

INTER-AMERICAN INSTITUTE OF AGRICULTURAL SCIENCES
Office in the Dominican Republic



INVENTORY OF INSTITUTIONS IN THE CARIBBEAN AND CENTRAL AMERICA
WITH ACTIVITIES IN POSTHARVEST LOSS REDUCTION

Jerry La Gra.



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P R E F A C E

There are many institutions in and around the Caribbean region carrying out valuable work in the identification and reduction of post-harvest food losses. Unfortunately their activities are not well disseminated due to language barriers and the lack of established channels for exchanging experiences and information. The purpose of this document is to improve upon this situation by identifying the diverse institutions, and their key personnel, and outlining their activities in postharvest food loss reduction. It is hoped that through this instrument greater efforts will be made to take advantage of existing regional knowledge and expertise and thus facilitate problem identification and problem solution in a practical and economical manner.

The financing for the research and publication of this material was derived in-part from a donation received from the Commonwealth Secretariat, London, an institution which has shown considerable interest in the identification and reduction of post-harvest food losses in the Caribbean, and the world in general.

established specific units or divisions to look at some aspect of the post-harvest loss problem however, of these, none had established what could be classified as loss reduction programs. It is significant to point out that of the 10 food marketing institutions only 4 have activities in postharvest loss identification and reduction.

Concerning the type of agricultural products handled 7 institutions work only with perishables. Of these 6 are in the Caribbean and 1 in Central America. Four others work only with grains and all of these are found in Central America. Two in the Caribbean work exclusively with industrialized products. Seven institutions work with both perishables and with grains and one works predominantly with perishables and industrialized products.

In reference to the number of employees there exist big differences between institutions, varying from as few as 17 persons in CIGRAS to 2400 in CNP. As would be expected the institutions of the larger countries tend to employ more people than their counterpart institutions in the smaller countries. The type of organization employing the most people are the marketing institutions, however within this type of institution the percentage of professional staff is lower due to the day to day operational nature of the work. The other types of institutions tend to be more scientific, dedicating a larger part of their time to research and investigation. It is interesting to note the relatively small number of marketing professionals employed in the marketing institutions. In the non-marketing institutions the non-existence of marketing people is not relevant.

In the case of postharvest specialists a total of 78 have been identified within the 21 institutions. It is important to stress that these cover a wide variety of fields including: chemistry, food technology, planning, entomology, rodent control, plant pathology, seed technology, grain conservation and handling, cold storage management, fresh fruit handling, food processing, dehydration, microbiology, nutrition, food contamination, postharvest loss identification and reduction, grades and standards, pesticide residual research in perishables and others. The names, addresses and field of expertise of these diverse postharvest specialists are included in the following pages in accordance with the institution which they serve.

Although the absolute number (78) of "postharvest specialists" is significant, yielding an average of 3.7 for the 21 institutions studied, it is important to point out that 4 institutions have no postharvest expertise, 6 have only 1 or 2 specialists and all but one of the institutions having 3 or more postharvest persons are specialized or regional organizations working with specific crops or in very specific areas of the postharvest system.

Of the 21 institutions studied the only ones that have organized and planned activities in postharvest loss reduction are INESPRES in the Dominican Republic, CITA and CIGRAS in Costa Rica, ICAITI in Guatemala and CIAT in Colombia.

III. INSTITUTIONAL DATA BY COUNTRY

The remainder of this report presents the data collected on the 21 institutions on a country basis, and in alphabetical order, beginning with the 6 countries of the Caribbean, followed by the four countries of Central America, then Panamá, Colombia and some notes on Honduras.

BARBADOS

1. Name of Institution

Barbados Marketing Corporation - BMC

2. Address

Princess Alice Highway
P.O. Box 703C
Bridgetown, Barbados

3. Telephone

75250

4. Date of Foundation

1965

5. Nature of the Institution

The BMC is a statutory body with the aim of developing commercial activities related to the handling, processing and marketing of agricultural products (excluding sugar) in the interests of local producers. It is the intention that these activities should be of special benefit of the smaller producers and that the marketing of produce by BMC should be carried out so as to keep in check price rises in the retail sector.

6. Objectives

The objectives of the BMC are the following:

- To stimulate, facilitate and improve the production, marketing and processing of produce in the island, particularly for the benefit of producers.
- To secure the most favourable arrangements for the purchase, handling, transportation, storage, importation, shipping, marketing and sale of produce whether in the island or out of the island, and in particular to assist agriculturist and fishing cooperative societies to dispose of their produce to the best advantage, and
- To make recommendations on any matter directly or indirectly related to the production and marketing of produce, upon being required to do so by the Governor-in-Executive Committee.

7. Institution or Organization upon which Dependent

Ministry of Agriculture, Food and Consumer Affairs.

8. Number of Employees

Total number : Approximately 125

Number of technicians and professionals : 20

Number of professional working in agricultural marketing : 5

Number of professionals working in Post-harvest loss reduction : 2

9. Areas of Expertise of those Technicians working in Post-harvest Loss Reduction

BMC is lacking personnel in the specific area of post-harvest loss reduction but has some expertise in food technology for the development of processed products as well as in the management and operation of cold store facilities.

10. Name of the Technical Unit (s) working in Post-harvest Activities

None

11. Principal Agricultural Products handled by the Institution

The BMC operates a system of contracts with producers. Prices are based on current market prices except in times of glut when a guaranteed minimum price is paid. The principal crops handled are: bananas, beets, cabbage, carrots, cucumbers, onions, potatoes (Sweet), tomatoes, yams.

12. Summary of Principal Functions carried out in the Area of Post-harvest Loss Reduction

The BMC no longer provides a pick-up service for producers who normally deliver their produce to the main facility in Bridgetown.

In case of onions, storage and drying facilities are operated by the Corporation which has the responsibility of marketing the entire crop. Despite these facilities, post-harvest losses for onions have been quite high due to the combined effect of varieties which do not keep well, inadequate drying in field and poor operation of drying facility.

13. Infrastructure, Equipment and Work Facilities

The BMC has warehouse and cold storage facilities at its central location in Bridgetown. These include chill storage units with a capacity of 330 cubic meters of chill space to handle vegetables. There is a reception area which has limited space and inadequate facilities for proper selection and handling of produce brought by farmers.

New facilities on the outskirts of Bridgetown are planned but the date when they will be operative is uncertain.

14. List of Recent Publications related to Post-harvest Loss Reduction

None

15. Source of Financial Support

BMC is financed by its own operations and government subsidies

16. Coordination and Agreements with other Institutions

None

17. Post-harvest Specialists

Name : Mr. J. Lucas
Address : Barbados Marketing Corporation
Princess Alice Highway
St. Michael
Languages : English
Field of expertise : Food Technology
Products handled : Processed fruits and vegetables

1. Name of Institution

Barbados National Standards Institution - BNSI .

2. Address

Barbados National Standards Institution
Culloden Road
St. Michael, Barbados, W.I.

3. Telephone

63866/73

4. Date of Foundation

1973

5. Nature of the Institution

The Barbados National Standards Institution(BNSI) is a joint undertaking of the Government of Barbados, Industry, Commerce, Consumers, and all those interested in the planned and organised industrial development of the nation.

6. Objectives

- Evolve standards suitable to the country and its needs.
- Help improve the quality of production in the country.
- Assure the importation of good quality raw materials.
- Help coordinate standards among CARIFTA countries.
- Establish a quality control laboratory and then organise a Certification Marking Scheme of the Institution.
- Assist the process changeover to the Metric System of measurement.

7. Institution or Organization upon which Dependent

The BNSI is an autonomous organization established under the "Companies Act." It is jointly sponsored by the Government of Barbados and members from the industrial/commerce sector.

8. Number of Employees

Total number : Approximately 26

Number of technicians and professionals : 10

Number of professionals working in agricultural marketing : 0

Number of professionals working in post-harvest loss reduction : 0

9. Areas of Expertise of those Technicians working in Post-harvest Loss Reduction

None

10. Name of the Technical Unit(s) working in Post-harvest Activities

None

11. Principal Agricultural Products handled by the Institution

Standards are established mainly for industrialized products. Onions is the only fresh product for which standards have been established.

12. Summary of Principal Functions carried out in the Area of Post-harvest Loss Reduction

The BNSI does not work in post-harvest loss reduction. It is mentioned here because it has established a set of standards for grading onions and many agro-industrial products including the following: honey, canned pineapple, cured ham, sausages, smoked bacon, wieners and others. It has also established a code of practice for hygienic conditions for fruit and vegetable canning units; methods of sampling and analysis of processed fruits and vegetables, ante-mortem and post-mortem inspection of slaughtered animals, etc.

13. Infrastructure, Equipment and Work Facilities

Facilities include office space, chemistry and food laboratory, textile laboratory, engineering laboratory and metrication laboratory.

14. List of Recent Publications related to Post-harvest Loss Reduction

None

15. Source of Financial Support

Government of Barbados and members of BNSI from the private sector

16. Coordination and Agreements with other Institutions

Considerable assistance has been received from the United Nations in terms of training, technical assistance and equipment.

17. Specialists

Name : Mrs. Emeline E. Taitt
Title : Head, Specifications and Implementation Division
Address : BNSI Flodden
Culloden Road
St. Michael, Barbados, W.I.

Name : Dr. José L. Tudor
Title : Head, Laboratory Section
Address : BNSI Flodden
Culloden Road
St. Michael, Barbados, W.I.

DOMINICAN REPUBLIC

1. Name of Institution

Instituto de Estabilización de Precios-INESPRE
(Price Stabilization Institute)

2. Address

Instituto de Estabilización de Precios
P.O. Box 86-2
Plaza Independencia
Santo Domingo, Dominican Republic

3. Telephone

533-3111

4. Date of Foundation

1969

5. Nature of the Institution

INESPRE is an autonomous state organism created for the purpose of regulating the prices of agricultural products within the process governed by the laws of supply and demand.

6. Objectives

The objectives of INESPRES are the following:

- Promotion and maintenance of production of those crops considered of vital importance through a system of minimum prices at the farm level.
- Consumer protection through price stabilization.
- Improving the marketing system in benefit of the small farmers.
- Construction and improvement of basic marketing infrastructure.
- Direct intervention in the marketing of basic agricultural products.

7. Institution or Organization upon which Dependent

INESPRE is autonomous, however, the Minister of Agriculture is the head of the Board of Directors, and can thus influence policy.

8. Number of Employees

Total number : 1 705

Number of technicians and professionals : 160

Number of professionals working in agricultural marketing : 15

Number of professionals working in post-harvest loss reduction : 8

9. Areas of Expertise of those Technicians working in Post-harvest Loss Reduction

The 8 technicians working in the Division of Post-harvest Handling concentrate their activities in providing technical assistance to producers of perishable commodities such as onions, potatoes and garlic. Their extension activities are oriented towards training in improved methods of handling these perishables at the farm level in respect to harvesting, curing and packaging.

10. Name of the Technical Unit(s) working in Post-harvest Activities

Division of Post-harvest Handling within the Department of Technical Norms and Standards.

11. Principal Agricultural Products handled by the Institution

INESPRE handles rice, sugar, vegetable oil, maize, beans, onions, potatoes, tomato paste, eggs, chicken, pork, plantain, garlic and other products. The Division of Post-harvest Handling works mainly with onions, garlic and potatoes.

12. Summary of Principal Functions carried out in the Area of Post-harvest Loss Reduction

As the marketing institution responsible for all internal marketing and exclusive responsibility in the case of rice, INESPRES carries out all marketing functions from purchasing at the farm level to distribution to marginal consumers in urban and rural areas of the country. In the case of specific actions oriented toward loss reduction INESPRES has carried out a detailed diagnosis of post-harvest losses in rice and periodically realizes extension and training activities to improve post-harvest handling of perishable produce at the farm level.

13. Infrastructure, Equipment and Work Facilities

INESPRE has considerable infrastructure distributed between 5 regional centers. Each center purchases, stores and sells the produce handled by INESPRES. This infrastructure includes 172 silos with a total capacity for 31,000 metric tons of corn or rice; 10 rice dryers with a total capacity of 77 MT/hour; and 88 warehouses (owned and rented) with storage capacity of 78,655 cubic meters. INESPRES also has 12 controlled temperature facilities with capacity for 9,824 cubic meters.

14. List of Recent Publications related to Post-harvest Loss Reduction

Recent publications on postharvest losses include:

- Manual técnico operativo almacén de conservación ambiente mixto, natural y refrigerado para productos perecederos.
- Manual técnico de papas; su manejo durante la cosecha, almacenaje y conservación.
- Manual técnico de cebolla; su manejo durante la cosecha, almacenaje y conservación.

At the present time a book is being edited on the postharvest losses of rice in the Dominican Republic.

15. Source of Financial Support

INESPRE's resources, for the most part, come from income generated through the sale of produce, particularly imported items such as rice and oil. From time-to-time the Government provides subsidies.

16. Coordination and Agreements with other Institutions

At the present time INESPRES is receiving technical assistance from IICA on information systems. Assistance was received from the Tropical Products Institute and IICA in carrying out the study of postharvest losses in rice. At the present time INESPRES is negotiating a technical cooperation agreement with IICA to undertake a training program for INESPRES staff during the 1981 calendar year.

17. Post-harvest Specialists

Name : José F. Martinez
Title : Ingeniero Agrónomo
Address : Instituto de Estabilización de Precios
Normas Técnicas
Apartado 86-2
Santo Domingo, República Dominicana

Languages : Spanish, English
Field of expertise : Storage of food grains
Products handled : Rice, corn, beans, sorghum, onions, potatoes
poultry, eggs, pork meat.

Name : Héctor Méndez A.
Title : Ingeniero Agrónomo
Address : Instituto de Estabilización de Precios
Normas Técnicas
Apartado 86-2
Santo Domingo, República Dominicana

Languages : Spanish
Field of expertise : Storage of perishable products
Products handled : Potatoes, onion , garlic, poultry,
pork meat.

Name : Eliseo Guerrero
Title : Ingeniero Agrónomo
Address : Instituto de Estabilización de Precios
Normas Técnicas
Apartado 86-2
Santo Domingo, República Dominicana

Languages : Spanish, French
Field of expertise : Storage of perishable products
Products handled : Onion, Potatoes, eggs, poultry

Name : Gerardo Quezada
Title : Ingeniero Agrónomo
Address : Instituto de Estabilización de Precios
Normas Técnicas
Apartado 86-2
Santo Domingo, República Dominicana

Languages : Spanish
Field of expertise : Storage of food grains
Products handled : Rice, corn, beans, onion , potatoes

1. Name of Institution

Instituto Dominicano de Tecnología Industrial-INDOTEC
(Dominican Institute of Industrial Technology)

2. Address

Instituto Dominicano de Tecnología Industrial-INDOTEC
Avenida Núñez de Cáceres esquina José A. Soler
Apartado postal 329-2
Santo Domingo, Dominican Republic

3. Telephone

566-5848; 566-8121

4. Date of Foundation

Created by law in 1974, began services in 1975.

5. Nature of the Institution

INDOTEC is a scientific and technological institution dedicated to the industrial development of the nation.

6. Objectives

The basic objective of INDOTEC is to contribute effectively to the transfer, application, improvement and development of industrial technology through investigation, consultation, technical assistance and information to public and private sector institutions and businesses.

7. Institution or Organization upon which Dependent

Central Bank

8. Number of Employees

Total number : 140
Number of technicians and professionals : 75
Number of professionals working in agricultural marketing : 0
Number of professionals working in post-harvest loss reduction : 4

9. Areas of Expertise of those Technicians working in Post-harvest Loss Reduction

Of the four persons working in post-harvest activities one is a pharmacy student and the remaining 3 are graduate chemists, including 2 chemical engineers.

10. Name of the Technical Unit(s) working in Post-harvest Activities

Unit for the Conservation and Storage of Fruits and Vegetables (2 persons)
Unit for the Processing of Fruits and Vegetables (2 persons)

11. Principal Agricultural Products handled by the Institution

Perishables including onions, cassava, pineapple, lettuce, mango, tomatoes, cauliflower, bread fruit, avocados, grapes, papaya and less perishable items such as garlic, beans and pigeon peas.

12. Summary of Principal Functions carried out in the Area of Post-harvest Loss Reduction

In providing services to the public and private sector INDOTEC carries out more than 4000 laboratory analysis each year of food and water samples. Other activities include technical assistance provided directly to private industries, the realization of technical studies contracted by either public or private institutions, identification and communication of new technologies, evaluation and improvement of agro-industrial products, the promotion of new industries and the training of public and private sector employees in priority areas.

INDOTEC also maintains an information service through its center for scientific and technological information (CENICIT). This service includes several million references, subscriptions to over 400 technical magazines, and hundreds of books in specialized areas. CENICIT edits a monthly bulletin with summaries and references of selected technical articles as well as a monthly listing of table of contents from the most important technical magazines.

13. Infrastructure, Equipment and Work Facilities

INDOTEC has well equipped laboratories including those for chemical and microbiological analysis, gas chromatography, atomic absorption infrared and ultraviolet spectro photometry and pharmaceutical analysis. It also has a well equipped pilot plant for the industrial processing of agricultural products.

14. List of Recent Publications related to Post-harvest Loss Reduction

At the present time there are no publications available related to post-harvest activities, however, several studies have been carried out on the physical and chemical characteristics of diverse fruits and vegetables. These are to be published during 1981.

15. Source of Financial Support

Financing is derived from the Central Government through the Central Bank (90%) and fees generated from services (10%).

16. Coordination and Agreements with other Institutions

In the past technical assistance was obtained from ICAITI. At the moment no technical or financial assistance is being received from any international or regional organizations.

CENICIT has an agreement with the National Technical Information Service of the U.S.A. for the distribution of its documents in the Dominican Republic.

17. Post-harvest Specialists

- | | | |
|--------------------|----|--|
| Name | : | Teresa Colón de Eugenio, Chemist |
| Title | : | Head Fruit and Vegetable Conservation and Storage Unit |
| Address | : | Avenida Núñez de Cáceres esquina José A.Soler
Apartado postal 329-2
Santo Domingo, Dominican Republic |
| Languages | .. | Spanish, English |
| Field of expertise | : | Trained in Post-harvest physiology, works on the physical and chemical characterization of perishable produce. |
| Products handled | : | Avocado, mango, papaya, pineapple, grapes, bread fruit, others. |
| | | |
| Name | : | Angel Andujar Vega, Chemical Engineer |
| Title | : | Head Fruit and Vegetable Processing Unit |
| Address | : | Avenida Núñez de Cáceres esquina José A. Soler
Apartado postal 329-2
Santo Domingo, Dominican Republic |
| Languages | : | Spanish, English |
| Field of expertise | : | Drying and canning of fresh fruits |
| Products handled | : | Dehydration of yuca and ginger, processing of pineapple, mangos and other fresh fruits |

Name : Horacio Ramírez, Biochemical Engineer
Title : Principal specialist in food technology
Address : Instituto Dominicano de Tecnología Industrial
Apartado 329-2
Santo Domingo, República Dominicana
Languages : Spanish
Field of expertise : Processing of milk products and fresh fruits
and vegetables, dehydration and freezing of
foods
Products handled : Legumes, fresh fruits, vegetables and milk
products

Name : Manuel Puerie, Chemist
Title : Food technology engineer
Address : Instituto Dominicano de Tecnología Industrial
Apartado 329-2
Santo Domingo, República Dominicana
Languages : Spanish, English
Field of expertise : Food Technology, product design and development,
through canning, freezing, fermenting, packaging,
etc.
Products handled : Milk products, fish, meats, fruit, vegetables

GRENADA

1. Name of Institution

Marketing and National Importing Board - MNIB

2. Address

Marketing and National Importing Board (MNIB)
Young St.
St. Georges', Grenada

3. Telephone

-

4. Date of Foundation

1979

5. Nature of the Institution

The MNIB is a statutory body with responsibilities for the import of basic food (rice, sugar, etc.) and non food (cement, etc.) items; the export of non traditional agricultural commodities and the internal distribution of fresh produce.

6. Objectives

The objectives of the MNIB are the following:

- Importation and distribution of rice, sugar and cement (other items to be added).
- Assist in the marketing of farm produce destined for local, intra and extra regional markets.
- Provide retail outlets for basic commodities in at least 6 points in the country.
- Market processed produce from state agro-industries.

7. Institution or Organization upon which Dependent

Ministry of Planning, Finance, Trade and Industry.

8. Number of Employees

Total number : 33

Number of technicians and professionals : 5

Number of professionals working in agricultural marketing : 2

Number of professionals working in post-harvest loss reduction : 0

9. Areas of Expertise of those Technicians working in Post-harvest Loss Reduction

None

10. Name of the Technical Unit(s) working in Post-harvest Activities

None

11. Principal Agricultural Products handled by the Institution

Domestic market: vegetables, root crops, fruits, rice and sugar.
Export market : eggplant, mangoes, pumpkins

12. Summary of Principal functions carried out in the Area of Post-harvest Loss Reduction

The MNIB is presently in the process of establishing packing sheds in farm areas to maintain produce quality for export.

13. Infrastructure, Equipment and Work Facilities

The MNIB has warehouse storage space for imported dry goods. It recently moved into new facilities having small chill and cold rooms (not yet in use).

14. List of Recent Publications related to Post-harvest Loss Reduction

None

15. Source of Financial Support

MNIB finances its operations through profits obtained on imported items.

16. Coordination and Agreements with other Institutions

None

17. Post-harvest Specialists

None

GUYANA

1. Name of Institution

Guyana Marketing Corporation -GMC

2. Address

Guyana Marketing Corporation
Lot 1, Lombard St.
Charlestown
Georgetown, Guyana

3. Telephone

65846

4. Date of Foundation

The GMC was established on January 1, 1964. The corporation took over the coordinating functions performed earlier by the Ministry of Trade and Industry and the Ministry of Agriculture (Marketing Division).

5. Nature of the Institution

The GMC is a co-operative, state corporation, responsible for the marketing of basic agricultural produce.

6. Objectives

The objectives of the GMC are the following:

- In the interest of producers, assist and improve the marketing and processing of all their produce, with the exception of rice and sugarcane.
- Provide guaranteed minimum prices to farmers.
- Supply produce to the consumer at subsidized prices through wholesale and retail outlets.

7. Institution or Organization upon which Dependent

The GMC as other semi-autonomous corporations in Guyana, is administratively responsible to the Guyana State Corporation. Policy with respect to the agricultural sector is laid down by the Ministry of Agriculture.

8. Number of Employees

Total number : Approximately 240

Number of technicians and professionals : 15

Number of professionals working in agricultural marketing : 2

Number of professionals working in post-harvest loss reduction : 1

9. Areas of Expertise of those Technicians working in Post-harvest Loss Reduction

The one person working part-time in post-harvest loss reduction is the assistant planning officer who is implementing some studies to identify post-harvest losses in GMC warehouses.

10. Name of the Technical Unit(s) working in Post-harvest Activities

None

11. Principal Agricultural Products handled by the Institution

Plantain, eddoes, oranges, bananas, pineapples.

12. Summary of Principal Functions carried out in the Area of Post-harvest Loss Reduction

Purchasing : This function is carried out principally at times of glut at approximately 20 buying stations scattered throughout the country. GMC must purchase all produce offered for sale, however low prices usually minimize supply offered.

Transport : GMC transports produce in its own or rented trucks or by steamer service offered by the Transport and Harbours Department, from the buying points to the central warehouse in Georgetown. Transport in GMC trucks is offered from the central Warehouse to wholesale/retail outlets.

Distribution: Produce is stored by GMC for as short of periods as possible and then distributed to wholesale and retail outlets. Very little is done in grading and packaging.

Processing : GMC operates a plant for slaughtering and processing pork products.

13. Infrastructure, Equipment and Work Facilities

The GMC has very little basic infrastructure and equipment. Most buying stations are without facilities. The principal warehouse in Georgetown is in poor condition and has recently been sold. Small-scale steel, grain silos built by GMC have never been used and are being transferred to another corporation. GMC has 9 lorries of which one is used for collection and the others for distribution to urban markets.

14. List of Recent Publications related to Post-harvest Loss Reduction

None

15. Source of Financial Support

GMC finances part of its costs through sales, the remainder is subsidized by the Government.

16. Coordination and Agreements with other Institutions

The GMC is presently executing a loan with the Interamerican Development Bank to finance infrastructure development and technical assistance.

17. Post-harvest Specialists

Name : Winston Smith
Title : General Manager
Address : Guyana Marketing Corporation
Lot 1 Lombard St.
Charlestown
Georgetown, Guyana
Languages : English
Field of expertise : Planning loss studies
Products handled : Fruits and Grains

J A M A I C A

1- Name of Institution

Agricultural Marketing Corporation - AMC

2- Address

188 Spanish Town Road,
P.O. Box 144
Kingston 11, Jamaica

3- Telephone

923-9261

4- Date of Foundation

1963

5- Nature of the Institution

The AMC is a statutory body established with the purpose of providing Jamaica with an efficient system of marketing agricultural produce.

6- Objectives

The objectives of the AMC are the following:

- To provide and maintain adequate marketing outlets for agricultural produce.
- To buy and sell agricultural produce
- To provide for the collection, transportation, storage, grading, packing and processing of agricultural produce.
- To import and export agricultural produce.

7- Institution or Organization upon which Dependent

Ministry of Agriculture

8- Number of Employees

Total Number : Between 200 and 300

Number of Technicians and professionals: 30

Number of professionals working in agricultural marketing: 2

Number of professionals working in Post-harvest loss reduction : 0

9. Areas of Expertise of those Technicians working in Post-harvest Loss Reduction

The AMC is seriously lacking personnel in the area of Post-harvest Loss Reduction. Considerable loss and wastage occurs in the regional buying/packing warehouses and in centralized cold and dry storage.

10. Name of the Technical Unit(s) working in Post-harvest Activities

None

11. Principal Agricultural Products handled by the Institution

The AMC buys all the marketable produce which the farmer offers for sale. The principal products handled are: potatoes, lettuce, cabbage, carrots, yampies, pumpkins, onions, melons, yams, corn and others.

12. Summary of Principal Functions carried out in the Area of Post-harvest Loss Reduction

The AMC provides transportation on a regular basis to approximately 150 buying points. This has the effect of reducing on-the-farm losses, however, it is really only a transfer of losses between the farmer and AMC who suffers high losses during repackaging and/or cold storage of perishable produce.

The AMC attempts to reduce losses by using cold storage facilities, however, improper management of the infrastructure often results in very high losses.

13. Infrastructure, Equipment and Work Facilities

The AMC has considerable warehouse space and limited cold storage facilities at its central location in Kingston. It maintains 8 regional branches, spread across the island, which serve approximately 150 buying stations. These facilities are linked together by a fleet of cars and trucks. Within the major population areas some 18 green groceries are supplied and operated by AMC.

14. List of Recent Publications related to Post-harvest Loss Reduction

None

15. Source of Financial Support

AMC is financed by its own operations and government subsidies

16. Coordination and Agreements with other Institutions

None

17- Post-harvest Specialists

For information write to:

Chairman, AMC
188 Spanish Town Road
P.O. Box 144
Kingston 11, Jamaica

1. Name of Institution

Storage and Infestation Division, Ministry of Industry and Commerce

2. Address

Storage and Infestation Division, Ministry of Industry and Commerce
20 Hope Road
Kingston 10, Jamaica

3. Telephone

9267107 and 9267450

4. Date of Foundation

June 1958

5. Nature of the Institution

This Division is the government entity responsible for the inspection and control of food stuffs to prevent contamination and losses.

6. Objectives

The objectives of the storage and Infestation Division are the following:

-To prevent and minimize the destruction, deterioration and spoilage of foodstuff.

-To increase storage and shelve life of foods.

-To insure that locally grown foodstuffs for the local and external markets, as well as imported food, is free from contamination and of the highest possible quality.

7. Institution or Organization upon which Dependent

Ministry of Industry and Commerce.

8. Number of Employees

Total number : Approximately 20

Number of technicians and professionals : 8

Number of professionals working in agricultural marketing : 0

Number of professionals working in post-harvest loss reduction : 8

9. Areas of Expertise of those Technicians working in Post-harvest Loss-Reduction

At the central level there are four Food Storage Officers who carry out research on methods for dry and cold storage to reduce losses and increase storage life. Experiments are carried out on insect and rodent control during storage.

In the field, Food Storage Officers and Inspectors periodically visit ships, warehouses, farms, schools, prisons, hospitals, etc., -where food is stored, to inspect its quality, control its use and give recommendations for extending product life or minimizing losses.

10. Name of the Technical Unit(s) working in Post-harvest Activities

Storage and Infestation Division

11. Principal Agricultural Products handled by the Institution

All types of foodstuffs, including meat.

12. Summary of Principal Functions carried out in the Area of Post-harvest Loss Reduction

-Inspection of stored foodstuff in ships, institutions, industries or other points upon request.

-Inspection and control of infested produce and identification of pests.

-Laboratory experiments with new methods for the control of insects and rodents.

-Testing of insecticides for future use.

-Preparation of technical materials for use of field staff and extensionists from other institutions.

-Identification of ways to extend product life. Investigations have been carried out with the following products: banana, breadfruit, cabbage, cassava, dasheen, escallion, limes, mango, onions, papaya, plantains, sweet, potatoes, tomatoes and yams.

13. Infrastructure, Equipment and Work Facilities

Facilities and equipment are limited but include three laboratories:

-Entomology laboratory

-Rodent laboratory

-Root crops, fruit and vegetable laboratory

14. List of Recent Publications related to Post-harvest Loss Reduction

No recent publications related to loss-reduction have been produced by the Division. Some of the professionals of the Division do periodically publish results of their studies.

15. Source of Financial Support

Financial support is very limited and is derived from the Ministry of Industry and Commerce.

16. Coordination and Agreements with other Institutions

Some projects are being prepared to seek outside financing.

17. Post-harvest Specialists

Name	:	K.R. Walker
Title	:	Chief Food Storage Officer
Address	:	20 Hope Road Kingston 10 Jamaica
Name	:	Daniel B. Jayasingh
Title	:	Food Storage Officer
Address	:	20 Violet Ave. Mona Kingston 6 Jamaica
Languages	:	English, Tamil
Field of expertise	:	Storage entomology and rodent control, Insecticides, rodenticides and their evaluation
Products handled	:	Legumes, paddy rice, corn, peanuts, ginger, pimento and coffee.

TRINIDAD TOBAGO

1. Name of Institution

Central Marketing Agency-CMA

2. Address

Central Marketing Agency
P.O.Box 449
Beetham Highway
Port-of-Spain, Trinidad-Tobago

3. Telephone

62-32406/8 ; 62-31853

4. Date of Foundation

The CMA was created in July of 1966, it was preceded by the Marketing Board which was created in 1948. The CMA took over all responsibilities of its predecessor.

5. Nature of the Institution

The CMA is a non-autonomous statutory body under the control of the Ministry of Agriculture.

6. Objectives

The objectives of the CMA are as follows:

- Regulate the wholesale marketing of agricultural produce and handicraft products.
- Control and operate wholesale markets and to regulate the flow and movement of produce and products into retail markets.
- Develop and carry out a coordinated programme for the purchasing, selling, handling, storage, processing, distribution and transportation of agricultural produce and handicraft products and to operate and maintain services necessary or incidental thereto.
- Export, import and sell for export any agricultural produce, and issue export licenses.
- Implement price support measures.

7. Institution or Organization upon which Dependent

The CMA depends directly from the Ministry of Agriculture, Land and Fisheries.

8. Number of Employees

Total number : 222 permanent; 145 regular/casual
Number of technicians and professionals : 24
Number of professionals working in agricultural marketing : 1
Number of professionals working in post-harvest loss reduction : 1

9. Areas of Expertise of those Technicians working in Post-harvest Loss Reduction

The CMA has no specialized persons working in post-harvest loss reduction. The 6 persons mentioned above are warehouse administrators who have experience in food handling and attempt to keep food losses at a minimum.

10. Name of the Technical Unit(s) working in Post-harvest Activities

Wholesale unit

11. Principal Agricultural Products handled by the Institution

Rice, hogs, cucumbers, eggplant, melons, pumpkins, blackeye peas, pigeon peas, corn, miscellaneous.

12. Summary of Principal Functions carried out in the Area of Post-harvest Loss Reduction

The CMA purchase basic farm produce at guaranteed prices from farmers at 10 depots and later transports, stores for short periods, packs and distributes to some 30 Government institutions and 3 CMA retail outlets. The CMA is also involved in the marketing of pork (purchase-slaughter-wholesale, distribution) and chicken (including regulation and control of poultry industry as well as imports and distribution of frozen chickens). The CMA imports and distributes selected food and non-food items and markets agricultural inputs (fertilizer, etc.) through its 10 depots.

13. Infrastructure, Equipment and Work Facilities

The CMA has one cold storage van, one chilled van and four small cold/chilled storage units. Each of the ten depots have dry storage space for produce and agricultural inputs. The central facilities in Port-of-Spain have two large warehouses for dry storage.

14. List of Recent Publications related to Post-harvest Loss Reduction

None

15. Source of Financial Support

The CMA is financed by its own operations plus Government subvention to cover annual deficits.

16. Coordination and Agreements with other Institutions

The CMA works closely with the Ministry of Agricultural which provides expertise in pre-harvest and extension activities when necessary.

17. Post-harvest Specialists (The following persons can provide information on post-harvest activities, however they are not Post-harvest Specialists).

Name : Anthony James
Title : General Manager CMA
Address : Central Marketing Agency
P.O. Box 449
Beetham Highway
Port-of-Spain, Trinidad-Tobago

Name : Elias Romany
Title : Assistant General Manager
Address : Central Marketing Agency
P.O. Box 449
Beetham Highway
Port-of-Spain, Trinidad-Tobago

Name : Guy Massiah
Title : Secretary
Address : Central Marketing Agency
P.O. Box 449
Beetham Highway
Port-of-Spain, Trinidad-Tobago

Name : Carl Thompson
Title : Chief Accountant
Address : Central Marketing Agency
P.O. Box 449
Beetham Highway
Port-of-Spain, Trinidad-Tobago

1. Name of Institution

Caribbean Agricultural Research and Development Institute-CARDI

2. Address

Caribbean Agricultural Research and Development Institute
University Campus
St. Augustine, Trinidad, W.I.

3. Telephone

662-5511 extension 340

4. Date of Foundation

CARDI was established in May of 1975. It grew out of the Regional Research Center which was closely associated with the University of the West Indies.

5. Nature of the Institution

CARDI is an autonomous Institute established by the Governments of the Caribbean Community to promote agricultural research and development on a regional basis.

6. Objectives

CARDI has the following major objectives:

- to provide for the research and development needs of the agriculture of the Region as identified in national plans and policies;
- to provide an appropriate research and development service to the agricultural sector of Member States;
- to provide and extend the application of new technologies in production, processing, storage and distribution of agricultural products of Member States;
- to pursue for specified periods long term research in pertinent areas;
- to provide for the co-ordination and integration of the research and development efforts of Member States where this is possible and desirable;
- to undertake teaching functions normally at the postgraduate level, limited to the development of the relevant research by any Member State.

7. Institution or Organization upon which Dependent

CARDI is a legal entity established by the Governments of Antigua, Barbados, Belize, Dominica, Grenada, Guyana, Jamaica, Montserrat, St. Christopher-Nevis-Anguilla, St. Kitts, St. Lucia, St. Vincent, and Trinidad/Tobago. It is

governed by the standing Committee of Ministers responsible for agriculture of the member countries and has a Board of Directors with members from the University of the West Indies, the University of Guyana, the Caribbean Community Secretarial and the Caribbean Development Bank, in addition to representatives from the member Governments.

8. Number of Employees

Total number : Between 150 and 165

Number of technicians and professionals : 55

Number of professionals working in agricultural marketing : One professional but no on-going marketing activities

Number of professionals working in post-harvest loss reduction : 8 trained professionals, however, relatively little activity in the area of post-harvest loss reduction.

9. Areas of Expertise of those Technicians working in Post-harvest Loss-Reduction

Crop protection : 2 pathologists (T/T); 4 entomologists (Belize, Grenada and 2 Barbados); 1 Virologist (T/T); 1 nematologist (T/T).

10. Name of the Technical Unit(s) working in Post-harvest Activities

CARDI Resource Group: for each project an interdisciplinary team is formed with a project coordinator.

11. Principal Agricultural Products handled by the Institution

Vegetables, fruits and selected root crops (yams and sweet potatoes) will be the focus of future activities.

12. Summary of Principal Functions carried out in the Area of Post-harvest Loss Reduction

At the present time most of CARDI'S activities related to marketing and post-harvest loss reduction are in the area of investigation including the following:

-Pre-harvest conditions affecting post-harvest losses, for example, virus diseases of yams which affect product quality.

-Storage of selected products.

-Pesticide residue analysis with the objective of establishing a system of pesticide monitoring:

. to determine the level of toxic residues of certain of the more highly hazardous pesticides in agricultural commodities.

. to determine pesticide residues that occur in "market basket" samples throughout the commonwealth Caribbean.

to determine, by measurement of blood cholinesterase (ChE) level, the exposure of agricultural workers to organo-phosphate and carbamate insecticides, so that steps can be taken to ensure the safety of such workers from over-exposure.

-Small Farm Multiple Cropping Systems Project which sets out:

- . to characterize all aspects of the small farmers production/marketing system.
- . to identify the constraints of this system.
- . to remove the constraints through farm-based research and development activities.

13. Infrastructure, Equipment and Work Facilities

CARDI is equipped with a modern central analytical laboratory for soil, plant, environmental and other type analysis, including animal feed analysis, mercury in fish analysis, chemical residues in agricultural commodities, etc. it has a full range of sophisticated analytical instruments.

14. List of Recent Publications related to Post-harvest Loss Reduction

- Agboade, P.O. "Crop Losses due to Insects and its Assessment with Particular Reference to Storage Pests", Masters paper.
- Mantell, S.H. et al, "Virus Diseases of Yams in the Commonwealth Caribbean", Technical Report No. 3, June 1977 CARDI.
- Solomon, Gloria. Storage Diseases of Food Crops in Trinidad.
- Miscellaneous other documents produced by graduate students and technical papers printed in technical journals by CARDI specialists.

15. Source of Financial Support

Member governments finance between 30 and 40 percent of the annual budget. The balance is financed by specific projects from diverse sources.

16. Coordination and Agreements with other Institutions

CARDI receives financial support from many organizations including: AID, IDRC, ODM, UNDP-OPEC, European Development Fund (EDF), IDA, CDB and others. Some of these specific projects have elements touching on marketing research and identification of ways of reducing post-harvest loss reduction.

17. Post-harvest Specialists

Name : Ralph H. Phelps, PhD
Title : Plant Pathologist
Address : CARDI, University Campus
St. Augustine, Trinidad W.I.

Name : Samsundar Parasram
Title : Entomologist, Coordinator Small Farm Multiple
Cropping Systems Project
Address : CARDI University Campus
St. Augustine, Trinidad, W.I.

1. Name of Institution

Caribbean Industrial Research Institute-CARIRI

2. Address

Caribbean Industrial Research Institute
Tunapuna Post Office
Trinidad/Tobago

3. Telephone

662-7161, 7162, 7163, 7164, 7165

4. Date of Foundation

1970

5. Nature of the Institution

CARIRI as its name implies is an Industrial Research Institute established to promote and assist industrialization. It works in cooperation with other agencies to provide technical services to industry. It is subdivided into six divisions including: Engineering, Food and Chemistry, Materials Technology, Electronics/Instrumentation, Technical Information Services and Economics/Systems Research.

6. Objectives

The objectives of CARIRI are to:

- Provide industry with technical services including: collection/dissemination of technical information, chemical analytical work, physical and materials testing, engineering services and economic and technical feasibility studies.
- Engage in industrial research programmes relating to industrial operations in the region.
- Provide training for the staff in the above mentioned fields both through fellowship and on-the-job training by international experts.

7. Institution or Organization upon which Dependent

CARIRI is a legal entity established by the Government of Trinidad/Tobago and run by a Board of Management comprised of representatives of the Government of Trinidad and Tobago, the private sector, the Industrial Development Corporation, The University of the West Indies, and the United Nations Development Programme.

8. Number of Employees

Total number : Between 125 and 135

Number of technicians and professionals : 40

Number of professionals working in agricultural marketing : 1 in
Economics and Systems Research

Number of professionals working in post-harvest loss reduction : 4

9. Areas of Expertise of those Technicians working in Post-harvest Loss-Reduction

Bio Chemist/Chemist; Food Technologist/Packaging; Engineer and Technical Information Specialist.

10. Name of the Technical Unit(s) working in Post-harvest Activities

Food and Chemistry Division

11. Principal Agricultural Products handled by the Institution

Locally grown perishable fruits, vegetables, root crops and spices.

12. Summary of Principal Functions carried out in the Area of Post-harvest Loss Reduction

-Commercialisation of agricultural produce:

Study of processing of wet season crop of blackeye peas, including integrated production/processing and marketing of yellow mature peas.

Feasibility study of processing local fruits into dried and candied products and pilot plant processing.

-Packaging:

packaging survey of the islands of the English speaking Caribbean to upgrade and improve the quality of packaging.

-Post-harvest loss reduction:

assessment of losses throughout the marketing system in diverse commodities grown locally and design of programs to reduce losses in priority areas identified. This program is in take-off stage.

13. Infrastructure, Equipment and Work Facilities

-Modern very well equipped chemistry laboratory

-Modern very well equipped microbiological laboratory

-Food product development laboratory

-Food packaging laboratory

-Food pilot plant

14. List of Recent Publications related to Post-harvest Loss Reduction

Reports are prepared by CARIRI specialists and published by the clients.

15. Source of Financial Support

CARIRI is a non-profit organization; it operates as a consultant working on projects for Government and Industry, usually at subsidized fee-rates. Its main source of funds for the establishment and operation of the Institute is the Government of Trinidad and Tobago. Other sources of funds include:

- U.N. assistance in expert staff, equipment and fellowship funding.
- Grants from other organizations which fund development activities.
- Income earned from services provided.

16. Coordination and Agreements with other Institutions

CARIRI maintains a close working relationship with the University of the West Indies and other local and international research institutes and information centers. Since 1971 it has received technical assistance from the United Nations Development Programme (UNDP) through the United Nations Industrial Development Organization (UNIDO).

17. Post-harvest Specialists

Name : Ms Waveney Henry
Title : Analytical Chemist, Head, Food and Chemistry Division
Address : Tunapuna Post Office
Trinidad, W.I.

Name : Edward A. Comissiong, PhD
Title : Food Technologist/Packaging
Address : Tunapuna Post Office
Trinidad, W.I.

Name : Maura P. Imbert, PhD
Title : Organic Chemist
Address : Tunapuna Post Office
Trinidad, W.I.

C O S T A R I C A

1. Name of Institution

Consejo Nacional de Producción-CNP
(National Council for Production)

2. Address

Consejo Nacional de Producción
Apartado 2205
San José, Costa Rica

3. Telephone

23-60-33

4. Date of Foundation

1948

5. Nature of the Institution

The CNP is an autonomous state institution responsible for the promotion of agricultural and industrial production and price stabilization of selected commodities consumed by the people of Costa Rica.

6. Objectives

The principal objectives of CNP are the following:

- Increase agricultural and animal production through programs to stimulate planting of basic crops.
- Provide farmers with necessary agricultural inputs (credit, seeds technical assistance, farm machinery) for the production of basic grains.
- Promote the agro-industrial sector.
- Provide minimum farm prices for basic grains and stabilize the prices of basic consumer goods through storage and effective marketing.

7. Institution or Organization upon which Dependent

The CNP is an autonomous institution responsible before the executive branch of government.

8. Number of Employees

Total number : Approximately 2400
Number of technicians and professionals : 70
Number of professionals working in agricultural marketing : 10
Number of professionals working in post-harvest loss reduction : 2

9. Areas of Expertise of those Technicians working in Post-harvest Loss Reduction

Of the two persons with training related to post-harvest loss reduction one is working in a program to study methods for conserving basic grains at the farm level while the second works as a laboratory technician.

10. Name of the Technical Unit(s) working in Post-harvest Activities

Agro-technical Department and Unit for Quality Control and Conservation dependent to the Grain Purchasing Department.

11. Principal Agricultural Products handled by the Institution

Rice, corn, beans, sorghum, beef, fish, liquors.

12. Summary of Principal Functions carried out in the Area of Post-harvest Loss Reduction

Studies are being undertaken to evaluate the problems related to post-harvest losses at the level of the small farmer. Experiments are underway with solar dryers and farm level grain silos. A program is being implemented to make appropriate technology for drying, shelling and storage available to those small farmers desiring such innovations.

13. Infrastructure, Equipment and Work Facilities

After purchasing basic grains and some other products, the CNP may process, dry, store and or transport them between different points. These functions require considerable infrastructure and equipment.

The CNP has silo storage capacity for approximately 25,000 tons. and warehouse space in excess of 40,000 tons. It also has more than 15 cold storage facilities and a fleet of trucks and jeeps. Laboratory needs are met by CIGRAS.

14. List of Recent Publications related to Post-harvest Loss Reduction

None

15. Source of Financial Support

The financing of CNP is provided in-part by benefits from the Government Liquor Monopoly and in-part by direct income obtained for services provided to the public.

16. Coordination and Agreements with other Institutions

The CNP receives technical assistance from Peace Corps Volunteers in the field of solar drying of grains and on the farm storage.

17- Post-harvest Specialists

Name : Guillermo Herrera

Address : Consejo Nacional de Producción
Apartado 1231
San José, Costa Rica

1. Name of Institution

Centro de Investigaciones en Tecnología de Alimentos-CITA
(Center for Investigation in Food Technology)

2. Address

CITA
Universidad de Costa Rica
San José, Costa Rica

3. Telephone

25-98-85 Direct
25-55-55 Extension 701 via University

4. Date of Foundation

Informally 1969
Oficially 1974

5. Nature of the Institution

CITA is a mixed Government-University laboratory and research center linked to the University of Costa Rica and the Ministry of Agriculture receiving technical and financial assistance from diverse national and international institutions.

6. Objectives

The objectives of CITA are the following:

- Investigate the most adequate use of actual and future foods of Costa Rica.
- Contribute to the maintenance and improvement of the National Food supply thru investigations leading to the treatment of agricultural products to improve economies and shelve life over prolonged periods of time.
- Study the processing of relatively inexpensive food stuffs with adequate nutritive value in favor of low income groups.
- Foment and assist local food industries improve sanitary conditions and nutritive value of processed foods.
- Improve Costa Rica's competitive position in national and international markets thru improved technological and operational efficiency of the processed food industry.
- Act as the national center for science and food technology and coordinate interdisciplinary activities in investigation, extension and teaching based on policies compatible with the countrys potential for agro-industry.

7. Institution or Organization upon which Dependent

CITA operates at the same level as the University of Costa Rica and the Ministry of Agriculture and is linked to these institutions by contract.

8. Number of Employees

Total number : Approximately 50

Number of technicians and professionals : 24

Number of technicians working in agricultural marketing : None

Number of professionals working in post-harvest loss reduction : 8

9. Areas of Expertise of those Technician working in Post-harvest Loss Reduction

The food technologists work on priority projects which vary with time. At the moment of this interview studies were underway on diverse uses of bananas, types of packaging for marketing papaya, reinforced nutritional drinks, sausage preparation and pre-cooked beans.

10. Name of the Technical Unit(s) working in Post-harvest Activities.

Unit for the development of Projects and Investigation and the Unit for appropriate Rural Technologies.

11. Principal Agricultural Products handled by the Institution

Banana, papaya, cassava, mango, fish, pickles, preserves and other fruits and vegetables.

12. Summary of Principal Functions carried out in the Area of post-harvest Loss Reduction

CITA investigates possible uses of food and improved methods for handling perishable commodities. The recommendations are then passed on to the Ministry of Agriculture and other institutions for implementation. Considerable effort goes into training people in food technology and the University of Costa Rica offers an interdisciplinary degree in food technology which is developed by CITA.

13. Infrastructure, Equipment and Work Facilities

Pilot industrial plant, laboratory and equipment for investigation.

14. List of Recent Publications related to Post-harvest Loss Reduction

CITA as an institution has published a few documents presenting the results of its studies and investigations of fruits and vegetables and some pamphlets on foods and vitamins. It has also published projects for; the fortification of vitamins and minerals in rice, the extraction of oil from rice husks and the obtention of proteins and their nutritional application.

Technicians employed with CITA and mentioned below in 17 have published documents on the following subjects:

- Enzymology/protein chemistry
- Processing of mangos: drying, freezing, juices
- Cassava processing
- Vegetable milks
- Effects of processing of yuca on its residual content
- Products processed from bananas for human consumption
- Methodology for the study of the equilibrium point applied to an industry for processing yuca chips and flour
- Effects of some variables on the yields of crude papaina

15. Source of Financial Support

Ministry of Agriculture (14%)
University of Costa Rica (20%)
National Council for production (1%)
Agreements and contracts with national and international institutions (65%)

16. Coordination and Agreements with other Institutions

CITA has received technical and financial assistance from:

- Interamerican Development Bank (IDB)
- Agency for International Development (AID)
- Organization of American States (OAS)
- British Government
- Israel Government
- Spanish Government
- Dutch Government
- Organization of United Nations for Industrial Development (ONUJI)

17. Post-harvest Specialists

Name : Fernando Arias
Title : Director CITA
Address : CITA
Universidad de Costa Rica
San José, Costa Rica

Name : Rodrigo Fernández H.
Title : Sub-director CITA
Address : CITA
Universidad de Costa Rica
San José, Costa Rica
Languages : Spanish
Field of expertise : Dihydration and freezing of mango and yuca
Products handled : Mango, yuca

Name : Alberto Ortíz Navarrete
Title : Professor/Investigator
Address : CITA
Universidad de Costa Rica
San José, Costa Rica
Languages : Spanish
Field of expertise : Post-harvest management of papaya and other fruits,
drying of papaya latex to obtain crude papaina
Products handled : Papaya and fruits

Name : Luis G. Madrigal Sánchez
Title : Food Technologist
Address : CITA
Universidad de Costa Rica
San José, Costa Rica
Languages : Spanish
Field of expertise : Post-harvest handling and industrialization of
papaya and yuca
Products handled : Fruits

Name : Carlos Enrique Avalos Hoffman
Title : Investigator
Address : CITA
Universidad de Costa Rica
San José, Costa Rica
Languages : Spanish
Field of expertise : Alternative ways of marketing fish and meat
Product handled : Fish, meat

Name : José R. González V.
Title : Investigator
Address : CITA
Universidad de Costa Rica
San José, Costa Rica
Languages : Spanish, English
Field of expertise : Processing of beans and soya by extrusion.
Preparation of pastas
Products handled : Cereals, bread, beans, dehydrated vegetables

Name : Celsa Lastreto
Title : Investigator
Address : CITA
Universidad de Costa Rica
San José, Costa Rica
Languages : Spanish, English
Field of expertise : Preparation of products from banana, including
baby cereal and dihydration of banana
Products handled : Bananas and baby cereals

Name : R.D. Cooke
Title : Tropical Products Institute Consultant
Address : CITA
Universidad de Costa Rica
San José, Costa Rica
Languages : English, Spanish
Field of expertise : Consultant from the Tropical Products Institute
specialized in food processing, dehydration
and freezing and post-harvest handling of fresh
fruit, especially mango and papaya.
Products handled : Fresh fruit

1. Name of Institution

Centro para Investigaciones en Granos y Semillas-CIGRAS
(Center for Investigation of Grains and Seeds)

2. Address

CIGRAS
Facultad de Agronomía
Universidad de Costa Rica
San José, Costa Rica

3. Telephone

25-91-80

4. Date of Foundation

5. Nature of the Institution

CIGRAS is a center attached to the Faculty of Agronomy of the University of Costa Rica dedicated to the investigation and teaching of grain and seed technology. It also acts as official laboratory in Costa Rica for tests of quality of grain and seed products.

6. Objectives

The principal objective of CIGRAS is to promote a better understanding of grain and tropical seed technology through training and investigation so as to maximize the use of agricultural resources of Costa Rica and Central America in general.

7. Institution or Organization upon which Dependent

University of Costa Rica

8. Number of Employees

Total number : 17
Number of technicians and professionals : 6
Number of professionals working in agricultural marketing : 0
Number of professionals working in post-harvest loss reduction : 1

9. Areas of Expertise of those Technicians working in Post-harvest Loss Reduction

Investigation and training in the post-harvest handling of grains, control of grain quality through laboratory analysis, and estimation of post-harvest losses.

10. Name of the Technical Unit(s) working in Post-harvest Loss Reduction

Grain Unit (Unidad de Granos)

11. Principal Agricultural Products handled by the Institution

Rice, maize, beans and sorghum

12. Summary of Principal Functions carried out in the Area of Post-harvest Loss Reduction

CIGRAS promotes investigations related to grain storage and processing and trains university students and members of the private sector in the identification and evaluation of post-harvest losses.

13. Infrastructure, Equipment and Work Facilities

CIGRAS has a well equipped laboratory for grain and seed analysis with rooms for germination and cold storage. It also has a very good library in the field of grain and seed technology.

14. List of Recent Publications related to Post-harvest Loss Reduction

-Processing of arroz in the CNP instalation in Barranca, R.C.
Master thesis, José Guardia.

-Insects in Grain Stored in Tropical Zones: Barranca, C.R. Masters
thesis, Ricardo Garrón.

-Measurement of Maize Weevil and Fungi Damage to store corn (MS) Miguel
Mora C.

-Damage to Stored Maize Infested with Sitophilus Zeamais (PhD) Miguel
Mora C.

-Storage Conditions and Systems for Evaluating Seed Quality (Rice and
Maize) Miguel Mora C.

-Storage vs. Bean Hardening, Miguel Mora C.

-Diagnosis of the Post-harvest handling of Grains by the Small Farmer
in Costa Rica, Miguel Mora C.

15. Source of Financial Support

Budget of the University of Costa Rica and loans or contributions from
other countries.

16. Coordination and Agreements with other Institutions

CIGRAS maintains close relationship with national institutions such as:

- Ministry of Agriculture
- National Marketing Institution (CNP)
- National Seed Commission

On an international basis CIGRAS works closely with:

- Inter-American Institute of Agricultural Sciences (IICA)
- Tropical Products Institute (TPI)
- National Academy of Sciences (USA)
- League for International Food Education (LIFE)

17. Post-harvest Specialists

- | | | |
|--------------------|---|---|
| Name | : | Dr. Ronald Echandi |
| Title | : | Director of CIGRAS |
| Address | : | CIGRAS
Universidad de Costa Rica
San José, Costa Rica |
| Name | : | Dr. Miguel Mora C. |
| Title | : | Sub-director CIGRAS |
| Address | : | CIGRAS
Universidad de Costa Rica
San José, Costa Rica |
| Languages | : | Spanish, English |
| Field of expertise | : | Post-harvest handling of basic grains |
| Products handled | : | Basic grains in general |

GUATEMALA

1. Name of Institution

Instituto Nacional de Comercialización Agrícola-INDECA
(National Institute for Agricultural Marketing)

2. Address

Instituto Nacional de Comercialización Agrícola
11 Calle, 3-23 Zona 9
Guatemala, Guatemala

3. Telephone

316423 y 321335

4. Date of Foundation

INDECA was formed in 1971. It was preceded by the Instituto de Fomento de la Producción (INFOP) which dates from 1956.

5. Nature of the Institution

INDECA is the institution of the public sector in Guatemala responsible for the marketing of grains.

6. Objectives

The objectives of INDECA are the following:

- Set prices for basic agricultural products
- Regulate the supply of basic agricultural products
- Identify and introduce the necessary changes in the internal marketing systems for basic agricultural products.

7. Institution or Organization upon which Dependent

Ministry of agriculture

8. Number of Employees

Total number : fluctuates between 600 and 720
Number of Technicians and professionals : 40
Number of professionals working in agricultural marketing : 7
Number of professionals working in post-harvest loss reduction : 3

9. Areas of Expertise of those Technicians working in Post-harvest Loss Reduction

-At the central level there are three specialists who establish norms, direct and evaluate the handling of the products. These include 2 agronomists and one economist/agronomist.

-At the regional level there are approximately 25 laboratory workers responsible for quality control of the products handled by INDECA plus approximately 10 technicians who supervise storage and conservation.

10. Name of the Technical Unit(s) working in Post-harvest Activities

Direction of operations; sections for storage and conservation and register and control of supplies.

11. Principal Agricultural Products handled by the Institution

Maize, bean, rice and sorghum

12. Summary of Principal Functions carried out in the Area of Post-harvest Loss Reduction

- Purchase of grains from producers
- storage and conservation of grains
- transport and sell to wholesalers and retailers
- importation of grains
- control of external commerce of agricultural products in general
- promotion and extension in agricultural marketing
- normalization of basic grains
- operation of the price and market information service for agricultural products in Guatemala

13. Infrastructure, Equipment and Work Facilities

One terminal plant in Guatemala City with the following capacity: 80 metric tons per hour for receipt and dispatch; 40 MT/H drying; 25 MT/H cleaning, 16,000 MT silo storage space for corn and 1,500 MT warehouse storage space for corn.

Five terminal plants at Regional levels with total capacity as follows: 160 MT/H for receipt and dispatch; 80 MT/H cleaning and drying; 32,000 MT silo storage space for corn and 5,800 MT warehouse storage space for corn.

Twenty-two treatment plants for purchase and assembly in the production areas (country elevators) with a total capacity as follows: 175 MT/H for receipt and dispatch, 175 MT/H cleaning and drying, 15,000 MT silo storage space for corn and 7,000 MT warehouse storage space for corn.

One central laboratory for quality control and one laboratory for grain classification in each of the 27 plants.

14. List of Recent Publications related to Post-harvest Loss Reduction

None

15. Source of Financial Support

INDECA is the Government marketing institution. Its annual budget is derived from its operations and government subsidies.

16. Coordination and Agreements with Other Institutions

At the present time (June 1979) INDECA has no contracts or agreements with international institutions, however, conversations are being held with the Canadian International Development Agency (CIDA) for technical assistance in maintenance of silos and with FAO, for a program of small on-farm silos, as an activity in post-harvest loss reduction.

17. Post-harvest Specialists

- Name : Ing. Agr. Julio Soler
Title : Director de Operaciones de INDECA
Address : 11 Calle, 3-23 Zona 9
Guatemala, Guatemala
- Name : Juan José Velásquez G.
Title : Head, Department Planning Operations and Control
Address : 27 Avenida 24-28 Zona 5
Guatemala, Guatemala
- Languages : Spanish, English
Field of expertise : -Management and conservation of stored grains
-Pest control in production zones
Products handled : Maize, beans, rice
- Name : Marco Tulio Sánchez R.
Title : Head, Department of Management and Conservation of grain
Address : 4 calle 1-28 Zona 1
Guatemala, Guatemala
- Languages : Spanish
Field of expertise : Grain handling (drying, etc.), storage in silos and warehouses and control of insects.
Products handled : Maize, rice, beans, sorghum

Name : Flaviano Alfonso Rivera
Title : Head Central Laboratory
Address : 5 a Calle 31-05 Z 11 Col. Utatlán II
Guatemala, Guatemala
Languages : Spanish
Field of expertise : Grain management (drying, cleaning), grain
storage and insect control
Products handled : Maize, beans, rice and sorghum

1. Name of Institution

Instituto de Nutrición de Centroamérica y Panamá -INCAP
(Institute of Nutrition for Central America and Panamá)

2. Address

Instituto de Nutrición de Centroamérica y Panamá
Apartado Postal 1188
Guatemala, Guatemala

3. Telephone

43-762-67

4. Date of Foundation

1949

5. Nature of the Institution

INCAP is a scientific organization affiliated with the Panamerican Health Organization (PAHO) and serves as the specialized center of the organization to study the nutritional problems of the region, identify means to solve them and collaborate through technical assistance, with the member governments, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua and Panamá, to assure the effectiveness of the recommended measures. Through its extensive training program it also contributes to the preparation of professional and technical personnel in different aspects of nutrition and food sciences.

6. Objectives

The primary objective of INCAP is to contribute towards reaching a satisfactory level of nutrition for the total population of the Isthmus of Central America and by extension, the whole continent, through a better understanding of nutrition in all of its aspects and resulting applications.

7. Institution or Organization upon which Dependent

Panamerican Health Organization

8. Number of Employees

Total number : Between 400 and 450

Number of technicians and professionals : between 100 and 120

Number of professionals working in agricultural marketing : None

Number of professionals working in post-harvest loss reduction : 5

9. Area of Expertise of those Technicians working in Post-harvest Loss Reduction

The two fields of expertise covered by INCAP professionals are bio-chemistry and food technology.

10. Name of the Technical Unit(s) working in Post-harvest Activities

- Division of technical sciences and food
- Division of control and analysis of food
- Unified laboratory for food control

11. Principal Agricultural Products handled by the Institution

Corn, wheat, soya, sesame, beans, coffee, vegetables and others.

12. Summary of Principal Functions carried out in the Area of Post-harvest Loss Reduction

In an attempt to reach its objective INCAP carries out activities in investigation, education and technical cooperation in five principal areas of action:

- Studying the food and nutritional problems of the region, the responsible factors and their consequences.
- Looking for and proposing solutions to the problems identified.
- Colaboration with member countries in the formulation of plans and policies oriented towards the solution of the food and nutritional problems at the national and regional level.
- Promoting the application of these plans and policies.
- Training professional and technical personnel in different aspects of nutrition and food sciences.

13. Infrastructure, Equipment and Work Facilities

- Laboratories provided with excellent equipment destined for work in physiological chemistry, agricultural and food sciences and clinical and micro-biological investigations.
- Instalations for the development of clinical and metabolism studies in children and adults with a well equipped laboratory for work physiology.
- Pilot plant for food technology with equipment for food processing.
- Facilities for studies of experimental animals, statistical laboratory, center for the mechanical processing of data, an ample auditorium, conference rooms, audiovisual services and shops for printing, photography, mechanics, carpentry and others.
- One of the most complete libraries on nutrition and related fields in Latin America, containing more than 30,000 volumes, 25,000 summaries of selected articles and 15,000 serialized pamphlets on related subjects.

-A rural training center and various field stations.

-An experimental farm of 47 hectares

14. List of Recent Publications related to Post-harvest Loss Reduction

Each year INCAP publishes more than 100 scientific articles and graduate thesis on diverse aspects of health and nutrition in English and Spanish.

15. Source of Financial Support

Approximately 12 percent of the annual budget for INCAP comes from contributions of the six member countries. The balance comes from donations from PAHO and other institutions or foundations.

16. Coordination and Agreements with other Institutions

-Agreement with the University of San Carlos of Guatemala for the structuring of the Center for Superior Studies in Nutrition and Food Sciences (CESNA).

-INCAP receives technical and financial support from more than 20 international and bilateral institutions and universities.

17. Post-harvest Specialists

- Name : Dr. Ricardo Bressani
Title : Head of the Division
Address : INCAP
Apartado 1188
Guatemala, Guatemala
Languages : Spanish, English, Italian
Field of expertise : Microbiological and nutritional evaluation of grains, legumes and processed foods.
Products handled : Grains, legumes, processed foods
- Name : Marit de Campos
Title : Head, Section on Food Contamination, Unified Laboratory for Food Control
Address : INCAP
Apartado 1188
Guatemala, Guatemala
Languages : Norwegian, English, French, German, Spanish, Swiss
Field of expertise : Food contamination, correct methods for food storage and transportation and protection against insect attack.
Products handled : All types of food products

Name : Elvira González de Mejía
Title : Associate Investigator of the University of the
United Nations
Address : INCAP
Apartado 1188
Guatemala, Guatemala
Languages : Spanish, English
Field of expertise : Post-harvest loss reduction of legumes and cereals.
Products handled : Cereals, grain legumes

1. Name of Institution

Instituto Centroamericano de Investigación y Tecnología Industrial-ICAITI
(Central American Institute for Investigation and Industrial Technology)

2. Address

Instituto Centroamericano de Investigación y Tecnología Industrial
Avenida la Reforma 4-47 Zona 10
Apartado postal 1552
Guatemala, Guatemala, C.A.

3. Telephone

310631/35- cable: ICAITI

4. Date of Foundation

Established : 1956

5. Nature of the Institution

The Instituto Interamericano de Investigación y Tecnología Industrial (ICAITI) is a non-profit regional organism established by the governments of the five republics of Central America: Costa Rica, Nicaragua, El Salvador, Honduras and Guatemala. Its purpose is to advise and provide technical services to member governments and the industrial sector of the region. It also carries out technological investigations tending to promote the rational and intensive use of the raw materials and natural resources of the region.

6. Objectives

The principal objectives of ICAITI are the following:

- Carry out studies concerning the production, preparation and use of raw materials.
- Develop, improve and test procedures, methods, tools, utensils, equipment and materials for new industries, for agricultural production, mining, domestic industries and others.
- Realize studies of existing productive enterprises so as to improve their efficiency.
- Undertake investigations, on a cost or cost-free basis, recommended by governmental institutions, industrial organizations, private enterprise or persons who desire to use the services of the institute.

- Carry out or participate in the preparation, publication and dissemination in a practical manner of technical information of use to the producers of the region.
- Help, in any way possible, to stimulate progress in technology, production, investigation and technical instruction.
- Cooperate with the respective offices of the Governments of Central America, universities, technical organizations and other entities to provide and promote scientific and industrial investigation and the training of investigators and technical experts, craftsmen and specialized workers.

7. Institution or Organization upon which Dependent

A directive committee composed of the Ministers of Finance of the five member countries.

8. Number of Employees

Total number : Between 120 and 140
Number of technicians and professionals : 60
Number of professionals working in agricultural marketing : None
Number of professionals working in post-harvest loss reduction : 12

9. Areas of Expertise of those Technicians working in Post-harvest Loss-Reduction

Two in food physiology, two in food biology and chemistry, four in food technology (processing) and four in food microbiology (processing).

10. Name of the Technical Unit(s) working in Post-harvest Activities

Chemical section of the Division of Applied Investigation

11. Principal Agricultural Products handled by the Institution

Basically tropical fruits, such as: pineapple, mango, avocado, papaya, banana, plantain and others.

12. Summary of Principal Functions carried out in the Area of Post-harvest Loss Reduction

Applied investigation in the following areas:

- industrialization of food products in Central America
- industrialization of tropical woods in Central America
- use of vegetable extracts
- drying and preservation of woods
- complete use of sugar cane for the production of "carburentes", raw materials for the synthesis of plastics, "microbiana" protein and pulp
- transport, handling and conservation of tropical fruits.

Studies have been made on many fruits, from the flowering stage through storage in cold and natural temperatures. Experiments have included use of preservatives and new containers.

Industrial technical studies and technical assistance:

- studies on chemical "intermedios" from renewable resources
- studies on low-cost housing construction materials in Central America
- technical assistance to other Industrial Technology Institutes
- "sucroquimia"

Efforts in normalization :

- preparation of proposals for norms for industrial quality, application of sampling, study of observations and final editing
- norms for agricultural products for export.

Analysis, trials and experiments:

- analysis and laboratory and pilot plant trials, inspection visits and certification of origin of raw material and production
- analysis of insecticide residues in meat for export and in food products for local consumption
- study of environmental and economic consequences of the use of pesticides in the production of cotton in Central America
- mobile laboratory unit for microbiological services.

Documentation and Information:

- center for industrial information for Central America

Applied geology

13. Infrastructure, Equipment and Work Facilities

ICAITI has the following modern instalations used for investigation, analysis, trials and experiments:

- organic chemistry laboratory
- inorganic chemistry laboratory
- laboratory for leather technology
- laboratory and pilot plant for pulp and paper technology
- laboratory and pilot plant for textile products
- food technology laboratory
- laboratory for instrument analysis including gas chromatography and others
- a pilot plant well provided with its principal equipment and instalations for unitary operations
- four storage units for fruit
- scientific and technical library and a publications unit. Also includes a specialized library for quality norms.

List of Recent Publications related to Post-harvest Loss Reduction

A considerable number of studies and graduate thesis have been published by ICAITI, including the following:

- a) Julio César Corado de la Vega, "Consideraciones sobre respiración de frutas tropicales y diseño de equipos y experimentos para su medida. Aplicación de la respiración en almacenamiento en atmósferas controladas".
- b) Julia Alicia de Zeissig, "Investigación de insecticidas residuales en la fauna marina".
- c) Josué Vázquez, "Comportamiento durante el almacenamiento en frío de algunas variedades de aguacate en Guatemala".
- d) Francisco Alvarado Gómez, "Análisis químicos y físicos de diferentes frutales tropicales deshidratadas por varios métodos de secado".
- e) Sylvia E. Mendizábal Lara, "Desarrollo de las sustancias prácticas y sus enzimas durante el proceso de maduración de algunas frutas tropicales".
- f) Francisco Orozco López, "Deshidratación de frutas por amortización".
- g) Maria Luisa Piñola V. "Maduración de frutas tropicales".
- h) Maria del C. León de Yon, "Cambio de los azúcares y efecto enzimático durante la maduración de frutas".
- i) Caracterización, Manejo y Almacenamiento de Aguacate (piña); (mango); (papaya); (banano).
- j) Estudio de las consecuencias ambientales y económicas del uso de plaguicidas en la producción de algodón de Centroamérica.

15. Source of Financial Support

Financing comes from donations from member countries and other entities such as the Special Fund of the United Nations. It also receives financial assistance from diverse sources to implement specific programs, especially in the area of applied investigation.

16. Coordination and Agreements with other Institutions

None

17. Post-harvest Specialists

Name : Lic. J. Fernando Mazariegos
Title : Head, Division of Analysis, Trials and Experiments
Address : ICAITI
Avenida La Reforma 4-47, Zona 10
Guatemala, Guatemala
Languages : Spanish, English

Name : Lic. Maria del C. de Arriola
Title : Head, Section Natural Product Chemistry
Address : ICAITI
Avenida La Reforma 4-47, Zona 10
Guatemala, Guatemala
Languages : Spanish, English

P A N A M A

1. Name of Institution

Instituto de Mercadeo Agropecuario -I.M.A.
(Institute of Agricultural Marketing)

2. Address

Instituto de Mercadeo Agropecuario
Apartado 5638, Zona 2
Panamá, Panamá

3. Telephone

61-4555 or 61-5280

4. Date of foundation

IMA was established as an autonomous state institution in 1975. Prior to this date marketing activities were carried out by the Dirección Nacional de Mercadeo del Ministerio de Desarrollo Agropecuario (MIDA).

5. Nature of the Institution

IMA is the institution of the public sector responsible for the development of the agricultural marketing sub-sector.

6. Objectives

The principal objectives of IMA are the following:

- Promote the improvement of marketing systems for agricultural and animal products.
- Execute the marketing policies formulated by the Ministry of Agriculture and Animal Development (MIDA).
- Guarantee markets (internal/external) for national agricultural and animal products at fair prices.
- Organize, modernize and control marketing channels for the national agriculture and animal production.
- Meet national needs for farm production through the regulation of national and imported produce.
- Protect and harmonize the interests of producers and consumers in the marketing process.

7. Institution or Organization upon which Dependent

Ministry of Agriculture and Animal Development (MIDA)

8. Number of employees

Total number : Varies between 600 and 1300 depending on time of year and products handled

Number of technicians and professionals : 30-50

Number of professionals working in agricultural marketing : 10-15

Number of professionals working in post-harvest loss reduction : 2

9. Areas of Expertise of those Technicians working in Post-harvest Loss Reduction

The two technicians working in the field of loss reduction concentrate their efforts in the definition of quality standards and methods for improving packaging, transportation and storage of grains and perishables.

10. Name of the Technical Unit(s) working in Post-harvest Activities

Department of Technical Norms.

11. Principal Agricultural Products handled by the Institution

The principal products handled by IMA include: rice, maize, sorghum, onions, beans, soya, potatoes and poroto.

12. Summary of Principal Functions carried out in the Area of Post-harvest Loss Reduction

-Identification of storage losses in silos and cold storage facilities and recommendations to reduce them.

-Introduce modern technological innovations into basic infrastructure.

-Establish technical norms and manuals of procedure.

13. Infrastructure, Equipment and Work Facilities

Three complete grain laboratories for the analysis of humidity, impurities, yield, etc.

14. List of Recent Publications related to Post-harvest Loss Reduction

"Establishing Norms and Standards for Agricultural Produce", "Manual for Determining Grain Quality" and diverse brochures on handling perishable produce.

15. Source of Financial Support

Its annual operating costs are financed from its own operations plus commercial credit and Government subsidies.

16. Coordination and Agreements with other Institutions

IMA is receiving financial assistance from USAID for construction of basic infrastructure (silos and cold storage facilities) and training personnel in their management.

17. Post-harvest Specialists

Name : José A. Rodríguez
Title : Head of Planning
Address : Instituto de Mercadeo Agropecuario
Apartado 5638, Zona 2
Panamá, Panamá

Name : Juan B. Lataste M.
Title : Head, Department of Technical Studies
Address : Instituto de Mercadeo Agropecuario
Apartado 5638, Zona 2
Panamá, Panamá

Languages : Spanish
Field of expertise : Establishing norms for grains and perishable produce, procedures for laboratory analysis and post-harvest management of produce.
Products handled : Rice, maize, sorghum, onions, potatoes, other fruits and vegetables.

EL SALVADOR

1. Name of Institution

Instituto Regulador de Abastecimientos-IRA
(Institute for the Regulation of Food Supply)

2. Address

Instituto Regulador de Abastecimientos
Pasaje número 3, Séptima Avenida Norte,
Urbanización Santa Adela del Centro del Gobierno
San Salvador, El Salvador

3. Telephone

26-10-11

4. Date of Foundation

The IRA was created in 1950 under the name "Instituto Regulador de Cereales y Abastecimientos". It became IRA in 1953.

5. Nature of the Institution

IRA is an autonomous institution of the public sector responsible for the marketing of basic grains.

6. Objectives

The objectives of IRA are as follows:

- Promote the production of maize, rice, beans and sorghum.
- Improve the level of income for those farmers producing basic grains through guaranteed minimum prices.
- Increase the purchasing power of consumers through sales of basic foods at fair prices.
- Cover the deficits of those basic foods produced in El Salvador in insufficient quantities for internal needs.

7. Institution or Organization upon which Dependent

Ministry of Agriculture

8. Number of Employees

Total number: Fluctuates between 1422 and 1658 depending on the time of year.

Number of technicians and professionals: 82

Number of professionals working in agricultural marketing : 4

Number of professionals working in post-harvest loss reduction : 0

9. Areas of Expertise of those Technicians working in Post-Harvest Loss Reduction

One food technologist is employed by IRA but he is not working in his field of specialty.

10. Name of the Technical Unit(s) working in post-harvest Activities

There is none

11. Principal Agricultural Products handled by the Institution

Maize, beans, rice, sorghum, sugar and imported milk.

12. Summary of Principal Functions carried out in the Area of Post-harvest Loss Reduction

Purchases:

Through its assembly centers and storage plants IRA purchases some 20% of the national production of basic grains at guaranteed prices. It also purchases nationally produced sugar and imported milk.

Storage, Analysis and Packaging

After purchase the products are stored for short periods or as long as one year, for some products, in some years. Laboratory analysis is carried out on the grains to determine quality. Rice, beans and sugar are packed in 2 and 5 pound bags for distribution to the consumer.

Sales

The sales of the products are carried out by mobile units in marginal areas in times of critical scarcity, through stores attended by IRA personnel, through small family owned stores, retail stores in the case of milk and through public and private institutions such as hospitals, cooperatives, etc.

To date IRA activities in post-harvest loss reduction have been minimal with the exception of the construction of new silos. This institution does not have personnel working directly in this area. However, there does exist an awareness of the problem and they intend to give higher priority to identification of grain losses during their activities programmed for 1980.

13. Infrastructure, Equipment and Work Facilities

The IRA infrastructure consists of 6 warehouse plants for the storage of basic grains plus sugar and milk. It also has 11 assembly centers for purchase and storage of approximately 2,500 tons of grains. When additional storage space is required it is rented. The IRA has technical facilities for the laboratory analysis of grains and packing machinery for cereals and sugar.

14. List of Recent Publications related to Post-harvest Loss Reduction

No recent publications are available on post-harvest problems.

15. Source of Financial Support

The institution functions with funds obtained from the Government budget, loans and its own operating capital.

16. Coordination and Agreements with other Institutions

Financing has been received from USAID and the Government of El Salvador for the construction of 11 assembly centers por purchasing and storing basic grains. This project was completed in 1978.

Financing was obtained from the Interamerican Bank for Economic Integration and the Government for the construction of two storage plants with a total capacity for 12,000 tons of grains. Terminated in 1978.

In 1979 an 18 month agreement between IRA and FAO was signed for the training of personnel to operate existing silos in rural areas, the establishing of a documentation center on basis grains, the organization of IRA engineering services and putting the new silos into operation.

17. Post-harvest Specialists

Name	:	Anamaría de Aguilar
Title	:	Jefe de Planificación
Address	:	Instituto Regulador de Abastecimiento-IRA San Salvador, El Salvador
Languages	:	Spanish
Field of Expertise	:	Planning

1. Name of Institution

Centro Nacional de Tecnología Agropecuaria -CENTA
(National Center for Agricultural Technology)

2. Address

Centro Nacional de Tecnología Agropecuaria
Carretera Panamericana Km 33 1/2
La Libertad
Apartado 888
San Salvador, El Salvador

3. Telephone

28-20-66

4. Date of Foundation

The Centro Nacional de Agronomía began in 1943. After diverse changes and restructuring its activities in investigation, extension and agricultural training were integrated in 1973 under the name of CENTA.

5. Nature of the Institution

CENTA is a centralized executing organism of the public agricultural sector for the generation and transfer of technologies. At the executive level it is organized in three divisions. Agricultural Investigation, Extension and Seed Technology.

6. Objectives

The principal objectives of CENTA are the following:

- To increment the production and productivity of the diverse products constituting the agricultural sector, with emphasis given to those which satisfy the basic food needs and offer employment to the work force. The basic instrument used are investigation and development and transfer of technologies, which are applicable to the environmental and socio-economic conditions of the country.
- Foment the active participation of the rural farm family in the development of the agricultural sector, thru the implementation of extension programs at the national level.

7. Institution or Organization upon which Dependent

Ministry of Agriculture and Livestock.

8. Number of Employees

Total number : between 600 and 700
Number of technicians and professionals: between 150 and 200
Number of professionals working in agricultural marketing : none
Number of professionals working in post-harvest loss reduction : six

9. Areas of Expertise of those Technicians working in post-harvest Loss Reduction

Bio-Chemistry

10. Name of the Technical Unit(s) working in Post-harvest Activities:

Laboratory for pesticide residue analysis and the Division for Extension Services.

11. Principal Agricultural Products handled by the Institution

Corn, beans, sorghum, rice, fruit, vegetables, cotton, sugar cane and henequen.

12. Summary of Principal Functions carried out in the Area of Post-harvest Loss Reduction

The laboratory for pesticide residue analysis offers services for the physical/chemical analysis of soils, water, inputs and agricultural products dictating the corresponding conclusions and recommendations. This includes the annual analysis of thousands of samples of agricultural products to determine the level of chemical residues (insecticides, etc.)

For over a ten year period the Extension Division has been implementing a program to introduce small scale silos (1 ton) at the farm level.

13. Infrastructure, Equipment and Work Facilities

CENTA has three modern and complete laboratories:

- Agricultural Chemistry
- Quality control
- Analysis of residues

14. List of recent Publications related to Post-harvest Loss Reduction

None

15. Source of Financial Support

Financing is derived from the public sector and loans from USAID, IDB and other international institutions.

16. Coordination and Agreements with other Institutions

CENTA has several agreements or contracts for technical assistance with AID, IDB, CATIE, Israel, England, CIMMYT, CIAT, CIP and IICA, however, none of these are related to activities in the reduction of post-harvest losses.

17. Post-harvest Specialists

Name : Dra. Gloria R. Calderón
Title : Head, Pesticide Residual and Food Contaminants
Research Laboratory, CENTA
Address : Laboratorio Investigación de Residuos de Plaguicidas
CENTA
Apartado 885
San Salvador, El Salvador

Languages : Spanish, English
Field of expertise : Pesticide residual research in vegetable crops and
foods in general
Products managed : Foods in general

COLOMBIA

1. Name of Institution

Centro Internacional de Agricultura Tropical-CIAT
(International Center of Tropical Agriculture)

2. Address

Centro Internacional de Agricultura Tropical
Apartado aéreo 6713
Cali (Valle) - Colombia

3. Telephone

27119 and 27044

4. Date of Foundation

1967

5. Nature of the Institution

CIAT is a non-profit international institution dedicated to agricultural and economic development in the tropics.

6. Objectives

The objectives of CIAT are to generate and transfer, in collaboration with national institutions, improved technologies which contribute towards increased production, productivity and the quality of some basic foods of the tropics, particularly those countries of Latin America and the Caribbean. In this way producers and consumers with limited resources can increase their purchasing power and improve their level of nutrition.

7. Institution or Organization upon which Dependent

CIAT works in collaboration with many national and international institutions but is dependent upon none.

8. Number of Employees

Total number : Approximately 1400
Number of technicians and professionals : 200
Number of professionals working in agricultural marketing : 0
Number of professionals working in post-harvest loss reduction : 6

9. Areas of Expertise of those Technicians working in Post-harvest loss-reduction

The specialists in post-harvest loss reduction include Entomologists, Biochemists and Plant Pathologists.

10. Name of the Technical Unit(s) working in Post-harvest Activities

Yuca Program and the Bean Program

11. Principal Agricultural Products investigated by the Institution

Yuca, beans, rice and pastures

12. Summary of Principal Functions carried out in the Area of Post-harvest Loss-reduction

Yuca; investigations related to:

- Nature of the physiological deterioration of the tubers.
- Control of physiological rots and microbes in the tubers.
- Chemical and bio-chemical changes occurring after physiological rotting.

Beans:

- Search for economical techniques to prevent bean losses in storage, for example: use of vegetable oil, non toxic insecticides, fumigation and genetic resistance of some bean varieties to insects.

13. Infrastructure, Equipment and Work Facilities

To carry out experiments in the Yuca and Bean Programs CIAT has the necessary infrastructure and equipment including: dry storage rooms, two growing rooms with controlled temperatures and humidity, laboratories and equipment, a germ plasm bank and lots for multiplication of varieties.

14. List of Recent Publications related to Post-harvest Loss Reduction

- Booth, R.H. Cassava Storage. Series EE-16-CIAT 1975.
- Lozano, J.C. Cock, J.H. and Castaño, J. New Advances in the Storage of Yuca (Spanish) Rev. Fitopatología Colombiana. Vol. 7, No. 1, julio 1978.
- CIAT. Informe Anual 1978-1979.
- Schoonhoven, A.V. Pests of Stored Beans and their Economic Importance in Latin America.
- Schoonhoven, A.V. Use of Vegetable Oils to Protect Stored Beans from Bruchid Attack.

15. Source of Financial Support

Financing comes principally from contributions from diverse foundations (Rockefeller, Ford, Kellogg) international banks (BIRF, BID) development institutions (AID, PNUD) and governments.

16. Coordination and Agreements with other Institutions

CIAT receives technical assistance from the Tropical Products Institute (TPI), London, in Post-harvest investigation and loss reduction and maintains cooperative agreements with diverse national and regional institutions.

17. Post-harvest Specialists

Name : José Carlos Lozano
Title : Plant Pathologist (SP)
Address : CIAT
P.O. Box 6713
Cali (Valle), Colombia

Languages : Spanish, English

Products handled : Yuca

Name : Christopher Wheatley
Address : CIAT
P.O. Box 6713
Cali (Valle), Colombia

Languages : English, Spanish

Products handled : Yuca

Name : Hart Van Schoonhoven
Title : Entomologist
Address : CIAT
P.O. Box 6713
Cali (Valle), Colombia

Languages : English, Spanish

Products handled : Beans

Other institutions in Colombia which have activities in investigation or reduction of postharvest food losses but which have not been included in this report due to insufficient time and financing, are the following:

<u>Institution</u>	<u>Activities</u>
1. Federation of Coffee Growers-Prodevelopment (Federación de Cafeteros)	Partial studies on postharvest losses in fruits and vegetables
2. Institute for Technological Investigations (IIT)	Studies on postharvest losses in Yuca and Plantains in Llanos Orientales and Quindío.
3. COLCIENCIAS	Studies of losses in perishable produce and grains.

HONDURAS

HONDURAS

It was not possible to either visit Honduras nor obtain the desired information by mail, however, it was learned that several activities in postharvest loss identification and reduction are underway in that country. These activities are summarized below:

1. The Secretary of Natural Resources (Sector planning and agricultural operations) has an agreement with the Swiss Government (Cooperación Suiza al Desarrollo-COSUDE) for the execution of a postharvest project. Three Swiss postharvest experts are presently working with two national counterparts in the following activities:

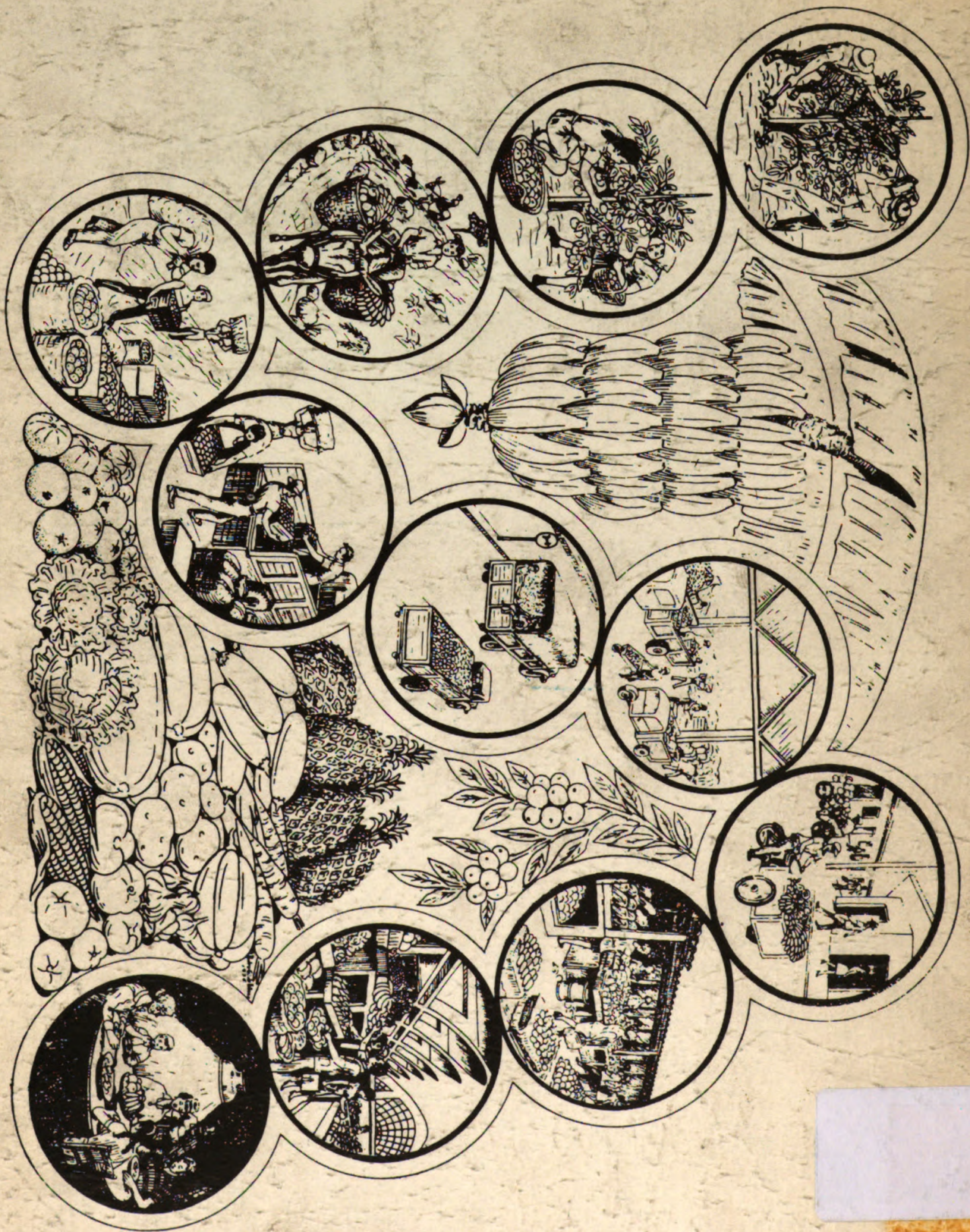
- Postharvest loss assessment at the small farm level.
- Identification and introduction of improved storage techniques.
- Training of extension staff.
- Development of human resources within the Secretariat of Natural Resources with the goal of establishing a postharvest coordinating body.

This programme is planned over an 8 year period with technical cooperation being offered on a 2 year renewable basis.

2. The Agricultural Marketing Institute (IMMA) for both perishables and grains is developing the following activities:
 - Rural silo project: development of rural silos/warehouses in grain collection centers.
 - FAO/IMMA Food Loss Programme: to establish 5 major silo complexes around the country and the rehabilitation of one rice mill. Entirely local staff.
 - Farm storage project: production of 9,000 1 Ton. metal bins for distribution to farmers (planning stage, funds to come from World Bank, EEC, Central American Bank and local).
3. DIFOCOOP-ICAITI (Dirección de Fomento Cooperativo):
 - Solar drying project for basic grains at Craola Cooperative Centre in Centro Oriental Region.
 - DIFOCOOP Professional Training Programme includes training in post harvest storage.

4. Comayagua Storage Investigation Unit (Unidad de Investigación de Comayagua) Sub-Dept. of USAID 1979. Small farm grain storage project for the development and distribution of metal bins. Offers extension and training of extension staff.
5. Escuela Agrícola Panamericana del Zamorano. Grain Storage trials at farm level.
6. CONADI: Food technology and nutrition.





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