

Harvest Maturity

It is important to pick avocados when they are mature, as immature fruit will shrivel and not ripen properly. Several indices may be used to determine avocado fruit maturity. Skin texture and appearance is an indicator of harvest maturity in most avocado cultivars. As fruit approach maturity, they develop a smoother skin surface. Also, the glossiness or shine of the skin becomes duller as the fruit reaches maturity.

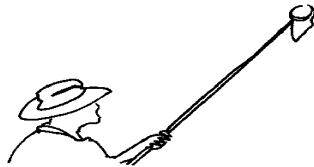
Colour of the fruit is another indicator of harvest maturity. The fruit colour of many cultivars changes from green to light green with maturity. Reddish streaks may also appear at the stem end of certain deep green-skinned cultivars when the fruit mature.

The area of the stem nearest the fruit changes from a green to brown or black colour when the fruit is mature and ready for harvest

An internal fruit characteristic indicative of harvest maturity is the colour of the seedcoat. The seedcoat typically turns brown when the fruit is sufficiently mature for harvest.

Harvest Methods

Avocados should be harvested with sharp clippers by severing the stem slightly above the fruit shoulder.



Fruits should never be pulled off the tree since the stem needs to remain attached. The stem length should be 1 cm (0.4 in) or less, in order to avoid puncture damage of adjacent fruit in the harvest container. Avocados should be harvested carefully as even small cuts, scratches and abrasions can spoil the appearance of the fruit and lead to decay. The use of gloves reduces the likelihood of skin damage during harvest. Where fruit cannot be reached by standing or climbing, a picking pole can be used to harvest the fruit. A cutting device is put at the end of the pole, with a catching bag below. The bag should be made from a soft fabric to prevent damage to the fruit.

The harvested fruit should be carefully put into paper-lined or padded field crates, or picking bags. Picking bags are either strapped around the waist or hung over the shoulder and made with a quick-opening bottom. Large synthetic or mesh sacks are not recommended for use as field containers. They provide little or no protection to the fruit and cannot be stacked without causing damage to the fruit. Field grading should be done at the time of picking to separate the marketable from the unmarketable fruit.

Preparation for Market

Cleaning

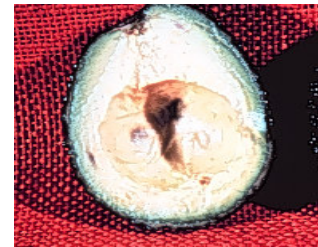
Most avocado fruit can be cleaned by gently wiping the surface with a clean soft cotton cloth or gloves. It may be necessary to use a moist cloth if the dirt particles or surface stains are difficult to remove. The cloth should periodically be dipped in a mild solution of household bleach (150 ppm hypochlorous acid or household bleach) to minimize the spread of disease.

Larger-scale operations may choose to clean the avocados by hand rubbing individual fruit dumped in a tank of sanitized water. 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. Avocados can also be cleaned mechanically by passing the fruit over a series of roller brushes wetted from above with spray nozzles.

A postharvest fungicide treatment (overhead spray or dip) applied after washing may help control disease. Effective treatments include 500 ppm benomyl or 1000 ppm thiabendazole. Benomyl (500 ppm) should be measured at 6.6 oz to 5 gl water (0.2 l to 19 l of water). Thiabendazole (1000 ppm) should be measured as 13.2 oz. to 5 gl waters (390 ml to 19 l). Hot water submersion of the fruits for 3 to 5 minutes at 50°C (122°F) may also help suppress disease development.

Grading and Sorting

Avocados should be graded according to size and external appearance. The National Bureau of Standards has established three different grade classes for the domestic market (Grade 1, Grade 2, and Grade 3) based on various fruit quality characteristics. Domestic marketed fruit are also classified into three sizes, based on minimum weight per fruit: small (250 gm or ½ lb), medium (500 gm or 1 lb), and large (1000 gm or 2 lb). Export market avocados should have a minimum weight of 125 gm (4.4 oz) and a maximum weight of 1220 gm (2.2 lb). Fruit intended for export must be mature and firm in order to withstand the rigors of handling and transportation. The fruit should be green or purple-green in colour; uniform in shape, and free of sunburn, wounding, insect damage, skin scarring, and decay. The internal colour should be creamy or light green without flesh browning.



Waxing

Waxing will improve the fruit appearance by adding shine and luster. Waxing also reduces weight loss and slightly delays ripening. In addition, waxing reduces the incidence of stem-end rot. A shellac



or carnauba based food-grade wax works well and may be applied manually by rubbing the fruit surface by hand, with a wax-saturated cloth, or mechanically by roller brushes.

Packing

Avocados should be packed in strong well-ventilated containers that can be stacked without collapsing. Large sacks filled with more than 20 kg (44 lb) of fruit should not be used, since they do not adequately protect the fruit against bruise damage and cannot be stacked without causing compression injury to the fruit. Wooden crates provide much better protection.

The preferred container for export marketing is a strong, well-ventilated fiberboard carton, typically holding 4 kg (9 lb) of fruit. It has dimensions of 40 cm (16 in) long, 30 cm (12 in) wide, and 11 cm (4.3 in) high. The fruit is packed according to count and ranges from extra large size 4 count to extra small size 30 count. The count sizes progress in even numbers from 4 to 30 and have the following average fruit weights:

4 count:780-1220 gm/ 1.7-2.2 lb	18 count:211-235 gm/7.4-8 oz
6 count: 575-780 gm/ 1.3-2.2 lb	20 count:191-210 gm/6.7-4.7oz
8 count:460-575 gm/ 1.3-1 lb	22-count:171-190 gm/ 6-6.7 oz
10 count: 366-460 gm/ 0.8-1 lb	24 count:156-170 gm/ 5.5-6 oz
12 count: 306-365 gm/ 0.6-0.8 lb	26 count:146-155 gm/ 5-5.5 oz
14 count: 266-305 gm/ 9.4-11 oz	28 count:136-145 gm/ 4.8-5 oz
16 count:236-265 gm/ 8-9.4 oz	30 count:125-130 gm/4.4-4.6 oz



Each alternate fruit should be wrapped in tissue paper to reduce vibration injury and fruit scarring. Shredded paper placed in the base of the carton also helps to reduce fruit surface damage.

Temperature Control

Postharvest temperature dramatically affects market life and the rate of ripening. The West Indian type avocado cultivars grown in Guyana should be held at 12.5°C (55°F) for maximum market life. The rate of ripening, fruit softening, and decay increases with temperature. Expected market life of fruit held at ambient temperature (25°C to 30°C or 77°F to 86 °F) will vary between 1 to 2 weeks, depending on harvest maturity.

Guyanese avocados are susceptible to chilling injury (CI) at temperatures below 12°C. External symptoms of CI include browning or blackening of the skin, sunken spots, abnormal ripening, and increased decay. Internal symptoms include browning around the vascular bundles, a general grayish-brown discolouration of the flesh, and off-flavour development.

The amount of chilling injury damage depends on the storage temperature, duration of exposure to chilling temperatures, cultivar, production area, and maturity stage.

The ideal storage relative humidity (RH) for avocados is between 90% to 95%. Weight loss and shrivel are much higher at low RH's.

Ripening

Avocados generally do not ripen on the tree. Ripening involves flesh softening and in some cases a change of skin colour. The rate of ripening after harvest is determined by the harvest maturity of the fruit, temperature, and exposure to ethylene. West Indian type avocados ripen best at temperatures between 16°C to 24°C (60°F to 75° F). At higher temperatures, fruit ripen unevenly and develop off-flavours. Treatment with 100 ppm ethylene at 20°C (68°F) for 24 to 48 hours causes avocados to ripen. Early season mature fruits may take 10 to 12 days to ripen at 20°C, whereas mature fruit harvested late in the season may ripen in five to six days. Unripe avocados should not be stored with ethylene-producing crops if required in the firm unripe condition. Ripe (soft) avocados require very careful handling to minimize bruising injury. Soft ripe fruit has a shelf life of only several days.

Principal Postharvest Diseases

Avocados are vulnerable to a number of postharvest diseases. Decay can be controlled by good pre-harvest sanitation, careful harvesting

and handling practices to minimize injury to the fruit, properly sanitized wash water, and storing the fruit at 12.5°C.

Anthracnose

Anthracnose symptoms begin as circular, slightly sunken, brown to black spots on the fruit. These spots enlarge rapidly and often become noticeably sunken with cracks radiating from the spots center. The affected areas eventually become covered with pinkish spore masses. The fungus can progress into the fruit flesh, producing a brownish-black decay and rancid odor.



Stem-end Rot

Stem end rot symptoms begin as dark brown to black spots at the stem end that enlarge and advance toward the blossom.



Fusarium Rot

Symptoms of Fusarium begin as brown sunken spots on the fruit surface that coalesce to form a dry, leathery discoloured peel.



Technical bulletins are also available on waxing fruits and vegetables and hot bath treatment. 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

AVOCADO (PEAR)

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