



# Cherimoya: Postharvest Quality-Maintenance Guidelines

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**C**herimoya is a heart-shaped fruit having few seeds and a smooth skin. Cherimoya are grown in Florida, California, and Hawai'i.

## Quality Characteristics and Criteria

Fruit size, shape, and skin color are important, along with the absence of defects and decay. Fruit are very susceptible to mechanical injury. Sugar levels can vary from 14 to 18%, with moderate acid levels.

## Horticultural Maturity Indices

Mature fruit are firm but become very soft during ripening. Skin changes color from dark to light green or greenish-yellow, and maturity is associated with increased surface smoothness. Fruit are harvested when mature and allowed to ripen during marketing.

## Grades, Sizes, and Packaging

There are no U.S. or international standards. Single-layer pack in fiberboard carton with foam sleeve or paper wrapping to avoid bruising. Carton size 4 and 8 kg (9 to 18 lb) with 12 to 24 count. Fruit weight from 250 to 600 g (9 to 21 oz).



Cherimoya, *Annona cherimola* Mill.

## Pre-Cooling Conditions

Pre-cool as soon as possible after harvest to about 12°C to 15°C (54 to 59°F); room-cooling or forced-air most often used.

## Optimum Storage Conditions

Store at 10 to 13°C (50 to 55°F) with 90 to 95% RH for 2 to 3 weeks. If held at 20°C (68°F), fruit last 3 to 4 days (Kader and Arpaia 1999). Storage is limited by skin darkening, desiccation, and disease due to chilling injury. Ripe, soft fruit should be held at 0 to 5°C (32 to 41°F).

## Controlled Atmospheres (CA) Consideration

Fruit held in 5% O<sub>2</sub> for 30 days at 10°C (50°F) ripened in 11 days after removal to air storage at 20°C (68°F), versus 3 days for fruit held in 20% O<sub>2</sub> (Palma et al. 1993a). Addition of CO<sub>2</sub> at 3% or 6% can also extend storage-life beyond that of storage in air (Alique and Oliveria 1994). However, not all results have been positive, and there may be varietal differences (Moreno and Dela Plaza 1983). O<sub>2</sub> levels < 1% can lead to off-flavor.



Damaged cherimoya (right)

### Retail Outlet Display Considerations

Display at room temperature (approximately 20 to 23°C; 68 to 73°F) if not ripe. Do not use misting or ice.

### Chilling Sensitivity

Fruit are chilling sensitive, especially below 10°C (50°F); the extent of injury depends upon duration. Symptoms include skin darkening and a failure to fully soften or develop full flavor.

### Ethylene Production and Sensitivity

Cherimoya, which are a climacteric fruit, have high rates of ethylene production, of 100 to 300  $\mu\text{L kg}^{-1} \text{h}^{-1}$  at 20°C (68°F) (Palma et al. 1993b). Exposure to ethylene at 100  $\mu\text{L L}^{-1}$  for 24 h leads to rapid ripening of mature green fruit.

### Respiration Rates

See Table 1. To get  $\text{mL kg}^{-1} \text{h}^{-1}$ , divide the  $\text{mg kg}^{-1} \text{h}^{-1}$  rate by 2.0 at 0°C (32°F), 1.9 at 10°C (50°F), and 1.8 at 20°C (68°F). To calculate heat production, multiply  $\text{mg kg}^{-1} \text{h}^{-1}$  by 220 to get BTU per ton per day or by 61 to get kcal per metric ton per day.

### Physiological Disorders

Chilling injury is the major postharvest disorder of cherimoya. The skin darkens and flesh fails to soften and can be “mealy,” with poor flavor (Palma et al.

1993b). The degree of injury depends upon variety and ripeness stage. Mechanical injury is a major problem during handling, leading to unsightly black blemishes that can be sunken. Splitting can occur during ripening and provide sites for decay. Early-season fruit, which frequently develop higher sugar levels, are more susceptible to this splitting.

### Postharvest Pathology

Anthraxnose (*Colletotrichum gloeosporioides*) appears as dark lesions and may produce pink spore masses under high RH conditions. Black canker (*Phomopsis anonacearum*) appears as purple spots that become hard and cracked, while Botryodiplodia rot (*Botryodiplodia theobroma*) first appears as purple, later black, spots, after which the flesh becomes brown and corky. These are preharvest diseases that require good orchard sanitation to eradicate. Careful handling, sanitation, and cooling, along with fungicides, if approved, can minimize these problems.

### Quarantine Issues

Cherimoya are a fruit fly host. Other quarantine pests include a seed borer and scales. Heat treatments and irradiation are potential treatments.

### Suitability as Fresh-Cut Product

The fruit is sold as a fresh-cut product, although the shelf-life is unknown. Ripe pieces can be held at 0 to 1°C (32 to 34°F).

### Special Considerations

None.

*An earlier version of this article was originally published at the USDA website: [www.ba.ars.usda.gov/hb666/contents.html](http://www.ba.ars.usda.gov/hb666/contents.html)*

### References

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**Table 1. Respiration Rates**

Temperature	mgCO <sub>2</sub> kg <sup>-1</sup> h <sup>-1</sup>
10°C	47 to 190
15°C	84 to 280
20°C	138 to 460