	X	X	X	X	X
58. Part 2. Postharvest Loss Investigations for Southeast Asia. A composite report based on work in Project No. 58.	X	X	X	X	X
60. Honduras/Jan. 85. Evaluation of Federacion de Asociaciones de Productores y Exportadores Agropecuarios de Honduras (FEPROEXAH). .Evaluate first implementation phase of agricultural export and services project. .Make recommendations for modifications or improvements	X		X	X	X

PIP PROJECT LIST

PIP PROJECT LIST	<u>Reduce postharvest loss to:</u>		Reduce costs of perishable commodities by improving marketing efficiency	Encourage development of fruit, vegetable, root and tuber crops, spices, etc. processing tries	
	increase availability of fruit, vegetable, root and tuber crops	enhance basic diets of people in developing countries			
61. Honduras/Feb. 85. Recommendations for Onion Production, drying and Storage in Honduras. .Analyze onion management systems. .Identify problem areas. .Recommend loss reduction measure.	X	X	X		
63. Philippines/Oct. 84. Solar Dryer Project: One Year Later. .Follow-up evaluation of Solar Dryer course conducted in July, August, 1983. .Questionnaires, faculty seminars, group discussions, on-site visitations and evaluations.	X	X		X	X
64. Honduras/Apr. 85. Workshop on Export Marketing, Storage and Packaging of Vegetable Crops. .Principles of postharvest management and handling of perishable crops for export. .Export marketing to the U.S.	X		X	X	X
65. Ecuador/Mar. 85. Recommendations for PITALPRO Library Improvement. Faculty of Science & Food Engineering, Ambato.	X	X	X	X	X
66. U.S./Feb. 85. Training for Egyptian Project Service Center personnel on modern farm machinery facility designs, repair procedures, administration and financial management. Visits made to prominent U.S. machinery manufacturers and farm machinery shows.	X	X	X		
67. Cancelled					
68. University of Idaho/Aug. 85. Solar Drying Workshop to train faculty as future instructors for upcoming international solar drying workshops.	X	X	X	X	X
69. Cancelled.					

PIP PROJECT LIST

	<u>Reduce postharvest loss to:</u>		Reduce costs of perishable commodities by improving marketing efficiency	Encourage development of fruit, vegetable, root and tuber <u>crops, spices, etc.</u> processing tries	
	increase availability of fruit, vegetable, root and tuber crops	enhance basic diets of people in developing countries			
70. University of Idaho/Sept. 84. Short course for 10 agriculturists from developing countries on postharvest perishables loss technology.	X	X	X	X	X
71. Ghana/June-Oct. 85. Investigation of adoption of improved agricultural technology in processing of cassava meal (gari).	X	X	X	X	X
72. Niger/Apr. 85. Solar drying workshop in conjunction with U.S. Peace Corps.	X	X	X		X
73. Dominican Republic/Sept. 85. Investigation of possible PIP services to appropriate agencies/organizations.	X	X	X	X	
74. Grenada/Nov. 85. Solar Drying Workshop for Peace Corps volunteers from Caribbean countries.	X	X	X	X	X
75. Jamaica/Dec. 85. Solar Drying Workshop for Jamaican farmers and mid-level professionals.	X	X	X	X	X
76. Cancelled.					
77. Cancelled.					
78. Univ of Idaho/Jul 86. Iraqi Postharvest Study Tour.	X	X	X	X	X
79. Asia/Sept-Oct 86. Investigation of processing & storage possibilities in conjunction with the postharvest loss assessment project.	X			X	X

PIP PROJECT LIST

PIP PROJECT LIST	<u>Reduce postharvest loss to:</u>		Reduce costs of perishable commodities by improving marketing efficiency	Encourage development of fruit, vegetable, root and tuber <u>crops, spices, etc.</u> processing industries	
	increase availability of fruit, vegetable, root and tuber crops	enhance basic diets of people in developing countries			
79. Asia/Oct 86. Development of a methodology to assess postharvest losses in perishable crops through use of mid-level agents in developing countries to collect relevant data (Phase 3). Phase 3 done in cooperation with the ASEAN Food Handling Bureau & Interamerican Institute for Cooperation in Agriculture.	X	X	X	X	X
80. Univ of Idaho/Oct 86. Onion/potato storage/pathology study tour for Iraq official.	X		X		X
81. Panama/Jan 87. A training course on postharvest handling and losses in perishable crops conducted for agricultural officials and private growers.	X		X	X	X
82. Developing Countries/Dec. 86. A comparative analysis of fruit and vegetable marketing to promote agricultural development in low income countries.	X		X		
84. Costa Rica/Jan 87. Analysis and recommended improvement of commercial harvesting, handling, exports; support services and technology transfers relating to fresh strawberries produced by commercial growers.	X		X	X	X
86. Latin America/Dec 86. Investigation of possible PIP services thru the Basic Ordering Agreement and project development on collaborative ventures in the following countries: Honduras, Costa Rica, Peru, Guatemala, Ecuador, Jamaica and Haiti.	X	X	X	X	

PIP PROJECT LIST

PIP PROJECT LIST	Reduce postharvest loss to:		Reduce costs of perishable commodities by improving marketing efficiency	Encourage development of fruit, vegetable, root and tuber crops, spices, etc.	
	Increase availability of fruit, vegetable, root and tuber crops	enhance basic diets of people in developing countries		Indus-	processing tries
87. Asia/Feb 87. Investigation of PIP services or collaboration to the following countries in Asia: Philippines, Malaysia (collaboration with ASEAN Food Handling Bureau) Thailand, Bangladesh, India, Singapore/Japan (collaboration with perishable importers).	X	X	X	X	X
88. Ecuador/Feb Mar 87. Conduct a course on harvest and postharvest handling of apples.	X	X	X	X	X
89. Jamaica/Jan 87. PIP/U. of Idaho food scientist went to Jamaica to examine the potential of removing hypoglycin A & B from ackee fruit to the import ban to the U.S. can be lifted.	X	X		X	X
90. India/June 87. Conduct a workshop/study on the Loss Assessment Methodology developed by PIP. Phase II of the project will be drafted during the Phase I workshop.	X	X	X	X	X
91. Thailand/June 87. Refrigeration/cooling specialist sent to Thailand at the request of the Ministry of Agriculture (thru USAID) to assist in training MOA technicians in the use of research cooling equipment.	X			X	
92. Central America/May 87. Consultation with officials of the Non-Traditional Agricultural Export program in Central America to discuss PIP's participation in this long term program. Also, conduct an assessment of cacao grower's processing problems in a remote region of Costa Rica.	X	X	X	X	X

PIP PROJECT LIST

<p><u>Reduce postharvest loss to:</u> increase availa- bility of fruit, vegetable, root and tuber crops</p>	<p>enhance basic diets of people in developing countries</p>	<p>Reduce costs of perishable commodities by improving marketing efficiency</p>	<p>Encourage develop- ment of fruit, vege- table, root and tuber <u>crops, spices, etc.</u> indus- processing tries</p>
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Research Papers

- | | | | | |
|---|----------|----------|----------|----------|
| <p>1-R Indonesia/June 85. Postharvest losses associated with exports of vegetables from Indonesia to Singapore.</p> | <p>X</p> | <p>X</p> | | |
| <p>2-R Pakistan/June 85. Winter season demand for fresh vegetables. A case study of cucumbers, peppers and tomatoes in the United States.</p> | <p>X</p> | <p>X</p> | | |
| <p>3-R Spice Milling/Feb 86. A comparative study of Grenadian and Indonesian nutmegs.</p> | | <p>X</p> | <p>X</p> | <p>X</p> |
| <p>4-R Univ of Idaho/Apr 86. Thesis on use of shrinkwraps to extend storage shelf life of quality potatoes.</p> | <p>X</p> | <p>X</p> | <p>X</p> | <p>X</p> |
| <p>5-R Univ of Idaho/June 86. Thesis on a potential tool to diagnose numerous destructive plant diseases caused by imperfect fungi in mangos.</p> | <p>X</p> | | | |



POSTHARVEST INSTITUTE FOR PERISHABLES

Instituto para el Estudio de Pérdidas Post-cosecha en los Cultivos Perecederos
Institut pour l'Étude des Pertes Post-récolte de Cultures Périssables

A D A P T I V E R E S E A R C H P R O G R A M

The Postharvest Institute for Perishables (PIP) at the University of Idaho has designed an Adaptive Research Program that is planned to have maximum impact on agriculture in developing countries. The projects are commonly related to modifying existing technologies so they may become economically feasible for specific situations in developing countries. Low cost is a major factor in the research, along with the ability to utilize local resources, be they human skills or materials.

A training component is associated with each adaptive research project that proves successful. The training will usually include farmers and farmer groups as well as agricultural officials and private sector individuals.

PIP has funded all or part of the projects within its adaptive research program. Various University of Idaho departments have conducted the research work in cooperation with PIP. As individual projects develop, funding requirements can cause shortages in PIP's research budget. External funding is often necessary to bring the selected adaptive research projects to a logical conclusion; either they are economically and technically feasible and can positively impact agriculture in developing countries or they are not feasible and are discontinued.

Below are listed the projects that PIP is developing or has developed in its Adaptive Research Program. The status of funding is also mentioned so that an over-all and current view of each project is portrayed.

I.

ZEOLITE/SOLAR WATER COOLER

Objective - to develop a solar cooling system and storage component of 100 cubic feet or more that is relatively inexpensive to construct, can utilize mostly local materials and can be produced by local skilled persons in a developing country. It is envisioned that a cooler such as this could help reduce losses in perishable crops by removing field heat from harvested fruits and vegetables prior to shipping.

Present Research Status - Bench tests by the Department of Chemical Engineering have shown that 130°F daytime collector temperature, or above, and 95°F or below nighttime temperatures are required to make the system viable. These temperatures should be attainable in most tropical climates during the hot dry seasons, but perhaps not in the



cloudy months, i.e. rainy season, when supplemental heat may be necessary. No work has been done on supplying supplemental heat from local waste products within this project. Module design concept should be adaptable to remote construction. The cost of the facility in developing countries has not been established.

Funding Status - An estimated \$15,000 will be needed to field test the unit in two developing countries.

II. POSTHARVEST METHODOLOGY/TRAINING MANUAL

Objectives - to develop a methodology of identifying losses, market aberrations and pinpointing areas that are in need of research in perishable commodities. An accompanying training manual that can be used by mid-level agriculturists and agents assigned to provincial or district posts in developing countries is in the draft stage. This would allow developing countries, when completed, to initiate this process with use of their own resources.

Present Research Status - The ASEAN Food Handling Bureau in Malaysia and the Inter-American Institute for Cooperation in Agriculture (IICA) in Costa Rica have cooperated with PIP to develop this project. A draft manual has been produced by a multidisciplinary team that visited a number of countries in Asia. Field testing will be done in 1987.

Funding Status - Phase I of the project is finished. Phase II, the field testing component, will begin in 1987. Workshop training sessions will then be organized. Total estimated costs per training session per region is between \$30 - 50,000, depending upon the number of participants.

III. SHRINK WRAP FOR POTATOES AND SOFT FRUIT

Objective - to extend the storage life and retard sprouting of potatoes in ambient room temperatures with the use of plastic shrink wrap. Shrink wrap, treated and untreated, will also be investigated for use on soft fruit to prolong storage, improve transportation and remove disease-carrying bacteria and organisms for its possible adverse affect on the larvae and eggs of destructive insects that might be in the fruit.

Present Research Status - The Plant, Soil and Entomological Sciences Department, in cooperation with PIP, has recently completed the first phase of research in this project. It was found that potatoes, for example, could be stored at room temperatures for up to 12 weeks with shrink wrap. Greening and sprouting problems were reduced. An expanded version or second phase under the direction of the above department has been initiated to relate the adaptive research to improved marketing of potatoes. Work will commence soon on shrink wrapping of mangoes to determine what advantages there are in reducing bruising and increasing quality and shelf life. PIP is investigating a possible collaborative venture with a USDA experimental laboratory to assess the use of shrink wrap to destroy fruit fly eggs and larvae.

Funding Status - The Plant, Soil and Entomological Sciences Department will continue to supervise research on the beneficial effects of shrink wrap on perishables. An estimated \$15,000 per year is needed for a three-year period -- or \$45,000 for supplies, travel, and other related expenses to complete the research period for both potatoes and soft tropical fruit.

IV.

SOLAR DRYING AND FOOD PRESERVATION

Objective - to continue to refine smaller solar food dryer units with supplemental heat developed and demonstrated by the Department of Agricultural Engineering and the School of Home Economics and funded by PIP. Workshops will be organized in response to requests by the developing country or by donor organizations.

Present Research Status - The development and field testing period has extended over several years. Future investigations may include the examination of larger drying units with commercial possibilities on high value crops. These might be utilized by farmer groups, associations or cooperatives for export crops where precise moisture removal and sanitation is required for the international market.

45

Funding Status - The project is currently funded by PIP. Expansion into commercial drying will require additional funding, but the amount is as yet undetermined.

V.
SPICE ANALYSIS

Objective - to conduct chemical and physical analysis of Grenadian-grown nutmeg to determine how this product can best be screened and sized in the grinding equipment of U.S. spice firms. Positive results were needed to convince U.S. spice firms to begin buying nutmeg directly from Grenada. The firms perceived a problem of adjusting their grinding/sizing equipment to fit Grenada's product with its different physical and chemical properties.

Present Research Status - The second phase of Grenadian nutmeg analysis, incorporating more representative samplings from the island, is being conducted by the Department of Chemical Engineering. A commercial production run of Grenadian nutmeg has also been analyzed, using equipment in cooperation with two U.S. spice firms. The results will be passed on to spice importers and processors.

Funding Status - USAID/Grenada is funding Phase II and III of adaptive research analysis and marketing assistance. An initial purchase order of 30,000 lbs. of nutmeg was ordered by a large U.S. spice processor.

VI.
STORAGE OF POTATOES AND ONIONS

Objective - to extend appropriate systems or methods that can be utilized in developing countries to prolong storage of potatoes and onions. The systems of preservation will need to be inexpensive and practical in developing countries.

Present Research Status - Within the state of Idaho there is a large body of research on storage of potatoes and onions but with the emphasis on developed countries. The University of Idaho has considerable involvement with storage of these crops under U.S. conditions. Innovations and modifications are needed for adapting this research to the needs of developing countries. PIP is collaborating with the Central Potato Institute in Peru on this project.

Funding Status - An initial effort for this project might be to develop the appropriate system(s) and produce an extension program, detailing construction and methods of storage and preservation. Identification of funding sources is underway.

VII. MARKETING AND CREDIT

Objective - to improve marketing of perishable crops and develop means to better channel credit to participants in the marketing of perishable crops.

Present Research Status - PIP participated in a fruit and vegetable research project and published a paper entitled "A Comparative Analysis of Fruit and Vegetable Marketing in Developing Countries." In addition, PIP is involved in a marketing developing plan for Grenada nutmeg.

Funding Status - Presently, investigative work funded by donor organizations.

- A} STUDIES AND RECOMMENDATIONS ON HANDLING, DRYING, STORAGE AND PROCESSING OF PERISHABLE CROPS TO REDUCE LOSSES.
 - B} ECONOMIC AND TECHNICAL STUDIES OF PERISHABLE SYSTEMS IN PROJECT DEVELOPMENT, DESIGN, MANAGEMENT AND IMPLEMENTATION.
 - C} MARKETING POLICIES AND AGRIBUSINESS DEVELOPMENT STUDIES.
 - D} ASSESSMENT, EVALUATION AND RECOMMENDATIONS ON FACILITY AND EQUIPMENT NEEDS, RESEARCH PLANNING, AND TECHNICAL ADVISORY SERVICES.
 - E} TRAINING COURSES FOR LDC PARTICIPANTS ON MARKETING, POSTHARVEST LOSSES AND HANDLING OF PERISHABLE CROPS.
 - F} COMBINATION OF ANY OF THE ABOVE WITH COLLABORATIVE APPLIED RESEARCH PROGRAM BETWEEN PIP ASSOCIATED TECHNICAL STAFF AND HOST COUNTRY PROFESSIONALS.
- PRIORITY IS GIVEN TO PROGRAMS OVER ONE OR TWO YEARS WHERE TECHNICAL ADVISORY SERVICES, TRAINING AND ADAPTIVE RESEARCH ARE MUTUALLY SUPPORTIVE.

4. CONTRACTUAL REQUIREMENTS ARE GENERALLY AS FOLLOWS:

- A} AID MISSIONS REQUEST SERVICES OF PIP THROUGH PROJECT OFFICER:

DR. HARVEY HORTIK
HORTICULTURIST
ST/AGR/AP, ROOM 411B, SA-18
AGENCY FOR INTERNATIONAL DEVELOPMENT
WASHINGTON, D.C. 20523.

PIP'S ADDRESS IS:

POSTHARVEST INSTITUTE FOR PERISHABLES
103 MORRILL HALL
UNIVERSITY OF IDAHO
MOSCOW, IDAHO 83843.
ATTENTION: HARVEY C. NEESE

- B} A SCOPE OF WORK, AS IN A PIO/T, IS REQUIRED. PROJECTS CAN BE SHORT OR LONG TERM. PIP IS PREPARED TO PROVIDE GUIDANCE ON PROBLEM DEFINITION AND DEVELOPMENT OF A WORK PLAN TO ADDRESS SPECIFIC PROBLEMS THROUGH SHORT-TERM TDY'S. THE SCOPE OF WORK SHOULD REQUEST TECHNICAL ADVISORY ASSISTANCE TO BRIEFLY EXAMINE THE SCOPE AND NATURE OF POSTHARVEST LOSSES FOR THE PRODUCTS IDENTIFIED BELOW AND PREPARE A NEEDS ASSESSMENT THAT

WILL ALLOW A WORK PLAN TO BE DEVELOPED. IN MOST CASES, THIS TYPE OF SHORT-TERM TDY CAN BE ACCOMPLISHED WITHIN TWO WEEKS WITH A TEAM OF TWO PROFESSIONALS. THE PRODUCTS MUST BE SPECIFIED IN ORDER TO IDENTIFY TEAM MEMBERS. PROVISION OF THIS SERVICE IS SUBJECT TO AVAILABILITY OF SUITABLE PROFESSIONALS AND REQUESTS SHOULD PROVIDE AT LEAST 45 DAYS LEAD TIME.

C) CONTRACTS OFFICE AID/WASHINGTON WILL REQUEST FROM PIP A PROPOSAL FOR WORK TO BE PERFORMED, INCLUDING COST ESTIMATES, TECHNICAL SKILLS AND LEVEL OF EFFORT TO BE PROVIDED.

D) AFTER FINALIZATION OF NEGOTIATIONS, CONTRACTS OFFICE TO ISSUE A DELIVERY ORDER FOR SERVICES TO BE PROVIDED.

5. PIP STAFF PLANS VISITS TO SOME REGIONS TO EXPLAIN MORE ABOUT ONGOING AND PROPOSED ADAPTIVE RESEARCH PROGRAMS, TRAINING OPPORTUNITIES, AND TECHNICAL ADVISORY SERVICES. PIP PROGRAMS ARE DIRECTED TOWARDS ESTABLISHING AND MAINTAINING LINKAGES WITH INSTITUTIONS IN THE HOST COUNTRY AND PIP WELCOMES OPPORTUNITIES TO CONSIDER COOPERATIVE AGREEMENTS BETWEEN INSTITUTIONS. PRIORITY WILL BE GIVEN TO PROGRAMS SUPPORTED BY AID MISSIONS.

6. PLEASE ADVISE VIA PROJECT OFFICER IF YOU CONTEMPLATE THE NEED FOR PIP SERVICES ON A "BUY-IN" BASIS THROUGH THE BOA. PIP WILL TRY TO SCHEDULE A TRIP TO YOUR MISSION AT NO COST TO AID/MISSION. 44

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Gracias

Att. Pedro Hernandez

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3. Give date the items arrived: . This was sooner than I expected when expected too late for use.
4. I use this material for: research teaching library extension other: Counselling to investors & for identifying new areas of investment.
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3. Give date the items arrived: 6/4/87. This was sooner than I expected when expected too late for use. late items expected only in time for
4. I use this material for: research teaching library extension other:
5. Comments/Needs: Thanks for your help.
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2. If you received photocopies or microfiche, please answer these: a. Copy quality was ok difficult to read* illegible*. b. Documents were: just what I expected.
3. Give date the items arrived: . This was sooner than I expected when expected too late for use.
4. I use this material for: research teaching library extension other: project on investment - background
5. Comments/Needs: AKA 2/10/87 wife
*Give us order number if you want a new copy.

RECEIVED
17 05 27

Mrs P. F. George,
Post harvest Institute for Perishables,
University of Agriculture,
Morrill Hall,
Moscow,
Idaho U.S.A 83843.

Nigerian Stored Products
Research Institute
P.M.B 4065
Sapele - Bendel State
Nigeria
1/5/87

My dear Mrs George,

You sounded very excited in your letter. This makes me think that you can imagine how I reacted on the receipt of my gift - the book. I nearly ran amok! I was mad with happiness!! I danced and danced and danced - my coworkers were so moved that they danced with me. It was terrific! and I really really thank God for his mercies!!!

There is nothing I can say here that can express my mind on how grateful I am to you. By securing this book for me, you have solved all my problems as an industrial microbiologist, and by so doing, you have brought a total change to my working life. Mrs George, for as long as I live, I shall remain extremely grateful to you. You are my fairy god-mother and I pray that God in his infinite mercies will provide for you too all that you ask in his name.

God bless you and thank you very

much.

yours sincerely

@ogali

ERINMA OGALI (Mrs)

N/B

Do you think I should write to Mr
Harvey Neese?

EO.

Ghana

Thank you for your journal which was sent to me. It has really become helpful to me ~~and~~ the former unit. I am therefore congratulating you for such help which is beyond my expectation.

I mean intercropping of vegetables & fruits as you have underline in your letter addressed to me for more specifically. God bless you for all that you have done and also the interest that you have given in me for the help which you ^{have} glad to provide.

I would be glad to welcome the above requested phot copies & paper. Merry Christmas & a happy new year to you all at Moscow, Idaho.

Thank you.

~~Sincerely yours,~~



Eric Saf-Larbi.

SAFO-LARBI # 914



4 PC
JSL
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on _____

POSTHARVEST INSTITUTE FOR PERISHABLES

Instituto para el Estudio de Pérdidas Post-cosecha en los Cultivos Pericederos
Institut pour l'Étude des Pertes Post-récolte de Cultures Périssables

SUBJECT REQUEST FORM

Requestor's Name DRAH KUDJOE EDGAR
 Complete address DRAHEON FARMS
P.O. Box 8373
Tema - Ghana
 Telephone No. _____ Telex/Cable No. _____

SUBJECT

Explain the topic. Be specific. Be sure to specify any crops or organisms important to subject. Define any special terms used. State points not to be included. USE A SEPARATE FORM FOR EACH DIFFERENT TOPIC.

I am with much pleasure to thank you for help me to expand my local experiential farming for schools and colleges moulding individual farmers to steady on.
 I was away for some agricultural course for one year now which has made me not to have being able to post the new title forms ~~now~~. I hope as I have posted attached I will be considered with ~~any~~ the books listed and hope that they will be send to be me by 8 weeks time by surface mail.
 I congratulate you for your new contents such as protein sources and general subjects like poultry, fish, meat and dairy postharvest problems. Long live your department.
 Your co-operation is highly needed for ~~my~~ our development.
 Thank You.

INDICATE PREFERENCES

Language Restrictions:
 All Languages
 English Only NO 1096 IS IN CHINESE
 Specific Language (List)

Geographic Restriction:
 All Countries
 Specific Region
 Country (List)

Expectations:

I expect very little information.
 I expect a moderate amount of information.
 I expect a great deal of information.

Return this form to:

PIP Information Center
 314 University of Idaho Library
 Moscow, ID 83843 (U.S.A.)

Office Use Only:

Postharvest Institute for Perishables Information Center

Egypt

No. 206 waf
Rec'd 870226

ANNUAL CLIENT SURVEY

September 1985

NOTE: IF YOU DO NOT RETURN THIS SURVEY, YOUR NAME WILL BE AUTOMATICALLY DROPPED FROM PIP'S MAILING LIST.

1. I have been a PIP user for (mark 1): 5 years 4 years 3 years 2 years 1 year or less

2. The following crop areas interest me (mark as many as apply):

- fruits
- vegetables
- roots & tubers
- nuts
- oilseeds
- spices
- essential oils
- beverage crops

3. I work in the following area(s) (mark as many as apply):

- tropical
- subtropical
- temperate
- household level
- village level
- commercial level
- low technology
- intermediate technology
- high technology

4. In the next two years I will be working on the following topic(s): cereal crops
poultry and pig farming

5. I can read materials in these languages (list all that apply): English

6. Can you use materials on microfiche? no yes
videocassette no yes which format When I am provided with
slides no yes
audio cassette no yes which format When am provided with them.

7. Do you have any suggestions or comments for the PIP staff? I only want to congratulate the PIP staff for their hard working and have included my name in their publications. I hope more will be needed like animal husbandry section. Thank you.

10/23