

# Cassava in Tropical Africa

A Reference Manual



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## UNIT 8

# Storage of Fresh Cassava

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Cassava tubers are extremely perishable. They can be kept in the ground prior to harvesting for up to about 2 years, but once they have been harvested they begin to deteriorate within 40-48 hours. The deterioration is caused by physiological changes and, subsequently, by rot and decay. Mechanical damage during the harvesting and handling stages also renders the crop unsuited to long-term storage.

Deterioration of cassava has an adverse effect on the processed product, and thus the crop must be stored properly. Traditional and modern methods of storage have been devised to combat post-harvest losses.

### Traditional storage methods

In most areas where cassava is grown under subsistence farming conditions, the problem of storage is overcome by leaving the mature cassava crop in the ground until needed. The main disadvantages of this method are that:

- large areas of land are used as a storehouse for the already mature crop and therefore cannot be used for further cropping; this decreases the economic output of the land and increases pressure on the land (there is already a considerable amount of pressure on the land in many countries in Africa because of high population growth rates)
- susceptibility to loss is increased because the tubers are vulnerable to attack by rodents, insects and nematodes
- tubers become more fibrous, lignification occurs, and consequently the crop's starch content and its suitability for many food preparations decline

Other traditional methods, based on the principle of preventing moisture loss from the tubers, include:

- storing harvested tubers in pits (this involves burying them in pits lined with straw or some other vegetative material)
- piling them into heaps and watering them daily to keep them fresh
- coating them with a paste of mud
- storing them under water

These methods prolong the shelf life of cassava by only a few days and are not widely used.

## **Improved storage methods**

Among the improved storage methods for fresh cassava are those based on techniques involving freezing, gamma irradiation, control of storage environment (relative humidity and temperature) and waxing. However, none of these techniques has been sufficiently tested. Three improved storage methods which have undergone sufficient testing, including field testing, involve:

- dipping fresh tubers in fungicide and packing them in polyethylene bags
- storing them in specially prepared trenches
- storing them in moist sawdust

Although these three methods are not yet widely used, they are useful for small- and medium-scale cassava production.

### **Storage in polyethylene bags**

This method appears to be the simplest way of storing tubers. If properly conducted, it ensures a shelf-life of 2 weeks or more.

The method is based on the principle of 'curing' — the capacity of the tuber to form a new layer of cells over damaged tissues. Freshly harvested roots are treated with 0.4% solution of Mertect, a thiabendazole-based fungicide. They are then packed in polyethylene bags and sealed. Inside the bags, the tubers create the

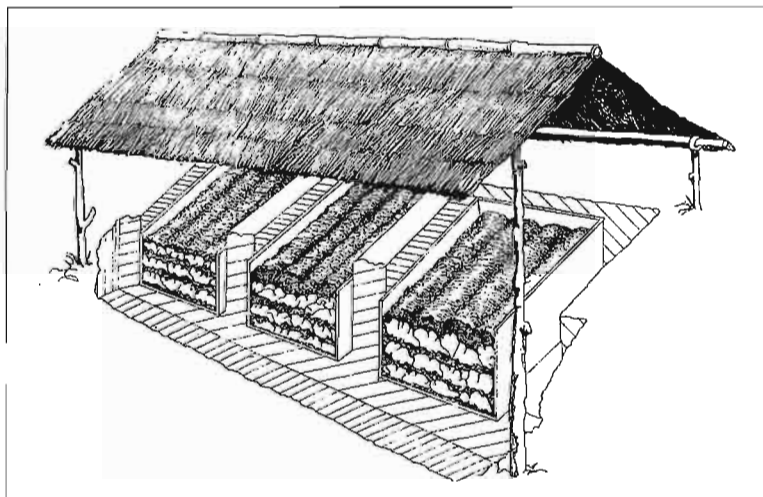
necessary temperature/humidity environment (temperature should range between 30 and 40°C and RH should exceed 80%). The fungicide treatment prevents the growth of micro-organisms in the humid environment.

## Storage in trenches

This low-cost method, developed by the Nigerian Stored Products Research Institute, keeps cassava fresh for at least 6 to 8 weeks and can be implemented easily by farmers and processors.

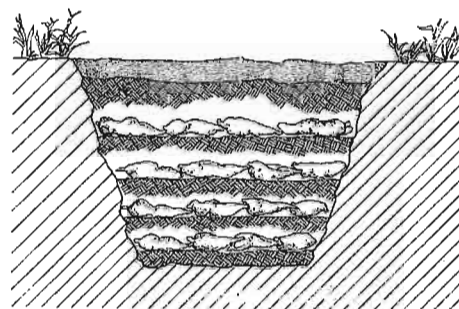
A trench is dug in the ground at a site which has a low water table, thus protecting the tubers from seepage of underground water. The trench should be 2m long, 1.5m wide and 1m deep. Depending on the size of the tubers, a trench of this size can store from 0.5 to 0.7 tons of cassava.

A shed made of wood and iron, or bamboo, with a thatched roof, is constructed over the trench. It is economical to make several trenches under the same shed (see Figure 8.1).



**Figure 8.1**  
*Fully filled trenches under a protective shed*

Two layers of palm branches or raffia leaves are laid on the bottom of the trench. One or two layers of freshly harvested, undamaged cassava tubers, with stems attached, are arranged on the branches/leaves. This process is repeated until the trench is almost full. The final layer of branches/leaves is covered with soil, 7 to 10cm deep; the soil is moistened once a week with clean water (see Figure 8.2).



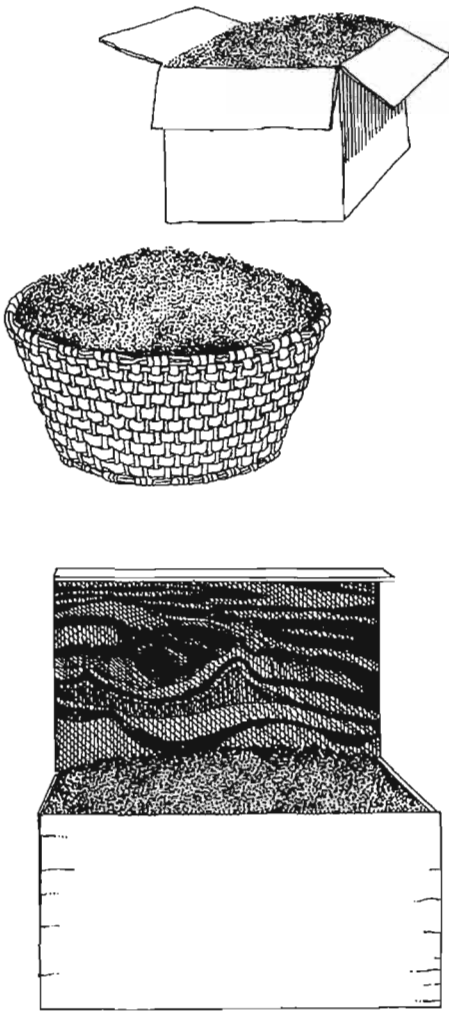
**Figure 8.2**  
*Cassava tubers stored in a trench, covered with soil*

## Storage in sawdust

Cassava tubers stored in sawdust must be freshly harvested with 15 to 20cm of the stem attached. The three types of containers which can be used for this method are woven baskets, paper cartons and wooden boxes with covers (see Figure 8.3). Tubers can be stored by this method from 6 to 8 weeks.

A layer of sawdust is spread at the bottom of the container. A layer of fresh cassava tubers, carefully arranged so that the tubers do not touch each other, is then placed on the sawdust. Another layer of moist sawdust is put on the tubers, followed by second layer of tubers. Sawdust is packed between the tubers and also at the top of the container, and is then moistened. The containers can be transported or stored in this way.

It is essential in this type of storage to inspect cartons every 3 days to ensure that the sawdust is moist. It is also important to ensure that the harvested cassava tubers have no mechanical damage, as this method is suitable only for storing undamaged tubers.



**Figure 8.3**  
*Three types of containers used for storing cassava tubers in sawdust*