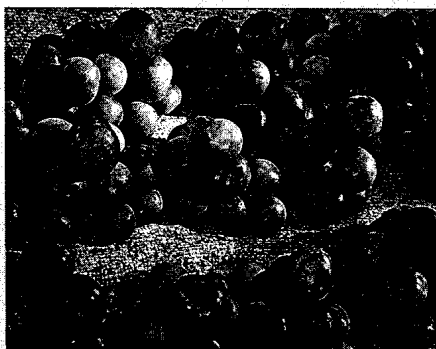


# How quality control protects consumers

By G. Sileshi and P. Barklund

**D**EMAND for exotic tropical and subtropical fruits is on the increase in developed countries, in tandem with the growing popularity of organically produced foods among consumers who want to enjoy healthier lifestyles. The demand is creating new market opportunities for farmers and businesses around the world.

Experience from Uganda and Burkina Faso shows that the demand for dried fruit cannot be satisfied at current levels of production. For instance, Masaka Organic Producers of Uganda process about 800kg of dried fruit a month, but demand from Germany for their produce is about five tonnes (5000kg) a month. Dried fruit is used in breakfast cereals, confectionery and baking, dairy and baby food products, and is widely enjoyed as a treat on its own.



*Demand for fruits on increase.*

Since the Uruguay Round Agreement on Agriculture (URAA), there has been a significant improvement in market access for goods such as fruit products originating in developing countries. Some indigenous fruits of the miombo have international marketing potential, but certain minimum standards of quality have to be met before that potential can be tapped.

Plant protection poses a major challenge to ensuring quality in fruit products. Our experience in southern Africa shows that a wide range of pest organisms in the forest affects miombo fruit trees. Theoretically, intensified cultivation of fruit trees leads to increased pest attacks, and there are already clear indications of growing levels of pest infestations of trees and fruits.

Commercialisation of the fruit is also bound to lead to changes in the way we deal with the organisms that attack fruits as we try to meet the demands for better quality produce. Organisms that we consider as normal pests of a tree in the miombo ecosystem may not be tolerated at all under commercial cultivation. Unless special precautions are taken, fruits can become contaminated with fungi, bacteria and insects which are always present in the air, soil and water. Contamination can occur any time in the orchard or when the fruit is on its way to the consumer. Phyto-sanitary and food safety issues inevitably influence the marketing of fruits. Therefore, quality control becomes a critical issue.

Among the areas that need to be urgently addressed are quarantine pests, pesticide residues and food safety issues.

## Quarantine pests

When exotic pests and pathogens are introduced into an area in which they did not previously exist, they are likely to cause much more catastrophic epidemics than do the native ones. A quarantine pest is one of potential economic importance in the area it endangers, whether it is present there, or present but controlled and not widely distributed. Also, if a pathogen already exists in an area, the introduction of new genotypes that cross with existing genotypes would allow for greater gene diversity and thus poses a greater risk of the pathogen overcoming the trees' resistance. Quarantine therefore

becomes more necessary than ever, because to limit the genetic diversity of an existing pest can be as important as excluding new pathogens. Pests and diseases usually survive for a long time during storage and transport when fruits, timber and other products are shipped to other countries. The receiving country therefore, needs import quarantine to protect its own plants.

Fruits that are likely to harbour quarantine pests and diseases are banned from the countries where these pests and diseases are known to occur. Insects such as fruit flies, codling moths, scale insects and mealy bugs that attack miombo fruits are among the major quarantine pests.

In almost all countries all fresh fruits are subject to import quarantine. Certain fresh fruits can be allowed in only when pest disinfection methods are completely effective, and the import ban is lifted through bilateral negotiations under special phyto-sanitary conditions. Certain fruits can also be imported when they have been frozen in accordance with standards specified under quarantine regulations. Likewise, dried fruit can be exempted from import restrictions if it is treated with seasonings and preservatives such as salt, sugar, vinegar, alcohol and sulphurous acid.

The accelerated spread of pathogens associated with the increase in food

*...continued on Page 20*



*A Uapaca Kirkiana pest.*

*Young Uapaca fruits trees affected by pest and diseases. Many Miombo fruits are susceptible to pests and diseases.*

## How quality control protects consumers

...continued from Page 19

trade between developing and industrialised countries has caused phyto-sanitary problems which are sometimes held up as barrier to trade. That is why national plant protection organisations worldwide have developed global institutions for international harmonisation of phyto-sanitary measures and their technical justification. The International Plant Protection Convention (IPPC), which was revised and approved by the Food and Agriculture Organisation (FAO) Conference in 1997, puts particular emphasis on International Standards for Phyto-sanitary Measures (ISPM) and their technical justification by Pest Risk Analysis (PRA).

Under IPPC, the Regional Plant Protection Organisations (RPPO) function as coordinating bodies in the different continents to further the objectives of the Convention, and to gather and disseminate information. The RPPO in Africa is Inter-African Phyto-sanitary Council (IAPSC). RPPOs produce regional standards for their members, and cooperate with each other and with FAO. They hold technical consultations to promote the development and use of relevant standards and to encourage inter-regional cooperation on phyto-sanitary measures for controlling quarantine pests and preventing their introduction and spread.

### Pesticide residues

Pesticide residues in food are a major cause for rejection of consignments. Farmers often use pesticides to control pests that could damage their fruit crop. Many farmers think that without pesticides they would make less profit, either because they would have lower yields or because their products would have poor quality. For example, fruits with attractive colour or smooth skin fetch a higher price than those with marks of insect or fungal damage.

Most countries have established Maximum Residue Levels (MRLs) for pesticides to safeguard consumer health, minimise the presence of residues in the environment and to

establish a uniform standard by which goods can be traded between countries. The MRL of any pesticide that may be left in a product is the number of milligrams of the pesticide residue per kilogram of the product. In the United Kingdom and the European Community a statutory instrument introduced in 1999 specifies maximum levels of pesticide residues for crops, food and stockfeeds. In the United States the Food Quality Protection Act of 1996 lays down similar guidelines, as does the Fertilisers, Farm Feeds, Agricultural Remedies and Stock Remedies Act in South Africa.

### Food safety

The last 10 years have seen the emergence of a range of scares associated with food safety, a significant increase in awareness of health issues and a redefinition of the quality of life. Food safety has emerged as a major source of conflict in international trade. Most of the foods considered unsafe originate from developing countries. The most frequent violations arise from contamination by insects, followed by microbial contamination and excessive levels of pesticide residue.

In the developed countries post-harvest handling of fruits and quality assurance have improved among producers, middlemen, retailers and processors. Refrigeration technology has also made possible establishment of cold chains for the post-harvest handling operations.

In most parts of Sub-Saharan Africa, however, storage, packaging, transport and handling technologies for fruits are practically non-existent, and tonnes of produce are lost or contaminated. The problem is particularly acute for small-scale fruit producers and processors. Consequently they meet tremendous obstacles in exporting fruits to the US or Europe.

There are many hazards associated with biological, physical and chemical contaminants. We will limit our discussion to those that relate to mycotoxins, allergens and pathogens.

**Mycotoxins** are fungal metabolites which are very poisonous to humans and

animals. They are produced mainly by the fungal genera *Aspergillus* and *Penicillium* (aflatoxins and ochratoxin) and *Fusarium* (deoxynivalenol, zearalenone, and fumonisin). In favourable conditions these fungi grow and produce mycotoxins in foodstuffs such as groundnuts, dried fruit, nuts, spices, apple juice and a range of cereals. They favour high temperatures, so contamination is widespread in tropical and subtropical regions of Africa, Asia and Latin America. Such contamination can occur in crops in the field, at harvest, during post-harvest operations and in storage.

Mycotoxins attract worldwide attention because of the significant economic losses associated with their impact on human health, animal productivity and domestic and international trade. Ochratoxin, aflatoxin and patulin cause major problems for food producers, and the European Commission strictly limits their levels in nuts, dried fruits and apple products.

**Allergens:** Food can be contaminated with allergenic sensitisers of plant, microbiological and animal origin. Of all the allergenic contaminants known to occur in post-harvest products, it is the storage mites that have received the most attention, though beetles, moths and moulds are also known.

**Pathogens:** Juices contaminated by pathogenic micro-organisms have caused numerous illnesses and deaths. Cooking eliminates many of the harmful pathogens in common foods of plant and animal origin, but fresh, unpasteurised fruit juices, despite their health-promoting value, can harbour dangerous contaminants. Refrigeration and controls on acidity can limit pathogen growth.

According to a recent FAO report, more than 11 outbreaks of food poisoning from fruit juices and ciders were recorded worldwide between 1994 and 1999. Most of them involved *Salmonella*, *Escherichia coli* O157 H7, *Cryptosporidium* and Hepatitis A. The emergence of hitherto unsuspected food pathogens with acid resistance, combined with growing numbers of people living with HIV and AIDS and susceptible individuals among the

# Use agroforestry to wipe out poverty, urges minister

INDIGENOUS fruit tree (IFT) domestication and commercialisation has received a positive response from farmers, the business community and other stakeholders.

In addition to eradicating hunger among the rural poor, IFTs have enabled some rural people to generate income and build assets, things they had not dreamed of in the past. Many farmers are already making a living from domesticating of indigenous fruit trees and processing the products.

"Indigenous fruits are also useful in advancing the health and nutrition of rural people. They adapt easily to local climate changes and thus are useful in conserving biodiversity," said Mr Mundia Sikatana, the Zambian Minister of Agriculture and Cooperatives, during the 14<sup>th</sup> Regional Agroforestry Steering Committee (RASC) meeting held in Lusaka, Zambia, in March 2004.

Mr Sikatana said IFTs could play the same role as other agroforestry species such as fodder and soil fertility improving trees. He urged ICRAF and its partners to grab the opportunities offered by indigenous fruits to help wipe out poverty in the



*Mr Sikatana receives indigenous fruit trees from Alfred Mkonda of ICRAF.*

region.

"There is a lot of potential in the domestication of indigenous fruit trees. There are ready markets for these fruit tree products throughout the region and overseas. ICRAF and partners should embark on serious capacity building, at individual and institutional level, to promote research and development of these indigenous fruit trees," he said.

*...continued on Page 22*

chronically ill, the very young and very elderly, has dramatically changed approaches to the problem.

Commercial fruit juices are therefore subject to strict regulatory control. Safety must always take precedence and strict safeguards have been imposed on production, harvest, transportation, storage, manufacture, processing, labelling and distribution. They include Good Agricultural Practices (GAPs), Good Manufacturing Practices (GMPs), Hazard Analysis, Critical Control Point (HACCP) procedures and "assured product schemes". HACCP is now an integral part of most food processes and can be applied all along the food chain, from the primary producer to the final consumer.

International regulatory organs such as the Codex Alimentarius Commission have developed food standards aimed at protecting the health of consumers and ensuring fair practices in the food trade. The commission, which is a joint effort by FAO and the World health

Organisation, promotes coordination of all food standards work undertaken by international agencies, government and non-governmental agencies. The commission's Codex Recommended International Code of Hygienic Practice for Tree Nuts provides basic hygienic requirements for orchard, farm processing and post-harvest handling.

Producers and exporters of miombo fruits should get to know about these standards and take the responsibility of complying with them.

## Conclusion

It is clear that meeting international health and safety requirements and standards is a crucial aspect of product development and commercialisation of miombo fruits for both the domestic and the export market. Appropriate pre- and post-harvest technologies must be developed and producers trained in:

- good farming practices that reduce pests and pesticide use;

- post-harvest procedures that reduce contamination of products with pathogens and toxic chemicals;
- hygienic processing, quality assurance and accepted rules of trade.

For small-scale producers to meet these standards, the FAO recommends that they participate in locally-based, applied field research such as integrated pest management farmer field schools. Manuals on good agricultural practices should be developed for use by farmers and extension officers. All stakeholders need to work closely with the national bureaus of standards, phyto-sanitary and quarantine regulators and export promotion agencies.

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