

PN-AAW-100
ISN-9752
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Postharvest Institute for Perishables

Postharvest Losses of Perishable
Horticultural Foods
in the
Yemen Arab Republic

Report to the Yemen Arab Republic Government,
the Consortium for International Development
and the U.S. Agency for International Development

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by
Dr. Ronald W. Buescher

for the
Postharvest Institute for Perishables

GTS Report No.
PIP/Yemen/May 83/No. 4



in cooperation with
United States Agency for
International Development

Project Title: Storage and Processing of Fruits and Vegetables
Project No. AID/DSAN-CA-0265
Washington, D.C., U.S.A. 20523

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Yemen Arab Republic**

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I. EXECUTIVE SUMMARY

The U.S. Agency for International Development Mission in Sana'a requested in cable Sana'a 1528 that the Postharvest Institute for Perishables (PIP) provide technical assistance to the Ministry of Agriculture and the Yemen Marketing Association. Technical assistance and training were requested in postharvest handling, transportation, storage and marketing of vegetable and fruit.

In response to this request PIP obtained the services of Dr. Ronald Buescher from the Food Science Department at the University of Arkansas. Dr. Buescher spent the period of April 17 to 25, 1983 in Yemen doing an on-site review of the postharvest problems in collaboration with personnel from the Consortium for International Development (CID).

The results of Dr. Buescher's review are reported here. They will form the basis for a workshop on the subject to be conducted in Yemen during the latter part of May and early June, 1983. Dr. Buescher is expected to conduct the workshop in cooperation with appropriate personnel from CID.

Concerning the postharvest handling, transportation, storage and marketing of vegetables and fruit in Yemen, the following observations were made:

1. The demand for fresh fruits and vegetables in Yemen is increasing.
2. The present system of handling of perishable horticultural crops requires immediate marketing because there is a complete lack of techniques and facilities for delaying spoilage.
3. The lack of a market infrastructure results in heavy postharvest losses which cause commodity deficits and related wide price fluctuations.
4. Imported fruits are initially handled properly, but as they move through the transportation and market channels, there are serious losses because of improper handling.
5. Five crops (grapes, okra, onions, potatoes and tomatoes) are important because of domestic consumption and potential export market value. The YAR is capable of producing these crops in excellent quality and there is an excellent potential for a regional market.

However, before this market can be realized postharvest spoilage problems must be solved in order to export high quality produce.

6. Recommendations for reducing postharvest losses of perishable crops focused primarily on the needs for education, applied research programs, development of a communication system for farmers and marketing agencies, improvement of handling and storage systems, and development of preserved food products.

II. THE SITUATION

This assessment of the postharvest handling, storage, transportation and marketing situation in the Yemen Arab Republic (YAR) is based on discussions with government and private sector personnel, and visits to production centers, wholesale and retail markets around Dhamar, Sana'a, Al Bayda, Taiz, and Hodeidah and various related written studies (Appendix).

It is evident that demand for fresh fruits and vegetables in YAR is increasing. Farmers are responding by shifting production from traditional grain crops to the high-valued horticultural crops. In contrast to grain crops most horticultural crops are highly perishable and require rapid marketing and/or specialized techniques in order to prevent spoilage. In the YAR appropriate postharvest technologies have not been developed for protecting fruits and vegetables against deterioration of quality and loss of food value. While no defined studies have been conducted on the extent of postharvest losses in the YAR, it is obvious from products examined during marketing that losses are substantial.

The present system of handling of perishable horticultural crops requires immediate marketing since there is a complete lack of techniques and facilities for delaying spoilage. Even with rapid marketing, large losses are encountered since varieties resistant to deterioration are not used and methods of protecting against physical damage, high temperature, desiccation, insect, disease and rodents have not been adapted. When delays in marketing are encountered losses become catastrophic.

Farmers are particularly vulnerable to the present inadequacies in postharvest technologies and the lack of marketing infrastructure. The perishable nature of horticultural crops necessitates rapid marketing or facilities for storage when immediate marketing is not possible. During periods of surplus of particular commodities, farmers presently have no alternative but to assume economic losses due to insufficient prices or spoilage losses due to the lack of storage and handling systems.

The lack of methods to delay spoilage also affects consumers since uniform supplies are not available. Following periods of excessive production of certain crops farmers shift their production which causes deficits of particular commodities, a situation resulting in wide price fluctuations and inefficient land utilization. In addition, seasonal fluctuations in production result in similar trends of surpluses and deficits. The development of appropriate postharvest technologies and marketing systems is critically needed to provide uniform supplies of valuable foods and to protect against losses at the farm gate.

Companies which import fruits (bananas, apples and oranges) initially protect against spoilage losses by proper handling, sorting, sanitation and temperature management. However, it was observed that most of these fruits are subsequently transported and marketed at ambient temperature without suitable protection against desiccation, dirt and pests. Thus at the retail level many fruits are severely damaged and spoiled.

Five horticultural crops (grapes, okra, onions, potatoes and tomatoes) have been identified as being important for internal utilization and potential export markets. The export market for these commodities is highly promising since the YAR is capable of producing excellent quality and it is strategically located near countries which lack sufficient agricultural food production resources. Prior to establishing export markets it is critical that postharvest technologies and marketing infrastructures be established to assure the maintenance of quality standards and to protect against spoilage.

III. SUMMARY OF OBSERVATIONS

- A. Production of horticultural crops is increasing and future increases in production are promising;
- B. Postharvest technologies to protect against adverse changes in quality and product spoilage are lacking;
- C. Marketing channels, grades, information for efficient handling, quality indices and quantity and price news need improvement;
- D. Large losses of perishable foods are encountered at farm, wholesale and retail levels from inadequate postharvest technologies and deficiencies in the marketing complex.
- E. Research and training programs to address the present situation and develop solutions to reduce postharvest food losses have not been established.

IV. RECOMMENDATIONS FOR REDUCING POSTHARVEST LOSSES OF PERISHABLE HORTICULTURAL FOODS IN THE YAR

- A. Training programs need to be established for educating students, extension workers and personnel in the private sector on postharvest principles and practices for reducing food losses.
 - 1. University programs should include a course on postharvest horticulture;
 - 2. Extension workers need to become knowledgeable of problems and remedies protecting against food losses so that they may educate the public and especially persons involved with production, handling and marketing of horticultural foods.
- B. Research programs need to be established for the development of appropriate methods and technologies for reducing losses in the YAR.
 - 1. Varieties which are most suitable for postharvest handling need to be determined;
 - 2. Technologies used in developed countries such as the U.S., Europe and Australia need to be examined for direct transfer to the YAR;

3. New methods need to be developed for situations which are unique to the YAR.
- C. Reports on local and regional production, availability, quality and wholesale prices need to be developed and broadcast to farmers and marketing agencies.
1. Establishment of marketing news service by MAF and/or marketing associations;
 2. Establishment of reports by the private sector and furnished by subscription.
- D. Handling and storage systems need to be developed to delay postharvest spoilage and maintain quality products.
1. The private sector needs to develop handling and storage systems for wholesale and retail markets as well as for export markets.
 - a. Long term storages for potatoes and onions;
 - b. Storages to delay deterioration of grapes, okra and tomatoes;
 - c. Methods of accumulating quantities of produce for efficient transport;
 - d. Methods of grading, pest control, packaging and temperature management.
- E. Methods of food preservation and product development need to be examined.
1. Generally crops for processing are much lower in value than those for fresh market, however various products could be developed which would greatly increase the value of the fresh commodity. Preserved products unique to the YAR and for potential export need to be examined.

V. APPENDIX

1. Farms and Markets Observed

- a. Sana'a retail and wholesale markets
- b. Dhamar - seed potato production center
- c. Al Bayda - potato and onion production, retail market
- d. Taiz - wholesale and retail market, tomato, potato, onion production
- e. Hodeidah - retail markets, cold storage facilities of Foodic, Hodeidah Cold Storage Company and Yemeni Dairy and Juice Products

2. Persons Contacted

- a. Ahmed Said, MAF, Marketing Section
- b. Ali Saif Hassan, General Manager, Agricultural Marketing Company
- c. Jeff van Horn, General Manager, Seed Potato Center
- d. J.S. Brar, Horticulturist, MAF/UNDP, Taiz
- e. Nouraldin Thabet, Yemeni Dairy and Juice Products
- f. Faisal - Agricultural Marketing Company
- g. Agricultural Marketing Company personnel in Al Bayda, Taiz and Hodeidah
- h. Tom LaQuey, CID/Yemen
- i. Milton Snodgrass, CID/Yemen
- j. Robert Witters, CID/Yemen
- k. Royal Brooks, CID/Yemen
- l. Tracy Atwood, USAID/Yemen
- m. Pat Peterson, USAID/Yemen
- n. Richard Cobb, USAID/Washington
- o. Chris Crowley, USAID/Washington
- p. John Robins, USAID/Washington

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