



# Longan: Postharvest Quality-Maintenance Guidelines

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This small fruit, a relative of lychee, is 2.5 to 3 cm (1 to 1.2 in) in diameter with a smooth, thin yellowish-brown shell and a sweet, translucent flesh (aril) surrounding a large, hard, non-edible seed (Paull and Duarte 2011; Menzel and Waite 2005). The pulp comes away cleanly from the shell and seed.

## Quality Characteristics and Criteria

Shell color, size, and shape; seed size; and sweetness are criteria. Fruit should be free of insect damage and skin blemishes; it can be culled while sorting for size. See Jiang et al. (2002) for further information.

## Horticultural Maturity Indices

Maturity is judged by shape, skin color, and flavor of each cultivar. Most fruit can be picked from a tree with one harvest, unless multiple flowerings have occurred. No definite harvest index exists for longan, but growers usually note changes in skin appearance: mature fruit develop a smooth and relatively darker skin (Wong and Ketsa 1991).



Longan, *Dimocarpus longan* (Lour.) Steud.

## Grades, Sizes, and Packaging

One-piece fiberboard crates are used, either 4.5 kg (10 lbs) or 2.25 kg (5 lbs), with plastic liners, if not already packed in polystyrene containers. Fruit are clipped from the stem, as hand removal often leads to some inadvertent skin removal.

## Pre-Cooling Conditions

Room or forced-air cooling. Longan in plastic baskets can be hydro-cooled, although hydro-cooled longan should not be treated with SO<sub>2</sub>. SO<sub>2</sub> fumigation damages hydro-cooled fruit skin by producing brown spots on both the inner and outer skin surface. It also results in greater

SO<sub>2</sub> residues remaining on the fruit (Suwanagul 1992). SO<sub>2</sub> treatment of fruit to be sold as fresh is not approved in the U.S.

## Optimum Storage Conditions

The recommendation is 4 to 7°C (41 to 46°F) at 90 to 95% RH (Paull and Chen 1987). Fruit can be held for 2 to 3 weeks, although the skin loses its yellowish color-

ation and becomes brown. At lower temperatures, there is a rapid loss of eating quality, and above 10°C (50°F) postharvest diseases are a concern. See Table 1. for the expected storage-life of longan held at high relative humidity (Suwanagul 1997).

### Controlled Atmospheres (CA) Considerations

No controlled atmosphere studies have been reported, though MAP in 0.03 mm (1/1000 in) polyethylene bags has been tested for 7 days at room temperature, followed by 35 days at 4°C (39°F). A MA of 1 to 3% O<sub>2</sub> delays browning and maintains SSC and vitamin C content (Zhang and Quantick 1997). A 1% O<sub>2</sub> treatment results in a slight off-flavor.

### Retail Outlet Display Considerations

Should display refrigerated; do not mist so as to avoid microbial growth.

### Chilling Sensitivity

At storage temperatures less than 5°C (41°F), a slight off-flavor can develop after about 1 week. The peel color of longan stored at 0°C (32°F) turns dark brown, while SO<sub>2</sub>-fumigated longan remain yellowish-brown. The dark brown peel of longan that develops at very low temperatures is regarded as chilling injury (La-Ongsri et al. 1993).

### Ethylene Production and Sensitivity

Longan fruit have a low rate of ethylene production at less than 1 nL kg<sup>-1</sup> h<sup>-1</sup>. There are no reports on ethylene sensitivity.

### Respiration Rates

See Table 2. To get mL kg<sup>-1</sup> h<sup>-1</sup>, divide the mg kg<sup>-1</sup> h<sup>-1</sup> 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 mg kg<sup>-1</sup> h<sup>-1</sup> by 220 to get BTU per ton per day or by 61 to get kcal per metric ton per day. Data are from Liao et al. (1983).

### Physiological Disorders

Desiccation is a major problem that leads to a rapid loss of bright yellowish skin, which turns to a dull brown color (Jiang et al. 2002).

### Postharvest Pathology

Similar postharvest diseases as lychee. Fungi associated with skin browning and darkening of the skin along with mycelium include *Lasiodiplodia theobromae*, *Pestalotiopsis* sp., *Cladosporium* sp, *Fusarium* sp. and *Aspergillus niger* (Sardsud et al. 1992).

### Quarantine Issues

Longan is a fruit fly host. Suitable treatments include hot air, vapour heat treatment, or irradiation.

### Suitability as Fresh-Cut Product

Peeled, de-seeded fruit aril can be used as a fresh-cut product.

### Special Considerations

Longan are fumigated with SO<sub>2</sub> in Thailand and other countries to prevent skin browning and to control post-harvest disease (Tongdee 1994). Although very effective,

Table 1. Storage Life of Longan

Temperature	Storage Life (Days)	SO <sub>2</sub> -Treated (Days)
0°C	14 to 28	21 to 42
4°C	14	14 to 28
10°C	7 to 14	14
20°C	3 to 5	7
30°C	1 to 2	3 to 5

Table 2. Respiration Rates of Longan

Temperature	mg CO <sub>2</sub> kg <sup>-1</sup> h <sup>-1</sup>
5°C	3.5 to 11.3
10°C	16.0 to 25.0
20°C	30.0 to 53.0

the treatment is not approved for use in the U.S. for fruit to be sold as fresh. Asian consumers prefer longan in bunches. They assume that single fruit have fallen from the bunch because it has been dropped or that fruit are not fresh. Individual fruit may also have a higher rate of weight loss.

*An earlier version of this article was originally published at the USDA's website: [www.ba.ars.usda.gov/hb66/contents.html](http://www.ba.ars.usda.gov/hb66/contents.html)*

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