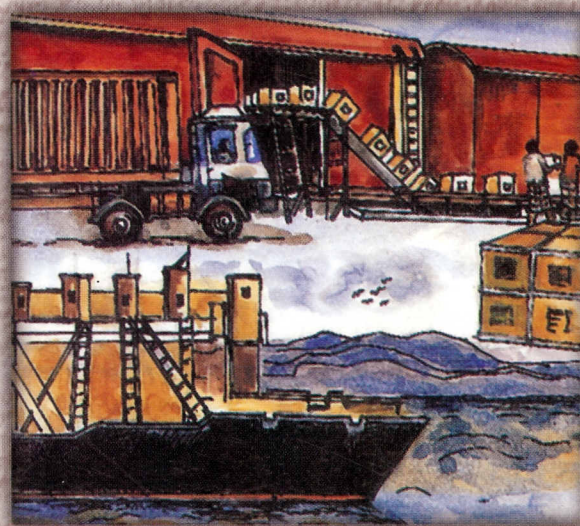
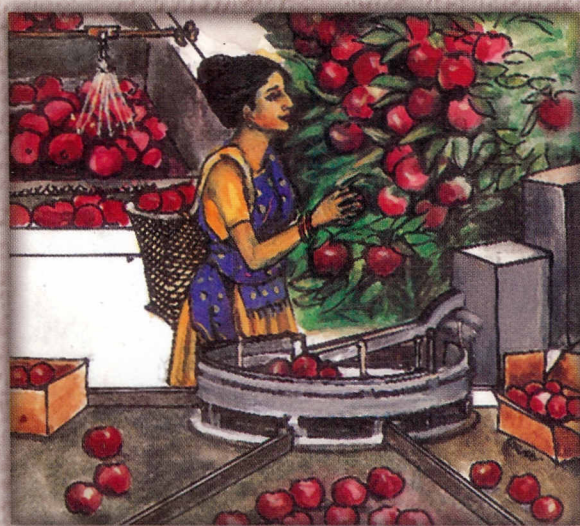




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Postharvest Management in Agriculture

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A S Chandel and R M Kamal



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the mud or back walls of the silos or bins to provide moisture proofing. Construction methods for the different sizes of store are explained. The bamboo basket is similarly protected against rodent damage with 700 gauge polyethylene film separating 2 baskets placed inside each other. Black LDPE film is used to seal the solar bed upon which grain is spread for drying. Technical data and comments are included regarding durability, grain quality, air-tightness and thermal insulation for these structures. Costs in Indian rupees are also presented.

190 YADAV, TD. 1990. **Use of plastic film for storage of food grains in India.** *Proceedings of the 11th international congress on the use of plastics in agriculture.* (New Delhi: 1990: 26 Feb-2 Mar). Rotterdam, Netherlands: AA Balkema, D.31-D.39.

India has depended on plastic films to provide safe storage structures and facilities and ensure proper protection during pre-harvest and postharvest handling. Cover and plinth, fumigation cover and liner in rural storage bins (Pusa bin/Pusa Kothar) are popular. All these uses are mainly based on low density polyethylene film (LDPE), "Agri film". Processed food and spices are packed in polypropylene, polystyrene or LDPE laminate. A large range of plastics of flexible and non flexible categories used in drying, disinfestation, threshing, and rural fumigation have not been so widely used. The main advantages of plastics in storage and handling are moisture-proofing and air tightness combined with economic returns. Previous experience in the use of plastics, present status and future projections are discussed.

191 ZANJAL, PN; RAO, KVSS; MATHUR, BN. 1990. **Development in food packaging.** *Indian dairyman*, 42: 10, 419-424; 19 ref.

Developments in food packaging materials are reviewed under the headings: demands of the consumer; and plastic packaging (flexible packaging, laminates and integrated packaging). Data on types of packaging films used for different foods and milk products are tabulated.

AGRICULTURAL PRODUCE

Storage and storage decay

192 AGRICULTURAL PROJECT SERVICES CENTRE (APROSC), KATHMANDU, NEPAL. 1982. **A study on farm level storage practices in Nepal.**

193 BHAT, RV. 1988. **Mould deterioration of agricultural commodities during transit: problems**

194 DASGUPTA, MK; MANDAL, NC. 1986. **Ecology and epidemiology of postharvest diseases of perishables: prelude to their control.** *Review of tropical plant pathology. Volume 2*/edited by WH Heywood; J McNeil. New Delhi: Today and Tomorrow's Printers and Publishers, p. 329-363.

by developing countries. *International Journal of Food Microbiology*, 7: 3, 219-225; 4 ref.

The problem of mould growth and aflatoxin accumulation in the commodities transported over long distances from the cultivation regions to the consumption centres is discussed. If the contamination occurs during transit, often no insurance cover for the risk is available. Because of different methods of sampling followed in the exporting and importing countries it is often difficult to define the exact responsibility of the development of aflatoxin as having taken place during transit. The statistics of the export of aflatoxin high-risk commodities like red pepper (chillies), cotton seed and groundnut extractions clearly, for the last decade, demonstrate the extent of loss suffered by the exporting countries because of aflatoxins. The problem of mould damage and mycotoxin contamination can be minimized by improving facilities for storage at ports and transit points as well as on ships.

195 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS, ITALY (ROME) 1977. **An analysis of an FAO survey of post harvest food losses in developing countries.**

196 HIMALAYAN CENTRE FOR APPLIED ECONOMIC RESEARCH, KATHMANDU, NEPAL. 1992. **A survey of storage facilities for Agricultural Commodities and their utilization in 31 Districts.**

197 KHAN, RAR. 1992. **How to save growers against losses of perishables.** *Journal of Rural Development and Administration (Pakistan)*, Agriculture Development Bank of Pakistan, Islamabad (Pakistan) 24: 2, 43-50.

198 REED, W. 1987. **Increase of productivity of crops: control of pre-and post-harvest losses.** *Towards a second Green Revolution. From chemical to new biological technologies in agriculture in the tropics. Proceedings of the International Meeting. No. 19: Developments in Agricultural and Managed-Forest Ecology.* (Rome, Italy: 1986: 8-10 September)/ edited by GB Marini Bettolo. Amsterdam: Elsevier, p. 249-258.

199 SRIVASTAVA, UK; VATHSALA, S. *Agro-processing strategy for acceleration and exports*. New Delhi: Oxford & IBH Publishing, 1989. 435 p.

The proceedings of a workshop organized by the Export Centre for Management in Agriculture, at the Indian Institute of Management, Ahmedabad Campus are presented. The report contains the Keynote address and three theme papers dealing with, respectively: (1) farm-industry linkages; (2) science and technology in agricultural development, using the farm-industry linkage approach; (3) trends in the domestic export market; and (4) short-run food exporting strategies. Commodity-related discussions and papers are also included. Products or product groups studied include: (1) fruits and vegetables; (2) processed foods and snacks; (3) marine products; (4) meat and meat products; (5) silk and silk products; (6) plantation crops; and (7) oil cakes and soya products. Finally, the report contains two papers dealing with respectively: (i) credit availability for setting up agro-industrial projects; and (ii) policy issues relating to exports and packaging.

Marketing

200 BHATIA, GR; BHATTACHARYA, AK. 1990. *Marketing of agricultural produce of Bhutan*. *Agricultural Marketing*, 32: 4, 17-23.

Integrated river valley projects, initiated by the government in Bhutan have shown positive results in terms of agricultural production and rising marketable surplus. However, domestic absorption of this surplus is limited and there is need to look for adjoining markets in India to raise returns to Bhutanese farmers and the agricultural economy, in general. Financed by the Government of India, this survey attempts to identify markets of probable interest to Bhutan and suggest ways of improving marketing. A list of potential markets is drawn for specific products such as oranges, apples, potatoes, dried chillies, soyabeans and off-season green vegetables. The development of early maturing varieties, in some cases, could yield even higher returns. But there is need to improve storage, packaging and transport of perishables. Other recommendations include a regular flow of information, credit facilities, collective marketing by formal and information groups and regulation by the Food Corporation of Bhutan. Primary data for the survey were collected by means of interviews with traders, market committee staff and government officials. Where available, secondary sources were used to supplement the data.

201 BIRADAR, RD. 1989. *Effectiveness of regulated*

markets in protecting the interests of cultivators at the market place: a case study of Shree Shahu market yard, Kolhapur, Maharashtra. *Agricultural Marketing*, 32: 2, 25-28.

The paper studies the marketing system at the Shree Shahu regulated market yard in Kolhapur, Maharashtra, India, and the effectiveness of the market in protecting the interests of farmers. It reports on the weighing and grading system, payment procedures, market intelligence, storage, transport, packaging and the turnover of the market. Amongst the suggestions for improvement are that the market should stay open for extended hours throughout the harvesting season, the higher prices and lower marketing costs are needed to make the market more attractive, and that prompt payments to farmers are needed.

202 CHOUDHARY, R; GUPTA, S; PANT, M; BAIKAKATI, D; MASOOD, K; SARKAR, S. 1987. *Agricultural exports strategy: problems and prospects*. London: Sangam Books, 349 p.

The book looks at various trade aspects of India's agricultural export commodities, which are grouped as live animals, meat and meat products, cereals, vegetables and fruits, flowers, spices and oilseeds, cakes and edible oils. Following the introduction, chapter 2 examines India's export performance between 1970-81, chapter 4 highlights India's major competitors on the international market and chapter 7 discusses the comparative trade advantages. Chapters 3, 5 and 6, which have been abstracted separately [see author index under same authors], review respectively: the major world importing markets of the agricultural commodities normally exported by India; trends in the volume and value of imports of fruit and vegetable juices into 25 major importing countries; and the structure and technological level of the fruit processing industry in India. The final chapter outlines the policy implications of findings.

203 CHOUDHARY, R; GUPTA, S; PANT, M; BAIKAKATI, D; MASOOD, K; SARKAR, S. 1987. *Identification of major importing markets and behaviour of their imports of agricultural commodities*. *Agricultural exports strategy: problems and prospects*. London: Sangam Books, p. 44-122.

Trends in volume and value of world agricultural imports between 1970-81 are analysed with particular attention to fruits (oranges, tangerines, clementines, bananas, lemons, apples, grapes, pears and raisins), vegetables (potatoes, tomatoes and onions), citrus fruit concentrates (pineapple juice and mango juice), oilseeds, edible oils and fats, spices, meat and meat products and

cereals (wheat, rice, barley, malt and maize). The leading importing countries are highlighted noting their relative share of world imports.

204 KASHYAP, P. 1991. **Marketing rural products in India.** *Small Enterprise Development (United Kingdom)*, 2: 2, 51-55.

205 RAO, BR; RAO, DP. 1990. **Agricultural commodity transportation in India - a bird's eye view.** *Agricultural Marketing*, 33: 2, 31-36; 1 tab.

An efficient transport system is a crucial component of a marketing system for perishable agricultural products. The article outlines the role of the transportation system in Indian agriculture and gives a product-wise account of the modes of transport used. Products include cereals, pulses, oilseeds and oils, fruits, vegetables, spices and drugs. Natural fibres and livestock are also discussed. Generally, animal-driven carts and trucks are used domestically and ships are used internationally. The need to review the existing infrastructure is emphasized. It is argued that commodity flows can be improved significantly.

206 THAKUR, DS; CHAUHAN, SK; SHARMA, KD. 1988. **Efficiency and weaknesses of regulated markets.** *Indian Journal of Agricultural Marketing*, 2: 1, 48-59.

The paper highlights the weaknesses and efficiency as well as remedies for improving the functioning of regulated markets, with reference to Himachal Pradesh and Gujarat states. Regulated markets in Himachal Pradesh were found to be much more developed than in Gujarat. In many cases the regulated markets exist only on paper as the act has not been implemented in practice. Various marketing problems were faced by farmers due to lack of sufficient facilities in the markets, delays in auctioning and unloading of trucks for several days, delayed payment, deductions made on the pretext of spoilage, low grade, defective packaging, etc., and the charging of unauthorized market charges and a high rate of commission from both buyers and sellers.

CEREAL GRAINS

Postharvest handling

207 AGRICULTURAL PROJECT SERVICE CENTRE, KATHMANDU, NEPAL. 1983. **Nepal postharvest food grains sector study.**

208 ALL INDIA CO-ORDINATED ICAR SCHEME FOR STUDIES ON HARVEST & POST HARVEST TECHNOLOGY INDIA, IDRC-ICAR OPERATIONAL RESEARCH PROJECT IN POST HARVEST TECHNOLOGY. 1982. **Highlights of post harvest research in India 1972-1982.** 40 p.

This report includes sections on harvesting technology (rice, sorghum, groundnut, acoustic type moisture indicator); cleaning and grading technology (T NAV winnower with scalper, tested on paddy and sorghum; rotary screen grain pre-cleaner, tested on wheat and paddy); drying technology (solar cabinet drier; agricultural waste-fired drier); storage technology (coal tar drum bin and Hapur bin; Udaipur bin; Chittore stone bin; double-walled polyethylene sandwiched bamboo bin; nanda bin); shelling and decortication technology (pedal-operated dehusker sheller, power-operated maize husker sheller; groundnut decorticator); milling technology. Technology under research and ready for research is listed.

209 BAINS, GS. 1989. **Grain processing in India.** *Trends in food science and technology: Proceedings of the Second International Food Convention.* (Mysore: 1988: 18-23 Feb.). Association of Food Scientists and Technologists, p. 319-326; 15 ref.

Grain processing techniques and the developing trends towards more refined products are discussed.

210 BANSAL, NK. 1989. **Solar crop drying: status and prospects.** *Renewable energy for rural development. Proceedings of the national solar energy convention.* (Hyderabad: 1988: 1-3 Dec)/edited by VVN Kishore; NK Bansal. New Delhi: Tata McGraw-Hill, p. 1385-1399.

Developments in solar crop drying technology are described, from solar kilns for drying timber to cabinet, tunnel and shelf driers for grain and flat-plate solar air heating collectors. A case study of grape drying to produce raisins is presented. The parameters influencing the drying process are discussed and variations of solar drying methods are illustrated. Floor drying with different covers (PVC foils) produce different colour quality. A multilayer drier with air heating collector and fan is illustrated. Prospects for solar fruit crop drying in India are considered.

211 CONWAY, G. 1978. **Food grain in Nepal: an overview of the post harvest sector.** Nepal Food Corporation, Nepal.