

Nigeria is a leading producer of onions in Africa (FAOSTAT, 2013). Commercial onion production is mainly carried out in the Northern part of the country. Studies have indicated that postharvest losses account for as much as 50% of Nigeria's onion harvest (World Vegetable Centre (WVC), 2018). Mechanical damage due to impact bruising, compression and vibration during transportation because of poor transport conditions (including bad roads), account for a good part of the post-harvest losses of fruits and vegetables.

Market Glut and Post-Harvest Losses

Market Glut is when the supply of a commodity exceeds demand usually resulting in a substantial fall in its price. In agriculture, and especially in developing countries, supply of agricultural produce often exceeds demand in the immediate post-harvest period. With few good storage facilities available, farmers are unable to store their produce for sale in later markets and therefore have no option but to dispose of them at very low prices. An inadequate transport system makes it more difficult for the farmer to sell products in good time and in markets with the most attractive prices.

Transportation and storage facilities play a major role in reducing glut and post-harvest losses. The consequences of market glut and post-harvest losses go beyond individual losses of money; they impact the entire national economy. Gaps in knowledge on how to properly cure and grade onion bulbs for marketing and how to manage stored produce have been identified as factors that accentuate market glut and post-harvest losses in Nigeria.



Tradition jute bag used in storing onions in Nigeria

Source: https://www.nairaland.com/attachments/337279_1.jpg

What can YOU do to reduce post-harvest losses in onion production?

Below are strategies that, if carefully implemented, will help reduce post-harvest losses experienced by onion farmers.

- **Choice of Cultivar:** The basic requirement for successful storage of dry bulb onions starts with the choice of cultivar. Cultivars intended for long-term storage should have a long dormant period and form strong outer skin when fully cured. The brown and red-skinned cultivars are best in this respect.
- **Harvesting:** Onions should be harvested as carefully as possible to minimize mechanical damage (bruises and scratches). Onions are best harvested when the weather is dry; harvesting after a rainfall, or when the humidity is high increases susceptibility to post-harvest disease. Bulbs intended for storage should not be harvested at an immature stage as this causes the plant to develop a thick neck, which is prone to disease in storage.

- **Curing:** This refers to the drying of the neck and about two to three layers of the outer skin. Curing decreases the incidence of neck rot, reduces water loss during storage, prevents microbial infection, and is desirable for development of good scale color. Under ideal situations, onions must be cured soon after harvest by placing them in a drying room at 20-30°C and 70% relative humidity for 12 to 24 hours. Where this is not possible, curing can be carried out in the field (under dry conditions and protected from direct sunlight) for at least two to three weeks or until the top necks are completely dry and the outer skin becomes slightly crisp. To prolong storage life, onions must be stored immediately after curing.
- **Sorting:** This must be carried out before storage. Only onions with high initial quality can be stored successfully. Damaged produce should be sorted out to prevent well matured and undamaged bulbs from being infected. Without proper grading and sorting prior to storage, up to half of onions stored are likely to decay or shrivel.
- **Packaging:** Before storage, onions should be packaged inside a material that allows proper air circulation such as a mesh or jute bag, basket or in a crate. The container can then be stored in a structure that is dry and well ventilated. Bulbs must be stored in darkness to further increase their storage life.

What are the ideal temperatures for storing onions?

There are two temperature ranges in which onions store well, between 0 - 4°C and 25 - 31° C. The temperature range between 20 - 25° C is very dangerous for the onion because within this range, bacteria and fungi that cause disease to the bulbs are most active. The optimum temperature for long-term storage (about 12 months) of onions is 0°C with 65-70% relative humidity.

For countries like Nigeria, with hot tropical climate the temperature range of 25-31°C is recommended. Considering the Nigerian farmers' lack of access to environmentally controlled storage facilities, the best alternative is a cool ventilated structure whose interior is totally screened from sunlight. The traditional straw structure locally referred to as “*Rudu*” (as shown in the picture) provides this alternative. With adjustments in its design to enhance proper ventilation, it can store onions for up to six months. All storage structures must be carefully monitored to promptly remove decaying and moldy onions. Sprouting and growth of bacteria can be minimized in the *rudu* by stacking not more than 3 levels to allow sufficient aeration of the bulbs at the base.

How important is Reduction of Post-Harvest Losses?

Minimizing post-harvest losses could be more sustainable than increasing production to compensate for the losses in the short run. A little effort can make a huge difference when applied at the right time. Mere reduction of mechanical damage during harvesting, grading and packaging would greatly decrease the likelihood of post-harvest losses due to pathogens.



The traditional “Rudu” used in storing onions alongside the improved structure that allows for better aeration.

Source:<https://avrdc.org/building-an-improved-onion-storage-facility-in-sokoto/>

This would improve overall quantity, quality and food safety, translating to higher profits to growers, marketers and even processors. The problem of food loss after harvest takes on greater importance as world food demand grows. Cutting postharvest losses could add a sizable quantity to global food supply, reducing the need to intensify production in the future.

For more information on the content provided in this manual, contact: Balaraba Sule (IBB University, Lapai, Niger State. balaraber@ibbu.edu.ng)

The production of this document was supported by the Feed the Future Nigeria Agricultural Policy Project’s scholars program at Michigan State University.

Feed the Future Innovation Lab for Food Security Policy

Nigeria Agricultural Policy Project
May 2019

Reduction of Post-Harvest Losses in Onion Production

Balaraba Sule



<http://bit.ly/2WuqBHq>

What is Post Harvest Loss?

Post-harvest loss refers to the degradation in both quantity and quality of food produced from the time of harvest to consumption. Qualitative losses affect the shape and size of the product, its nutrient or caloric composition, its acceptability and edibility as well as its taste and smell. Quantity losses on the other hand refer to losses of the amount of a product. Post-harvest losses have been observed to be more common in developing countries like Nigeria and more acute with vegetable crops due to their perishable nature.