

## Harvest Maturity Indices

The principal harvest maturity measurement for sweetpotato is root size. Sweetpotatoes should be harvested when most of roots have reached the correct size for the intended market. This typically requires between 3 to 3.5 months from the time of transplanting. Average root size in a field can be judged by removing the soil around several randomly selected plants in different locations.

## Harvest Method

The sweetpotato vines should be cut off near the soil before the intended harvest date. During the dry season, the vines should be removed three to seven days before digging. Removing the vines helps to toughen the skin of the root. The vines can be removed manually with a scythe or machete, or mechanically with a rotary mower. During the rainy season, the vines should be left intact until the day of harvest. Roots exposed to wet soil conditions without intact leaves and vines are most at risk to postharvest disease.

After removing the vines, the sweetpotato roots can be dug by hand or by machine. Manual harvesting of sweetpotatoes is typically done using a spade, pick, or fork which is used to loosen the soil and undercut the roots. Care must be taken to avoid cutting or injury to the roots. The roots are then lifted out of the ground, separated from the main stem, and temporarily left on top of the soil or put directly into a field container.

The roots should be handled gently to minimize skinning and bruising. Wounded areas lower the attractiveness of the root and become entrance sites for bacterial and fungal pathogens.



The harvested sweetpotatoes should be pre-graded in the field, separating the marketable roots from the unmarketable ones. Roots less than 2.5 cm (about 1 in) in diameter are generally discarded. The roots should be gently dry brushed to remove excess soil. Cotton gloves are typically worn to facilitate field cleaning of the roots.

Although large synthetic sacks are commonly used as field and market containers, they provide little protection and can cause root skinning during loading, transport, and unloading.

Wooden crates or strong plastic field boxes are much better as harvest containers. They need to be strong enough to be stackable and easily cleaned.

## Curing

Curing is a process in which the skin thickens and new tissue forms beneath the surface of injured areas in the root. The purpose of curing is to heal the skin scratches and wounds inflicted during harvest and handling, reduce water loss during storage, and minimize decay. Curing can significantly prolong the shelf life of sweetpotato. Curing should be done within 12 hours or less after harvest.

The best conditions for sweetpotato curing are 26°C to 32°C (80°F to 90°F) and 90% to 98% relative humidity (RH) for 4 to 7 days. The curing will not occur at temperatures below 23°C or RH's below 65%. On the other hand, the temperature should not exceed 35°C, (95°F) nor should the RH be so high that water condensation appears on the root surface.

Uncured roots will age faster and lose more weight than cured roots. In addition, uncured sweet potatoes lack the visual appeal and eating quality of cured roots.

Roots should never be washed prior to curing and/or storage, as this facilitates decay. They should be stored in bins or crates, and washed only prior to packing for market.

## Temperature Management

After curing, the sweetpotatoes should be moved to a separate well-insulated storage room at 12.5°C (55°F) and 90% to 95% RH. Storage life of 6 to 10 months can be expected under these conditions. Temperatures above 15°C (59°F) increase the rate of weight loss and result in sprouting.

Sweetpotatoes are vulnerable to chilling injury (CI) and should not be held below 12.5°C. Even a few weeks of storage at below 12.5°C will result in tissue damage. Symptoms of chilling injury include root shriveling, sunken pits on the surface, fungal decay, and internal tissue browning. The extent of CI depends on the temperature and length of exposure below 12.5°C. Damage increases the longer the



fruit is exposed and the lower the temperature. Uncured roots are more prone to CI.

## Relative Humidity

Moisture loss and root shriveling are common postharvest problems of sweetpotatoes. In order to reduce these problems, the RH should be maintained at 90% to 95% throughout the storage period. Sweet potatoes stored at 50% to 60% RH will have nearly twice the rate of weight loss compared to ones stored at 90% RH. Storage above 95% RH is not recommended because of possible surface mold growth.

## Market Preparation

### Washing/Cleaning

Before packing for market, sweetpotatoes should be removed from storage and carefully submerged in a tank of sanitized water. A multiple tank system may be necessary to keep the wash water clean and properly sanitized. The water should be sanitized with 150 ppm hypochlorous acid (household bleach) maintained at a pH of 6.5. This is equal to 2 oz of household bleach (such as Marvex) per 5 gallons of water, or .3 liters of bleach per 100 liters of water. Dirt and debris will collect quickly so it is important to change the water in the dump tank often.

### Grading/Sorting

After cleaning, the roots should be graded according to size, shape, uniformity, and amount of defects. Remove all cut, cracked, insect-damaged, and decayed roots to make the pack as attractive as possible. Good quality sweetpotatoes are smooth-skinned, firm, even in shape and size, free from mechanical damage, and have a uniform colour typical of the cultivar. The National Bureau of Standards has established three different grade classes for domestic marketed sweetpotatoes (Grade 1, Grade 2, and Grade 3) based on various root characteristics. Domestic marketed roots are also classified into three sizes, based on weight per root:

- small: 112.5 g to 340.5 g (¼ lb to ¾ lb)
- medium: 340.5 g to 681 g (¾ lb to 1½ lb)
- large: 681 g to 1362 g (1½ lb to 3 lb)

Export market sweetpotatoes should follow a similar size classification.

### Packing

Sweetpotatoes should be packed in strong, well-ventilated containers that can be stacked without breaking or damaging the roots. Large

synthetic sacks over-stuffed with more than 40 kg (88 lb) of roots are often used in the domestic market. These sacks provide little protection to the sweetpotatoes and result in considerable root damage. Wooden crates are better and provide more protection to the sweetpotatoes. Roots of the same size and shape should be packed in the same container. The Caribbean market accepts different sized cartons, depending on the destination and buyer. For the European market, sweetpotatoes should be packed in either 6kg (13 lb) or 10 kg (33 lb) fiberboard cartons. The Canadian market package standard is the 40 lb (18 kg) fiberboard carton. The carton strength should be able to withstand long distant sea shipments without collapsing and injuring the roots. A strong, well-ventilated, attractive carton is important for success in the export market.



### Principal Postharvest Diseases

Sweetpotatoes are vulnerable to a number of postharvest fungal and bacterial pathogens. Decay can be kept to a minimum by using careful harvesting and handling practices, by prompt curing, and storage at 12.5°C (55°F) and 90% to 95% RH. During root cleaning, the wash water should be properly sanitized and the postharvest fungicide 2, 6-dichloro-4-nitroaniline (Botran) may be applied after washing to reduce the amount of fungal decay during transport to market.

#### *Fusarium Dry Rot*

*Fusarium* dry rot appears as pale brown, dry, circular spots on the root. Infected tissue shrivels and sometimes forms cavities filled with white mold.



#### *Java Black Rot*

Initial signs are a moderately firm yellow-brown surface decay, with light brown interior tissues. As the rot grows, the colour of the skin and tissue just below the skin changes from brown to black. Eventually the entire root becomes black, hard, and mummified.



#### *Rhizopus Soft Rot*

Symptoms of *Rhizopus* soft rot include a soft, watery decay that rapidly grows to completely rot the entire root in 4 to 5 days. Newly infected areas will give off a yellowish-brown liquid when broken and will become withered, stringy and firmer as water is lost. A sweet odour is given off. Wherever the skin is broken, a coarse, grayish-black whiskery fungal growth develops and quickly covers the rotted portion. A lot of fruit flies in the storage area usually indicate the presence of this disease.

#### *Bacterial Soft Rot*

Infected roots show black streaks in the vascular tissue and later a soft moist decay. The watery decay is usually bounded by a dark margin. The decaying tissue gives off a bad odour.

### Storage Disorders

#### *Pithiness*

Pithiness, or hollowness, is an internal tissue break down of sweetpotatoes that occurs after several months of storage in some cultivars. Pithiness results from storage at high temperature and low RH.

#### *Sprouting*

Sprouting of sweetpotato roots will occur at temperatures above 16°C (61°F). It will take a month or more for sprouts to show at 18°C (64.4°F), but at 23°C (73.4°F) and warmer, sprouts may develop in several weeks. Sprouting is always accompanied by a high weight loss and adversely affects eating quality. Sprouting can be prevented by maintaining a 12.5°C (55°F) storage temperature.

**Technical bulletins are also available on waxing fruits and vegetables and curing. Contact:**

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# SWEETPOTATO

## Postharvest Care and Market Preparation Information Sheet



*This information sheet provides growers and agriculture extension personnel with a summary of the recommended harvest and postharvest handling practices for sweetpotato. A more technical and detailed bulletin is available from the New Guyana Marketing Corporation (NGMC) and the National Agricultural Research Institute (NARI).*