

## Harvest Maturity Indices

The first fruit are normally ready for harvest about 2 months after planting, depending on cultivar and growing conditions. It usually takes about 10 days from flowering until harvest.

The main external sign of harvest maturity is the size of the fruit. The fruit should be harvested at an immature stage, before reaching full size. The proper size depends on the use and the cultivar. Bitter melons should be at least 10 cm (4 inches) long, but may be of acceptable quality up to 30 cm (12 in) in length in some cultivars. Diameter at the center of the fruit should be between 5 cm to 6.4 cm (2 in to 2.5 in). The fruit should be firm to the touch with a tender skin.



Skin colour is another widely used guide of judging fruit maturity. The peel should be an even colour when harvested, ranging from light green to dark green, depending on the cultivar. The fruit should be harvested before the skin starts to change yellow or orange in colour. This is an obvious sign of over-maturity. The fruit surface should also have a noticeable shine.

Fruit that are over mature have a tough leathery skin and the peel may also split open. In the case where over-mature fruit have been left on the vine, they should be removed as soon as possible. Over-mature fruit will retard flowering and the development of new fruit.



A cross sectional slice taken from the center of the fruit can be taken to judge fruit ripeness. When the fruit is harvested at the correct time, the flesh will have a uniform white colour along with immature white seeds. Any yellow colouration of the flesh indicates fruit over-maturity. The flesh texture should be firm but not tough. Small hollow holes often develop in the flesh of over-mature fruit and the texture becomes spongy. The taste of over-mature fruit also becomes noticeably bitter.

It is suggested that harvesting be done during the coolest time of the day, best in the morning, and the harvested bitter melons be kept as cool as possible. The fruit generally have their highest water content at this time. However, harvest should be delayed until the leaves and fruit have completely dried to avoid the spread of diseases. Bitter melons should be harvested every other day for best yield and quality.



## Harvest Methods

Bitter melons should be carefully removed from the vine using one of two harvest techniques. The first technique involves squeezing the stem attached to the vine between the thumbnail and forefinger, followed by pulling off the fruit from the vine. This will leave a jagged stem which will need to be trimmed with a sharp knife. The second technique, which is better, is to use a small knife to sever the fruit stem from the vine at a point just above the shoulder of the fruit. Done properly, the stem will not have to be re-cut during packing. Bitter melons should not be torn off the vine, as this will result in damage to the vine and/or fruit.

The harvested fruit should be carefully put in a light-weight field container lined with protective padding or paper to prevent fruit scarring and abrasion. The container should be well-ventilated and filled with no more than about 15 kg (33 lb) of fruit. Once the field container is full, it should be taken to a shaded, well-ventilated temporary holding area. Avoid leaving the fruit exposed to direct sun.

## Preparation for Market

### Cleaning

Bitter melons produced from trellised fields will require little, if any, cleaning since the fruit does not come in contact with the soil. However, fruit from non-trellised fields will need cleaning. Soil on to the ground spot area or other surface stains should be removed by rubbing the fruit surface with a soft damp cloth or cotton gloves. Washing the fruit is more efficient if the bitter melons are particularly dirty, or if the quantity of fruit is large. In this case, the fruit should be submerged in clean water and gently scrubbed with a soft bristled brush. The wash water should be properly sanitized to

reduce the potential for spread of disease. The wash 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. After cleaning, the fruit is generally placed on a soft mesh or wire table to dry before sorting and grading.

### Grading

Bitter melon quality is mainly based on size, uniformity of shape, firmness, and skin colour. Additional quality indices include the amount of surface blemishes and incidence of decay. High quality bitter melon fruit should be fresh in appearance, free from visual defects, even coloured, firm, straight, and glossy. There are no established grade standards for bitter melon. However, the minimum acceptable fruit length in most markets is 4 cm (1.6 in). The preferred diameter at the center of the fruit typically ranges between 5 cm to 6.4 cm (2 in to 2.5 in). Over-mature fruit with yellow or orange skin colouration should not be marketed. These fruit will generally have an unacceptably bitter flavour.

### Packing

Bitter melons should be packed in strong, well-ventilated containers. Wooden containers that allow for stacking without collapsing are suitable for the domestic market. Durable plastic crates are also acceptable. Mesh sacks should not be used as they provide little or no protection to the fruit.

Bitter melons for export should be packed in clean well-ventilated fiberboard cartons with a minimum test strength of 275 psi. Carton size varies depending on market destination, but typically contains 6 kg to 10 kg (13 lb to 22 lb) of fruit. The bitter melons should be oriented in the same direction inside the package.

## Temperature Management

The best postharvest temperature for bitter melon is 10° C (50°F). At this temperature, bitter melons can be expected to have a 2 to 3 week market life. Holding bitter melons without refrigeration at ambient temperatures will result in noticeable shriveling, softening, and decay after 3 to 4 days. Storage of bitter melons below 7° C (45°F)



should be avoided, as this will result in chilling injury (CI). The amount of CI depends on temperature and cultivar. Symptoms of CI include tissue collapse, water-soaked spots, darkening of the skin, and increased susceptibility to postharvest decay. Symptoms of CI may occur after 1 week at 4°C (39°F).

### Relative Humidity

Although bitter melons have a waxy skin, they are at risk for water loss during storage and marketing. Bitter melon fruit will soften and lose their crisp texture within several days at a low relative humidity (RH). In addition, the fruit may discolour and show signs of shriveling. The best RH for holding bitter melons is 95%.

### Principal Postharvest Diseases

The rate of disease can be reduced by using good pre-harvest disease control practices, careful harvesting and handling to minimize injury to the delicate skin tissue, cleaning of the fruit in properly sanitized water, and holding the bitter melons at 10°C.

#### *Alternaria Rot*

Alternaria rot begins on injured areas of the skin and initial symptoms are tan-coloured circular to oval spots on the fruit surface. The spots become sunken and are covered by a dark mould. Fruit which have been stored for long periods are more vulnerable to Alternaria, along with fruit which have been damaged from chilling injury.

#### *Belly Rot*

Symptoms of belly rot include a dark brown water-soaked decay on the side of the fruit in contact with the soil, followed by a yellowish-brown discolouration of the fruit surface. Belly rot is usually more severe on fruit harvested during the rainy season.

#### *Cottony Leak*

Cottony leak is another postharvest disease associated with fruit produced in poorly drained areas or during the rainy season. The first symptoms of cottony leak are soft, dark green, water soaked lesions on the fruit surface. After the fungus penetrates the skin, fluid may be exuded. A white, cottony fungal growth develops on the fruit surface. Decay spreads rapidly at ambient temperatures and during transit, with nests of mouldy fruit giving off watery juices.

#### *Rhizopus Soft Rot*

Rhizopus soft rot becomes established in wounded areas of the fruit, forming yellowish-brown water-soaked spots with a fairly distinct edge. The spots are irregular in shape and develop into sunken wounds. Grayish-white masses of mould develop over the wounded area, which eventually turn black. Diseased tissue is soft and very wet.

#### *Botryodiplodia Rot*

Symptoms of Botryodiplodia rot include light brown spots with a water-soaked margin. The spots are frequently found at the stem end. A dark gray mould may develop on the surface of the spots. The fruit typically undergoes a dry rot and a sour odour usually accompanies the decay.

#### *Bacterial Soft Rot*

Bacterial soft rot infects the fruit via wounds in the skin and often becomes established in areas infected with fungal disease. Soft rot rapidly crumbles the flesh, turning it into a soft mass of leaky tissue. The infected fruit typically have a foul odour.



New Guyana Marketing Corporation

# BITTER MELON

## Postharvest Care and Market Preparation Information Sheet



#### For additional information contact:

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