

Bananas

Postharvest Care and Market Preparation Information Sheet

This information sheet provides growers and agriculture extension personnel a summary of the recommended harvesting and postharvest handling practices for bananas.

Harvest Maturity Indices

Time from flowering

Counting the number of days (or weeks) from the time of flowering is one of the most common methods used to indicate harvest maturity in Guyana. In Guyana, this time frame is usually 3 months from flowering (opening of the first hand) until harvest maturity. A colored ribbon wrapped around the stalk of the bunch can be used to designate the time of flowering. Ribbons of a different color are used each week, and date of wrapping the ribbon on the stalk is recorded. Eleven weeks after flowering (just under 3 months), bunches with the appropriate color code are checked for fullness of the fingers (angularity) and diameter.

Finger fullness (angularity)

The degree of fullness of the fingers or the angularity of the fruit in cross section is another reliable way of determining harvest maturity. Cross sectional slices of immature fruit are angular in shape and have distinct ridges. As the fruit matures, it becomes less angular and more rounded. Fruit intended for the domestic market should be harvested in the green peel stage when the fruit shape is nearly round (between 90-100%

mature). Overly developed fruit usually has split peels or some ripe fruit on the bunch. Export market fruit intended for the Caribbean or Canada should be harvested in the green peel stage when the fruit shape is three-quarters round (75% mature). At this stage, the fruit will have pronounced ridges with convex planes between the ridges.



Finger diameter

A third method used to determine harvest maturity is to measure the diameter of the middle finger on the outer bunch of the second hand using a caliper. It has to be between 31-41 mm wide in order for the bunch to be mature enough for harvest.

Maturity of the fruit can also be determined in the change in peel color to light green on the fruits of the upper hands. In addition, the flower remnants are easily rubbed off the fruit tip.

Harvest Methods

The bunch of fruit is harvested manually by a team of two workers. One worker, the carrier, moves into position underneath the bunch to catch it on a shoulder pad or padded platform. The other worker, the cutter, removes the leaves near the bunch and then cuts a notch into the fruit stalk so that the bunch falls slowly towards the carrier



who guides the bunch onto his shoulder pad.

In small-scale operations, the bunches are taken to a central collection site, where they should be kept in a well-ventilated, shaded area with foam or padding on the ground to cushion the bunches. For local consumption, the hands are usually left on the stalks, loaded onto a transport vehicle, and sold to vendors who cut the hands/fingers to the customer's order.

Bunches that are intended for export should be loaded onto transport vehicles as soon as possible for transfer to the packing facility. A foam cushion or padding material should be placed on the floor and side walls of the transport vehicle to reduce bruising injury. The bunches should not be stacked on top of each other. Rough handling of the bunches will cause peel browning and internal flesh discoloration.

Preparation for Market

Cleaning

Bananas that are sold domestically can be cleaned with cotton gloves or a moist cloth to remove surface dirt once the hands have been cut from the main stalk. Export market fruit must be subject to a more thorough cleaning process.

The hands should be cut smoothly from the main stalk using a sharp curved knife or blade. A portion of the crown is left attached to the hand, which typically has from 4 to 10 joined fingers (individual fruit). The sap (latex) which come out from the cut off crown should not be allowed to come in contact with the peel, this will cause a dark stain on the peel. In order to avoid latex burn, the hands can either be left to drain for 2

minutes on de-latexing trays or floated in water tanks to wash the latex off the fruit surface. If de-latexing trays are used, cellulose crown pads impregnated with thiabendazole are applied to the cut crown area after the latex has stopped exuding.

If a water tank is used to clean the bunches, it should be filled with clean flowing water sanitized with 150 ppm free chlorine for decay control and 1% aluminum potassium sulphate (alum) to prevent latex burn. In addition, the fungicide thiabenbazole (500 ppm) or imazalil (1000 ppm) should be added to the wash water for postharvest disease control. The fruit should remain



in the water tank about 15 minutes or until oozing of latex ceases. The clusters are removed from the tank, placed on trays, dried, and graded.

Grading

The fruit should be free of serious blemishes, scars, insect damage, and decay. All fruit should be mature, uniform green in color, uniform in size, and well shaped. For Canadian export market fruit, the minimum acceptable length of the middle finger on the outer whorl of each hand is 203 mm.

Packing

Bananas sold in the domestic market are usually not packaged. They are transported to market as intact bunches. Bananas

exported to Caribbean or Canadian destinations should be packed in strong, well-ventilated cartons, typically containing 30 or 40 lb (14 or 18 kg) of fruit.



The hands of banana fruit should be packed in a neat, regular pattern to minimize movement and chafing of the peel. The crowns should face the base of the carton. A thin paperboard divider should be used to separate the two layers of fruit. A semi-permeable polyethylene bag is often used to envelope the fruit packed in cartons destined for export.

Temperature Control

Banana fruit stored and transported at high temperatures have a short shelf life and poor quality after ripening. Overheating of banana bunches can lead to the phenomenon of 'mixed ripe' fruit in which some fingers ripen and turn color on the bunch well in advance of other fruit. The ideal storage and transport temperature for maximizing banana shelf life is 13.5°C (57°F). This temperature will delay ripening, but avoid low temperature chilling injury, caused by exposing the fruit to temperatures below 13°C (56°F). Symptoms include a gray peel discoloration, flesh darkening, uneven ripening, and off-flavor. The amount of chilling injury a banana receives depends on the specific temperature and the length of time exposed to the chilling temperature.

The average shelf life of bananas harvested at the 75% mature stage and stored at 14°C is between 3-4 weeks. If the bananas are stored under ambient temperature the shelf life will be

about 7-10 days. Shelf life of green mature bananas can be extended by storing the fruit in polyethylene bags with an ethylene absorbent (potassium permanganate) wrapped in porous paper. In this microenvironment, banana shelf life can be extended up to 3 weeks at 29°C (85°F).

Relative Humidity

The best postharvest relative humidity (RH) for bananas is between 90-95%. Storage of fruit at greater than 90% RH will result in peel dehydration and shriveling. Water loss from skin abrasions and chafed areas of the peel will be accelerated with decreasing RH, and the damaged areas will turn brown to black.

Principal Postharvest Diseases

Bananas are susceptible to a number of postharvest diseases. Decay is much worse when the fruit is mechanically damaged and postharvest temperatures are high.

Crown Rot

Fungal spores colonize the wounded area where the hand is removed from the stalk. Breaking the stalk near the crown rather than cleanly cutting it with a knife will increase the amount of crown rot. Symptoms at first appear as softening and blackening of tissues at the cut crown surface. In severe cases, the point of individual fruit attachment to the hand may also rot. Control of crown rot is achieved by dipping the hands of fruit in a fungicide-treated wash tank and/or applying fungicide-impregnated cellulose crown pads to the cut surface of the hand. Dipping the fruit in 50°C (120°F) water for 5

minutes is also effective in reducing deterioration. Holding the fruit at 13.5°C will minimize decay.

Anthracnose

Infection originates on immature fruit in the field, but lesions typically do not develop until the fruit ripens. Symptoms include large dark oval lesions, often covered with pink-colored fungal spores. Diseased fingers mature more rapidly than healthy fingers. Recommendations for anthracnose control are similar to those used for crown rot.

Cigar End Rot

The disease begins with a localized darkening and wrinkling of the peel at the tip. Blackening of the tip continues and the area later becomes covered in a powdery mass of spores, which resembles the ash on a cigar. Control of this disease is obtained by removing the dried flower parts as soon as the fruits are formed. Spray applications of copper fungicides to the developing fruit tips are also effective.



