

Harvest Maturity Indices

There are several reliable internal and external indicators of tomato fruit maturity. Internal characteristic are used for determining harvest maturity of randomly selected green fruit of different sizes.

Skin Colour:

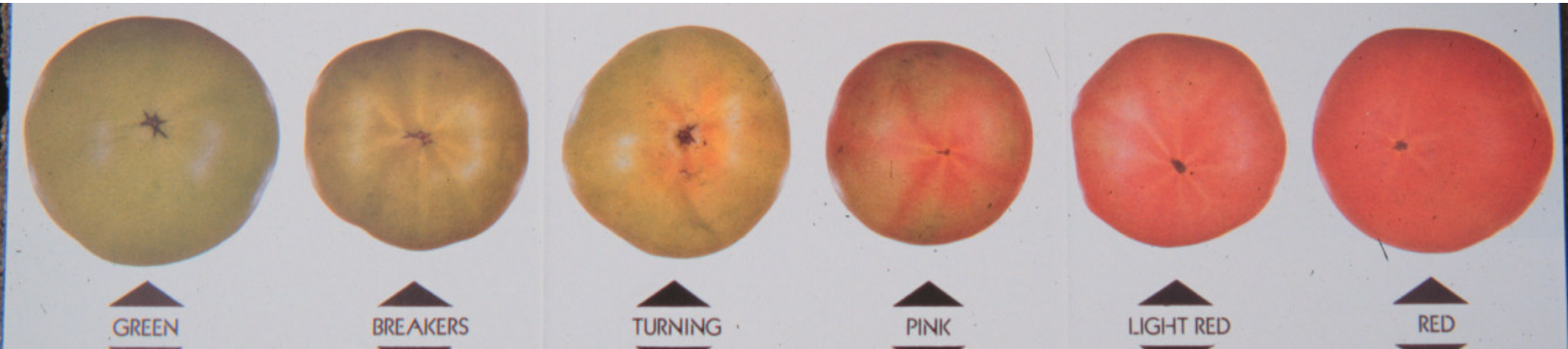
Tomatoes should be harvested in the mature-green stage. All green fruit of similar size and from the same location on the plant should be ready to harvest at the same time. Green tomatoes are mature when one or more white streaks form at the blossom end of the fruit, typically in the shape of a star.

The fruit will continue to change colour, even after it is cut from the plant. Tomato fruit colouration follows a progression with ripening. Ripening stages of mature tomato fruit are categorized as green, breaker, turning, pink, light red, and red.

Tomatoes should be picked at mature-green stage for maximum market life. Fruit that ripen on the plant to a full red colour before picked will have a significantly shorter market life and are more easily damaged.

Seed Development

Mature green fruit have fully developed tan-coloured seeds which can be cut through when the fruit is sliced with a sharp knife. The seeds in the immature green fruit are white and not fully formed and are cut through when the fruit is sliced open with a knife.



Jelly Formation

The fruit of the mature-green fruit is completely filled with jelly in each of the cavities. Immature green fruit will have one or more cavities without jelly.

Harvest Methods

Pick tomato fruit by gently twisting or rotating it in order to cleanly remove the stem. In some tomato plants, a natural break point forms on the stem and the fruit should be pulled upward with the thumb and forefinger pressed against the stem.

The stem should be removed before putting the fruit in the harvest container. Workers should wear cotton gloves during picking to minimize harvest damage.

Harvested fruits should not be thrown or dropped into the picking container, as they are very susceptible to bruise damage. The picking container should have smooth inner walls to prevent abrasion of the fruit. Do not fill the container with more than 40 fruits (or 10 kg of fruit) to avoid compression injury.

Tomatoes should be picked during the coolest part of the day, such as early morning or late afternoon. To avoid spreading disease, tomatoes should never be picked when wet. Fruit that are injured, diseased, or unmarketable should be removed from the plant and not mixed in the same harvest container as the marketable fruit.

Preparing for Market

The fruit should be handled carefully, to avoid bruising and injury to the tissue. The fruit should be kept in a well-ventilated shaded area during market preparation.

Cleaning

Clean the surface of the fruit and remove any dirt, surface stains, or leaves. This can be done by wiping individual fruit with a damp cloth or putting the fruit in a water tank or with an overhead spray wash system. 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 chlorine level and water pH should be checked often.

Grading:

The main fruit characteristics used to grade tomatoes are size, colour, shape, appearance, and firmness. Tomatoes should be separated into small, medium, and large sizes. Size affects market demand and price. Tomatoes may be sized manually or semi-mechanically by passing the fruit over a series of perforated belts with holes corresponding to the maximum allowable diameter for the particular size/class.

Tomatoes of uniform colour and shape should be packed into the same container. The fruit should have a smooth, shiny external appearance, void of cracks, bruises, open wounds, sunscald, insect injury, or decay. The fruit should be firm enough to withstand transport and distribution to market.

Packing

The fruit surface should be dry before packing in order to reduce storage rot. The type of container used for packing tomatoes depends on the market destination. It should be well-ventilated, strong, and capable of being stacked without damaging the fruit. Improper packaging can be a major source of postharvest loss. Sized and graded mature-green tomatoes



destined for export are typically packed loose in strong well-ventilated fiberboard cartons containing a net weight of 11 kg (25 lb).

Postharvest Temperature

Fruit harvested at the mature-green stage should be kept between 13°C to 20°C (56°F to 68°F), depending how long the fruit needs to be stored. Holding the fruit at the lower temperatures will maximize the storage life, which is up to 4 weeks with mature green fruit. Holding mature-green tomatoes above 25°C (77°F) will result in soft fruit.

Fully red fruit can be stored at 10°C (50°F) for about 7 to 10 days. Tomatoes should never be held below 10°C, as chilling injury (CI) will result and the fruit will not ripen properly. Symptoms of CI include off colour development, softening, surface pitting, water-soaked spots, seed browning, off-flavour development, and increased postharvest decay.

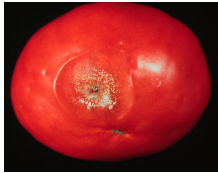
The ideal storage Relative Humidity (RH) for tomatoes is between 90% to 95%. Tomato fruit are very high in water content and susceptible to shrinkage after harvest.

Postharvest Diseases

The major cause of postharvest loss in tomatoes is postharvest decay caused by damage to the fruit. Tomatoes are very delicate and should always be handled gently. Postharvest decay can be minimized by following a good sanitation program in the field and during all the steps in preparing the fruit for market. Keeping ripe fruit at 10°C will also help minimize postharvest decay.

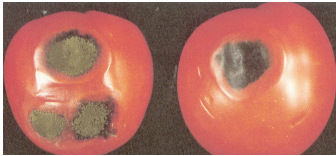
Bacterial Soft Rot

Spots are initially soft and slightly depressed, appearing water-soaked near the margins. The bacteria can enter the fruit through the stem scar while in wash water. Rotting is rapid at average temperature and the skin may split and leak infected juices. The soft, mushy tissues of decaying fruit have a bad odour.



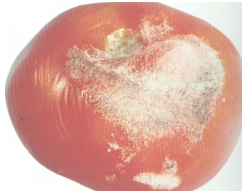
Alternaria Rot

Spots begin as sunken or slightly flattened areas, sometimes water-soaked in appearance. The surface of spots become covered with a thick, dark gray to black fungal growth.



Rhizopus Rot

Rhizopus rot primarily attacks ripe fruit. Spots begin as rapidly enlarging, water-soaked areas located next to wounds, stem scars, or open pores in the blossom end. Grayish white masses of mould form on the surface of diseased fruit and groups of decayed fruit develop in packed cartons.



Sour Rot

Signs of sour rot begin as water-soaked spots in wounded tissue or at the edge of the stem scar. On mature-green fruit the spots appear pale and dull and have a definite sour odour. On ripe fruits, infected tissue is dark, soft, and watery. If the skin splits then a creamy white mould develops on the exposed flesh and the watery contents spill out. Bad ventilation and warm temperature promote this type of rot.



Technical bulletins also available on Waxing Fruits and Vegetables. 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



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New Guyana Marketing Corporation

TOMATOES

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