Harvest Maturity Indices

The time period from planting is a rough measurement of when to begin harvest. Eddoes generally require a minimum of six months to mature, however, this may be extended to 8 or 9 months, depending on the growing conditions, cultivar, and desired market size.

The vegetative condition of the plant is also commonly used as a measure of harvest maturity. The older, outer leaves begin to turn yellow and age as the eddoe approaches maturity. The length of new stem growth also becomes shorter. Harvesting should begin when the leaves of the majority of plants have naturally aged and turned yellow or dry. Eddoe can remain in the ground several months after leaves age and yellow; this allows the bulbs to get bigger. However, harvest should not be delayed too long because the inner part of the eddoe bulb becomes woody and inedible with age.

Bulb size is the other good measure of harvest maturity. When eddoes have reached their full size, they often begin to push out of the soil surface. This is a sign that the crop should be harvested soon. Randomly selected plants should be dug at different times and locations to estimate the average eddoe size in the planting.

Harvest Methods

Eddoe is typically harvested by hand by lifting the lower part of the stem in a shaking motion and pulling the plant out of the ground. A harvest tool (fork or cutlass) may be used to help lift the eddoe out of the ground. Care must be taken during harvest to minimize damage to the bulb, as this reduces market life. Once harvested, any large pieces of soil should be rubbed off the eddoe surface.

If the eddoes are intended to be sold immediately, the stem should be cut back to right above the shoulder of the bulb. If the eddoe is to be cured and stored, a slightly longer length of stem, sticking out above the shoulder by about 2 to 3 cm (1 inch), should be left attached to the bulb. The tail end of the bulb should also be cut back so that 1.3 cm (0.5 inch) stalk remains. All seriously injured, or partially decayed bulbs should be sorted out in the field at the time of harvest

Eddoes intended for market should be carefully put into appropriate harvest container and taken to a shaded and open air collection area or packing site. The ideal harvest containers are well-ventilated wooden crates or durable plastic containers. Large synthetic sacks are not appropriate for harvesting as considerable bruising and surface cuts to the bulbs can result.

Curing

Curing is a process in which the skin thickens and new tissue forms beneath the surface of injured areas on the bulb. Curing also reduces postharvest water loss and minimizes decay during storage. The best conditions for curing eddoes are 26.5°C to 30°C (80°F to 86°F) and 90% to 95% relative humidity for several days immediately following harvest. Eddoes can be cured outdoors if piled in a partially shaded area. Cut grasses or straw can be used as insulating materials and the pile should be covered with canvas, burlap or reed mats.

Eddoes should never be washed or scraped clean before curing and/or storage, as this may cause decay. After curing, eddoes should be stored in well-ventilated bins or crates, and washed only before packing for market.

Temperature Control

The ideal storage temperature for eddoes is 11°C (52°F). At this temperature, properly cured and healthy bulbs can be stored for 3 months. Storing eddoes at normal outside temperatures will significantly shorten the storage life. Intact bulbs will typically remain in a marketable condition for only up to 3 weeks at 22°C (72°F). Eddoes that have been cut off at the ends and/or had the skin removed will have a potential market life of only 2 weeks due to a higher rate of decay and weight loss. Temperatures above 15°C (59°F) lead to sprouting and a high weight loss.

Eddoes are vulnerable to chilling injury (CI) if exposed to 10°C (50°F) or below. Symptoms of CI include sunken holes and pits on the bulb surface, dark internal flesh, postharvest decay, and poor flavour. The amount of damage from CI will be greater as the temperature decreases and the length of exposure time increases. Injury may occur in as soon as 5 days at 8°C (46.4°F) or 2 days at 4°C (39°F).

Relative Humidity

Moisture loss, shriveling, and softening are common postharvest problems with eddoes. In order to minimize these problems, the relative humidity (RH) should be maintained at 90% to 95% during storage. Storing eddoes above 95% RH is not recommended because of surface discolouration and mould growth.

Preparation for Market

Cleaning

For the domestic market, excess soil should be removed from the eddoe surface with a soft brush or cotton gloves. The skin should not be scraped with a knife nor should the base part of the bulb be cut.

Due to a protocol required by the government, eddoes destined for Barbados have to be completely scraped clean and washed. This can cause open wounds in the eddoe tissue and significantly diminishes potential market life.

Eddoes should only be washed if the market requires it, or if the bulbs are very dirty with soil. The water should be clean and sanitized with 150 ppm hypochlorous acid. 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. The water should be maintained at a pH of 6.5. The bulbs should remain in the chlorinated water for 30-60 seconds. The wash water should be changed regularly to prevent the build-up of soil particles and micro-organisms. Eddoes can be further protected against postharvest decay by dipping in a 500 ppm benomyl or 1000 ppm thiabendazole fungicide solution after washing. Benomyl (500 ppm) should be measured at 6.6 oz to 5 gl water (0.2 l benomyl to 19 l of water). Thiabendazole (1000ppm) should be measured as 13.2 oz. to 5 gl waters (390 ml to 19 l). The surface of the eddoes should be thoroughly dried before grading by placing them on a table in a well-ventilated area.

Grading

Damaged and partially decayed bulbs should be removed from those intended for market. Carton should be packed with sound bulbs of the same size and shape. High quality eddoes are large, dark brown, and fresh in appearance. The bulbs should not be soft, spongy, or puffy. They should not have any visible dirt, damage, and surface mould. Export markets typically require large sized eddoes between 1 to 1.5 kg (2.2 to 3.3 lbs) in weight. The bulbs should have skin over the entire surface, no shriveling, and be free from fungal infection, insect damage, sprouting, and softening. The internal flesh colour should be a uniform white.

Packing

The surface of the eddoe should be completely dry before packing. Eddoes for export should be loose-packed in strong well-ventilated fiberboard cartons. The most common carton sizes are 18.2 kg (40 lb) and 23 kg (50 lb).

Principal Postharvest Diseases

The majority of the micro-organisms that cause damage are soil-borne and are present on the surface of the eddoe at harvest. Infection typically begins where skin damage or abrasion has occurred. Disease can be reduced by minimizing the amount of injury to the bulb, proper curing, storing the eddoes at 11°C (52°F), and using clean sanitized wash water (150 ppm hypochlorous acid maintained at a pH of 6.5). A postharvest fungicide application (500 ppm benomyl or 1000 ppm thiabendazole) may also reduce the amount of decay.

Blue Mould

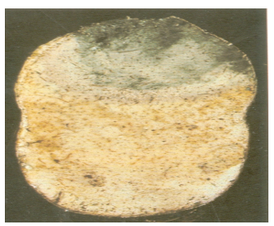
Typical symptoms include a blue mould growth on cut or damaged surfaces. In some cases, the inside of the eddoe may rot without any exterior symptoms. The rotted tissue is pale to dark brown, and may be firm or soft.

Botryodiplodia Rot

There may be no external symptoms, even when decay is advanced. Internal tissue initially turns gray or pink, later darkening to blue-black with an indistinct separation between diseased and healthy tissue. The texture of the flesh usually becomes spongy.

Rhizopus Soft Rot

Symptoms include a soft, watery rot that progresses rapidly and may rot an entire eddoe in 4 to 5 days. The skin of the bulb generally remains intact until the rot is very advanced. If the skin is broken, a coarse white mould develops. Decayed tissue is soft and pale, with a slight yeasty odour. The postharvest fungicide 2,6-dichloro-4-nitroaniline (Botran) may be applied after cleaning to reduce the risk of soft rot development in the packed cartons during marketing.



Sclerotium Rot

Sclerotium rot begins at or near the soil surface. Symptoms of decay include a sharply defined margin between rotted and healthy tissue. In humid conditions there is a widespread development of white mould on the eddoe surface. Rotted internal tissue is pale brown to pinkish, soft, and somewhat stringy.

Pythium Rot

Pythium rot may be a serious postharvest fungal disease on eddoes grown in poorly drained soils. Symptoms of infection include pale and soft internal tissue, with a crumbly or cheesy consistency. The infection results in an oddly shaped but sharply defined margin between decayed and healthy tissue.

Fusarium Rot

Decay usually begins at the base or side of the bulb. Symptoms of fusarium infection include dry, off-coloured, spongy tissue bordered by a distinct brown margin. In humid environments, the eddoe surface may become covered with dense white mould.

Bacterial Soft Rot

Symptoms of bacterial soft rot damage include a slimy, soft rot of the tissue, which is accompanied by a strong foul smelling odour.

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

New Guyana Marketing Corporation (NGMC) 87 Robb & Alexander Sts., Georgetown, Guyana
Tel: 226-8255, 226-2219

National Agricultural Research Institute (NARI)
Mon Repos, East Coast Demerara, Guyana
Tel: 220-2950

With the assistance of
The United States Agency for International Development

New Guyana Marketing Corporation

EDDOE

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 eddoe. A more technical and detailed bulletin is available from the New Guyana Marketing Corporation (NGMC) and the National Agricultural Research Institute (NARI).