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PROCEEDINGS OF THE GASGA WORKSHOP ON
POSTHARVEST INFORMATION MANAGEMENT

April 17-19, 1989



**KANSAS
STATE
UNIVERSITY**

**FOOD & FEED GRAIN INSTITUTE
MANHATTAN, KANSAS 66506**

PROCEEDINGS OF THE
GASGA WORKSHOP ON POSTHARVEST INFORMATION MANAGEMENT
April 17-19, 1989

Edited by

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PREFACE

The GASGA Workshop on Postharvest Information Management was held at Kansas State University by the Food and Feed Grains Institute (FFGI) from April 17 to 19, 1989. The purpose of the workshop was to provide a forum where representatives from international postharvest centers would be able to address the following issues specific to information management in this field:

- Information/documentation needs of postharvest projects
- The role of the information manager in agricultural assistance
- Microcomputers as networking tools for postharvest centers
- Agricultural data bases for postharvest research

The activities of the workshop included presentations, round-table discussions, exhibits of hardware and software, and a summary session in which issues discussed throughout the workshop were clarified for future action.

Fifty participants from 18 countries were present at the workshop. Their individual and collective contributions demonstrated the variety and complexity of information needs that have yet to be adequately met, despite a recent growth of postharvest-oriented centers having their own document collections.

Among these information needs, one of the most prominent was that of increased communication among managers of such collections. Although postharvest seminars and workshops are frequent, this was the first devoted to sharing the problems of information collection and dissemination as such. In its "Statement of Consensus", the group promoted continuing such meetings on a regional basis, where limits to travel are not as likely to inhibit participation. It was noted during the meeting that poor attendance from representatives of key Latin American and African postharvest organizations was indicative of the current financial distress in those regions. Donor organizations, such as those found in the Group for Assistance on Systems Related to Grains After Harvest (GASGA), should be approached to finance travel of lesser developed countries (LDC) participants to subsequent regional workshops on postharvest information issues.

Regional efforts to systematize postharvest information gathering and dissemination were found to be lacking in coordination, and lacking in their efforts to reach all levels of the postharvest work force. Participants from Southeast Asia, where several projects to centralize postharvest information have been developing, noted the difficulties in establishing boundaries of responsibility for collecting and distributing documents across national public and private institutions.

For example, the task of identifying postharvest literature among nationally indexed serials and monographs is currently being carried out by the Food and Agriculture Organizations AGRIS data base, and its Asian subset, AGRIASIA. Simultaneously, the ASEAN Food Post-Production Information Exchange (APEX) project takes responsibility for systematizing a collection of postharvest

literature supported by its own data base. Representatives of these two organizations were able to meet during the GASGA workshop and discuss plans underway to coordinate their collection and dissemination functions in the future.

Even given extensive coverage of postharvest subject matter in such data bases, the provisions of documentation itself to users in a form appropriate to their immediate needs was a key concern. The range of documentation types includes "perishable" data, such as news and directory information, detailed methodological and historical treatments found in dissertations or theses, simply instructional materials suitable for extension demonstrations, and theoretical or experimental literature. A system to provide available documentation to users that answers their type of information need without creating yet another package (i.e. a newly authored publication restating previously published information) is a major goal of postharvest information management.

It was apparent that a lack of awareness of even cooperative regional efforts hampers postharvest workers in the private and public sectors. Illustrative of this problem was the lack of awareness among participants from Latin America of groups such as Asociación Latioamericana de Postcosecha de Granos (ALAGRAN). Postharvest information managers need to actively participate in the evolution of regional networks, since they are created for the purpose of information sharing.

Among the recommendations made by participants in the "Statement of Consensus" was that an international directory be maintained identifying centers of postharvest specialization. Such a directory can only be useful if regional postharvest information managers share the responsibility for its updating, and if the information is distributed in an inexpensive and timely manner.

The Postharvest Documentation Service was given responsibility for initiating such a directory, to be augmented and further developed by input from the developing regional postharvest networks. A format for microcomputer-based data entry to the directory has been drawn up, and a plan for real-time on-line updates to a mainframe - supported backup data base has been developed. Participants in the workshop will be asked to contribute regional directory information for the year 1989/90. After 1 year, the usefulness of the directory to recipients will be evaluated.

With regard to the contents of the following proceedings, Section II contains the edited papers presented at the workshop. Excluded from this section are outlines and abstracts to several presentations made, for which no complete papers were received, as well as papers which were accepted for inclusion, but whose authors were unable to attend due to lack of financial support. Readers wishing to have more information are referred to the authors for those additional presentations listed below:

National Agricultural Library products on compact disk, by Maria Pisa

Network concepts and models for information exchange, by Tom Graham

CGIAR information dissemination project on compact disk, by Eleanor Frierson

Organization and services of the postharvest institute for perishables, by Selma Nielsen

CD-ROM data bases in the library, by Glenn Remelts

Some notes toward an understanding of information access in the Third World; the case of agriculture and farming systems literature, by Noel Young

The ASEAN Grains Postharvest Program and the ASEAN Food Handling Bureau, by Antonio Frio

Information needs of rural women in postharvest loss prevention, by J.A. Raju

The need for national and regional coordination of agricultural information systems in developing countries with special emphasis on postharvest information, by Speciosa Nsimbi

Uses and development of data bases for agricultural projects in Africa, by Kebour Ghenna

Students' levels of awareness to computers and computer applications; implication for the improvement of the University of the Philippines Los Baños (UPLB) Library computerization program, by Zenaida Pamulaklakin

Documentation of information on postharvest technology in India, by Banshi Shukla

Information system for marketing, by Fred Katumbi

SECTION I

SCHEDULE

SCHEDULE

Sunday, April 16, 7:30-9:00 P

Welcoming Reception

Monday, April 17

8:00 A Registration

8:30A Presentations

Donna Schenck-Hamlin (Postharvest Documentation Service (PHDS), USA), "Closing the Postharvest Information Gap; a Network Proposal"

Zenaida Toquero (Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA), Philippines), "Information/Documentation Needs in Post-Production Related Projects in the Philippines"

Robert Semple (Inter-Country Cooperation on Postharvest Technology and Quality Control of Food Grains (REGNET), Thailand), "Priorities for Development of Coordinated Postharvest Data bases; Towards an Information Network in Asia"

10:00 A Break, Question and Answer

11:00 A Presentations

Harlan Shuyler (Private Consultant, USA), "The Postharvest Computer Teleconference"

Maria Pisa (National Agricultural Library, USA), "National Agricultural Library Products on Compact Disk"

12:00 N Lunch

1:00 P Round Table Discussions

"Survey of Regional Needs for Postharvest Information"

2:00 P Group photograph

2:30 P Exhibits of microcomputer products will be open until 6:00 P

Tuesday April 18

8:00 A Presentations

Tom Graham (DPRA, Inc., USA), "Network Concepts and Models for Information Exchange"

Paulette Foss (University of the South Pacific, Western Samoa),
"Building a Network - Simply and Affordable - the Pacific Way"

Eleanor Frierson (Consultative Group for International Agricultural
Research (CGIAR), USA), "CGIAR Information Dissemination Project on
Compact Disk"

9:30 A Break, Question and Answer

10:30 A Presentations

Selma Neilson (Postharvest Institute for Perishables Information
Center (PIPIC), USA), "Organization and Services of the Postharvest
Institute for Perishables"

Glenn Remelts (Kansas State University Libraries, USA), "CD-ROM Data
bases in the Library"

12:00 N Lunch

1:00 P Round Table Discussions

"Establishing Priorities Among Postharvest Information Needs"

Exhibits of microcomputer products will be open until 6:00 P

Wednesday April 19

8:30 A Presentations

Noel Young (Kansas State University Libraries, USA), "Some Notes
Toward an Understanding of Information Access in the Third World:
The Case of Agriculture and Farming Systems Literature"

Mohammed Khaliludin Ramly (ASEAN Food Handling Bureau, Malaysia),
"APEX: An Effort at Coordinating Food Post-Production Information
Flow in ASEAN"

10:00 A Break, Question and Answer

11:00 A Presentations

Josephine Sison (Agricultural Information Bank for Asia (AIBA), -
Philippines), "Postharvest Information in AGRIASIA in the CARIS-
SEA Data base"

Antonio Frio (ASEAN Grain Postharvest Program, Thailand), "The ASEAN
Grains Postharvest Program and the ASEAN Food Handling Bureau"

12:00 N Lunch

- 1:00 P Question and Answer
- 1:30 P GASGA Panel Summary and Statement of Consensus
 "Needs and Priorities for Action to Improve Regional Access to
 Documentation for Postharvest Projects"
- 2:30 P Tours
 Department of Grain Science and Industry
 American Institute of Baking
- 6:30 P Banquet

EXHIBITS OF MICROCOMPUTER PRODUCTS
FOR INFORMATION MANAGEMENT

April 17 and 18, 1989
2:00-6:00 P.M.

BIBLIOFILE

Kansas State University (KSU), Department of Entomology,
(Subramanyam Bhadriraju)

DEST SCANNER

Modern Office Methods, Inc. (Vince Williams)

DPRA TITLE SEARCH

DPRA, Inc. (Beth Turtle)

FINDER

American Institute of Baking (Ron Wirtz)

MOLLI

American Institute of Baking (Ron Wirtz)

NORTON UTILITIES

KSU Libraries (Dan Scott)

PHDS DATA ENTRY METHOD

Postharvest Documentation Service (Wade Ramsey, Tibisay Marin)

PRO-CITE, PRO-SEARCH

U.S. Grain Marketing Research Laboratory (David Sauer)

QUICK CARD

American Institute of Baking (Ron Wirtz)

SCI-MATE

KSU Department of Entomology (John Reese)

TECMAR BACKUP

KSU Libraries (Dan Scott)

WINNEBAGO CIRC

KSU Libraries (Cliff Conrad)

CD-ROM Products

AGRICOLA ON CD

KSU Libraries (Bill Weise, Glenn Remelts)

AGRICOLearn

National Agricultural Library (Maria Pisa)

CGIAR FOOD, SCIENCE AND AGRICULTURE

World Bank (Eleanor Frierson)

GDCS (GOVERNMENT DOCUMENTS CATALOG SERVICE)

KSU Libraries (Doug Bates)

SCIENCE CITATION INDEX ON CD

KSU Libraries (Glenn Remelts, Bill Weise)

OTHER EXHIBITS

CONFERENCE BY COMPUTER

Private Consultant (Harlan Shuyler)

FOOD AND FEED GRAINS INSTITUTE (FFGI)

KSU, FFGI (John Pedersen)

INTERNATIONAL GRAINS PROGRAM (IGP)

KSU, IGP (Roger Johnson)

POSTHARVEST INSTITUTE FOR PERISHABLES (PIP)

University of Idaho, PIP (Selma Neilson)

SECTION II
PAPER PRESENTATIONS

CLOSING THE POSTHARVEST INFORMATION GAP
A NETWORK PROPOSAL

by

Donna Schenck-Hamlin
(Postharvest Documentation Service, K.S.U.)

The Information Access Problem

Perhaps each of us has come to this workshop with a different concept of what 'information management' is. All of us, however, work with institutions or individuals involved in postharvest processes, and as diverse as those processes are, we all share a common concern; the need for greater access to postharvest information resources.

A meeting such as this offers one of the most direct modes of information access one can have, that of person-to-person communication. However, travel opportunities are rare, and for long-term answers to daily information needs, we must build more efficient modes of information transmission. Specifically, we should consider the establishment of a network among international institutions involved in the collection of postharvest information. A network is needed because the problems of postharvest information, like those of agricultural information in general, require cooperation among diverse individuals and institutions for their solution. No single institution can claim satisfactory access to all of the information it needs, and optimum information access is as critical to the survival of well-established postharvest projects here as it is to the development of new ones elsewhere.

Information is so important a factor that among North American universities it is not always possible to obtain money for overseas assistance if one cannot demonstrate a superior information resource base. Government and private donors of research and development grants have considered information resources, defined by such measures as library size, as well as faculty resources when selecting a university to award. For instance, a .50 correlation between the library collection sizes of 91 United States universities, and their total research and development expenditures has been found¹. In addition, there are specific cases where a library's lack of resources was given as the reason for a rejected grant application. This indicates the role that library collections play in demonstrating adequate resources for research and development.

At the other extreme, countries which are the target of many agricultural research and development efforts typically lack the information resources necessary to sustain further progress once a project is completed. A survey of Nigerian agricultural libraries has been made in an article by G.O. Ibekwe in

¹ Total volumes for each library were collected from all libraries listed in ARL Statistics 1986-86 (Daval and Lichtenstein, 1987), then correlated with "Total R&D Expenditures at Universities and Colleges, Fiscal Year 1986" listed for each library's University (National Science Foundation, 1988).

a 1988 issue of the "Bulletin of the International Association of Agricultural Librarians and Documentalists" (Ibekwe, 1988).

Information access was judged poor in each of the areas of agricultural work examined: food production, research, education, administration and extension. There is no central national agricultural collection in Nigeria, and among the country's colleges of agriculture the books and periodicals maintained are too sparse to serve the needs of the faculty or students. It is no surprise that requests for foreign agricultural assistance come frequently from regions such as this, where the information component of their agricultural infrastructure is weak.

If Nigeria's agricultural information component is considered 'weak', how would one characterize a 'strong' information component? One could define it as any system that provides maximum access to the greatest variety of information resources. How does one construct such a system? If one thinks of the system in terms of a traditional agricultural library, the translation of this definition into a policy for collecting materials is rather predictable. Agriculture has for a long time been classified in western librarianship according to the animal or plant groups exploited for human survival. In addition, it has been common to classify information according to characteristics of published or printed materials (Table 1). A combination of these modes of classification results in the general goal set by many libraries in the United States, i.e. to collect the greatest number of books, journals, etc. that cover the greatest number of agricultural subject such as animal husbandry, forestry, aquaculture, etc.

This standard for a strong information component may serve well-established agricultural university libraries in North America. But it appears to be totally inappropriate to apply to regions where the agricultural problems cannot wait for long-term development of agricultural libraries as we are accustomed to defining them. One reason for this is the well documented problem of foreign exchange rates inhibiting the purchase of international publications. In the United States, as well as less developed regions, this problem has impeded the consistent collection of important journals in many academic libraries. Another reason for the inappropriateness of this model for an information component is that it does not address specific agricultural problems. Collections of agricultural information in developing regions should be built around the specific agricultural problems that face those regions. To be cost effective, a problem-defined information component would be preferable, one which would include a collection based on selected areas of agriculture that is classified according to "stage," "commodity," and "question" (Table 2).

A postharvest component based on this concept would collect information on all of the stages of agriculture that follow production. It could further specialize by the type of food commodities of interest. In this manner, the Postharvest Documentation Service (PHDS) at Kansas State University collects materials on cereals, grain legumes, and oilseeds. Another institute, the Postharvest Institute for Perishables (PIP) at the University of Idaho, collects postharvest information on fruits, vegetables, roots, and tubers. I will only outline PHDS' services briefly, and refer you to our exhibit table this afternoon. You will be hearing a presentation about PIP later during the workshop.

PHDS has served since 1980 as a problem-defined information service of the Food and Feed Grains Institute here at Kansas State University. PHDS collects documentation designed to help reduce postharvest losses of cereals and grain legumes. Individuals or institutions working on postharvest problems may obtain copies of these documents through the mail, and may also ask for information searches based on a particular postharvest subject. Copies of documents and results of information searches are airmailed directly to our international clientele. PHDS also periodically mails lists of documents added to the collection.

These services of information retrieval and document delivery are oriented toward individual users, and serve as short-term solutions to the lack of available postharvest information in many developing regions. However, they do not answer the need in these regions to develop their own agricultural information components. In addition, there is a gap in postharvest information that is very difficult for PHDS to fill by itself. That is the gap between information that is commercially published in well-established refereed journals, and the wealth of undistributed information that is printed in small quantities for local readers, but which never becomes available internationally.

It is difficult to estimate the volume of valuable postharvest documentation that exists in the form of extension pamphlets, training manuals, government and private project reports, or compiled data, all of which is so difficult to collect in a systematic manner. Only by regularly contacting those persons whom we know are doing postharvest research and development, and by asking them repeatedly for donations, is PHDS able to capture a fraction of this documentation.

In addition, it is common in regions where publishing opportunities are limited that agricultural experts cannot obtain even those materials written locally, because no person is responsible for their systematic collection or dissemination. Without being able to contact someone with this responsibility, PHDS is handicapped in its ability to make less well-known but very valuable postharvest information available worldwide. A network of several information components like PHDS would be in a better position to address this need.

Networks as a Solution

What exactly do I mean when I suggest a network? In general, a network can be defined as a group of autonomous entities having the capability of communication with one another. For example, a professional network among scientists is characterized by communication linkages such as newsletters, meetings, and also telecommunications of various types. By 'autonomous' I am stressing that each network participant is independent and self-sufficient, governed ultimately by its own institution.

What would a group of independent postharvest information components want to communicate? The answer falls into two categories: what one has and what one needs (Table 3). Both categories share the same elements of information resources, which include printed documentation as well as other resources such as technical expertise and programs.

Documented information plays such a central role in any problem solving effort that my definition of an information component assumes that it is composed of some kind of collection of documentation. However, I would emphasize that a local collection is not in itself the goal of the information component. Along with a local collection, information components participating in a network would need to have reference materials leading them to documentation located elsewhere, as well as technical facilities for duplication and transmission of information.

Focusing on the element of documentation, a network would facilitate the communication of new titles added to a given collection (Acquisitions); requests for document copies or exchanges between collections (Document Delivery); requests for searches of collections for particular titles or for material on a general subject (Information Retrieval); and general exchange of ideas on postharvest information management.

There can be several technical means of communicating these four items, some of which will be discussed in more detail during this workshop. Instead of listing these systematically, I would prefer to give two illustrations of possible network situations designed to address the four documentation-oriented concerns listed above. They represent two approaches: one a highly structured network and the other highly unstructured. Consider these examples not as packages to be accepted or rejected as a whole, but only as illustrations of possible combinations. I have given you these examples as handouts so that you may refer to them during later round-table discussions. Hopefully they will bring into focus some of the concerns that characterize information as well as the various approaches taken to information sharing.

The unstructured approach (Table 4) is probably the most easily achievable. It assumes that each member, acting independently according to its own ability, will notify all other members of any additions to its collection of documentation. PHDS and PIP both follow this example in their distribution of printed lists of new titles. It also assumes that one member may or may not agree to send copies of the actual documents to other members on demand. If the desire for document delivery is one of the main reasons for joining such a network, then one member's withholding that service may frustrate other members. Information retrieval in the unstructured example would also be left up to individual members to carry out in whatever manner their own system of organization allows them. In general, the frequency of communication between members would be fairly high in this illustration. For example, one member may have to ask every other member for a particular document before finally locating it. This could be potentially very time-consuming.

In the highly structured example (Table 5), members would each contribute records describing their new acquisitions into a central data base. Each would have equal access to the data base of collective records of the entire network. FAO's AGRIS system of collecting international agricultural records of documents is an example of this type. Communication between members would be reduced, since requests for information retrieval as well as document retrieval would be made to a single location. The demands by the network on each member, however, might be much greater than in the unstructured example. For example, if each member were to store a backup copy of each of their documents in a clearinghouse for

document delivery to other members, the task of copying everything could be problematical. Questions of compatibility between existing systems of cataloging and data entry would have to be addressed.

There are advantages and disadvantages to each of these two illustrations, associated with each of the four items for communication between members. As the concept of a network is discussed, potential members must think of the relative value of each of these four items to the particular institutions that they represent, as well as the proportion of questions to answers that they would likely be communicating in each case. Network membership is not accepted by autonomous institutions unless the institution perceives the potential benefits of acquiring resources from other members to be proportional to the cost of dispersing its own resources to other members.

During the remainder of this workshop, you will be hearing presentations that describe resources available for postharvest research and development, further discussion of the needs for postharvest information, and of the role that information management plays in agricultural problem solving. You will also be given opportunities to discuss in groups your own situations and the priorities that you believe should be established for solving information access problems. We only have 3 days, but our group size is small enough that we may each contribute in this working meeting to the development of solutions. By Wednesday I hope that the ideas generated by our presentations and round-table discussions will bring us closer to establishing a network of postharvest information centers. If we can develop by then a statement of consensus that provides evidence of the desire for some form of network development, we will have accomplished a great deal.

In closing, I want you to consider one of the causes of postharvest losses of food and compare it to information loss.

If farmers succeed in overcoming the biological losses to grain such as spoilage, insect infestation or rodent damage, but then have no way to transport their grain to the marketplace, then their grain will be lost to potential consumers. Transportation, marketing, and distribution facilities are part of the postharvest infrastructure.

Similarly, if information and documentation are collected, but do not ever arrive in an open marketplace of ideas, knowledge will be lost to the many people who are not physically located at the source of the information. We need to bring our separate information resources together, not only at this workshop as if it were the only 'market day', but we must develop the infrastructure that maintains a perpetual marketplace of postharvest information. With your contributions, that infrastructure can start to take form. Thank you.

TABLE 1

TRADITIONAL CLASSIFICATIONS OF AGRICULTURAL DOCUMENTATION

Agricultural Subjects	Publication Types
Universal Decimal Classification	Monographs
631 General subjects of agriculture	e.g. textbooks, handbooks, directories, catalogs, reports, etc.
632 Plant injuries, diseases, pests, plant protection, pest control in general	Serials
633 Individual crops	e.g. yearbooks, journals, newspapers, newsletters, etc.
634 Forestry, silviculture and forest products	Series
635 Vegetable gardening	e.g. monographs published in sequence on a common topic
636 Animal breeding	Unpublished Materials
637 Products of domestic animals	e.g. materials printed, but not published or widely disseminated, such as private papers, educational materials, pamphlets, etc.
638 Apiculture, sericulture	
639 Hunting, fishing, fish breeding	
Library of Congress	
S General	
SB Plant culture	
SD Forestry	
SF Animal Culture	
SH Aquaculture	
SK Hunting	

TABLE 2

A PROBLEM-DEFINED CLASSIFICATION OF AGRICULTURAL INFORMATION

Stage	Commodity	Question
Resource management Breeding Propagation Harvest Transportation Storage Processing Marketing Consumption	Cereals Sugar and Starch Crops Oil Crops Fibre Plants Fruits Trees and Crops Vegetables Pastures and Feed Crops Cover Crops Stimulant Plants and Crops Flavoring and Per- fume Plants Rubber and Wax Plants Tan and Dye Plants Drug Plants Pesticide Crops, etc.	What are the dimensions of the problem and the requirements for its solution? Who has worked with this problem before? When has the problem occurred before or been solved before? Where are the re- sources needed to solve the problem? How is the problem detected, solved, avoided, or pre- vented?

TABLE 3

WHAT IS COMMUNICATED AMONG NETWORK PARTICIPANTS?

- A. Needs (Questions) for: Documentation (e.g. readable information in print or non-print forms)*
- B. Resources (Answers) for: Technical Expertise (e.g. persons who can work on a specific problem)
- Educational Opportunities (e.g. training, seminars, degree programs)
- Research (e.g. cooperative projects)
- Other Resources (e.g. private or public financing)

* Specific questions and answers about documentation:

- 1) Acquisitions
- 2) Document Delivery
- 3) Information Retrieval
- 4) General Concerns

TABLE 4

ILLUSTRATION OF A HIGHLY UNSTRUCTURED NETWORK
AMONG POSTHARVEST INFORMATION CENTERS

1) **Acquisitions** -- not coordinated

Each member announces the latest acquisitions to its collection in the form of printed bibliographies, mailed periodically to other members.

2) **Document Delivery** -- optional

Each member may negotiate agreements with other members to provide copies of its documents upon demand, based on payment or exchange.

3) **Information Retrieval** -- individualized

Each member may request searches of the other members' collections for a specific title or general topic as needed. Searches could be carried out either on-line by the requesting member or by the answering member at the site of the collection.

4) **General Concerns** -- sporadic

New and specific problems could be shared between members as needed by letter or various telecommunications mediums.

TABLE 5

ILLUSTRATION OF A HIGHLY STRUCTURED NETWORK
AMONG POSTHARVEST INFORMATION CENTERS

1) **Acquisitions -- coordinated**

Each member records its acquisitions in a centralized data base of records, which regularly distributes an updated listing to all members.

2) **Document Delivery -- required**

A backup copy of all collective documents is kept in one location, which provides the document delivery on demand to all members, who maintain their own collections locally.

3) **Information Retrieval -- generalized**

Information about the total collective holdings of all members is maintained at each member's location, either on-line, on compact disk, or in a printed index for searching. Members do not have to contact one another in order to request a search.

4) **General Concerns -- scheduled**

In addition to sporadic communications as needed, a meeting of all members would be called on a regular basis, either at the location of one member or via telecommunications.

INFORMATION/DOCUMENTATION NEEDS IN POST-PRODUCTION-RELATED
PROJECTS AND/OR ACTIVITIES IN THE PHILIPPINES

by

Zenaida F. Toquero
(Southeast Asian Regional Center for Graduate Study
and Research in Agriculture, the Philippines)

Introduction

In spite of the numerous post-production-related activities and/or research done in the Philippines, a majority remain unknown, unpublished, or kept within the confines of research and development institutions and agencies. If they ever are published or referenced, they are difficult to locate or identify by title as relevant to post-production. This is especially true for socioeconomic studies in post-production. Part of the problem is the absence of a central agency or clearinghouse to monitor, collate, summarize, update, and disseminate these studies. The limited or sometimes inappropriate descriptors or key words used in cataloging further aggravate the problem. This paper will attempt to discuss these issues through the experiences and problems encountered in the implementation of the Postharvest Economics Advisor (Asia) project.

The Postharvest Economics Advisor (Asia) project is funded by the International Development Research Center (IDRC) through a grant to the Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA) in support of their Postharvest Program. The project aims to:

1. Develop/evaluate improved economic research methodologies for postharvest activities,
2. Develop monographs and data bases, and provide recommendations to further Asian research on selected postharvest economic subjects, and,
3. Improve the quantity and quality of postharvest economic training material.

In addition, the project assists the IDRC Asian Post-production Systems Program and Agricultural Economics Program in the design, implementation, and evaluation of postharvest economic research in selected IDRC-supported projects. This includes ongoing projects and the development stage of projects for consideration of IDRC support. These responsibilities are undertaken by the advisor in consultation with IDRC's Post-production and Agricultural Economics Program officers located in IDRC regional offices in Singapore and New Delhi.

In support of these above-mentioned activities, the Postharvest Economics Advisor (Asia) project is currently preparing a Philippine directory of people and/or institutions involved in post-production grain. This is an initial attempt to bring together in summary form a directory that will serve as a medium to facilitate contacts and enhance exchange of information among post-production workers in the country - a gap long felt by workers and institutions alike. It will likewise serve as a basis for identifying and locating technical manpower

which could be tapped for further post-production-related activities in teaching, research and extension.

This paper will first identify some of the agencies/institutions involved in post-production, and then will discuss the experiences and problems encountered in preparation of the "Post-Production Directory in Grains" as they relate to information and documentation needs of the rice industry.

Post-Production Agencies and Institutions in the Philippines

Several research agencies/institutions and academic and training programs have been established in the Philippines in response to the needs of the post-production sector. These include:

1. **National Food Authority (NFA)** -- created under Presidential Decree No.4 to replace the defunct Rice and Corn Administration (RCA). The NFA assumes the primary responsibility for all government activities relating to processing, storage, transport, and marketing of grains. Through its Grains Business Regulations Directorate, NFA has the power to license, register, and supervise persons engaged in the different activities as well as those who own and operate facilities pertaining to postharvest operations of the grains industry. Its Technology Resource Research Directorate (TRRD) and the Extension and Training Directorate conduct research, development, extension, and training activities in support of government-owned and/or operated post-production structures, facilities, and equipment.
2. **National Postharvest Institute for Research and Extension (NAPHIRE)** -- created by virtue of Presidential Decree 1380 in May 1978 to accelerate the development of the postharvest system in the grains industry through research and extension activities. It started operation in 1980 and was made a subsidiary of NFA. To date, it has completed 22 research projects, a number of training extension programs (some completed and others on a continuing/regular basis), and is currently involved in 10 ongoing research activities (Obien and Jimenez, 1989).
3. **Postharvest Horticulture Training and Research Center (PHTRC)** -- established in 1977 with funds from the ASEAN-Australian Economic Cooperation Program. It served as a regional center until 1985, catering primarily to the needs of the Association of South-East Asian Nations (ASEAN) in conjunction with the Food Handling Project on Horticulture. It is a unit of the Department of Horticulture at the University of the Philippines at Los Balos, serving as the research and extension arm of postharvest. The center is also responsible for teaching undergraduate and graduate courses on postharvest handling and physiology of horticultural crops. It maintains a library where accumulated information (drawn mostly from the research of the center) on appropriate postharvest technology of horticultural crops can be found.
4. **Philippine Root Crop Research and Training Center (PRCRTC)** of the Visayas State College of Agriculture (VISCA) -- A state-supported institution, the PRCRTC has been designated as the center of root crops research in the

country. In addition, the center staff are involved in teaching and extension activities of VISCA.

5. **Bureau of Plant Industry (BPI)** -- among the post-production-related activities of the Bureau are seed viability, seed treatment studies, irradiation (which they pursue with the Philippine Nuclear Research Institute), hot vapor and heat treatment for fruits and perishables, and other quarantine activities pursued with Food Terminal Incorporated (FTI), a subsidiary of the NFA.
6. **Philippine Rice Research Institute (PHILRICE)** -- is the national rice research and development agency established on November 1985 through Executive Order No. 1061. It aims to unify and strengthen the manpower capabilities and improve the physical facilities of major agencies involved in Philippine rice programs. PHILRICE coordinates with PCARRD and the Department of Agriculture's Bureau of Agricultural Research (DA-BAR) in planning, monitoring, and reviewing its programs. It also collaborates with state colleges and universities in technology generation and with the Department of Agriculture regional offices on technology adaptation, verification, and dissemination. It collaborates with NAPHIRE and other line agencies to pursue post-production activities.
7. **Philippine Council for Agriculture and Forestry Resources Research and Development (PCARRD)** of the **Department of Science and Technology (DOST)** coordinates, plans, evaluates, integrates, monitors, and funds agriculture, forestry and natural resources research and development activities. Through its **Management Information Service (MIS)**, it updates and publishes a research directory which contains current research undertakings of government agencies as well as colleges, universities, and some private sectors in the country. Post-production-related studies are not treated separately but may be pursued in any of the specific commodity areas.
8. **University of the Philippines at Los Balos (UPLB)** through the:
 - (a) **Agricultural Process Engineering Technology (AGPET)** -- an academic research and development unit of the **College of Engineering and Agroindustrial Technology (CEAT)**. The AGPET staff collaborate with agencies such as PHILRICE, PCARRD, ASEAN Grains Postharvest Program (AGPP), the **Philippine Coconut Research and Development Foundation (PCRDF)**, IDRC, etc. in post-production research and development and training activities. The department offers a B.S. and M.S. curriculum with majors in postharvest engineering wherein students conduct a thesis study or field practice for the undergraduate level and a thesis study for the graduate level.
 - (b) **Agricultural Mechanization Development Program (AMDP)** of CEAT prints, broadcasts, and produces audio-visual materials on production and post-production machinery for popularization and extension use. Its **Information and Documentation Section (IDS)** has recently expanded its publication program to include **Agricultural Mechanization Updates** and **Working Paper Series** to cater to different clientele. The AMDP is a national program for the improvement of land and labor

productivity and profitability through the production and use of agricultural tools, implements, and machineries. Its activities include research and development as well as adaptation and indigenous manufacture of agricultural machinery for small farms.

- (c) **UPLB Library** is the National Focal Point of the ASEAN Post-production Information Exchange Project (APEX) of the ASEAN Food Handling Bureau (AFHB). Their postharvest documentation follows the standard format being used by AFHB. Similarly, the UPLB Library collaborates with the Agricultural Information Bank for Asia (AIBA) for the bibliographic control of the international information systems of the United Nations Food and Agriculture Organization, specifically: **AGRIS**, the International System for Agricultural Sciences and Technology and **CARIS**, the Current Agricultural Research Information System.
- 9. Other state colleges and universities are members of the **Association of Colleges of Agriculture in the Philippines (ACAP)** and the **Philippine Association of Universities and Colleges (PASUC)**.
- 10. **University of the Philippines Institute for Small Scale Industries (UP-ISSI)** -- a research and training organization established through a bilateral agreement between the Philippine government and that of the Netherlands to assist and promote development of small enterprises in the Philippines. It has important linkages with the Ministry of Trade and Industry and other government ministries and agencies in the Philippines; with the Research Institute for Management Science in Development, Netherlands; with Technonet Asia in Singapore; with development assistance agencies of other countries; and with international organizations and development foundations. Some of the interesting materials prepared by UP-ISSI include **Agriculture and Agribusiness Opportunities in the Twelve Regions (1985)** and **Directory of Researchers/Organizations in Project Feasibility Studies**.
- 11. **Productivity and Development Center (PDC) of the Development Academy of the Philippines (DAP)** -- considers the socio-economic and cultural concerns which affect the productivity level of the country. Its areas of specialization include:
 - (a) Cottage, small, and medium industry research and surveys on technoeconomic possibilities; promotion of economically advantageous ancillary firms; marketing field assistance and entrepreneurship development;
 - (b) Food and agribusiness which emphasizes product diversification, and making food accessible and beneficial to the widest population; and
 - (c) Productivity enhancement.

Some of the interesting publications related to postharvest technology the PDC produces are **Food Map of the Philippines**, **How to**

Establish a Food Processing Business, Food Watch, Commodity Profile, and Pre-Feasibility Study Guide.

12. Home Economics Program Division of the Agricultural Training Institute (ATI) includes postharvest-related activities such as:
 - (a) The Integrated Program for Rural Women, involving welfare development activities for rural farm families through technology dissemination accompanied by appropriate support services,
 - (b) Provision of pamphlets and brochures related to post-production, and
 - (c) Regional programs and projects.
13. Bureau of Agricultural Statistics (BAS) of the Department of Agriculture - In addition to the collection and analysis of agricultural data, BAS issues papers and publications such as Investment Prospects In ... (e.g. shrimp, soybeans, etc.), and Marketing Studies (crops or commodities).
14. Philippine Social Science Council (PSSC) -- a private organization whose key areas of concern are training, research, professionalization, information dissemination, collaboration, and linkage. It is an organization of professional social science associations composed of a 12-member discipline organization, 26 associate members, and a nationwide research network. PSSC was tapped by IDRC to look into various components of each IDRC-supported project in the Philippines with a view to creating a training program with more rigorous attention to social components of projects and to provide requisite instruction to deal with problems of a rapidly changing socioecological environment.
15. Other post-production-related activities are pursued by regional and international organizations existing in the Philippines, such as:
 - (a) Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA) -- the agriculture center of the Southeast Asian Ministers of Education Organization (SEAMEO), an intergovernmental body founded in 1965 to promote cooperation among Southeast Asian nations through activities in education, science, and culture. It is involved in post-production related research, training, and information dissemination activities through AIBA and its communication and publications office;
 - (b) Regional Network for Agricultural Machinery (RNAM) -- promotes technical cooperation among developing countries in the area of agricultural mechanization through exchange of information on selection, design, development, adaptation, testing, local manufacture, and popularization of agricultural machinery, including post-production machinery. Each participating country has a national institute which provides the focal point of regional activities for strengthening capabilities through training courses, workshops, study tours, technical advice, catalytic assistance, and information dissemination;

- (c) **International Rice Research Institute (IRRI)** -- the foremost rice research center in the world, financed by grants from private foundations, government agencies, and international organizations. IRRI's comprehensive rice research program embraces all aspects of plant and soil sciences including plant breeding, cereal chemistry, agricultural engineering, economics, etc. While most of the research effort is concentrated on agronomic aspects of rice production, considerable efforts have been expended on rice postharvest practices and improvements. This includes physico-chemical and genetic improvements of rice, machinery design, testing, and evaluation as well as exploratory, technical, and socioeconomic studies.

Information/Documentation Needs and Problems

The foregoing indicates a considerable number of government, private agencies, and institutions involved in post-production-related activities. A number of these produce reports or publications which may either (a) remain in their own institutions due to confidentiality of the information or because it is not included in the mainstream of a centralized documentation center, or (b) they may be available either because they were done jointly with other agencies or because complimentary copies were sent to libraries or documentation centers.

Some of the needs and problems of post-production information and management are:

1. Absence of a central agency/institution to coordinate, monitor, and evaluate post-production activities in the country.

This absence results in a widely scattered and fragmented post-production information and documentation system. Individual agencies and institutions keep or maintain their own libraries or storage of documentation. Unless they are well-known in the postharvest field, it is very common for them to be overlooked in the search for pertinent data or reference materials.

2. Duplication and overlapping of activities or functions.

The absence of a coordinating body in the post-production sector often leads to agencies or institutions initiating their own activities, resulting in inefficient use of resources. At times, efforts are duplicated while other important efforts are left unattended. Inadequate interaction and limited information exchange among researchers and technocrats have hampered the important process mutual learning and have prevented the integrated and coordinated development of post-production activities. There were past efforts made to achieve more consolidated work through a national postharvest program.¹ However, subsequent efforts to

¹ In 1985, NAPHIRE conducted a series of national planning activities to integrate existing efforts into a program involving support and participation of all concerned sectors for food and feed crops. These included an interagency consultation meeting among management from government, academic, and private sectors; a project development workshop to formulate activities for the national postharvest plan; and follow-up meetings to finalize the proposed program.

continue the initial coordination of activities were terminated (Obien and Jimenez, 1989).

In the field of postharvest information and documentation, a number of the agencies and institutions listed above maintain or are planning to build data bases to meet their own specific needs. These may include statistical information, abstracts, and bibliographies on published and unpublished studies, etc. Although the activity will certainly meet their own needs, the duplication of effort involved in personnel training, documentation, microcomputer acquisition, etc. will use resources that could be applied to other needs of the postharvest sector.

3. Inadequate information/documentation on post-production activities of the private sector.

The private sector (as represented by traders, processors, financiers, or other companies or corporations engaged in post-production activities) is one of the important sectors in post-production. Yet most of their activities remain unknown because of the absence of a coordinating agency in post-production. Unlike most governmental agencies and academic institutions whose work is reported, a majority of these do not maintain any record or literature on their work. Sometimes, if such is available, it can only be accessed if the company is willing to share this information or if one has a contact inside of the company.

Corollary to this problem is the feeling among these processors, millers, traders, etc. that their work is not considered "research and development" because it is done on the spot or informally. This is a major problem being encountered in preparation of the Post-production Directory for Grains, where questionnaires mailed to the private sector were seldom returned or were returned with the answer "no post-production research or activity done".

4. Limited or inappropriate descriptors or key words used in post-production documentation.

One of the major problems encountered in accessing post-production data base is the limited amount of descriptors used. Sometimes these descriptors or key words are so inappropriate or misleading that a researcher or user has to read the whole paper to be able to determine if it is really related to post-production. This is especially true in studies related to socioeconomic issues in post-production technology. What is commonly found in post-production data bases are key words describing technical aspects of harvesting, drying, storage, milling, or losses. If there ever are socioeconomic key words used, they are limited to such general terms as "economics", "cost analysis", "distribution", "marketing", etc. Other important socioeconomic variables such as impact or consequence studies, labor displacement, turnaround time, income, labor and employment, impact on women, policies, programs, etc. are seldom found, if not totally missing as key words. This can partly be attributed to the fact that the earlier concerns in post-production were focused on losses, their patterns and magnitude, or the postharvest technology itself and its

technical efficiency. It is only recently that interest has been generated on the consequent socioeconomic impact of these alternative post-production technologies and its policy implications. There is a need to review and expand key words and descriptors used in post-production literature. Whenever possible, this should be prepared in consultation with social scientist and other users directly using such terminology.

Summary and Conclusion

There is a need to establish a national clearinghouse for post-production information and documentation to:

1. Collect and disseminate information,
2. Upgrade and improve document delivery services,
3. Facilitate regional access to international information,
4. Encourage information exchange between and among researchers and users in the area of post-production.

The UPLB Library can be the initial solution to meet this need inasmuch as it links to both the national institutions and agencies through the APEX project of AFHB and to the regional and international institutions through AIBA for bibliographic control of AGRIS/CARIS, as well as to other national nodes in the ASEAN region.

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PRIORITIES FOR COORDINATED POSTHARVEST DATA BASES:
TOWARDS THE DEVELOPMENT OF
A REGIONAL INFORMATION NETWORK IN ASIA

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Introduction

The promotion of specialized information data bases originates from the needs of user groups to establish a forum for the exchange of information, technology, and experiences in their specific field of interest.

Postharvest information tends to be of a multi-disciplinary nature, located from a diversity of socioeconomic, scientific, and technical sources, which are (often) available, but difficult to access by all types of users. Additionally, the requirements for postharvest information are complicated by the need to include an enormous variety of sectors, systems, and commodities within its scope.

It is perhaps not cost-effective or sustainable for individual countries in Asia to set up documentation/information centers to cover each and every postharvest subject area. Within the government sector, specialized national research, development, and extension centers have already been established, attached to ministries of agriculture, food, and commerce, in order to evaluate new and improved technology as well as to promote its nationwide adoption. Selected universities also play a vital role in promoting and producing research-related information, often discipline-specific in nature.

National information systems which collect, collate, and disseminate general agricultural information provide the key to linking these specialized centers into a workable postharvest information network. These have been established in all participating countries of REGNET (UNDP/FAO Intercountry Cooperation on Postharvest Technology and Quality Control of Food Grains). National information systems in Asia also operate within the FAO-coordinated International Information System for Agricultural Sciences and Technology (AGRIS) and the Current Agricultural Research Information System (CARIS), which provide a mechanism for information exchange and worldwide document access.

Recognizing the impracticality and duplication of effort involved in establishing a regional postharvest technology information center or clearinghouse, it is proposed that postharvest information exchange in Asia make maximum use of these

existing information systems, especially those operating as AGRIS/CARIS national focal points. A Regional Information Network among centers should be established for the development of efficient information exchange between participating countries of the region. Such exchange of technical information will not only facilitate technology transfer among nations and improve the understanding of grain postharvest technology, but will also provide a vital component of other regional activities.

Regional Network on Postharvest Technology and Quality Control of Food Grains (REGNET)

Past efforts in directly transferring postharvest technologies for threshing, drying, storage, processing, and protection of grains from one environment to another that is dissimilar in climate, economics, technical, and human resources have often led to poor results, wasted effort, and frustration. There is, therefore, a need for developing countries to evolve their own appropriate technologies, through applied and adaptive research in their own environments. Some developing countries have already started to do this, but are handicapped by a shortage of trained and experienced personnel, equipment, and financial resources. A system of inter-country cooperation with the exchange of information for this purpose would help these countries to increase their resources, reduce duplication, and make better use of their own institutional infrastructures.

Such cooperation would require a network to better utilize the existing national institutes, one which would coordinate efforts for selection and transfer of technologies, and for training to achieve the required national level of competence. A REGNET consultancy was undertaken in 1986 to ascertain the need for strengthening information activities as a means of providing better support for national research, development and extension activities in postharvest sub-sectors.

During the first operational phase of REGNET, a small data base was set up for grains-related postharvest technology using CDS/ISIS software. Between 800 and 1000 bibliographic entries were stored and two volumes were printed. The process, however, was found to be extremely time-consuming and proved also to be relatively nonproductive, as little feedback from network participants was received in the form of reprints or publications.

The objective of establishing within the network a viable information/consultation system was recognized as a top priority at the first National Coordinators' meeting of REGNET held at Bangkok, Thailand in May 1986. Thirteen developing countries in the region participated, with Japan and Australia maintaining Observer status. The participating countries within the Regional Network are currently Bangladesh, Burma, China, India, Indonesia, Republic of Korea, Malaysia, Nepal, Philippines, Pakistan, Sri Lanka, Thailand, and Vietnam.

The original objectives and activities established in May were modified after the second National Coordinators' meeting of REGNET held at New Delhi in September 1986. A more focused program concentrating on human resource development and technology transfer between network member countries was established, and the United Nations Development Program (UNDP) agreed to finance

an extension of the Intercountry Cooperation Program for a further 3 years (1987-1990).

The objectives of the REGNET's information support component are:

1. Improvement of postharvest processing of rice and other food grains by the promotion of effective mechanisms for the exchange of information on grain postharvest technology (pht) between participating countries in the region,
2. Strengthening of national capabilities in the collection, processing, and distribution of information on grain pht,
3. Dissemination of information already available in existing information systems to institutions, researchers, and industry engaged in grain postharvest handling, drying, storing, processing, and marketing.

A network planning meeting coordinated by REGNET was held at Bangkok, Thailand in March 1989. Participants were drawn from information organizations of the region, including the Agricultural Information Bank for Asia (AIBA), the ASEAN Food Handling Bureau (AFHB), ASEAN Food Post-production Information Exchange Project (APEX), Kasetsart University Main Library, Institute of Food Research and Product Development, Bangkok Thailand (IFRPD), the Asian Institute for Technology (AIT), and the ASEAN Grain Postharvest Program (AGPP). Based on discussions of the participants, it was felt that a regional network for postharvest technology information exchange should be developed.

Certain issues and concerns were identified and prioritized in order to address the issue of providing the best services through a network to participants in the region. Of the many issues, five were identified as most important for improving the efficiency of existing information systems:

1. Information needs of end-users

Information generated by postharvest technology (pht) researchers and technologists is readily utilized by the scientific community and academic institutions. On the other hand, the information requirements for policymakers, extension workers, and the private sector are less well known, and existing systems do not adequately cater to their specialized information needs.

Certain users have requested specialized statistical and marketing information for certain food grains. Policymakers are also found to request such information. A coordinated effort, therefore, is necessary at the national and regional level to comprehensively establish specific information requirements. Results of such activity would lead to better planning and maximization of resources in the specialized data centers.

2. Ineffective processing of information

Ineffective processing methods and systems for exchanging subject matter information specific to pht at the national, subregional and regional levels leads to inefficiencies in information dissemination. Causes for

such inefficiencies include bureaucratic compartmentalization; lack of meetings between information specialists and generators of pht information; lack of funds to coordinate such activities in national libraries; lack of motivation and funding on an individual basis; no formal linkage between institutions; lack of trained subject specialists; local language barriers; limited access to timely information; non-sharing attitudes; and overlapping of data bases.

A need exists for closer interaction between pht experts who generate information, and information specialists who process and store such data. Information seminars/workshops, scientific and technical-oriented seminars/workshops should be attended by such specialists to improve technical knowledge sharing, and to coordinate activities. Such gatherings would also familiarize specialists with one another, making interaction and cooperation more effective.

3. Lack of awareness of existing information centers

End users of pht information are often unaware of the location and services offered by existing information centers at national and regional levels. This is mainly due to lack of promotional activities and the marketing of packaged information. A coordinated promotional activity through a network would be suitable for this purpose.

4. Lack of standard nomenclature of key words for processing information

While many information centers are well established in their methods of processing information, certain exchange and dissemination activities are hampered, due to each center's using its own computer language suited to its own requirements. Certain data bases cannot be merged with one another without entailing a lot of work, often including changes in data structures.

A related problem is lack of uniformity in key words and descriptors used by each information center. Key words are not standardized between what is used in abstracts, journals, technical papers, and data bases. Standardizing descriptors would require continuous up-dating, which would presently tie up limited resources. A collaborative mechanism that brings together pht experts and information specialists would help initiate a solution to this problem.

5. Training needs

It is imperative to include a training component to upgrade the skills of information managers and programs. Both AIBA and AIT are well-positioned to undertake this function due to their previous courses undertaken independently. The International Development Research Center (IRDC) sponsors a 3-year training program involving AIBA (indexing), University Pertanian (computer applications), and AIT (information packaging), all of which should be taken into consideration in a network concept.

It has been decided to designate national focal points for information

exchange in the regional network as the national AGRIS and CARIS centers (see below). A coordinating office will maintain and improve exchange of information between REGNET and other institutions and networks covering the same subject scope and/or regional scope, such as AFHB/APEX, AGPP, PNAM, AFMA, AIBA, APO, FFTC/ASPAC, AIT, selected CGIAR centers, GASGA members, GIFAP, and other specialized UN agencies (ESCAP, UNIDO, UNEP, WHO, etc).

A description of some of the key organizations participating in a regional information network for pht information follows.

Primer on AGRIS/CARIS

Samaha (1986)¹ provided a review of the International Information System for the Agricultural Sciences and Technology (AGRIS) and how it can be utilized as a basis for a specialized postharvest documentation and delivery system.

AGRIS deals with published literature, either conventional -- articles, books, or non-conventional -- reports, proceedings, theses, and other material not available through the traditional book-selling channels. AGRIS is an index of the worldwide agricultural literature. 120 countries and 14 regional and international centers participate in this system, providing annually about 120,000 items. The total number of references accumulated since the system became operational in 1975 neared 1,200,000 at the beginning of 1986. The information is made available monthly in published form (Agrindex) and on magnetic tapes. The whole data base is loaded on DIALOG (USA), DIMDI (W. Germany), and the IAEA's computer in Vienna (Austria) and is accessible on-line via the international communication networks. Centers having computer facilities can use the AGRIS tape to disseminated information to their own users. For countries where no computer facilities are available, FAO offers AGRIS services upon request.

Most participating countries have improved the bibliographic control of their agricultural literature and gained access to outside information not otherwise available to them. The computerized production of national agricultural bibliographies extracted from AGRIS became easy and of reasonable cost; it can be extracted by the AGRIS Coordinating Center, (India, Nepal, Pakistan) or by the regional center, namely Agricultural Information Bank of Asia (AIBA) of Singapore, Indonesia, Malaysia, Philippines and Thailand. In addition, specialized bibliographies have been prepared on forestry, renewable sources of energy, and population. A bibliography on wheat, barley, and triticale is extracted every 2 months for CIMMYT. AGRIS has not only improved access to agricultural literature, but has also promoted and catalyzed the development of national and regional agricultural information infrastructures. Many countries

¹ AGRIS and CARIS as Sources of Information on Postharvest Technology, by Emile K. Samaha, Chief, Systems and Project Development Branch, Library and Documentation Systems Divisions, FAO, Rome. Prepared for the First National Coordinator's Meeting of the UNDP/FAO Intercountry Cooperation Project on Postharvest Technology and Quality Control of Food Grains (REGNET), 26-28 May, 1986, Bangkok, Thailand.

have been able to develop their documentation services around AGRIS and to obtain donor support for this purpose.

AGRIS offers users the possibility not only of obtaining a retrospective search (since 1975) on their specific subject of interest, but also of receiving monthly Selective Dissemination of Information (SDI) produced by computer according to their profile of interest. In this manner, they are kept aware of current publication in their field. Users should contact their national AGRIS centers for assistance in getting the most adequate service from AGRIS. In those countries where no AGRIS center has yet been established, users can write directly to the Agris Coordinating Center, FAO, Rome, Italy.

The national institutions participating in AGRIS in the network member countries of REGNET, which are currently Bangladesh, Burma, Peoples' Republic of China, Republic of Indonesia, India, Republic of Korea, Malaysia, Nepal, Pakistan, Philippines, Sri Lanka, Thailand and Vietnam, is given in Appendix I. The Royal Kingdom of Bhutan is likely to participate as a full member during the follow-up project phase on REGNET linked through a national Accelerated Agricultural Production Project funded by UNDP and executed by FAO. It should be mentioned that the designation of a national AGRIS center is made by the government and communicated to the Director-General of FAO. The national center should have the responsibility of serving all users in its country, not only those working in its host department or institution.

How to Find References on Postharvest Technology in AGRIS. The input center assigns one, two, or three subject category codes to the bibliographic reference in AGRIS which allow for grouping and retrieval of documents in the same subject area. For example, in AGRIS-1975/85, documents dealing with "protection of stored products of plant and animal origin" are coded H70, "agricultural engineering, structures, and equipment" are N10, and "farm equipment" N20. If a documents deals with several topics it will receive up to two additional codes. However, in Agrindex the reference will appear under the main category with cross references to the other(s). In addition, a reference is assigned a commodity code (e.g. for wheat, rice, flours, coconut oil, etc.), and a geographic code. The geographic code enables the retrieval of a document related to a country to a region.

Starting with Volume XII (1986), a modified categorization scheme has been introduced along with indexing using the multilingual thesaurus, AGROVOC. The new categorization scheme has specific categories on postharvest technology detailed as follows:

- J10 Handling, transport, storage, and protection of agricultural products;
- J11 Handling, ... of plant products
- J12 Handling, ... of forest products
- J13 Handling, ... of animal products
- J14 Handling, ... of fisheries and aquacultural products

J15 Handling, ... of non-food or non-feed agricultural products

Users of Agrindex have the following options:

1. To browse under the appropriate category for a quick view of what has been published in a given area,
2. To search in the commodity index (1975/85) or the subject index (1986 to) for a given crop, product or concept,
3. To search in the geographic index (1975/85) or the subject index (1986 to) to find documents on a given country.

Users can also combine these three searching modes and/or use the personal author, corporate author, and report or patent number indexes which are also available.

To facilitate the search, cumulative indexes have been produced on microfiche since 1978. Using a simple microfiche reader, all references related to a specific topic in the index can be retrieved at a glance.

It should be noted that AGRIS covers documents related to extension, but does not contain references to actual extension material addressed to farmers and other end-users. Most often such material is produced in the vernacular language and is location-specific. National or regional AGRIS centers can use the AGRIS methodology to process such material and add it to their national or regional bibliographies.

Computer searching offers another means of responding to the users' needs (retrospective searches, individual, or standard profile searches). Anyone wishing to receive, on a regular basis, a printout of what is entered into the AGRIS data base every month on a given subject can request it be to to them. The subject, together with the user's identification is called a "User Profile", while regular monthly distribution of the extracted information is called "Selective Dissemination of Information" (SDI) service. AGRIS centers having access to computer facilities receive free monthly AGRIS tapes and can provide such services directly to their users. At present, AIBA (for South East Asia), Malaysia and India AGRIS centers provide such services.

A bibliographic service on postharvest technology based on AGRIS can be developed for a given "network", provided that resources are available at the coordinating center of the network, mainly for printing and distribution. Furthermore, AGRIS material can be used to prepare state-of-the-art reviews and other specialized services as required, for example, by REGNET.

CARIS

CARIS deals with information on ongoing research activities. An important time-lag exists between obtaining results in the laboratory or the field and their publication. In many cases no publications are made and results remain in handwritten or draft form. Such a delay, added to the duration of the research activity itself, leaves useful information unknown and leads to duplication of

efforts even within one country, to a lack of cooperation, and to shortcomings in research management. Through AGRIS, researchers are informed of what has been published, by whom, and where; but they also need to know who is doing what and where. CARIS provides the answer as it offers developing countries a mechanism to collect, organize and disseminate information on their respective current research activities and to exchange this information among themselves.

Since 1979, the FAO Conference has approved the development of CARIS according to a decentralized scheme whereby participating countries are responsible for the collection and processing of data, which FAO ensures coordination and training, development of the methodology and maintenance of the global data base obtained by merging national and regional files. No international directories will be issued by FAO, but publication of national and regional CARIS inventories is being encouraged, since CARIS should be of high priority for research managers and workers at national and regional levels.

It will be noticed that in some countries the AGRIS and CARIS centers are identical while in others they are distinct. AIBA is maintaining a regional CARIS data base for Indonesia, Malaysia, Philippines, Singapore, and Thailand. Bangladesh and the Philippines have published their national directories and Pakistan is updating its own. All ongoing research projects dealing with post-harvest technology are supposed to be covered. A printout listing such projects in a given number of countries can be easily produced and distributed.

CARIS methodology is compatible with AGRIS and uses the same classification scheme and thesaurus. Therefore, the retrieval of data is done in a similar manner. CARIS requires the collection of data from research institutions and research workers, and this is where the major problems were and are to be found. Most of the national CARIS centers report difficulties in collecting the data. Unless the research community cooperates fully in this exercise, the CARIS inventories cannot be comprehensive and useful to all. The expressed needs of end-users and the existence of specialized networks, such as REGNET, should provide incentives for the activities of CARIS centers.

Integration with Existing Regional Programs and Specialized Institutions

AFMA. The Association of Food Marketing Agencies for Asia and the Pacific (AFMA) has been constituted through a General Assembly in 1983, and is currently supported by a regional UNDP/FAO project "Strengthening of Food Security Through the Promotion of TCDC for Food Marketing Improvement" (RAS/86/032).

The First General Assembly and Foundation Meeting of AFMA (8-10 February, 1983) set out a very comprehensive constitution and bylaws governing the operation and financial remittances of AFMA members to implement approved activities.

An Executive Committee composed of five AFMA member institutions, an elected Chairman, Vice Chairman Executive Director as ex-office member, and observers from FAO formulates work plans and budgets for the next 2 years (which are approved for implementation by the biennial General Assembly).

Additionally, ten National Coordinators have been elected from AFMA member institutions to oversee the implementation of the above-mentioned UNDP/FAO

project, RAS/86/032, which has the objective of institutionalizing related training by its completion in 1990.

AFMA is an autonomous association supported by FAO and the governments of the respective member institutions. It is also seeking a liaison status with FAO. AFMA will carry out its activities in close cooperation with the FAO Asia and the Pacific Commission on Food Security, and other relevant regional institutions and networks which deal with food marketing.

Membership in the association is open to:

1. National-level government ministries, departments, and other institutions which are involved in planning and policy formulation, management, regulatory functions, and other supporting functions, such as grading, information, inspection, etc., for the food marketing system.
2. National-level government departments, statutory bodies, or cooperative associations which are responsible for physical handling of food (grains, fruits and vegetables, livestock and livestock products) including procurement, storing, and distribution.
3. National-level institutions which are involved in training and research in food marketing and management.

The current membership is 21 institutions from 12 countries. For AFMA, food means grains and grains products, fruits, vegetables, and their by-products, livestock and livestock products. Marketing means planning, management, physical and supporting functions for the movement of food from producers to the consumers.

The objectives of the association are:

1. To stimulate economic and technical cooperation among food marketing institutions in the region for the improvement of food marketing systems in the respective countries;
2. To establish among its members a mechanism for systematic interchange of information and experiences regarding various aspects of food marketing activities; and,
3. To establish and maintain appropriate relationships with FAO and other international and regional organizations pursuing similar or related objectives.

Activities to achieve stated objectives:

1. Exchange of Information

A country profile on Food Marketing System Improvement Policies and Programs updated every 2 years

A periodical survey report of Food Marketing Training Facilities

A quarterly newsletter entitled "Food Marketing News"

2. Exchange of Experience (expertise)

AFMA Senior Executives Group Observation Tours on Food Marketing Systems
Food Marketing Exchange Program

3. Training Programs and Seminars

4. Mutual Technical Cooperation Program

Marketing experts of member institutions provide technical consultancy services to member institutions in planning and/or initiating a new program, in evaluation of an existing program, and in training of marketing staff.

5. Applied Research

AFMA conducts applied research on major policy issues on food marketing systems, such as pricing policy, marketing costs and margins, physical distribution management, marketing for rural development, cooperative marketing, etc.

Regional Network for Agricultural Machinery (RNAM). RNAM is an example of a successful Regional Network that over the past decade or so has developed an intricate hierarchical administrative structure to oversee the implementation of its activities. It is currently in its fourth 5-year phase of operation (January 1987 - December 1991) after being initially established by an ESCAP Resolution #156 on March 6, 1975.

The RNAM Project was based on the network concept involving linkages to facilitate sharing of technology and experiences among the eight participating countries. The basic elements of the network consist of the National Institutes (NIs) which are focal points in the Participating Countries (PCs) for implementing/coordinating National Network (NN) activities at the national level and the Regional Office (RO) which implements, coordinates, and catalyzes activities at the regional level. ESCAP is the UN Executing Agency, in association with FAO and UNIDO, and in cooperation with the International Rice Research Institute (IRRI). UNDP, the participating governments, and the other ESCAP member governments, particularly Australia and Japan, which are currently involved with the projects, provide financial inputs through contributions in cash or kind. Together with ESCAP, FAO, UNIDO, and IRRI, they form the Technical Advisory Committee (TAC) and the Governing Body (GB), which provide technical advice and policy direction, respectively, to the project.

During the fourth phase (1987 - 1991), the institutional framework of RNAM will continue to be a network of participating countries in the region with a nucleus office at Los Baños, Philippines. The participating countries are already actively engaged in sharing technical information. This phase will focus more

sharply on activities which will produce a greater but measurable impact on the countries' development, including formulation of mechanization strategies, design and development, local manufacture, extension, and popularization of selected machinery for food and feed crops, seeding and planting, harvesting, threshing, drying, and milling.

Asean Grains Postharvest Program (AGPP). The ASEAN Grains Postharvest Program (AGPP) is a regional collaborative research and development program of the ASEAN member countries: Brunei Darussalam, Indonesia, Malaysia, Philippines, Singapore, and Thailand. It is financially supported by the Canadian International Development Agency (CIDA) and the International Development Research Center (IDRC) of Canada.

AGPP is a 5-year program that replaces the ASEAN Crops Postharvest Program (ACPHP), which terminated in June 1988. The AGPP's main concern is the priority needs of the participating ASEAN countries in grain postharvest research and development.

The basic belief cultivated in the AGPP is that the deeper understanding of postharvest issues in the context of local cultural, social, economic, and political setting, and the motivation to improve the welfare of the people in the industry should rest squarely on a country's own scientists.

The AGPP research and development activities are focused on harvesting, threshing, drying, storage, and milling problems encountered in rice, maize, soybean, and groundnut commodities.

Applied research addressing operational problems is encouraged, as are basic studies in support of applied research. These activities are national and regional research projects, short-term training programs, and information exchange/dissemination through publications of selected relevant subjects. A unique feature of AGPP is its thrust on utilization of research results, adaptation, transfer of proven technologies, and the collaborative relationship among country research and development project workers.

The immediate beneficiaries of AGPP are the millions of small-farm families, small-scale traders, and small-scale rural entrepreneurs. This emphasis on farming communities that handle the first stage of postharvest operations, where the product is most vulnerable to irreversible damage, and on the majority of lower-income consumers, provides the greatest opportunity for AGPP's contribution to national and regional development.

AGPP is composed of six member units:

1. National postharvest committees coordinate the planning and implementation of individual country research and development projects.
2. National research and development institutions are responsible for the planning and conduct of country activities funded by AGPP.

3. A Technical Advisory Committee (TAC) is composed of senior and experienced scientists representing member countries and donor agencies, and provides a regional forum for discussion of issues of priority and attention.
4. A Program Steering Committee (PSC) provides policy decisions and AGPP directions.
5. A country host agency hosts the AGPP Secretariat and administers AGPP funds from the donor agencies. The Department of Agriculture of Thailand is the country host agency. IDRC acts as executing agency on behalf of the AGPP donors.
6. The AGPP Secretariat provides technical assistance and related administrative support services to national research and development institutions in planning and implementing a country project. The AGPP Secretariat holds office at the Agricultural Engineering Division of the Department of Agriculture, located on the Kasetsart University Campus in Bangkok, Bangkok.

Asian Institute of Technology (AIT). Based in Bangkok, AIT was established to help meet the growing need for advanced engineering education in Asia. The institute was founded in 1959 as the SEATO Graduate School of Engineering. In November 1967, it became fully independent under its present title. Its charter, granted by the Royal Thai Government, accords AIT the status of an autonomous international institution and empowers it to award degrees and diplomas. The institute is supported by contributions from governments, foundations, businesses, industries, and individuals, in the form of scholarships, seconded staff, equipment, sponsored research, operating funds, grants for campus development, and the AIT Endowment Fund.

The institute provides advanced education in engineering, science, and allied fields through:

1. Academic programs leading to the Diploma of the Asian Institute of Technology and to the degrees of Master of Engineering, Master of Science, Doctor of Engineering, and Doctor of Technical Science;
2. Research by students, faculty, and research staff directed toward the solution of technological problems relevant to Asia, and
3. Special programs, including conferences, seminars and, short courses.

The institute's academic programs are related closely to the needs of Asia. They include the study of problems common to the regional as well as study of the engineering and scientific methods upon which the solutions to these problems depend. Students are drawn from many countries across the Asian and Pacific region. A few come from Africa, Australia, and other non-Asian countries. AIT students are taught and supported by around 200 faculty and staff from 30 countries.

The institute is composed of nine academic divisions: Agricultural and Food Engineering, Computer Science, Energy Technology, Environmental Engineering,

Geotechnical and Transportation Engineering, Human Settlements Development, Industrial Engineering, Structural Engineering and Construction, and Water Resources Engineering. Two interdisciplinary programs are Agricultural Land and Water Development, and Natural Resources Development and Management. The institute's academic centers include the Asian Disaster Preparedness Center, Continuing Education Center, Regional Computer Center, and Regional Research and Development Center. The academic programs and centers conduct research programs in cooperation with institutions in Asia and other regions.

a. AIT's Library and Regional Documentation Center (LRDC)

AIT devotes considerable efforts and resources to the development of an outstanding library collection to serve the needs of the institute's expanding teaching and research to serve as a regional resource reference center. The library contains more than 170,000 volumes and subscribes to more than 800 journal titles in science, engineering and technology. Some 80 specialized indexing and abstracting journals facilitate the search for published literature. There are large collections of maps, microtexts, vertical file materials, and microforms. Modern viewing and photocopying equipment, including microfilm, microfiche reader-printers, and microfilming facilities are available.

The LRDC data bases may now be accessed on-line by interested customers in Thailand. Being a member of the International Data base Access and Remote Computing Service (IDAR) of Thailand, LRDC has access, through TYMNET, BITNET, and TELENET to international computerized data base vendors such as DIALOG and ESA. Such access facilitates research projects at the institute and enables AIT to participate in worldwide teleconferencing.

In 1973 AIT introduced its information/documentation activities by setting up the first information center, the "Asian Geotechnical Engineering Information Center" (AGE), and later a second one, the "International Ferrocement Information Center" (IFIC). The "Environmental Sanitation Information Center" (ENSIC) and the "Regional Energy Resources Information Center" (RERIC) were both established in 1978. LRDC coordinates and operates all of AIT's information center activities.

The information centers acquire published and unpublished information, from the AIT Library and from external sources. They also produce publications such as brochures, newsletters, current awareness journals, abstracting journals, bibliographies, proceedings, etc. Each center has developed one or more in-house data bases on subjects covered by the center. They regularly receive requests for information on specific topics, and provide reference service for that which they do not already have in a prepackaged form or as a publication in the Library.

In addition to information dissemination through publications, reference and referral services, the centers are also involved in

direct technology transfer activities, such as training and the organization of conferences and seminars. LRDC provides training designed for information professionals, including in-service training, short courses, and summer semester course work.

b. AIT's Regional Computer Center (RCC)

The Regional Computer Center administers computing facilities and provides computing support, conducts training courses, and undertakes applications development projects. Its main functions are:

- (1) To provide computing services for AIT's students, faculty, and staff,
- (2) To organize and conduct special programs which will increase the computer-related expertise in the region,
- (3) To provide computing services and assistance to local, regional, and international public-sector organizations,
- (4) To provide networking services.

The RCC has two mainframe computers, an IBM 3083 and IBM 3031, with a total of 22 megabytes of main memory with multi-MIP processing power and 12 gigabytes of secondary storage. Both interactive and batch processing are available through the VM/CMS OS/VSI and DOS/VSE operating systems.

A wide variety of software packages for programming, mathematical, statistical, engineering, and business are available. Nearly 80 terminals ensure that users will be able to utilize the resources of the RCC. Output can be derived from two line printers, a laser printer, or two color pen plotters.

Additionally, the RCC has a well-equipped microcomputer laboratory with 50 microcomputers of four different makes, many linked to the mainframe as well as the RCC broadband local area network and a CAD/CAM laboratory with 6 CAD/CAM work stations.

The RCC staff includes professionals from 11 countries around the world who share a uniformly high level of academic and working experience. The staff provides a solid core for its support, training, management, operations, and development functions.

c. AIT's Division of Agricultural and Food Engineering (AFE)

The division as a whole emphasizes technology required to increase the efficiency of food production as well as the efficiency of harvesting, storing, processing, preserving, and distribution of food for consumption. Furthermore, this emphasis is made within the context of identified agricultural systems and the socioeconomic and policy environments wherein they are operated.

The division offers five academic programs: Agricultural Machinery and Management, Postharvest Technology, Aquaculture, Agricultural Systems, and Agricultural Land and Water Development. The Postharvest Technology program deals with the handling, processing, and preservation problems of raw agricultural commodities in developing countries. Emphasis is placed on the following areas: application of engineering principles to design postharvest processes and equipment; studying changes which may occur within the products during handling, processing, and storage; measuring and controlling the quality of raw food materials; handling and utilization of wastes generated during on-farm processing; and economics of food production and processing at the farm level.

Areas of research in general focus on processing, storage, and handling of raw agricultural materials for consumption as food and feed. Specific research activities include the study of alternate grain drying and storage systems, as well as heating, pre-cooling and controlled atmosphere storage of fruits and vegetables.

Asean Food Handling Bureau. The AFHB has been established to provide an administrative and technical base for the ASEAN Food Handling Project of the ASEAN-Australian Economic Cooperation Program. It also offers a consultancy and advisory service in postharvest food handling, specifically in the areas of fish, grains, meat and livestock, and fresh fruits and vegetables. Part of its role in the technical and advisory capacities is to disseminate specialized information on the subjects specified.

Its Technical Information Service (TIS) was envisaged to undertake the dissemination of information based on its own specialized resource collection (see Appendix II.1), the resources and expertise of other institutions (see Appendix II.2), as well as established data bases. Information disseminated is mainly in the form of reports and journal articles. The subject coverage ranges from general fields of agriculture to specific topics in postharvest processing and technology. The collected postharvest documents are coded and stored in a computerized SDI (selective dissemination of information) data base of the AFHB-TIS, which has now been incorporated into the new HP 3000 Series 37 computer system as part of the APEX project.

APEX, the ASEAN Post-Production Information Exchange Project, will link Asian national postharvest information data bases currently being created to the SDI data base. AFHB will function as the headquarters of the APEX Project, but National Focal Points (NFPs) in each participating country will:

1. Build up a national comprehensive food post-production data base,
2. Systematically collect and disseminate nationally produced food post-production literature,
3. Upgrade document delivery services,
4. Facilitate regional access to international information, and

5. Encourage information exchange.

The national data bases that have been set up are located at:

1. The National Library for Agricultural Sciences (Indonesia),
2. The Food Technology Division of the Malaysian Agricultural Research and Development Institute - MARDI (Malaysia),
3. The University of the Philippines at Los Baños (Philippines),
4. The City Veterinary Center (Singapore),
5. The Institute of Food Research and Product Development (Thailand).

The AFHB, as coordinator of the project, will continue to pull information from international publications and keep subscribers informed of the latest post-production processes and technology. Besides coordinating activities, the headquarters will merge records from the NFPs to provide the region with a single source of ASEAN materials on post-production food information.

Agricultural Information Bank for Asia (AIBA). Ms. J.C. Sison will be giving this seminar a detailed description of the role, function, and potential services that AIBA supplies under the AGINFONET-SEA program. The summary below indicates its role as envisaged within the proposed postharvest Regional Network for Asia.

Conclusions and Recommendations

A coordinated regional network for pht information should be developed through the strengthened national AGRIC/CARIS focal points and the specialized national research and development institutes and programs at the national, subregional and regional levels. This would mean a linkup among existing facilities in the region through AFMA/AGPP/AFHB(APEX), and possibly a coordinating function of a center at AIT.

The coordinating activities should have a step-wise implementation, beginning with:

1. Definition of the scope of the network,
2. Assessment of needs of potential users,
3. Development of extended thesaurus and classification,
4. Location of a Center within an existing institution,
5. Recruitment of additional staff,
6. Compilation of an initial data base/bibliography from existing sources,
7. Collection of materials,
8. Strengthening of National Focal Points (training, marketing),
9. Promotion of the network and development of services.

Commodity coverage would initially be grain pht, but in the long term, other crops may be selected for limited specialized documentation.

The current position and future plans for expanding information activities in postharvest technology are as follows:

1. Regularly collect postharvest information as part of the data bases on agriculture being maintained at AIBA.
2. Produce repackaged information products from the AGRIS, AGRIASIA, and CARIS-SEA data bases² such as bibliographies, directories, inventories of experts, or specialized data bases on given aspects of postharvest technology (for example, the "Corn Postharvest Bibliography" produced in 1983 of 1796 entries).
3. Provide information services including literature searching and document delivery.
4. Future activities may include training programs in information work like indexing and abstracting, data base creation and maintenance, and electronic publishing.

Systems to be used and personnel resources to implement the Regional Information Network for Asia are as follows:

1. AGRIS/CARIS methodology will be used for information analysis, storage, and retrieval.
2. In addition, microcomputer-based applications software will be used where desirable, such as Micro-CDS/ISIS, dBase III+, etc.
3. AIBA will work with its present complement of four information specialists and three support staff on any project in this field, with the option to hire short-term contractual staff should the need arise.

Types of data bases and nomenclature (key words/thesaurus) to be used include (1) AGRIASIA, (2) CARIS-SEA, (3) AGROVOC Thesaurus, and (4) AGRIS/CARIS Classification Scheme for subject analysis. An in-house developed categorization scheme for postharvest technology would also be used.

Financial Implications

AIT provides an example of a self-sustaining library and four documentation centers. However, the success of AIT's information centers was brought about not only by donor countries and international development funding agencies, but also by the private sector. The private sector is profit-oriented, and in a position to pay for information services required. The network will only be self-supporting beyond 5 years or more. One that heavily relies on ad-hoc funding and does not charge for its services will have no secure tenure.

² Postharvest information currently comprises about 10 percent of the AGRIASIA database, and about 8 percent of the CARIS-SEA database of ongoing research in the Southeast Asian region

It appears that there is a need for service charges covering all aspects of information center operations, and not just for materials disseminated to supplement the current limited budgets. Another financial constraint to be overcome is that when all incomes generated by the information centers are reverted to the mother institution (i.e., library to university, LRDC to AIT, AIBA to SEARCA, etc.), the centers are fully dependent for their operational needs. With the growing demand and requests for copies of publications and research papers, data centers find that expenses for packaging, handling and mailing are depleting their limited budgets. This is attributed to the fact that institutions in the region have meager budgets earmarked for information services, and in many cases, no budget at all.

The setting up of a network activity would require adequate resources. The information network should aim to be self-supporting within a recognized time-scale to be meaningful. It is anticipated that income would be from sales of service, membership fees, and possible external funds.

APPENDIX I

NATIONAL FOCAL POINTS AND CONTACT PERSONS IN AGRIS/CARIS CENTERS

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NATIONAL FOCAL POINTS AND CONTACT PERSONS IN AGRIX/CARIS CENTERS

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THE POSTHARVEST COMPUTER TELECONFERENCE,
OR DIALING LOCALLY, FOR ASSISTANCE GLOBALLY

by

Harlan R. Shuyler

Introduction

Computer teleconferencing is not new, but it is new to the postharvest areas of activity. Today this tool is available for use by any person involved in postharvest related activities anywhere on our globe, at any time of the day or night.

One of the very first teleconferences was started in 1978 (Turoff and Hiltz, 1978). The objective of this early teleconference was to assist the U.S. Government to achieve specific governmental objectives. This unique type of communication was duplicated by others in 1979 (Licklider, 1982) and 1981 (Hiltz and Turoff, 1982). Hundreds, perhaps thousands, of computer teleconferences are on-going today (Electronic Networking Association, 1989).

People participating in teleconferences around the world include individual artists, coin collectors and dealers, computer and teleconferencing specialists, governments, industry and trade associations, law-enforcement groups, lawyers, museums, "think-tanks", etc. A teleconference may involve people in only one city, one state, or one nation. There are some electronic networks that are global or at least inter-regional in scope.

Many computer teleconferences conducted by "for-profit" corporations are considered to be profitable. Most computer teleconferences are apparently self-supporting because of some particular need which overrides any losses which would otherwise be considered or they are supported by some form of subsidy. Many computer teleconferences are conceived and conducted for a period and then they fail. Most of the latter have not met one or both of the two prior conditions, need or subsidy (Ferrarini, 1985). Except for the multitude of computer teleconferences dealing with some aspect of computer knowledge, per se, there essentially have been no technical international computer conferences. Evidence has been found of only one such activity (Balsom 1985) that could be judged to be global, other than the "Postharvest Agriculture Conference."

The "Postharvest Agriculture" Conference is an on-going computer teleconference which is global in scope. Its primary aim is to assist those engaged in postharvest and related activities in the developing countries. The secondary aim is to assist all participants to keep up-to-date. It is expected that participants with special expertise will learn early of the potential need for consultants, etc., and apply for these activities in good time.

All subjects in training, education, operations, research and extension, pertaining to any commodity are open for discussion. Produce found in any geographic, climatic, ecological or sociological setting are to be discussed. Biology, entomology, engineering, marketing, processing, etc., are included.

Comments and questions are expected and are being obtained from participants. Inquiries regarding documentation, expertise, etc., are expected. At present, the conference is open-ended. The schedule presently in effect extends for 6 months, from November 22, 1988 until May 22, 1989. As near as known, it will continue much beyond that date.

This on-going computer teleconference is being conducted on two international computer networks. CARINET, within the EIES (Electronic Information Exchange Service) Network, via a mainframe computer of the New Jersey Institute of Technology (NJIT), has the Computer Conference 1993 (referred to as C1993). The CGNET Conference, within the DIALCOM Network, via a mainframe computer in Maryland, functions through GCD0011 and CGI156. CGNET is the computer telecommunications network for persons who are in or are in work related to, the Consultative Group for International Agriculture Research (CGIAR).

In the U.S., both of these networks are accessed through TELENET, a US Sprint Company. Local telephone numbers, solely for computer telecommunications, are available in 378 locations in the U.S. Six of these are available for Kansas users, and one of these is for the Manhattan area (Telenet, 1985). In some other countries, TELENET is also the medium for international access.

Except for conditions pertaining to a particular country, any participant may access the Postharvest Agriculture Conference at any time during the 24 hours of any day of any week. At infrequent intervals, each mainframe will be shut down for 2 or 3 hours beginning approximately midnight, EST or EDT, depending on the season. Access is potentially available to each participant from any part of any country which has the required equipment.

Technical Requirements for Participation

The country or countries in which participants are working must have packet switching equipment or the equivalent. The packet must be compatible for use with the other requirements listed below. An IBM-compatible computer, monitor, keyboard, and appropriate software are essential. A printer is highly recommended, and a photocopying machine is an extremely helpful adjunctive piece of equipment. A Hayes-compatible modem and appropriate software are required. The modem must operate at 1200 and/or 2400 baud, at least.

Instruction manuals for use of the equipment noted above must be easily available at any time. Instruction manuals for the software must be handy at all times. In addition, instruction manuals for accessing and using the services offered by one of the mainframe computers must be studied and referred to frequently.

Obviously, all this equipment must be designed for operations under the conditions of your power supply. You must have reasonably easy access to the above equipment, and should be positioned near a telephone.

You do not need to have a telephone line dedicated to the use of electronic telecommunications through your computer, as long as computer/modem-use periods are short or are during periods of the day with little or no other telephone requirements. But remember that when the undedicated phone is in use for conversation, the modem is not usable; and when the modem is in use for your

electronic telecommunication, the phone is not usable for incoming or outgoing voice communications.

I strongly urge the installation in the system of a power surge protector and an anti-static electricity mat that is grounded. Specially fitted covers for the computer/printer/copier equipment may be needed because of moisture or dust situations. I suggest you accept any warranty of hardware and installation of software that is made available.

Ample flexible disks should be available and used. Floppy disks may have many uses in connection with all kinds of computer-involved activities. One use is that of having outgoing messages on these disks, sending the messages from that memory, and storing these and incoming information on them. This has been very helpful to me.

In all your activities, it is important to have a budget for the costs of your computer teleconference work, and to know what that budget is, and how your cost pattern measures with respect to that budget. Particularly in developing countries, there seems to be a pattern of monthly charges for having access to the packet switching equipment. In addition, there will be several other kinds of charges. Some countries have mileage or kilometrage charges. This presumably refers to the distance between your location and the packet. These may be per use, per seconds or minutes of use, or per month (CARINET Notebook, 1989).

All countries for which I have seen data have one, two or three charges for the time the hook-up is in use. In several countries, these kinds of charges include a cost for the time used in transmitting bytes of information to a satellite or a cable, or receiving information from these sources.

Participation Today

Specialists from four continents are participating in this conference today. Reports are that negotiations are well underway for participation by one or more specialists in a fifth continent. Additional persons in several different countries, including the U.S. and others from which there are participants at present have expressed interest.

Each participant will have direct access to hundreds of other specialists in many dozens of countries. Private messages can be sent to and received from any of these at an 'out-of-pocket' cost much less than cable, and less than telex, Western Union's EasyLink or messages sent by FAX machines. Indirect access is available to thousands of additional specialists, or they can be reached directly at extra cost. With modest additional charges, many additional electronic telecommunications networks are available for use.

Moderator Duties

A moderator is to monitor all of the computer teleconference activities. This person endeavors to see that conference comments (CCs) are kept within reasonable bounds of brevity -- e.g., none are longer than five pages of about 30 cm in length. The comments are to be pertinent to the overall subject. The moderator

tries to be certain the schedule is followed. On the other hand, any participant is expected to make any entry pertinent to that person's needs at any time.

When a subject requires expertise not known to be represented among conference participants, it is up to the Moderator to find and get input from such a specialist.

Is widespread dissemination of postharvest agriculture information sufficiently important to each of us and to the few thousand others involved in activities related to this subject around the world? This is the aim of the teleconference. You will be the judges, independently and collectively. If you are not a participant at present, and you are interested in taking part, contact me at 6006 N. Kansas Ave., Gladstone, MO 64119-2116, telephone (816) 455-3447; via TELEX, 160923 CARINET; via EIES, 2521 SHUYLER; via DIALCOM, GCDO011 SHUYLER or CGI156 CARINET.

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BUILDING A LIBRARY NETWORK
-- SIMPLY, AFFORDABLE --
THE PACIFIC WAY

by

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Introduction

The Pacific Island nations are fortunate, not because of beaches, sunshine, and an unhurried lifestyle, rather, because we are small, work from limited resources, and are isolated. This reminds us constantly of our interdependence. We have no illusions of self-sufficiency. Perhaps this is why an agriculture library network joining 24 nations and territories came almost effortlessly into being last October. Since we did not have to fight attitudes of not needing others, our problems in designing a cooperative venture were to work out the details for our cooperation.

While any libraries deciding to cooperate will create their unique network, the process followed in the Pacific can provide useful insight. The most important feature of the Pacific experience is that the participants created it themselves on a shoestring budget. Virtually all of the network's proposed activities will be done within the cooperator's previously set budgets. Extra funds will be needed only for printing and distributing a few hundred copies of three documents.

Why did the group come together?

Primarily, we wanted to expand our own libraries' resources. We wanted to formalize interlibrary loan agreements. We wanted to know what other libraries really had, down to the last pamphlet and newest monograph.

Secondarily, we wanted to decrease our professional isolation. We wanted to talk with others who have the same problems, but different answers. We wanted to know the people and to know about their libraries, their management problems, and their successes.

Third, we wanted to find a way to remind the official library world that we in the Pacific exist. We want a voice in world-wide standards like LC, UDC and Dewey, AGRIS and CABI. We want our countries' names and authors included in authority lists, so our materials of substance are known, particularly within the developing world.

Another reason was to share the burden of making the most important regional materials available to all of us. Agriculture publications which deal with temperate crops, high technology and farms larger than many of our islands are not often relevant. We need to have access to the excellent articles from Papua

New Guinea's "PNG Agriculture Journal" or "Harvest" or the teaching materials in "South Pacific Agriculture Teacher". But neither CABI nor AGRICOLA, and not even AGRIS index these materials. We need a regional index to our own publications, but none of us have the time to do it.

When we do find a relevant citation in a journal published in a developed country, getting a copy is a nightmare. Interlibrary loan from overseas takes months; and, more importantly, requires not only money but in their currencies - which takes a government act to get in exchange for our all-too-local currencies. Knowing that someone "locally" (if 30 million square kilometers can be deemed "local") held the journal would save in many ways. Thus, a fifth reason was to discuss creation of a regional union list of agricultural serials.

The final reason for coming together was to seek ways to serve our audience of farm advisors, extension personnel and, ultimately, farmers more effectively. A problem unknown in the developed countries plagues our attempts to increase usage. Until a century ago all information was passed orally. Many of the local languages are still primarily oral. Only the Bible and three text books had been printed in Tuvaluan by 1985. Most of the 800 to 800 indigenous languages of Papua New Guinea still have no printed form. The lack of cultural emphasis on printed materials is pushing us, as librarians, into considering other ways to present information, and into assisting those who are developing farmer-level materials.

Who are the network members?

We are like libraries in many developing countries, ranging from small to tiny. The one distinctive feature of many of the participants in the Agricultural Information Network in the Pacific is that we serve the region in our individual mandates.

The South Pacific Commission (SPC) Library is located in Noumea, New Caledonia. It serves SPC staff and, minimally, the governments of the 22 countries which belong to it. Emphasis is on agriculture, human nutrition, health, rural development, demography, environment, fisheries, statistics, rural technology, media, women, and youth.

Materials are catalogued to MARC standards using LC subject headings and the Dewey Decimal Classification. There are 9,000 books, 13,000 reports/pamphlets, 1,000 serial titles and 90 microfilm and 40 drawers of microfiche. CSD/ISIS software creates an online catalog, currently including only 3,300 titles. Another 5,000 records are being converted from an older system. Dialog data bases can be searched thanks to the availability of a packet-switching network which allows an affordable telecommunications link.

The South Pacific Commission Plant Protection Service (SPC PPS) library located in Suva, Fiji, is also a member. Most of that collection is pamphlets and unpublished reports which make traditional control very difficult. Though LCSH and DDC are used, the online catalogue now being developed includes AGROVOC indexing for more detailed retrieval. The data base resides on CDS/ISIS for the moment, but will probably be converted to Pro-Cite. Also under development is a non-bibliographic quarantine data base using text and graphics to identify

pests, and to detail application methods for control. It will use HyperCard software and will be produced on CD-ROM. An IBM-compatible version without the graphics will run on Fox Base software.

The five Land Grant colleges and universities of the American Pacific -- American Samoa, the Commonwealth of the Northern Mariana Islands, Guam, the Freely Associated States of Micronesia, and the University of Hawaii -- cooperate in the 'Agricultural Development in the American Pacific" (ADAP) Project Collection of agricultural information there comes from the University of Guam, where a data base, BADAP, is being created along with an electronic bulletin board, and telefacsimile for document exchange. MacIntosh computers are being used with Pro-Cite for bibliographic data base management, and Oracle software for the non-bibliographic (personnel and crop management) data bases.

The Papua New Guinea University of Technology (Unitech) in Lae supports the broad-ranging research and teaching needs of the university, which has included agriculture only since 1987. Materials are cataloged using LCSH and DDC using a Brodart software program. The catalog is mastered on compact disk and searched from a number of public terminals. Pro-Cite software is being using on MacIntoshes to create a number of non-monographic data bases.

The University of the South Pacific School of Agriculture (USP SAO) is in Alafua, Western Samoa. Its library serves the 150 students and 40 research and teaching staff with a collection of 12,000 monographs and about 350 serials titles. About half of the monographs are on an INMAGIC data base.

CD-ROM access to the AGRICOLA and "Abstracts in Tropical Agriculture" data bases will soon be available. Now data base searches are provided by the Technical Centre for Agricultural and Rural Cooperation (CTA) headquarters in Wageningen, Netherlands, and usually performed by the Royal Tropical Institute (KIT).

Located within the USP Alafua Library is a unit of the USP Institute for Research, Extension, and Training (IRETA), the South Pacific Regional Agricultural Documentation Centre (SPRADC), where a Regional Reference File of ephemeral materials is being developed. SPRADC provides USP SOA Library's services to the 11 nation USP region through the IRETA Agricultural Liaison Officers and their Agricultural Information Network. Begun in October, its collection includes between 800-9000 documents. INMAGIC software is being used for data base creation, but Pro-Cite and Oracle will shortly be available.

What did the group do?

October 17-21, 1988, IRETA, SPC, and CTA brought together twelve representatives from the major Pacific agricultural information centers. It was important that all the participants were the librarians and information specialists who actually provide services and perform cataloging. We had the knowledge to understand the problems. As each of us works in a small library, we also had the authority to make decisions concerning internal operations (as long as there were no significant financial commitments).

During this seminar, participants first introduced themselves and their institutions. Then, we set to work addressing all the problems that brought us

together. Though disagreements on particular topics were sometimes heated, the goal of creating workable solutions to our problems kept the meeting moving. The agenda was divided into discussions on cataloging standards, data base production, data transfer, data base distribution, and services to users. A summary of agreements and actions taken by the group follows:

Cataloging Standards

Anglo-American Cataloging Rules, second edition (AACR2) will be used as the general authority.

Subjects will be indexed with Library of Congress Subject Headings (most recent edition) as the general authority. If additional subject indexing is desired, Agrovoc or AGRIS will be used.

Pacific Island Names by Lee S. Motteler (Honolulu: Bishop Museum, 2nd. edition) will be used as the general authority for geographic place names. The group agrees, in addition, to the following:

1. The political entity will be called the "Hawaiian Islands", with the largest island of the group called "Hawaii".
2. Palau will remain the official name of the political entity until any change is officially recognized by the United Nations.
3. Northern Mariana Islands will be used as the name of the political entity rather than an acronym (CNMI) or the Commonwealth of the Northern Mariana Islands.
4. Use of corporate main entries should be minimized. Title main entries are preferred.

Data Base Production

Eight major regional agricultural journals will be indexed from their beginnings as a cooperative effort of the participating institutions. Each institution will input information in a uniform CDS/ISIS format. The SPC PPS library will coordinate the effort.

Data Transfer

Common formats (field definitions) will be used in bibliographic data bases to enable translation between software programs. Appendix A lists the specific format definitions.

Diacritical marks will be included to the extent the originating system can utilize them. Documentation accompanying any data base exchanges will indicate which marks were used and which substitutions or omissions.

All regional institutions will train staff in CDS/ISIS data base design and maintenance.

Data Base Distribution

Bibliographic data bases will be exchanged in electronic formats between creating institutions. Modification, printing, or any further distribution of their data is at the discretion and expense of the receiving institution.

The common medium of exchange will be 5 1/4" IBM DOS 1.2 megabyte floppy disks initially, with institutions converting to 3 1/2" 1.4 megabyte diskettes as soon as possible.

User Services

A regional data base directory of agricultural personnel will be developed to improve personal networking and information exchange. Each institution will provide input for the directory which will be coordinated by IRETA SPRACD.

Access to materials will continue regionally through standard interlibrary loan practices.

Each institution will provide input for agricultural serial holdings into a data base to be coordinated by IRETA SPRACD.

The variation in the scope of the agreements and actions -- ranging from minute details to major operations -- illustrates the types of discussions that any new network must hold. With the growing access to microcomputers in libraries, every network should be prepared to address issues of data base design. Even if members do not yet have computers, agreements made in advance of the need will make later coordination much simpler. The fact that ADAP, SPC PPS, and SPRACD were all in the initial stages of computerization made it possible to reach as much agreement as we did during our 1-week meeting.

Every one of the above agreements and actions could be made by the attending representatives because their only major impact was on staff time. The various projects all fit within the scope of the participant libraries.

Other items, however, were discussed which created some need for external funding, for actions by groups over which we have no control, or for approval from higher authorities within our various organizations. These we summarized as recommendations, specifically:

Editors of international bibliographic standards like AGRIS, CABI, the Dewey Committee, LC, and UCD should improve coverage of the Pacific region in their bibliographic indexing and classification systems.

The Standing Committee on Agricultural Information Networking in the Pacific (SCAINIP) should be constituted to provide a continuing forum for the cooperative development and improvement of agricultural information services in the region.

Donor organizations should collaborate with SCAINIP on the provision and exchange of agricultural information in the Pacific.

A workshop should be held on improving the presentation of agricultural publications in the regional and IRETA should take the initiative in locating funding for such a workshop.

A funding agency should be approached to print and distribute the "Pacific Index to Agricultural Journals" (PIAJ).

UNESCO should be approached to conduct a CDS/ISIS training course in the Pacific.

SPC should be approached to print and distribute the "Regional Union List of Agricultural Serials" (RULAS), and should be approached to print and distribute the "Regional Directory of Agricultural Personnel".

How Can You Do It Yourself?

Look for an opportunity to get the important members together, away from their work places, and begin talking. Limit the group size to the number that can sit around one table. This will force every member to participate in the decisions, and to "buy in" to the network on a personal basis. Two or three key members may need to get together to plan the bigger meeting as we did in the Pacific. The larger meeting was held five months later after finding money for travel. In developing countries, most of international developing funding agencies support professional development of this type. They are also willing to support activities which increase the value of support they have previously given. CTA, with its specific charge of improving access to scientific and technical information, is particularly willing to assist independent ACP (African-Caribbean-Pacific) nationals.

The Pacific agriculture librarians left the meeting feeling excited, a bit overwhelmed, and a little surprised at having accomplished as much as we did. We created a library network which meets our own need by ourselves: truly appropriate technology. We are anxious to share even with those in the seemingly self-sufficient countries how interdependence can be affordable, professionally rewarding, and exciting. After all, Pacific Island etiquette requires us to share our good fortune.

APPENDIX I
ACRONYMS USED

ACRONYMS USED

ADAP	Agricultural Development in the American Pacific project
AGRIS	FAO's international agricultural index
AGROVOC	The controlled vocabulary used by AGRIS
AIN	Agricultural Information Network, part of IRETA
ALO	Agricultural Liaison Officer, IRETA representative in the ministry/department of agriculture of USP countries
BADAP	Bibliography of Agricultural Development in the American Pacific
CARIS	FAO's Current Agricultural Research Information System
CDS/ISIS	Computerized Documentation System/Integrated Set of Information Systems, UNESCO's data base management software
CTA	Technical Centre for Agricultural and Rural Cooperation
DDC	Dewey Decimal Classification System
FAO	Food and Agriculture Organization of the United Nations
IRETA	Institute for Research, Extension and Training in Agriculture, University of the South Pacific (Alafua, Western Samoa)
LC	Library of Congress classification system
LCSH	Library of Congress Subject Headings
PIAJ	Pacific Index to Agricultural Journals
PNG	Papua New Guinea
Pro-Cite	Bibliographic data base management software by Personal Bibliographic Systems, Inc.
RULAS	Regional Union List of Agricultural Serials
SCAINIP	Standing Committee on Agricultural Information Networks in the Pacific
SPC	South Pacific Commission
SPC/PPS	South Pacific Commission Plant Protection Service
SPRADC	South Pacific REgional Agricultural Documentation Centre
UDC	Universal Decimal Classification System
UniTech	University of Technology, Lae, PNG
USAID	United States Agency for International Development
USDA	United States Department of Agriculture
USP SOA	University of the South Pacific School of Agriculture (Alafua, Western Samoa)

APPENDIX II
COMMON FORMATS FOR BIBLIOGRAPHIC DATA BASES

COMMON FORMATS FOR BIBLIOGRAPHIC DATA BASES

The SCAINIP has agreed that the following four formats define the required minimal elements for agricultural bibliographic data bases. Additional fields may be added as required by the agency developing the data base. Specific variant practices agreed upon by the standing committee are indicated in footnotes.

Monographs

Author
Title
Place of publication¹
Date of publication²
Series
Pagination
Primary indexing³
Secondary indexing⁴
Location
Document level⁵

Analytics (Monographs)

Author⁶
Title⁶
Connector phrase⁷
Statement of responsibility for main work
Title of main work
Place of publication¹
Publisher
Date of publication²
Series
Pagination
Primary indexing³
Secondary indexing⁴

¹ e.g. "[198-?]"

² e.g. "[198-?]"

³ LCSH

⁴ Optional, use Agrovoc

⁵ Where applicable use "T" for Technical, "X" for Extension

⁶ Section

⁷ e.g., "In" or "With"

Location
Document level⁵

Journals

Place of publication¹
Publisher
Date⁶
Holdings
Location
Document level⁵

Analytics (Journals)

Author⁶
Title⁶
Title of main work
Volume and part
Date of publication²
Pagination
Primary indexing³
Secondary indexing⁴
Location
Document level⁵

APEX - AN EFFORT AT COORDINATING FOOD
POST-PRODUCTION INFORMATION FLOW IN ASEAN

by

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(Information Officer, ASEAN Food Handling Bureau)

Introduction

What is 'APEX'? APEX, short for the ASEAN Food Post-Production Information Exchange Project, was set up in 1986 with assistance from the ASEAN-Australian Economic Cooperation Program (AAECP) to meet the need for coordinated collection, dissemination, delivery and exchange of food post-production information in the ASEAN region. It is an integral part of the ASEAN Food Handling Project, and is headquartered at the ASEAN Food Handling Bureau in Kuala Lumpur, Malaysia.

The ASEAN Food Post-Production Information Exchange Project Networking Facility

APEX Headquarters

NLAS
Indonesia

MARDI
Malaysia

UPLB
Philippines

CVC
Singapore

IFRPD
Thailand

Primarily, APEX exists to provide current information according to specific subject preferences and requirements of individual users of the Selective Dissemination of Information (SDI) service. ASEAN as well as non-ASEAN residents may (on a case-by-case basis) register as users of the SDI service.

Subject Coverage of APEX

Information collected under APEX is listed under four broad categories of agricultural commodities -- grains; horticultural crops, livestock, and fisheries -- and under various food products and feeds. Each commodity is classified under the various disciplines of postharvest technology, postharvest losses, postharvest facilities and systems, and food science and technology. The full list of commodities and classifications are given in the "User Registration Form" (Annex I).

Services

Selective Dissemination of Information (SDI) Service. This has, as its basis, the APEX data base of serial articles and documents. It is the principle service offered under APEX. Relevant journals and other publications are regularly scanned and relevant articles extracted, processed and entered into the data base. The articles are collected from ASEAN and non-ASEAN sources.

A profile is developed for each user upon registration with APEX. This is then matched with the entries in the articles data base (to which new articles are added monthly) resulting in each user receiving on a monthly basis a list of articles according to his or her areas of interest and requirements (Annex 2).

Photocopies of the requested articles (up to 5 may normally be requested free at any one time) will be mailed subsequently to the user.

Literature Search

Searches for articles in particular subject areas may be requested and printouts of the titles (sometimes including the abstracts) are made available from the APEX headquarters. Photocopies of the requested articles will then be provided.

Requests are normally for information on postharvest or post-production aspects of the four categories of agricultural commodities and food products covered by APEX.

These requests are made both by subscribers as well as non-subscribers of APEX. From a total of approximately 280 reference inquiries received from non-subscribers for 1988, 45 percent were from Malaysia. This may be explained by the fact that APEX is headquartered in Malaysia. The other ASEAN member countries would account for another 45 percent of the total inquiries, while the remaining 10 percent would originate from other non-ASEAN countries. In most cases, these non-registered users would automatically apply for membership after their inquiries have been answered.

Reference Service

Print and non-print materials are held at the APEX headquarters. These may be available for reference or borrowing.

The APEX headquarters also maintains an index of manufacturers of equipment related to post-production and processing, as well as data on consultants and experts in the areas of food post-production and postharvest technology.

The National Focal Point (NFP) in each ASEAN member country focuses on the collection, organization and dissemination of local materials. Each are constantly kept informed of fugitive materials in other member countries by a mechanism called the "altering service", in which case, if an article on the Philippines is located in a journal in Thailand, then the Thai NFP will send its counterpart in the Philippines a copy of the article.

Training

The APEX training programs are primarily geared toward the upgrading of capabilities and skills of personnel and improvement of services at headquarters as well as at the NFPs. An example is the recently completed "Training Course on Micro/CDC-ISIS", conducted with the cooperation of University Saint Malaysia Library for staff members of the NFPs in August 1988. This was undertaken to familiarize staff members with CDS-ISIS, which has since replaced the dBaseIII+ software used at these focal points.

The APEX structure also allows us to support other ASEAN data bases with training and assistance for the establishment of information systems, such as the forthcoming training program for the ASEAN Plant Quarantine Training Institute (ASEAN Planti).

APEX Structure

Hardware and Software. APEX at its headquarters in the ASEAN Food Handling Bureau (AFHB) in Kuala Lumpur uses the HP-3000 series 37 computer with 1 megabyte memory. Brief specifications are as follows:

1. Hardware: HP-3000 Series 37, Storage (Fixed Disc) 240 megabytes, Memory size (RAM) 2 megabytes,
2. Software: Multi-Programming Executive operating system, MINISIS data base manager, Release G,
3. Network: IBM PC linkage to Maypac networking X.28 as well as linkage to the HP-3000 system. At the regional level, each NFP is equipped with an HP or IBM personal computer with MICRO CDS/ISIS software. Information is exchanged between and among NFPs and headquarters by diskettes (5 1/4") or hard copy printouts.

Organization of the Data base. APEX supports seven data bases, namely:

1. Serial Articles data base (records of scanned and selected articles from approximately 300 journals) This includes fields for document-number, key title, author, source (title of source journal, collation and pages), commodity codes, subclass, and key words. A copy of the "articles input sheet" is attached (Annex 3).
2. Documents data base (including proceedings, reports, especially those generated by the AFHB and its projects). This includes records other than those found in the Serial Articles data base, such as monographs, proceedings, reports, etc. Structured somewhat similarly to the former, it consists of fields for author(s), title, imprint, subject, location and acquisition code and dates. A copy of the "Documents Input Sheet" is given in Annex 4.
3. SDI data base consisting of:
 - (a) the user data base, which contains updated information on users of

- the APEX SDI Service (user name, position, address and type of organization, etc.);
- (b) the profiles data base, which maintains records of users according to their specific commodity requirements combined with disciplines (information gathered from the User Registration Form);
 - (c) articles data base (as in 1.)
 - (d) returns data base, structured to record the articles chosen by users from the returned "APEX Monthly Checklist" (includes year, month, user number, and numbers of articles).
4. Mailing lists for the "ASEAN Food Journal" and "ASEAN Food Handling Newsletter". Fields include those for name, designation, organization, country, status (subscription/exchange/ gratis), beginning- and expiring-dates, and registration number.
 5. ASEAN data base (documents including articles from ASEAN sources or by ASEAN nationals). Based on the APEX CDS-ISIS structure, its fields include document number, location, key title, author(s), language, etc. the "ASEAN APEX Input Sheet" is given as Annex 5.
 6. Equipment data base (food postharvest and processing equipment, especially ASEAN distributors). Details of manufacturers and suppliers of postharvest agricultural equipment are provided, including name, full, address, products, and brand names. Information on local ASEAN representatives is also given if available. The "APEX Equipment Input Sheet" is given as Annex VI.
 7. Consultants data base (consultants who are interested in registering themselves for possible consultancy in food postharvest areas in ASEAN). Details of registered individuals include name, qualifications, nationality, languages, expertise, and experience. The "APEX Consultant Input Sheet" is given as Annex 7.

APEX Membership

APEX services are at the moment provided free. Membership is open to individuals as well as institutions and organization. As of April 1989, APEX headquarters alone has 1186 registered members from ASEAN and non-ASEAN countries, who are on the SDI users list with breakdown by countries as follows:

Australia	34
Brunei	10
Indonesia	42
Malaysia	569
Philippines	327
Singapore	63
Thailand	92
Others	49

Of this total, 49 percent of the users are from government organizations and agencies with 22 percent from academic institutions. This is followed by the private and commercial bodies, accounting for 14 percent of users. Users from international organizations make up 5 percent while the balance include users from financial institutions (4 percent), libraries and information centers (3 percent), consultants (2 percent), and other (1 percent).

Assessments of APEX by its Users

Early in 1988 APEX conducted a survey of its SDI users to ascertain their needs so as to improve the service. The response from 648 ASEAN and 60 non-ASEAN users showed that 60 percent found the SDI checklists sent to individual users each month to be highly relevant, while 38 percent found it moderately relevant. The majority also agreed that the bibliographic information provided in these checklists was sufficient for them to make their selection.

The percentage of relevance of articles in the checklists was found to be at an average of 50 percent for about half of the number of users. Thirty-five percent found them to be more than 50 percent relevant, while 15 percent found the articles to be less than 50 percent relevant.

Fully 90 percent of those who responded to the questionnaire said that the subject and commodity coverage of APEX is comprehensive enough to cater to the needs of people, like themselves, who are involved in postharvest activity in one way or another. In this respect, there were suggestions by a minority that other subjects be included, for example nutrition, biotechnology, post-production policies, and product development. It was suggested that certain commodities be subdivided in more detail (fruits and vegetables were two such categories).

Probably the most significant finding of the survey was that almost three out of every five users indicated their willingness to subscribe to the SDI service for a minimum fee. The suggested sum was US\$30 per year. Some of the respondents even suggested that, on top of the minimum fee, charges should be levied on a per-article-plus-postage basis.

Of those who responded, 43 percent of APEX SDI users rated the service as good while 19 percent rated it excellent.

Conclusion

APEX is constantly looking into possibilities of linking with other related data bases, both off-line and on-line. Internationally, APEX aims to provide a very comprehensive coverage of food post-production information, which, if combined with other components in agriculture, can contribute toward the creation of a very comprehensive and detailed regional network of information data bases on the subject.

APEX has applied for an on-line subscriber status with DIALOG and has established off-line links with other regional data bases such as Southeast Asian Fisheries Development Center (SEAFDEC) and the International Buffalo Information Central Kasetsart University in Bangkok, the International Rice Research Institute

(IRRI), and the Agricultural Information Bank of Asia (AIBA) in the Philippines, APEX is also exploring possibilities of collaborative projects with the Asian Food Marketing Authority (AFMA) and the ASEAN Agricultural Development Planning Center (ADPC), both in Bangkok.

APEX is also considering the possibility of making its various data bases available on CD-ROM (compact disc - read-only memory) in the near future. Constantly updated bibliographies could be disseminated to users since most libraries are equipped with IBM-AT or -XT compatible computers with 640 K memory, and can gain access by installing a US\$550 CD player (the price of which is getting cheaper since manufacturing costs are dropping).

Since its inception in 1986, the APEX project has been faced with various challenges, technically and administratively. This was not unexpected, for an attempt such as this, but with the cooperation from our friends and colleagues in the NFPs, this project has survived its infancy and now is the main food post-production information source for ASEAN.

Information sharing is perhaps still the most practical solution to the ever-present problem of information explosion and control.

APPENDIX I
ASEAN POST-PRODUCTION INFORMATION EXCHANGE
(APEX)
USER REGISTRATION FORM

81

ASEAN POST PRODUCTION INFORMATION EXCHANGE
(APEX)

SELECTIVE DISSEMINATION OF INFORMATION SERVICE
User Registration form

NAME :
POSITION :
ORGANIZATION :
DEPARTMENT :
ADDRESS :
:
:
COUNTRY :
TELEPHONE NO. :
TELEX NO. :

TYPE OF ORGANIZATION (Please tick appropriate box)

- | | |
|--|---|
| <input type="checkbox"/> International/Regional Organization | <input type="checkbox"/> Academic Institution |
| <input type="checkbox"/> Governmental Organization | <input type="checkbox"/> Library Information Centre |
| <input type="checkbox"/> Business/Industrial Enterprise | <input type="checkbox"/> Consultancy |
| <input type="checkbox"/> Bank/Financial Institution | <input type="checkbox"/> Others (Specify)
..... |

Signature: Date:

ASEAN FOOD HANDLING BUREAU
LEVEL 3, BLOCK G14 & G15, DAMANSARA TOWN CENTRE
50490 KUALA LUMPUR, MALAYSIA
TEL: (03) 2544199/2551088
TLX: MA 31555 AFHBKL
FAX: 2552787

PLEASE ANSWER THE FOLLOWING QUESTIONS IN CONSECUTIVE ORDER.

1. Please indicate on Annex A not more than 10 commodities you are interested in.
2. Do you require comprehensive information on the commodities you have just selected?
 - Yes (Please answer and stop at Question No. 3)
 - No (Please answer Question Nos. 4-5)
3. If your answer to Question No. 2 is 'Yes', please indicate whether you are interested in any of the subject categories in Annex B and make your selection in the appropriate boxes.
4. If your answer to Question No. 2 is 'No', please indicate in the appropriate box(es) the specific aspect(s) of the commodity(ies) that you have chosen.

- | | | | |
|-------------------------------|--------------------------|-------------------------------|--------------------------|
| <input type="checkbox"/> B | POST-HARVEST TECHNOLOGY | | |
| <input type="checkbox"/> B001 | GENERAL | | |
| <input type="checkbox"/> B100 | CROPS | | |
| <input type="checkbox"/> B110 | Durables | <input type="checkbox"/> B140 | Perishables |
| <input type="checkbox"/> B111 | Pre-harvest factors | <input type="checkbox"/> B141 | Pre-harvest factors |
| <input type="checkbox"/> B112 | Harvesting | <input type="checkbox"/> B142 | Harvesting |
| <input type="checkbox"/> B113 | In-field handling | <input type="checkbox"/> B143 | In-field handling |
| <input type="checkbox"/> B114 | Cleaning/grading | <input type="checkbox"/> B144 | Cleaning/sorting/grading |
| <input type="checkbox"/> B115 | Drying | <input type="checkbox"/> B145 | Treatment/processing |
| <input type="checkbox"/> B116 | Processing | <input type="checkbox"/> B146 | Cooling |
| <input type="checkbox"/> B117 | Milling | <input type="checkbox"/> B147 | Refrigeration |
| <input type="checkbox"/> B118 | Packing/packaging | <input type="checkbox"/> B148 | Packing/packaging |
| <input type="checkbox"/> B119 | Storage | <input type="checkbox"/> B149 | Storage |
| <input type="checkbox"/> B120 | Transportation | <input type="checkbox"/> B150 | Transportation |
| <input type="checkbox"/> B121 | Quality and standards | <input type="checkbox"/> B151 | Quality and standards |
| <input type="checkbox"/> B122 | Distribution & marketing | <input type="checkbox"/> B152 | Distribution & marketing |
| <input type="checkbox"/> B123 | By-product utilization | <input type="checkbox"/> B153 | By-product utilization |
| | | <input type="checkbox"/> B160 | Other Food Crops |
| | | <input type="checkbox"/> B161 | Pre-harvest factors |
| | | <input type="checkbox"/> B162 | Harvesting |
| | | <input type="checkbox"/> B163 | In-field handling |
| | | <input type="checkbox"/> B164 | Cleaning/sorting/grading |
| | | <input type="checkbox"/> B165 | Drying |
| | | <input type="checkbox"/> B166 | Treatment/processing |
| | | <input type="checkbox"/> B167 | Refrigeration |
| | | <input type="checkbox"/> B168 | Packing/packaging |
| | | <input type="checkbox"/> B169 | Storage |
| | | <input type="checkbox"/> B170 | Transportation |
| | | <input type="checkbox"/> B171 | Quality and standards |
| | | <input type="checkbox"/> B172 | Distribution & marketing |
| | | <input type="checkbox"/> B173 | By-product utilization |

COMMODITIES

(Please tick not more the 10)

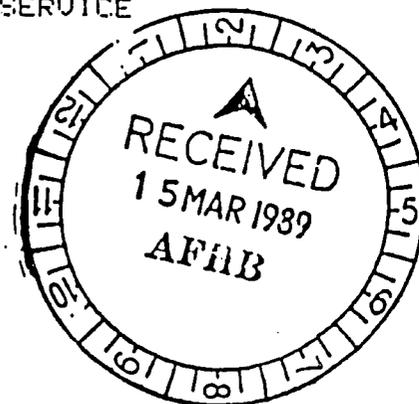
- | | | | |
|--------------------------|----------------------------|--------------------------|------------------------------|
| <input type="checkbox"/> | 0100 CEREAL GRAINS | <input type="checkbox"/> | 0700 LIVESTOCK |
| <input type="checkbox"/> | 0110 Corn | <input type="checkbox"/> | 0710 Cattle |
| <input type="checkbox"/> | 0120 Rice | <input type="checkbox"/> | 0720 Buffalo |
| <input type="checkbox"/> | 0190 Others | <input type="checkbox"/> | 0730 Poultry |
| <input type="checkbox"/> | 0200 PULSES | <input type="checkbox"/> | 0740 Swine |
| <input type="checkbox"/> | 0210 Soybean | <input type="checkbox"/> | 0750 Goat/Sheep |
| <input type="checkbox"/> | 0220 Peanuts | <input type="checkbox"/> | 0790 Others |
| <input type="checkbox"/> | 0230 Mung Bean | <input type="checkbox"/> | 0800 AQUATIC PRODUCTS |
| <input type="checkbox"/> | 0290 Others | <input type="checkbox"/> | 0810 Fish |
| <input type="checkbox"/> | 0300 ROOT CROPS | <input type="checkbox"/> | 0811 Freshwater fish |
| <input type="checkbox"/> | 0310 Cassava | <input type="checkbox"/> | 0812 Marine fish |
| <input type="checkbox"/> | 0320 Potatoes | <input type="checkbox"/> | 0820 Shellfish |
| <input type="checkbox"/> | 0390 Others | <input type="checkbox"/> | 0830 Aquatic plants |
| <input type="checkbox"/> | 0400 HORTICULTURAL CROPS | <input type="checkbox"/> | 0900 FOOD PRODUCTS |
| <input type="checkbox"/> | 0410 Fruits | <input type="checkbox"/> | 0905 Cereal/bakery products |
| <input type="checkbox"/> | 0420 Vegetables | <input type="checkbox"/> | 0910 Sugar & starch products |
| <input type="checkbox"/> | 0490 Others | <input type="checkbox"/> | 0915 Fruit products |
| <input type="checkbox"/> | 0500 INDUSTRIAL FOOD CROPS | <input type="checkbox"/> | 0920 Vegetable products |
| <input type="checkbox"/> | 0510 Oil palm | <input type="checkbox"/> | 0921 Products from pulses |
| <input type="checkbox"/> | 0520 Coconut | <input type="checkbox"/> | 0925 Edible oils and fats |
| <input type="checkbox"/> | 0530 Sugar | <input type="checkbox"/> | 0930 Beverage |
| <input type="checkbox"/> | 0590 Others | <input type="checkbox"/> | 0935 Spices and condiments |
| <input type="checkbox"/> | 0600 BEVERAGE AND SPICES | <input type="checkbox"/> | 0940 Fish & marine products |
| <input type="checkbox"/> | 0610 Cocoa | <input type="checkbox"/> | 0945 Meat and meat products |
| <input type="checkbox"/> | 0620 Coffee | <input type="checkbox"/> | 0950 Dairy and milk |
| <input type="checkbox"/> | 0630 Tea | <input type="checkbox"/> | 0955 Poultry and |
| <input type="checkbox"/> | 0640 Spices | | poultry products |
| <input type="checkbox"/> | 0690 Others | <input type="checkbox"/> | 0960 Others |
| | | <input type="checkbox"/> | 1000 FEEDS |

APPENDIX II

ASEAN FOOD HANDLING BUREAU - TECHNICAL INFORMATION SERVICES
SELECTIVE DISSEMINATION OF INFORMATION SERVICE

ASEAN FOOD HANDLING BUREAU - TECHNICAL INFORMATION SERVICES
LEVEL 3, G14 & G15, DAMANSARA TOWN CENTRE, 50490 KUALA LUMPUR, MALAYSIA
SELECTIVE DISSEMINATION OF INFORMATION SERVICE
THU, FEB 16, 1989

293
Cristina R Huqui
Research Chemist
Chemical & Microbiological Section
Bureau of Fisheries/Aquatic Resources
860 Arcadia Building
Quezon Avenue
Quezon City
Philippines



Recent publication:

Rambutan - fruit development, postharvest
physiology and marketing in Asean;
edited by P.F. Lan and S.Kosiyachinda.
US\$4.00 (Asean) / US\$5.00 (Other countries)

*** KINDLY RETURN CHECKLIST INTACT ***

MONTHLY LIST OF TITLES BASED ON YOUR SUBJECT PROFILE. TO RECEIVE PHOTOCOPIES
MARK (*) YOUR SELECTIONS (NOT MORE THAN 5) AND RETURN THE LIST TO AFHB-TIS
BEFORE 28TH FEB 1989

ARTICLE	TITLE/*SOURCE	ISSUE (PAGE NO)	(PAGE COUNT)
890102	Stock management in food processing *Food Processing	Mar, 1988 (p 45)	(4 pgs)
890121	Rapid detection of aflatoxin-producing strains of the A flavus group *Journal of the Science of Food and Agriculture	v40 n1, 1987 (p 11)	(3 pgs)
* 890136	Emulsifiers - A new generation *Food Manufacture	v63 n2, 1988 (p 65)	(1 pgs)
* 890149	Assessing food texture *Food Processing	Jan, 1988 (p 23)	(3 pgs)
* 890150	Hydrocolloids in the gelling and stabilization of food *Food Processing	Jan, 1988 (p 15)	(3 pgs)
* 890176	Review of analytical techniques used in the quality of control of feeds *Journal of the Science of Food and Agriculture	v40 n1, 1987 (p 32)	(1 pgs)
* 890177	Significance of anti-nutritional factors in feedstuffs *Journal of the Science of Food and Agriculture	v40 n1, 1987 (p 30)	(2 pgs)

APPENDIX III
SDI INPUT SHEET

SDI INPUT SHEET

DOCUMENT NO

KEY TITLE

AUTHOR

SOURCE

Title

Collation

Page

COMM CODE

SUBCLASS

KEYWORDS

PG COUNT

APPENDIX IV
DOCUMENT INPUT SHEET

DOCUMENT INPUT SHEET

FIELD NAME	DATA
AUTHOR	
TITLE	
IMPRINT	PLACE
	PUBLISHER
	YEAR
SUBJECT	
LOCATION	
ACQ CODE	
ACQ DATE	

APPENDIX V

ASEAN POST-PRODUCTION INFORMATION EXCHANGE NETWORK
(APEX)
MICRO CDS/ISIS INPUT SHEET

ASEAN POST PRODUCTION INFORMATION EXCHANGE NETWORK
(A P E X)
MICRO CDS/ISIS INPUT SHEET

DOCUMENT NO .. -----
*Tag 001 ----- TYPE
LOCATION Tag 002
Tag 020 -----

KEY TITLE:
IN ENGLISH . -----
**Tag 200 -----

OTHER TITLE -----
**Tag 201 -----

AUTHOR -----
**Tag 100 -----

LANGUAGE -----
**Tag 600 -----

MONOGRAPH/REPORT/CONFERENCE:

TITLE -----
*Tag 025 -----

IMPRINT -----
**Tag 401 -----

EDITION -----
**Tag 250 -----
PAGE -----
Tag 504 -----

(* Agris CDS/ISIS Format, ** Agris Format)

APPENDIX VI
EQUIPMENT INPUT SHEET

EQUIPMENT INPUT SHEET

ISN _____

Name of Organization: _____

Country: _____

Address: _____

Telephone No: _____

Telex No: _____

FAX No: _____

Contact Person: _____

Regional Rep: _____

Name of Organization: _____

Country: _____

Address: _____

Telex No: _____

FAX No: _____

Contact Person: _____

Products: _____

(for products & _____

brand names) _____

APPENDIX VII
CONSULTANTS INPUT SHEET

APEX

Consultants Input sheet

Name: _____

Date of Birth: _____ (DD) _____ (MM) _____ (YY)

Marital Status: _____

Qualification: _____

Nationality: _____

Language (s): _____

Designation: _____

Department: _____

Organization: _____

Address: _____

Employers: _____

Expertise: _____

Experiences: _____

Date of last update: _____

POSTHARVEST INFORMATION IN THE AGRIASIA AND CARIS-SEA
DATA BASES

by

Josephine Sison
(Project Officer, Agricultural Information Bank for Asia)

Background

In line with one of the objectives of this workshop, which is to discuss the issue of agricultural data bases for postharvest research, this paper describes two such data bases found in the Southeast Asian region, namely AGRIASIA and CARIS/SEA. These two projects are being undertaken by the Agricultural Information Bank for Asia, or AIBA, based in Los Baños, Philippines.

AIBA was established in 1974 in response to the need in the Southeast Asian region for more effective information services in agriculture. Since agriculture is one of the major avenues for development in the region, it receives high priority in national development programs.

As part of an agricultural information network, AIBA is the designated regional coordinating center for two of the Food and Agriculture Organization's (FAO) information services, namely AGRIS (International Information System for the Agricultural Sciences and Technology), and CARIS (Current Agricultural Research Information System).

Initially composed of nine countries (Indonesia, Malaysia, the Philippines, Singapore, Thailand, Bangladesh, Republic of Korea, Sri Lanka, and Hong Kong), it has since 1984 reduced its membership to five Southeast Asian countries (Indonesia, Malaysia, the Philippines, Singapore, and Thailand). This was done for financial reasons, as well as for better manageability of the network.

In each of the member countries there are government-designated AGRIS and CARIS centers which are responsible for the control of their current agricultural literature and research projects. These are regularly sent to AIBA, where they are processed and correspondingly merged with existing information in either of the two regional data bases, i.e., AGRIASIA and CARIS-SEA. The same information is also forwarded by each country to merge with the AGRIS data base processed in Vienna, Austria and to the CARIS coordinating center in Rome, Italy.

As conceived, AIBA has the following objectives:

1. Serve the information needs of Asian countries in the field of agriculture and allied disciplines.
2. Promote new and improved techniques for handling and disseminating agricultural information.

3. Serve as the regional coordinating center in Southeast Asia for the FAO's worldwide projects, AGRIS and CARIS, as well as other agriculture-related information projects.

In late 1986, an international consultation meeting involving countries and funding agencies participating in the network was held in Malaysia, following an evaluation of the AIBA project commissioned by the Canadian International Development Research Center (IDRC). While participants agreed that AIBA serves an important purpose and thus ought to continue, it was felt that a restructuring of the network from a directed to a non-directed configuration was needed. This was because the participating countries had reached such a degree of development that they could interact effectively with each other independently of a coordinating body. At that meeting, the network was renamed AGINFONET-SEA, or Agricultural Information Network for Southeast Asia, with AIBA now being only a network member, but still charged with a coordinating function.

AIBA has evolved into a major agricultural scientific information service in the Southeast Asian region, specializing in the collection, processing, and dissemination of information to all kinds and levels of users.

The AGRIASIA Data Base

When we speak of AGRIASIA, we speak of two things: the quarterly computer-generated regional bibliography, and the resultant data base that evolved from the computer file of document records that accumulated since the inception of the bibliographic journal in 1977. Now in its thirteenth volume, each issue of AGRIASIA is composed of some 2500 entries which represent the contributions of member countries in AGINFONET-SEA for a given quarter. To date, more than 80,000 records have been input by the member countries into the data base.

AGRIASIA is, strictly speaking, a subset of the AGRIS data base, which is now composed of around 1.6 million records. AGRIS is a worldwide information system that collects and distributes information about agricultural literature to its member countries and facilitates exchange of information among them. The foundation of AGRIS is global cooperation -- FAO acts as a coordinating agency within this global information system. In AGRIS, both the creation of input and the utilization of output are decentralized and are the functions of individual participating countries, while FAO provides the required central processing. The information sent in from the participating centers is processed by computer to provide a fast, effective and economical service to its users.

There are, however, "value-added" features in AGRIASIA that distinguish it from AGRINDEX:

1. It contains extension literature of interest in the region which are excluded from the AGRINDEX data base;
2. Abstracts are included in the printed bibliography, unlike AGRINDEX, which keeps them in the data base but does not print them in the monthly bibliography; and

3. It has computer-generated author, subject (KWIC-type), geographical indexes, as well as one on scientific names.

One of the strong points going for AGRIASIA, aside from the fact that it has demonstrated the relative success of a cooperative endeavour of this kind, is the fact that for the first time, a mechanism has been set up for catching Southeast Asian scientific agricultural literature in a systematic and more or less comprehensive manner. Much of this literature is non-conventional and would probably not be covered normally, and thus would be lost to users.

The main value of AGRIASIA is in its use as a current awareness tool. As such, new information gathered by its users would be valuable to them in one or more of the following activities: acquiring ideas for new work; supporting work in progress, being kept aware of developments in their field as well as in related fields, developing competence, and finally, helping them identify sources in the preparation of educational materials.

Of the 80,000 entries in the data base, 12,078 or 15 percent are on postharvest technology. The modified AGRIS/CARIS Categorization Scheme issued by the FAO in 1986 has specific categories on postharvest technology as follows:

- J10 Handling, transport, storage and protection of agricultural products
- J11 Handling, ... of plant products
- J12 Handling, ... of forest products
- J13 Handling, ... of animal products
- J14 Handling, ... of fisheries and aquacultural products
- J15 Handling, ... of non-food or non-feed agricultural products

A detailed description of the scope of these categories is attached to this paper as Appendix II, while examples of typical entries may be found in Appendix III.

It should be noted, though, that citations on other aspects related to postharvest technology, like economics and food processing, would be found under additional categories, so that care must be made in formulating search strategies using the right descriptors to enable one to retrieve needed information from the data base. The AGROVOC Thesaurus would be an invaluable tool for this purpose.

From time to time, AIBA extracts information on relevant subjects from AGRIASIA. Some such products are its Special Bibliography Series, one of which was the "Corn Postharvest Bibliography" produced in 1983, composed of 1,796 entries. More recently, a special bibliography on "Integrated Pest Management" was produced in 1988 with 345 entries. Both of these products were well received by users.

The CARIS-SEA Data Base

In contrast to AGRISIA, which answers questions on "Who has done what, where?", CARIS/SEA answers the question, "Who is doing what, where?" Because it is an inventory of on-going agricultural research in the Southeast Asian region, it is a small file.

Like AGRIS, CARIS is an international cooperative network composed of national, regional, and international centers, with the Coordinating Center located at FAO Headquarters in Rome, Italy. All participating countries take part on a voluntary and equitable basis. Each country is responsible for contributing information on projects being carried out within its boundaries. In return, it has access to all the information contributed by other countries, and takes from the system whatever information it needs. CARIS provides developing countries with a mechanism to exchange among themselves, as well as with developed countries, information on their current agricultural research activities.

The basic unit in CARIS is the set of data on a simple research project. The data required include:

1. Title and objectives of the research project, its starting and terminating dates and duration,
2. Name and address of the institution or station where the research is being carried out,
3. Names and researchers involved and their specialties.

The participating countries may add optional data in accordance with local needs, to be kept confidential if so desired, referring to elements such as budget, source of funding, specialized equipment, program of which the project forms part, post-graduate degree pursued by the researcher, etc.

At present, the CARIS/SEA data base is composed of 7,950 items, of which 1,355 or 17 percent are on postharvest technology. Samples of typical entries are attached as Appendix 4. Since CARIS uses a methodology compatible with AGRIS and applied the same classification scheme and thesaurus, the retrieval of data is done in a similar manner. Printed editions of the CARIS-SEA inventory are issued by AIBA annually.

Coordination of Information Services to Users

After a description of the two data bases at AIBA which may be tapped for postharvest information, it is perhaps appropriate at this point to focus attention on how to coordinate the efforts of different information systems in the Southeast Asian region who are involved in one way or another in the provision of services to postharvest information users.

This issue is significant because in spite of the existence of well-established information services in the region like the ASEAN Food Postproduction Information Exchange Program (APEX), AIBA, and the Regional Library and Documentation Center

of the Asian Institute of Technology (AIT), it seems that users' information needs are not being adequately met.

The situation was such that the FAO/UNDP-sponsored Regional Network on Grain Postharvest Technology (REGNET) actually planned at one time on setting up its own postharvest information system. It was finally decided, however, to utilize existing AGRIS and CARIS centers in the member countries involved to preclude unnecessary duplication of time, resources, and effort.

It was along this vein that the three major information systems in the region, namely AIT, APEX, and AIBA, were asked by the IDRC to sit together in Bangkok last month to brainstorm on how this coordination of efforts could be best achieved. Among the suggestions forwarded is to let APEX take care of providing needed information services to users, since it is the service that specializes in postharvest technology. While this idea is sound, certain technical difficulties would have to be ironed out first before this approach could be successfully implemented. For instance, relevant information from the region could be downloaded for APEX by AIBA from its AGRIASIA data base, inasmuch as APEX and AGINFONET-SEA have the same input centers in the participating countries, APEX would then only have to reformat the information to fit its own data structures. This approach would solve the present problem of having to input the same information twice -- once following the AGRIS input methodology and a second time following the APEX system.

In the interest of postharvest information users, a workable strategy must be evolved soon, one hopefully that would coordinate the strengths of all the information systems involved in the Asian Pacific Region.

REFERENCES

- SAMAHA, E. "AGRIS and CARIS as Sources of Information on Postharvest Technology". Paper presented at the Meeting of National Coordinators of the FAO/UNDP Regional Network for Grain Postharvest Technology, Bangkok, Thailand, 26-28 May 1986. 11 pages.
- SISON, J. "Possible Mechanisms for the Exchange of Information on Postharvest Technology in the Region." Paper presented at the Third National Coordinators' Consultative Meeting of the FAO/UNDP Intercountry Cooperation on Postharvest Technology and Quality Control of Food Grains Project, Bangkok, Thailand, 5-8 October 1987. 10 pages.

APPENDIX I

AGRIS/CARIS CENTERS OF AGINFONET-SEA

AGRIS/CARIS CENTERS OF AGINFONET-SEA

INDONESIA

PRABOWO TJITROPRANOTO
Director
National AGRIS/CARIS Center
National Library for Agricultural Sciences (NLAS)
Jalan Ir. Haji Juanda 20
Bogor, Indonesia
Telephone: 21746

MALAYSIA

SYED SALIM AGHA
Chief Librarian
National AGRIS Center
Library, University Pertanian Malaysia
Serdang, Selangor, Malaysia
Telephone: 03-356101/10
Telex: MA 37454

JARIAH JAIS
Chief Librarian
National CARIS Center
Malaysia Agricultural Research and Development Institute (MARDI)
P.O. Box 12301
General Post Office
50774 Kuala Lumpur
West Malaysia

PHILIPPINES

ANGELINA BAUTISTA
ACD Director
Philippines Council for Agriculture, Forestry and Natural Resources Research
and Development (PCARRD)
Scientific Literature Service
Los Baños, Laguna, Philippines
Telephone: 50014-19
Telegraph: AGRESPHIL, MANILA

LEONOR GREGORIO
Chief Librarian
National AGRIS Center
Library, University of the Philippines at Los Baños (UPLB) College, Laguna 4031
Philippines
Telephone: 2326, 2235

SINGAPORE

PEGGY WAI CHEE HOCHSTADT
Chief Librarian
National University of Singapore (NUS)
Kent Ridge, Singapore 0511
Republic of Singapore
Telex: RS 33943 UNISPO

THAILAND

PIGOONSIN WATANAPONGSE
Director
National AGRIS/CARIS Center
Kasetsart University Main Library
Paholyothin Road
Bangkhen, Bangkok 10900
Telephone: 579-2539

APPENDIX II

AGRIS/CARIS CATEGORIZATION SCHEME ON
POSTHARVEST TECHNOLOGY

133

AGRIS/CARIS CATEGORIZATION SCHEME ON
POSTHARVEST TECHNOLOGY

J POSTHARVEST TECHNOLOGY

J10 Handling, transport, storage and protection of AGRICULTURAL PRODUCTS

Handling, transport ... in general

Methods for storage (excluding storage structures) of agricultural products in general: bulk storage, central storage, cold storage, controlled atmosphere storage, farm storage, off-farm storage, refrigerated storage, seed storage, underground storage, etc.

Farm storage and warehouse management

Assessment of damage and losses to agricultural products in general during harvesting and postharvest phases (handling, storage, transport, etc.), and remedial measures for their prevention and control

Pests and disease organisms injurious to agricultural products in general; their occurrence and control

Damage to agricultural products in general caused by atmospheric factors, fire, equipment and other physical agents; its prevention and control

For: feed processing, use Q52

feed spoilage, use Q53

food processing, use Q02

food spoilage, use Q02

handling and transport equipment, use N20

handling, transport, storage and protection of animal products, use J13

handling, ... of fisheries and aquacultural products, use J14

handling, ... of forest products, use J12

For: handling, ... of non-food or non-feed agricultural products, use J15

harvesting of animal products, use L01

harvesting of aquacultural products, use M12

harvesting of fisheries products, use M11

harvesting of forest products, use K10

harvesting of plant products, use F01

primary processing of non-food or non-feed agricultural products,
use Q60

processing of forest products, use K50

storage structures, use N10

J11 Handling, transport, storage and protection of PLANT PRODUCTS

Handling, transport ... of plant products other than aquatic plant products, forest products, and non-food or non-feed plant products.

Storage methods for plant products other than aquatic ...

Storage methods for processed food and feed of plant origin; effects of storage conditions on food and feed quality; temperature, controlled atmosphere, etc; shelf life

Damage and losses to plant products other than aquatic ... during harvesting and postharvest phases and remedial measures for their prevention and control

Pests and disease organisms injurious to plant products other than aquatic ... and their occurrence and control

Damage to plant products caused by atmospheric factors, fire, equipment and other physical agents; its prevention and control

For: feed processing and preservation, use Q52

feed spoilage, use Q53

food processing and preservation, use Q02

food spoilage, use Q02

For: handling, transport, storage and protection of aquatic plant products, use J14

handling, ... of forest products, use J12

handling, ... of non-food or non-feed agricultural products, use J15

harvesting of plant products, use F01

primary processing of non-food or non-feed plant products, use Q60

processing of forest products, use K50

J12 Handling, transport, storage and protection of FOREST PRODUCTS

Transport of forest products in the forest, to the mill, floating, etc.

On-side storage and other storage methods for forest products

Damage and losses to forest products during harvesting and postharvest phases, and remedial measures for their prevention and control

Wood preservation

Pests and disease organisms injurious to forest products; their occurrence and control

Damage to forest products caused by atmospheric factors, fire, equipment and other physical agents; its prevention and control

For: forest injuries and protection, use K70

logging and other forms of harvesting, use K10

processing of forest products, use K50

J13 Handling, transport, storage and protection of animal products

Handling, transport, ... of animal products other than fisheries products, animal aquacultural products, and non-food or non-feed animal products

Handling and transport of domestic animals

Storage methods for animal product other than fisheries ...

Damage and losses to animal products other than fisheries ... and remedial measures for their prevention and control

Pests and disease organisms injurious to animal products other than ... and their occurrence and control

Damage to animal products caused by atmospheric factors, fire, equipment and other physical agents; its prevention and control

For: feed processing and preservation, use Q52

feed spoilage, use Q53

food processing, use Q02

food spoilage, use Q02

handling, ... of fisheries and aquacultural products, use J14

handling, ... of non-food or non-feed agricultural products, use J15

harvesting of animal products, use L01

milking, use L01

primary processing of non-food or non-feed agricultural products,
use Q60

shearing, use L01

slaughtering, use L01

J14 Handling, transport, storage and protection of fisheries and aquacultural products

Handling, transport, ... of fisheries and aquacultural products other than non-food or non-feed fisheries and aquacultural products

Unloading and other quayside operations

Storage methods for fresh fisheries products and aquacultural products other than non-food ...

Storage methods for processed food and feed from fisheries and aquacultural products; effects of storage conditions on food and feed quality: temperature, controlled atmosphere, etc; shelf life

Damage and losses to fisheries and aquacultural products other than non-food ... and remedial measures for their prevention and control

Pests and disease organisms injurious to fisheries and aquacultural products; their occurrence and control

Damage to fisheries and aquacultural products caused by atmospheric factors, fire, equipment and other physical agents; its prevention and control

For: feed processing and preservation, use Q52

feed spoilage, use Q53

food processing and preservation, use Q02

food spoilage, use Q02

handling, transport ... of non-food or non-feed fisheries and aquacultural products, use J15

harvesting of aquacultural products, use M12

harvesting of fisheries products, use M11

primary processing of non-food or non-feed aquacultural products,
use Q60

J15 Handling, transport, storage and protection of non-food or non-feed agricultural products

Handling, transport ... of non-food or non-feed plant products other than forest products: fibers, tobacco, cotton, etc.

Handling, transport ... of non-food or non-feed animal products: wool, fur, hides, leather, silk, etc.

Storage methods for non-food or non-feed agricultural products other than forest products; effects of storage conditions

Assessment of damage and losses to non-food or non-feed agricultural products of plant and animal origin during harvesting and postharvest phases, and remedial measures for their prevention and control

Pests and disease organisms injurious to non-food or non-feed agricultural products; their occurrence and control

Damage to non-food or non-feed agricultural products other than forest products caused by atmospheric factors, fire, equipment and other physical agents; its prevention and control

For: handling, transport, storage and protection of forest products, use J12

harvesting of forest products, use K10

harvesting of non-food or non-feed animal products, use L01

harvesting of non-food or non-feed aquacultural products, use M12

harvesting of non-food or non-feed fisheries products, use M11

harvesting of non-food or non-feed plant products, use F01

primary processing of non-food or non-feed agricultural products,
use Q60

APPENDIX III

SAMPLE ENTRIES ON POSTHARVEST RESEARCH IN AGRISIA

SAMPLE ENTRIES ON POSTHARVEST RESEARCH IN AGRIASIA

(En, Malay). *Teknologi Makanan* (Malaysia). ISSN 0127-4171. (Oct 1986). v. 5(2) p. 119- 123.

RICE; POSTHARVEST TECHNOLOGY; DRYERS; MALAYSIA

078117 Precooling effects on the quality of selected vegetables during storage. Macee Kitvckin; Asian Inst. of Technology, Bangkok (Thailand). 1985. 71 leaves. Summary (En). * A.I.T. Library, Bangkok (Thailand).

ZEA MAYS; CAPSICUM ANNUUM; ASPARAGUS BEANS; COOLING; REFRIGERATED STORAGE

The precooling methods consisted of conventional room, forced-air cooling and hydrocooling. The conditions of the cold room storage and forced-air precooling were temperature and relative humidity, of about 5 to 5 degree celsius and 85-90 percent, respectively for babycorn and 8-12 degree celsius and 90-95 percent RH for chilli and yard long bean. The packing density and air velocity in forced-air cooling were varied and the cooling rates were compared in terms of half-cooling and 7/8 cooling times based on commercial practices. Hydrocooling proved to be an effective means for rapid cooling and required only 2 to 9 minutes depending on the type of vegetables. However it adversely affected the quality of babycorn and chilli. Browning was observed to occur rapidly on babycorn while the chilli became more susceptible to mold development. Hydrocooling had good effects on the quality of yard long bean indicating more freshness than other precooling methods. Thus forced-air cooling was a preferred method for babycorn and chilli.

078118 Quality changes of palm oil products during shipping period - a case study. (En). Leong, W.L.; Siew, W.L.; Tan, Y.A. 11 tables; 3 refs. Summary (En). Proceedings of the 1987 International Oil Palm/Palm Oil Conferences - Progress and Prospects. Institut Penyelidikan Minyak Kelapa Sawit Malaysia, Bangi, Selangor (Malaysia). The 1987 International Oil Palm/Palm Oil Conferences - Progress and Prospects. Kuala Lumpur (Malaysia). 29 Jun - 1 Jul 1988. 1988. p. 227-234. *PORIM Library.

PALM OILS; OIL PRODUCTS; MALAYSIA; KOREA REPUBLIC

078119 Quality preservation during handling storage and transportation. (En). Elias bin Awang; Zainul Sham. 7 ill., 3 tables; 8 ref., Summary (En). Proceedings of the 1987 International Oil Palm/Palm Oil Conferences - Progress and Prospects. Institut Penyelidikan Minyak Kelapa Sawit Malaysia, Bangi, Selangor (Malaysia). The 1987 International Oil Palm/Palm Oil Conferences - Progress and Prospects. Kuala Lumpur (Malaysia). 29 Jun - 1 Jul 1988. 1988. p. 235-241. *PORIM Library.

PALM OILS; OLEINS; FREE FATTY ACIDS; USA

078120 [Research and development on postharvest handling of fruits and vegetables for export [in Malaysia]]. (Malay). Abd Shukor, A.R.; Abdullah, H.; Lam, P.F.; Mohd Salleh, P. (MARDI, Serdang, Selangor (Malaysia). Bahagian Teknologi Makanan). Summaries (En, Malay). *Teknologi*

Makanan (Malaysia). ISSN 0127- 4171. (Oct 1986). v. 5(2) p. 111-117.

TROPICAL FRUITS; VEGETABLES; POSTHARVEST TECHNOLOGY; MALAYSIA

078121 Respiration rates and ethylene production of ripening *Harumanis* mangoes [*Mangifera indica*] after different chilling storage periods. (En). Lam, P.F. (MARDI, Serdang, Selangor (Malaysia). Food Technology Div.). 6 ref. Summaries (En, Malay). MARDI Research Bulletin (Malaysia). ISSN 0126-5709. (Apr 1987). v. 15(1) p. 15-19. *UPM Library (btb S17.M35).

MANGIFERA INDICA; STORAGE; COOLING; DEGRADATION

078122 Seed grain pest control cum storage system for small- scale farmers: the case of the "kurob" [storage facility] model [Philippines]. De Pedro, R.C. Jr.; Villasin, J.M.; Visayas State Coll. of Agriculture, Baybay, Leyte (Philippines). 18. Anniversary and Annual Convention of the Pest Control Council of the Philippines. Davao City (Philippines). 5-8 May 1987. 1987. 1 p. Summary only. *Philippines Univ., Los Baños-National Crop Protection Center Library (Philippines).

GRAIN CROPS; LEUCAENA LEUCOCEPHALA; PEST MITES; PEST CONTROL; STORAGE STRUCTURES; FARMING SYSTEMS; CROP LOSSES; FUMIGATION; SEED LONGEVITY; DRYING; PHILIPPINES

An improved system of controlling insect and vertebrate pests in stored seed grains had been developed by local farmers and researchers using the farming system approach. The system approach consisted of a modified traditional storage facility (kurob) with a firing pit underneath the floor, and bamboo chimneys that convey smoke from burned *Leucaena* into the storage structure. The combined fumigation and concomitant drying reduced seed grain losses due to insect pests to more than half and extended seed viability and storability for 6 months. Rat guards fitted in elevated posts eliminated rat infestation.

078123 Storage and transport of fresh fruit and vegetables in New Zealand. Prasit Ativeerakul; Prince of Songkla Univ., Songkhla (Thailand). Faculty of Natural Resources. Dept. of Agro- Industry. 1983. 29 p. * acronym.

FRUIT CROPS; VEGETABLE CROPS; HARVESTING; STORAGE; NEW ZEALAND

J12 - Handling, transport, storage and protection of forest products

See also 078157, 078159

078124 An evaluation of the bond quality of *Gmelina arborea* plywood fabricated at different veneer peeling temperatures. (En). Badejo, S.O.O (Forestry Research Inst.

APPENDIX IV

SAMPLE ENTRIES ON POSTHARVEST RESEARCH IN CARIS-SEA

135

Jangkaru, Z.(Leader)
Kaunang, F.

/AQUACULTURE/
/AQUACULTURE/

STARTING DATE: Sep 1982; DURATION: 09 months

Balai Penelitian Perikanan Air Tawar
CODE: 051203

STARTING DATE: Apr 1984; DURATION: 12 months

M40 - AQUATIC ECOLOGY

See also ID05374 ID05460

ID05483 Biology and ecology of oysters (*Crassostrea* sp.) at the Seribu archipelago (Pari island, Indonesia)

OBJECTIVES: To study the development of oyster population at Pari island waters; to investigate the environmental factors influencing oyster development as a base for its culture

/OYSTERS/ /BIOLOGY/ /ECOLOGY/ /POPULATION/ /ENVIRONMENTAL
CONDITIONS/ /INDONESIA/

Hitam, M.S.(Leader)

/FISHERY BIOLOGY/

Institut Pertanian Bogor. Lembaga Penelitian
Jl. Raya pajajaran, Bogor (Indonesia)

CODE: 130100

STARTING DATE: Jul 1984; DURATION: 06 months

N10 - AGRICULTURAL STUCTURES

See also ID04890

ID05484 Effect of open and closed stalls on the growth performance of "kacang" goats in Ujung Pandang (Sulawesi, Indonesia)

OBJECTIVES: To derive information on the housing requirements of goats

/GOATS/ /HOUSING/ /CAGES/ /GROWTH/ /SULAWESI/

Ismartoyo(Leader)

/ANIMAL PRODUCTION/

Jiwa, L.

Banoong, S.

Rahardja, D.P.

Hasan, S.

Universitas Hasanuddin. Fakultas Peternakan

Jl. Mesjid Raya 55. Ujung Pandang-Sulawesi Selatan (Indonesia)

CODE: 130900

N20 - AGRICULTURAL MACHINERY AND EQUIPMENT

See also ID04939 ID05436 ID05529 ID05541 ID05546

ID05485 Design of a deep placement applicator

OBJECTIVES: To create and test the usefulness of a deep placement applicator

/FERTILIZER DISTRIBUTORS/ /DEEP PLACEMENT/

Ananto, E.E.(Leader)

/AGRONOMY/

Haryono

/AGRONOMY/

Ridwan, A.D.

/AGRONOMY/

Balai Penelitian Tanaman Pangan Sukamandi

Jl. Raya Sukamandi, P.O. Box 11, Cikampek (Indonesia)

CODE: 050806

STARTING DATE: 1986; DURATION: 12 months

ID05486 Designing and producing grain dryer prototype using solar energy

OBJECTIVES: To develop dryer prototype using solar energy for improving the paddy quality and drying time with floor drying methods

/RICE/ /DRYING/ /SOLAR ACTIVITY/ /DRYERS/

Damardjati, D.S.(Leader)

/TECHNOLOGY/

Haryono

/TECHNOLOGY/

Astanto

/TECHNOLOGY/

Balai Penelitian Tanaman Pangan Sukamandi

CODE: 050806

STARTING DATE: 1985; DURATION: 12 months

ID05487 Designing weeder equipment and their prototype for rice fields

OBJECTIVES: To develop weeder prototype with an operation cost of 15% cheaper than manual weeding

/RICE/ /PEST CONTROL EQUIPMENT/ /WEEDS/

Damardjati, D.S(Leader)

/TECHNOLOGY/

Haryono

/TECHNOLOGY/

Ridwan

/TECHNOLOGY/

Balai Penelitian Tanaman Pangan Sukamandi

CODE: 050806

SECTION III
SUMMARY SESSION

TRANSCRIPT OF THE SUMMARY SESSION

The following is an edited transcript of the final session of the GASGA Workshop on Postharvest Information Management, Wednesday April 19, 1989. Comments by participants are frequently paraphrased to make up for technical difficulties in the transcription.

The session was introduced by Donna Schenck-Hamlin. Panelists were asked to describe the composition of their respective discussion groups by geography and type of interest in postharvest problems, followed by a summary of their round-table discussions of the previous 2 days.

Rolando Flores' Presentation

Our group had two members from Venezuela who work with the FOLAR group, which is a private company that deals with grain handling, management, and processing and storage. The other two members included a member from Nicaragua who works with a group that is part of the government and has been working in postharvest especially in the area of developing identification of postharvest losses and their control. The fourth member in the group represents Zamorano, an academic institution of Honduras. The group first tried to see in what area every one of the participants was working and to see the constraints that they are having in their work.

It is interesting to notice here that we have a group related to the private industry in the case of Venezuela and in the case of the academic institution at Zamorano, but the others represent governmental institutions. They have different conditions. Those in the private sector are oriented more toward the application of information to their company problems. Those in Nicaragua and Honduras are oriented toward the use and application of specific knowledge and the storage of this in a library. The major constraints, however, for all of them are the political and economic conditions which limit funds--local and foreign. An example of this was the case of 35 extension documents which have been developed using EC funds in Nicaragua but which cannot be printed.

It is also difficult to apply sophisticated knowledge and technology -- especially when there is not sufficient understanding of equipment (how to use it and how to keep it functioning). The big need is in terms of where to find information, where to locate it, with whom to talk, how to find where the information is available. Everyone knew about PHDS, but the major channels they have been using for information are personal contacts. Therefore, the participant list to this workshop will be a very valuable list. In Venezuela they have specific needs for profit-making and must solve specific problems like examination of storage loss and finding help in analysis of stored grain losses in weight, dry matter, etc. In Nicaragua the problem is to have ways to follow up on the implementation of methods for reducing losses--ways to evaluate the quantity of grain now available after implementing the various new methods. These problems are familiar throughout Latin America.

Solutions to the grain loss assessment problem are being addressed by research at KSU. The suggestions for addressing the follow-up evaluation problem were minimal because they decided that their local conditions prevented much comparison with methods used elsewhere.

The immediate need that was discussed was the need for more information about who is working on what. All participants were interested to learn for first time about ALAGRAN, which was formed in 1982, and about the 1988 network of institutions in grain.

John Wright's Presentation

Our group was representing the UK, the US, and the Philippines. It was difficult to identify the essential problems of postharvest access. What I have to say is following the problems which were identified by Rolando Flores. In spite of having inadequate information, we identified the needs of a network. These are not in any specific order:

We need a method to get information to and from developing countries. It must be inexpensive. Technology must be appropriate: it should work without a standard supply of electricity, work in any climate, etc.

There is always a need for funding to develop anything from existing systems as well as to develop a new system.

There will be a need for coordination of systems, document delivery, etc.

The system needs to be simple, and easily understood, not complicated.

It needs to capture all the postharvest literature, or as much as possible.

There is a need for standardization, which is a very big problem, especially when looking at indexing systems.

There is a need for flexibility in the packaging of the information. Different users have different needs: a farmer who cannot read English will need a pictorial/diagrammatic form which is understandable.

There is a need for portable technology for information processing. One example: in southern Africa there was a jeep filled with high-tech equipment which was taken to the data, where the data was processed, and the vehicle moved on.

There is a need for the end-user to know where to go for the information. This is absolutely paramount.

There is a need to know who has what information and how it can be accessed.

There is a need to use existing systems and build from them. No point in spending money to build a system which will duplicate what already exists.

There is a need for information, and not just bibliographic information. The end-user requires hard information to answer his specific problems.

There is a need to capture as much of the grey literature as possible.

There is a possible need to solve copyright problems in the transfer of published information.

We have asked the questions and didn't find many solutions. The following suggested solutions are just first steps.

1. To base a solution on existing solutions, for instance AGRIS, makes sense based on the SE Asian experience.
2. Users need to be consulted as to the requirements of the system in some way or another, particularly in the form/packaging of the information.
3. Resources and sources should be identified: systems, libraries, people. The first step to do this is to produce a form of a directory database of sources and resources which has a relatively simple updating facility and this should be distributed as widely as possible. That is something GASGA could and should take on.
4. GASGA should provide a referral center in one recognized information center and we have one ready-made in FFGI.
5. All technology should be appropriate. Technology is a tool, not an end in itself.

Final comments: Any network or system must be sustainable in the long term. Priorities remain to be defined. They must be defined locally. The priority will almost certainly be provision of hard copies and safe housing for the same.

Paulette Foss' Presentation

Our group was an Asian-Pacific group with Americans. There was strong interest and definite plans to have a regional network.

The major problem was in the information packaging. Researchers, policy-makers, extension personnel, and beneficiaries all need different forms of information.

The researchers are currently interested in the problem of mycotoxins and related problems. There is a system for supplying this type of information, varying in degrees of functionality, which is already in place.

Translation of information into the specific forms needed by non-researchers is needed.

The group did feel very strongly that there should be strong specific recommendations coming from the group as a whole concerning developing of a functional network linking postharvest interests. To this end the group wrote the following recommendations and would like to have the group's concurrence on them.

(See "Statement of Consensus", appended below, for an outline of the recommendations discussed.)

Open Forum Discussion

Tom Graham: The problem of awareness is two-fold. On one level it is a public relations problem. People need awareness of what each group is doing. A directory would help. There is, however, more work on the extension level -- someone who can sell what the information system has. One example is of the training materials being developed by a PR person in Kenya. This is the end-user awareness level.

The other side of awareness is for those with basic awareness to acquire detailed information about where the specifics are available. This is the postharvest information workers' awareness which can be developed among ourselves. The idea was originally expressed by Pamela Fernandez.

Zenaida Toquero: What will be done about groups not part of GASGA and do the recommendations apply only to information centers who acquire and disseminate information?

Paulette Foss: As a non-GASGA member, we in the South Pacific envision joining the network. We did not see any limitation on either areas of interest nor types of postharvest workers. Rather we see diversity as an asset to membership.

George Pilz: There are no groups already in existence in Latin America and Africa, how can the network develop for nothing unless it is done from the top down?

Luis Pinel: The fact that there are Latin American networks which are unknown to our Latin American participants is a significant comment on the state of affairs.

Harlan Shuyler: GASGA historically has limited itself to grains, but each of the donors individually are capable of entering areas wider than grain, if they choose.

Luis Pinel: I hope that there would be a system of getting regional ideas together with the end of sharing the materials that already exist in places like Zamorano.

Rolando Flores: It was unfortunate that a variety of other representatives from already extant groups could not come. It would be perhaps helpful if these could get together.

This is desired because of the opportunity to have answers in the time required, which for the private sector is often very quickly needed. Closer links would be faster and also it is very difficult to get funds to travel outside the region.

Tom Graham: If you, Luis, knew a resource existed -- through the directory we are proposing for GASGA, for instance -- how would you get access to it? How before this meeting did you find out if a resource existed?

Luis Pinel: A Swedish group has been helping in my country, I would have asked them.

Tom Graham: You are saying the best way to find information is to locate it through contractors working in your country?

Luis Pinel: Through the government.

Harlan Shuyler: Could that kind of contact be made from the Washington, DC embassy back to the home office in Honduras?

Luis Pinel: It could be but most contact is made directly from person to person.

Sarath Ilangantilike: A meeting is planned in October which might serve as the forum for the postharvest network's inception.

Donna Schenck-Hamlin: All 90 individuals who showed some initial interest in coming to this meeting will receive our proceedings. Any further regional meetings' proceedings should also be distributed to today's participants as well.

Antonio Frio: We are already trying to have a grain postharvest group that is workable and practical. This is joining centers which are not strictly postharvest grains, but the group getting together will focus on just part of their activities.

Tom Graham: Are there other special interest groups which are dealing with the same kinds of problems who might be further along in developing a network? One whose experiences might be tapped? How could we identify those other groups?

Josephine Sison: Couldn't PHDS act as a central organization to keep the five regional groups informed?

Donna Schenck-Hamlin: Newsletters are often used as tools for keeping everyone informed - if the information were on line, it could be picked up as needed by whoever need them. Newsletters which PHDS and PIPIC receive could be indexed and input to those databases and used to keep a wide range of people updated.

Tom Graham: Would this be a GASGA function or something delegated to someone like PHDS?

Donna Schenck-Hamlin: GASGA does annually inventory the worldwide postharvest activities but it isn't very effective at distributing that information.

Harlan Shuyler: Historically GASGA has always distributed responsibility. One group has always volunteered for an activity and then been assigned to do it.

Donna Schenck-Hamlin: Since all GASGA members will receive this proceedings, they will be looking at it to see what is said, what particular projects individual GASGA members can take on.

Pamela Fernandez: What will happen now after the workshop? We want to see much of what was discussed implemented. Could we have a directory beginning with those here, other institutions we know about, consultants and postharvest workers in all areas - operational and geographical? It would be of much help.

Donna Schenck-Hamlin: That's a point well taken.

Tom Graham: Does that mean you'll do it?

Donna Schenck-Hamlin: PHDS has already produced one directory of Latin American postharvest projects. If this kind of directory information is important, seems to be so fundamental, PHDS would be willing to collect that information starting with the participants here.

John Wright: The questionnaires which you just collected if analyzed could provide the basis of a directory.

Donna Schenck-Hamlin: This information was to be compiled and appended to the conferences' proceedings.

Harlan Shuyler: For your information the 9th Latin American Congress of Zoology, group on vertebrate pest management, at the Denver Wildlife Research Center is already beginning to function as another participant for the directory.

Sarath Ilangantilike: If we are to implement the recommendations, what about future meetings? How do we act now -- as individuals, as a group? When? We should go as one group from this meeting -- it would be very strong. This would be better to go out as one than to just go out as a regional group as Asia-Pacific wants to do. We need something now from which to have an October meeting.

Donna Schenck-Hamlin: Do you want to use the workshop proceedings to convince of the need for further meetings?

Sarath Ilangantilike: They would come out too late for an October meeting. We need to contact donors now. Who should we contact, how are we going to go to donors? Who do we ask?

Donna Schenck-Hamlin: Whoever coordinates your regional meeting should try IDRC and any other organizations with whom you have a successful record of interaction.

Tom Graham: We need a concrete statement of consensus. We can take this to donors. If all of us can take the same story, the same words in the same way, so they don't get different stories, it will reinforce the same theme in the heads of the donors from all directions.

Donna Schenck-Hamlin: One group did create a good starting list of recommendations. We need to see if the other groups would like to accept this document or append to this document as a statement of consensus. That could take some time. We have the rest of this afternoon, but the tour begins at 2:30. It is a valid starting point that Paulette's group submitted. I can circulate this before I put out the proceedings. If you would like a consensus, we can do what is needed.

Harlan Shuyler: Everyone has faith that you can take the three groups statements and make them into a single statement using your own judgment to state priorities.

Pamela Fernandez: Will this be an executive summary/position paper?

Lindsay Semple: Right, and you're the executive.

Donna Schenck-Hamlin: What kind of a time frame are we talking about for getting the statement out?

John Wright: Before the banquet tonight?

Donna Schenck-Hamlin: I think we can easily come up with a statement of consensus. We can try by tonight. Otherwise we can fax or airmail it.

SECTION IV
STATEMENT OF CONSENSUS

STATEMENT OF CONSENSUS
April 19, 1989

The presentations of this workshop identified deficiencies that result in information gaps within the existing postharvest information systems (see below). These information gaps and problems of dissemination could be overcome by improving existing information activities within different regions in the world. The workshop participants therefore make the following recommendations:

1. Existing regional information systems should be strengthened to overcome problems of information gathering and dissemination. They should organize themselves into regional networks for postharvest information for the following areas:

Asia/Pacific
Africa
Latin America
Near and Middle East
Europe and North America
2. Each regional group should be linked with the others in order to facilitate global exchange of postharvest information.
3. The individual regional groups should meet at the earliest possible date. The purpose of these meetings would be to discuss specific regional issues and prepare a work program to identify linking mechanisms within each regional group.
4. Subsequently, all regional groups should be represented in an international meeting to identify linking mechanisms across regional groups.
5. An international directory identifying centers of postharvest specialization should be compiled within the year by the Postharvest Documentation Service and updated by the regional groups on a regular basis.
6. In order to implement recommendations (1) to (4) donor organizations should be approached for funding.

Deficiencies in Postharvest Information Access Identified by Working Groups of the GASGA Workshop on Postharvest Information Management

1. Lack of adequate local collections for postharvest work in:

Research
Education and training
Extension
Technical assistance
Public administration
Private sector postharvest processes

2. Lack of awareness of existing regional and international postharvest information resources,
3. Lack of coordination among existing centers of postharvest specialization resulting in unnecessary duplication of effort,
4. Slow speed of information delivery,
5. Lack of current directory information in the postharvest field.

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