

## Harvest Maturity Indices

The fruit matures about 75 days after flowering. The first fruit harvest from seeded yellow passion fruit plants normally begins about 10 months after transplanting, while grafted plants begin production several months earlier.

The most obvious measure of fruit maturity is skin colour. As the fruit matures, the skin colour will change from green to either yellow or purple, depending on the type of passion fruit. Green fruit, or fruit with limited colour, is not fully ripe and should not be harvested. Fruits that have not developed colour have higher acidity, less flavour and may not develop a full yellow or purple colour after harvest. The minimum ripeness for harvest should be when at least 50% of the fruit surface has turned yellow or purple.



Fruit quality will improve if the fruit are allowed to completely change colour and ripen on the vine. In order to get the best flavour quality and storage life, passion fruit intended for export should be harvested with 75% purple or yellow colour.

Fruit harvested at this stage will have a longer storage life and are less likely to spoil than fruit picked at more advanced stages of ripeness. Full yellow or purple coloured passion fruit can also be picked for export if the fruit is still firm. Export fruit should be harvested twice a week.

Fruit intended for the domestic juice market may be allowed to fully ripen on the vine and naturally fall off the vine. The fruit should be collected off the ground on a daily basis and processed as soon as possible.

## Harvest Methods

Passion fruit is harvested manually by cutting or clipping the fruit off the vine. The recommended harvest tools are a sharp knife or clippers with a sharp edge. A short piece of stem, approximately 4 cm (1.5 inches) in length should be left attached

to the fruit to help prevent water loss and fungal development. The fruit should not be pulled from the plant. Passion fruit should be harvested when the surface is dry.



The fruit should be harvested with care and placed in a strong bucket or field container without dropping or throwing. No more than 15 kg (33 lb) of fruit should be put in the harvest container in order to avoid bruising. The first sorting of marketable versus unmarketable fruit should be made at the time of harvest. The field containers with marketable fruit should be put in the shade to avoid overheating of the fruit.

## Preparation for Market

### *Cleaning*

The first step in preparing passion fruit for market is to clean the surface of the fruit and remove any dirt, surface stains, sooty mould, or leaf tissue. Small-scale operations usually choose to clean the individual fruit by wiping them with a damp cloth. Larger operations may use a water dump tank or overhead spray wash system to clean the fruit. In order to avoid the spread of disease, the wash water should be clean and regularly sanitized by maintaining a 150 ppm sodium hypochlorite concentration. 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 PH should be maintained at 6.5. The chlorine level and pH of the wash water should be checked regularly. Stem length is typically trimmed to about 4 cm for export-destined fruit, but to shorter lengths for domestic marketing. Following washing, the fruit should be placed on a flat surface to air dry.



### *Grading/Sorting*

Three different grades have been established for the domestic marketing of passion fruit. Grade 1 passion fruit are firm with a shiny appearance, no signs of shriveling, free from insects, disease, and surface damage. Grade 2 passion fruit must be of good quality, although 10% of the fruit in this grade may be soft

or show signs of shriveling, and not have a glossy appearance. Grade 3 passion fruit do not qualify for the higher grades, but should be clean, mature, free from pests and disease, and have similar colour, shape, and size. A total of 5%, 10%, and 15% by number or weight of passion fruits not satisfying the requirements of grades 1, 2, and 3, respectively, are allowed. However, the fruit not meeting the minimum grade requirements must not be rotten or unfit for consumption.

The quality standards of export grade passion fruit should meet the minimum requirements of domestic Grade 1 fruit. Export quality fruit must be firm, evenly coloured and shaped, and free of insect damage, physical injury, disease, brown discoloration, and other surface damage. The skin colour should be at least 75% yellow or purple, depending on type. Firm, 100% coloured fruit are ideal. Totally green coloured fruit are not ripe and should not be packed for export. The fruit should be round or egg-shaped, have a smooth and shiny appearance, and have a juicy pulp.

Passion fruit should be separated into 3 different sizes (small, medium, large), based on fruit diameter. The average diameter for fruit classified as small is 5 cm (2 inches); for medium, 6.5 cm (2.6 inches); and for large, 8 cm (3 inches). A 1 cm variation above or below the specific diameter is acceptable. In small-scale operations, passion fruit are usually sized manually. Sizing rings with the diameter of the 3 different size categories should be available for workers to check the fruit when necessary. Larger-scale operations use various types of sizing equipment to automate the grading process.

Other appearance standards for passion fruit include shape, firmness, and amount of surface blemishes. The fruit should not be misshaped. Also, the skin of export market destined fruit should not be wrinkled or show any signs of shriveling.

Internal fruit quality should be checked on randomly selected fruit. Soluble solids content (SSC) of marketable fruit should range between 10% and 18% for yellow passion fruit and between 10% and 20% for purple passion fruit. Acidity of the pulp should range from 3% to 5%.

### *Waxing*

Benefits of waxing include enhanced shine, reduced weight loss, and extended market life. A carnauba-based wax is preferred for passion fruit. The simplest ways to apply the wax is a manual rub or an overhead spray as the fruit are rotating on a bed of soft brushes.

### *Packing*

Passion fruit should be packed in strong, well-ventilated containers capable of being stacked without damaging the fruit. Wooden containers or durable plastic crates are better for the domestic market. Large synthetic or mesh sacks provide little or no protection to the fruit. Bruising of the fruit occurs when the sacks are piled on top of each other and result in deformed or split fruit. Export packaging for passion fruit should be a single-layer fiberboard carton containing either 2 kg or 3.5 kg (4.5 lb or 7.7 lb) of fruit. The cartons should be strong, self-locking so they can be stacked with ventilation holes for air movement and cooling.

Only the same sized and coloured fruit should be packed in the same carton. The carton should have a plastic liner with individual cells to protect and separate the fruit. Larger oval-shaped fruit should be placed on their side, with the stem either protruding above the adjacent fruit or below. The fruit are packed according to count (size). The most common number of counts per 3.5 kg (7.7 lb) carton is 24 (large), 36 (medium), and 48 (small).

### **Temperature Control**

Maximum postharvest life of yellow passion fruit is achieved at 7°C (45°F) storage, while purple passion fruit should be stored at 4°C (39°F) Passion fruit held at temperatures above this will ripen more quickly and lose weight. Fruits kept below the best storage temperature will suffer from chilling injury (CI). Symptoms of CI are pitting, sunken spots on the fruit surface, uneven skin colouration, internal darkening of the pulp, off-flavour development, and decay. At the best storage temperature, 75% surface coloured yellow passion fruit will have an average market life of 2 to 3 weeks and 75% purple coloured fruit will have a 4 to 5 week market life. Passion fruit picked fully ripe

will have only about a 7 to 10 day market life. Fruit should be stored at 90% to 95% RH in order to avoid peel shriveling. Passion fruit will lose a significant amount of moisture if held under low relative humidity (RH). Storage of the fruit in perforated plastic bags (bag with very small holes) or in containers lined with perforated plastic film will also minimize moisture loss.

### **Postharvest Diseases**

Postharvest decay can be reduced by using good field sanitation practices, pruning to open the canopy of the plant, pre-harvest fungicide applications, careful harvesting and handling practices to avoid injury to the fruit, proper wash water sanitation, and holding the fruit at its ideal storage temperature (7°C or 45°F for yellow types and 4°C or 39°F for purple types).

#### *Brown Spot*

Brown spot is one of the worst postharvest diseases of passion fruit. Symptoms appear as tiny spots, which enlarge into sunken circular spots with brownish centers. Eventually the rind around the diseased area becomes wrinkled and the fruits shrivel.



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

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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



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# **PASSION FRUIT**

## **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 passion fruit. There are two main types of passion fruit, yellow and purple. The yellow type is the principal one produced in Guyana. A more technical and detailed bulletin is available from the New Guyana Marketing Corporation (NGMC) and the National Agricultural Research Institute (NARI).*