College of Tropical Agriculture
and Human Resources
University of Hawai'i at Mānoa

Vegetable and Root Crops
January 2015
VC-5

Taro:
Postharvest Quality-Maintenance Guidelines

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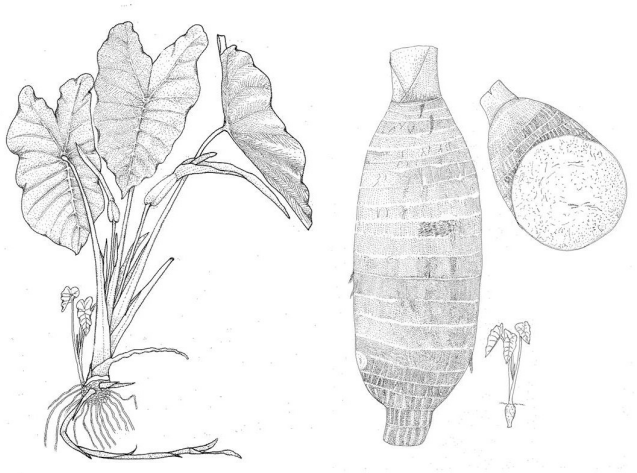
Taro is one of the oldest food crops, widely distributed throughout tropical Africa, Asia, and the Pacific. It is the fifth most important root crop grown in the world. There is also substantial production in Egypt and the Caribbean (O'Hare and Asokan 1986). The root, also called a corm or tuber, as well as the petioles and leaves are consumed. All parts of the plant must be cooked prior to eating because of the acridity associated with a compound on the calcium oxalate crystals (raphides) that it contains (Paull et al. 1999). The corm is high in starch and low in protein and fat. The plant is also known as kalo, tannier, malanga, dasheen, eddoe, and cocoyam. There are numerous varieties (up to 600), in which corm flesh color varies from white to yellow, orange, and red, to purple. In Hawai'i, the most common variety sold to consumers is the Chinese type 'Bun-Long' or 'Bin Liang', which has white flesh with obvious purple fibers and lower acridity than other varieties. For poi, 'Lehua Maoli', with its purplish flesh and dark purple fibers, is common.



From Lebot (2009); used with the permission of the author.

Quality Characteristics and Criteria

There are two main types, one having a smaller, brown, segmented root up to 14 cm (5.5 in) long, often known as eddoe, and the other having a larger, brown, cylindrical root upwards of 35 cm (14 in) and 10 to 15 cm (4 to 6 in) in diameter. The larger type sold in Hawai'i has a market size from 1 to 3 kg (~2 to 7 pounds); consumers prefer the smaller sizes and processors the larger sizes. In each type, the corm should have no sprouts and be free from excess soil, cuts, bruises, insects, and disease damage. All roots should be removed. The smaller taro type possesses some degree of dormancy, while there is no dormancy in the larger taro corms. In some markets overseas, 5 cm (2 in) of the cut petioles are left attached.

Horticultural Maturity Indices

Roots are harvested when they have met market needs as to size. Most often this is after they have stopped growing and leaves have begun to die back, 8 to 12 months after planting in the tropics. The main corm is harvested and smaller coromels removed; diseased areas on main corms are cut away. In eddoe, the coromels are also harvested. Young taro leaves are also harvested, bunched, and marketed as a leafy vegetable.

Published by the College of Tropical Agriculture and Human Resources (CTAHR) and issued in furtherance of Cooperative Extension work, Acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, under the Director/Dean, Cooperative Extension Service/CTAHR, University of Hawai'i at Mānoa, Honolulu, Hawai'i 96822.

Grades, Sizes, and Packaging

Corms are graded by size, skin color, shape, and flesh texture. They are packed in 22.5 kg (50 lb) cartons, crates, or sacks with adequate aeration. The smaller roots may also be sold in 4.5 kg (10 lb) cartons. There are no U.S. or international standards.

Pre-Cooling Conditions

Taro should be room-cooled to 10 to 14°C (50 to 57°F) at 80 to 90% RH as soon as possible after harvest.

Optimum Storage Conditions

Good ventilation is essential for storage. The storage recommendation is 7 to 10°C (45 to 50°F) with 80 to 95% RH for up to 18 weeks. However, roots must be eaten within 2 days of removal to ambient temperature (Snowdon 1992). At 0 to 2°C (0 to 4°F), storage life is up to 8 weeks. At 20°C (68°F), storage life is from 2 to 4 weeks. Some data suggest that leaving the apex on extends storage life.

Controlled Atmospheres (CA) Consideration

There are no published reports of CA. However, MAP in polyethylene film bags at 27 to 32°C (81 to 90°F) reduces weight loss (Passam 1982).

Retail Outlet Display Considerations

Display dry; do not mist.

Chilling Sensitivity

Chilling injury occurs when the corm is stored at less than 7 to 10°C (45 to 50°F) for a few weeks. It leads to pitting and increased postharvest disease.

Ethylene Production and Sensitivity

Taro roots have a very low ethylene production; there is no known response of taro roots to ethylene application.

Respiration Rates

Respiration rates of taro corms has been reported as 22 + 5 mL CO_2/kg fresh weight/hour at 27–32°C (81–90°F).

Physiological Disorders

Chilling injury is a common problem with large taro roots. Symptoms of chilling injury include internal corm browning that starts after 10 days at 4°C (39°F). Weight loss can be significant, with up to 20% loss occurring in 4 weeks when held at low relative humidity and 27 to 32°C (81 to 90°F). If stored at high relative humidity, sprouting can be a problem if the apex is still intact. Variation of unknown cause in cooked texture sometimes occurs.

Postharvest Pathology

The corm's high moisture content often leads to rots that are a major cause of postharvest losses, especially when poorly handled. Pythium root rot can be a major problem in wetland taro. Corm rots can also be associated with a complex of microorganisms, including *Fusarium*, *Sclerotinia*, *Erwinia*, *Botryodiplodia*, and *Ceratocystis*. These decay organisms are associated with field infection through wounds. After washing roots to remove soil and then cutting corms to remove diseased tissue, corms should be dried (cured) so that wound healing can occur. Curing is best done at 20 to 30°C (68 to 86°F), followed by cooling to control further disease development (Snowdon 1992). Considerable losses occur when corms are shipped in thick plastic bags that offer no mechanical protection.

Taro corms in an Asian wholesale market that were shipped and marketed in plastic bags.

Quarantine Issues

Aphids can be a major problem on taro leaves.

Suitability as Fresh-Cut Product

Taro must be cooked before eating.

Special Considerations

Corms are roasted, baked, boiled, or deep-fried. Grated, cooked corm is sometimes mixed with coconut milk. Corms are boiled, mashed, and sieved for producing poi.

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An earlier version of this article was originally published at the USDA website: www.ba.ars.usda.gov/hb66/contents.html