

Wax Apple

Robert E. Paull and Ching Cheng Chen
Department of Tropical Plant and Soil Sciences
University of Hawaii at Manoa, Honolulu, HI

Scientific Name and Introduction: Wax apple (*Syzygium samarangense* [Blume] Merrill & L. M. Perry) is the main species in this Southeast Asian genus consumed fresh. Other species with similar fruits are *S. aqueum*, rose water apple, *S. aimini*, java plum, *S. jambos*, rose apple and *S. malaccense*, Malay apple. The spice clove is *S. aromaticum*. The fruit is broad, bell shaped, sometimes oval, 5 to 6 cm long (2 to 2.5 in) and 4 to 5 cm wide (1.5 to 2 in), with one to four seeds. The skin can be green to light red to dark red and has a wax-like high gloss sheen. The low acid flesh is white and juicy (Nakasone and Paull, 1998).

Quality Characteristics and Criteria: Skin color, waxy glossy appearance, large size with small seed, crunchy watery sweet taste and subtle flavor.

Horticultural Maturity Indices: Harvest when blossom-end is fully expanded and skin shows desired market color. Green skin varieties are harvested when they reach full-size.

Grades, Sizes and Packaging: There are no U.S. or international standards. Fruit are generally graded by size and color. They are generally marketed in single layer fiberboard cartons of 2.25 kg (5 lb) with padding, sometimes in trays.

Pre-Cooling Conditions: Room-cooling is normally used, due to the risk of excessive moisture loss with forced-air cooling.

Optimum Storage Conditions: Storage at 2 to 10 °C (36 to 50 °F) is recommended. However, chilling injury is a problem at these temperatures. A conservative recommendation would be 12 to 14 °C (54 to 57 °F) with 90 to 95% RH, which should result in a shelf-life of 10 to 14 days.

Controlled Atmospheres (CA) Consideration: No CA studies have been reported. MAP in sealed polyethylene film bags reduces chilling injury and decay (Horng and Peng, 1983). Waxing is less effective, partly due to RH control.

Retail Outlet Display Considerations: Display in over-wrapped tray or closed polystyrene clamshell containers with no perforations at 10 °C (50 °F). Do not mist.

Chilling Sensitivity: Wax apples show pitting and skin scald after 4 days at 2 °C (36 °F), while slight injury occurs after 4 days at 10 °C (50 °F) (Horng and Peng, 1983).

Ethylene Production and Sensitivity: Wax apples produce very low ethylene. It is a non-climacteric fruit (Akamine and Goo, 1979). There are no reported responses to ethylene, but ethylene treatment may lead to premature senescence.

Respiration Rates:

Temperature	mg CO ₂ kg ⁻¹ h ⁻¹
10 °C	4 to 5
20 °C	8 to 11

Respiration declines after harvest (Liao et al., 1983). To get mL kg⁻¹ h⁻¹, divide the mg kg⁻¹ 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 mg kg⁻¹ 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, mechanical injury and water loss are the three major disorders. Chilling injury symptoms are pitting and scalding of the skin, while mechanical injury (impact and abrasion) lead to development of sunken areas and some darkening of affected flesh. Though fruit have a bright waxy coating, water loss is rapid, leading to shriveling on the skin and loss of crisp texture. At 2% moisture loss, fruit become slightly shriveled, and at 6% fruit are shrunken and lose turgidity (Horng and Peng, 1983).

Postharvest Pathology: There are no published reports found; may show anthracnose.

Quarantine Issues: This is a fruit fly host, irradiation at 300 Grays may have potential for disinfestation.

Suitability as Fresh-cut Product: Often available as a fresh-cut product in Southeast Asian markets in trays with over-wrap. Some potential as a fresh-cut product.

Special Considerations: None.

References:

- Akamine, E.K. and T. Goo. 1979. Respiration and ethylene production of fruits of species and cultivars of *Psidium* and species of *Eugenia*. *J. Amer. Soc. Hort. Sci.* 104:632-635.
- Horng, D. and C. Peng. 1983. Studies on package, transportation and storage of wax apple fruits (*Syzygium samarangense*). *Natl. Chung Hsing Univ. Hort. J.* 8:31-39.
- Liao, M.L., M.S. Liu and J.S. Yang. 1983. Respiration measurement of some important fruits in Taiwan. *Acta Hort.* 138:227-246.
- Nakasone, H.Y. and R.E. Paull. 1998. *Tropical Fruits*. CAB Intl., U.K. 445 pp.