

Maprang (*Bouea macrophylla* Griff.) Fruit Trees: Botany and Commercial Cultivation in South Florida¹

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Introduction

Maprang (*Bouea macrophylla* Griff.), also known as gandaria, marian plum, or plum mango, is a tropical fruit tree in the family Anacardiaceae cultivated throughout Southeast Asia and valued for its aromatic fruit, which resembles a small mango. The fruit has an edible, soft orange skin with a sweet to sweet-tart taste, described as having notes of mango, apricot, and plum. Commercial production occurs primarily in Thailand, with additional cultivation in Indonesia, Malaysia, Vietnam, Laos, and Cambodia (Lim 2015; Rifai 1991; Subhadrabandhu 2001).

Interest in maprang outside Southeast Asia has increased due to its high-quality fruit, compact tree size, high productivity, and attractive canopy (Love and Paull 2025). In Hawaii, maprang has emerged as a specialty crop distributed through farmers' markets and direct-to-consumer outlets (Imada et al. 2025; Love and Paull 2025). In south Florida, maprang can be grown successfully, but it is currently limited to private orchards and collections, with no established commercial plantings (Sanchez, unpublished data). The species shows promise for medium-scale commercial production and home landscapes due to its compact tree size, high yields, low pest pressure, and high-quality fruit. Production is well adapted to local conditions (Imada et al. 2025; Love and Paull 2025; Sanchez, unpublished data; Subhadrabandhu 2001). This publication provides information on maprang botany, phenology, fruit characteristics, and recommended horticultural practices for commercial growers, county and state Extension faculty, and homeowners and students interested in growing this species in Florida. This species is not invasive and is not on the state or federal list of invasive or potentially invasive species (UF/IFAS 2018).

Scientific Name

Bouea macrophylla Griff.

Common Names

Maprang, marian plum, plum mango, gandaria, kundang, ramania

Family

Anacardiaceae

Relatives

Bouea is a small genus within the family Anacardiaceae. This family includes economically important fruit crops such as mango (*Mangifera indica*), cashew (*Anacardium occidentale*), pistachio (*Pistacia vera*), and ambarella (*Spondias dulcis*). Although botanically distinct from mango (*M. indica*), maprang shares some morphology, phenology, and environmental requirements with mango. However, maprang differs in fruit size and characteristics, tree size, vegetative traits, and reproductive morphology (Jensen 2001; Love and Paull 2025).

Origin and Distribution

Maprang is native to mainland Southeast Asia, with primary centers of cultivation and commercialization in Thailand, Laos, Cambodia, Vietnam, and parts of Malaysia and Indonesia, where it is grown widely in small- and medium-scale orchards and home gardens. Interest from international specialty fruit markets has increased in recent years due to its distinctive flavor and attractive fruit (Love and Paull 2025; Rifai 1991; Subhadrabandhu 2001).

Description

Tree

Maprang is an evergreen tree that may reach 66–82 ft (20–25 m) in unmanaged tropical forests but is typically maintained at 13–26 ft (4–8 m) in cultivation through annual pruning. Trunk diameter of mature trees commonly ranges from 9.8 to 23.6 in (25 to 60 cm) at breast height. Depending on management and selection, growth habit ranges from upright to spreading. The tree develops a dense canopy with glossy foliage and can be pruned to maintain a manageable height for harvest. The bark is gray to brown and becomes rough and fissured with age. The tree is generally considered attractive as an ornamental for its foliage texture and seasonal fruit display (Jensen 2003; Lim 2015; Love and Paull 2025; Rifai 1991; Subhadrabandhu 2001).



Figure 1. Maprang tree.

Credit: Classic via Adobe Stock.

Leaves

Leaves are simple, opposite, elliptic to oblong, leathery, and glossy, with a prominent pinnate (feather-like) venation evident on the abaxial (underside) surface. Mature leaves typically measure 5–10 in (13–25 cm) long and 2–3 in (5–8 cm) wide, with entire margins, acuminate apices (tapers to a long, slender point), and cuneate-to-acute bases (wedge shaped or narrow near the stem but wider further down the leaf) (Rifai 1991; Lim 2015). Petioles are 0.4–1.0 in (1–2.5 cm) long. Leaves are deep green at maturity, while newly flushed growth is a distinctly lighter green (Lim 2015; Love and Paull 2025; Rifai 1991).



Figure 2. Maprang leaves.

Credit: sarayuth via Adobe Stock.

Flowers

Flowers are produced in axillary or terminal panicles, measuring 1.6–4.7 in (4–12 cm). Individual flowers are 0.08–0.12 in (2–3 mm) in diameter with four sepals and four pale yellow to cream petals. Flowering is seasonal and often follows cool, relatively dry conditions similar to mango. In south Florida, flowering has been observed primarily from December to February (Love and Paull 2025; Rifai 1991; Sanchez, unpublished data; Subhadrabandhu 2001).

Pollination

Pollination is presumed insect-mediated because the inflorescences attract a large number of insects, although specific pollinators in Florida are unknown. The degree of self-compatibility and the requirement for pollinizers remain unclear and require further evaluation (Love and Paull 2025; Sanchez, unpublished data).

Fruit

The fruit are drupes, typically oval to ellipsoid, measuring approximately 1.5–3.0 in (4–8 cm) in length, 0.8–1.6 in (2–4 cm) in diameter, and 3–5 oz (80–140 g) in weight depending on selection. The skin is smooth and turns yellow to orange at maturity. The flesh is yellow to orange, aromatic, and surrounding a single flattened seed approximately 1–2 in (3–5 cm) long with a characteristic purple color. The flesh-to-seed ratio and soluble solids content vary widely among seedling populations, with sweeter dessert types exhibiting higher soluble solids content and lower titratable acidity. Harvest maturity strongly influences sweetness and consumer acceptance (Lim 2015; Love and Paull 2025; Rajan et al. 2014; Rifai 1991; Subhadrabandhu 2001).

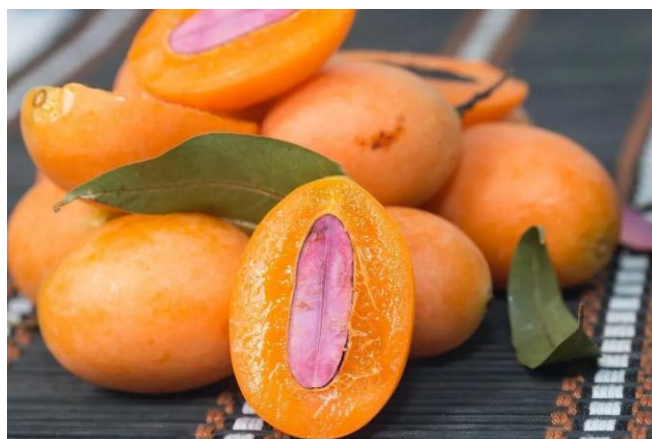


Figure 3. Maprang fruit.

Credit: sakdinon via Adobe Stock.

Varieties

There are no formally defined cultivars of maprang. In Thailand, where maprang is widely grown, fruit are commonly grouped by eating quality into sour culinary types and sweet dessert types (maprang wan), with premium sweet dessert fruit often marketed as ‘mayong chid’. These groups do not represent genetically uniform cultivars, and fruit quality varies widely due to the predominance of seed-based propagation and limited clonal selection (Lim 2015; Subhadrabandhu 2001).

Uses, Nutritional Value, and Market Potential

Maprang fruit are consumed primarily fresh as a seasonal dessert fruit. The ripe peel is thin, soft, and edible, and it is commonly eaten with the flesh, particularly in premium sweet types. In Southeast Asia, these fruit are also incorporated into desserts, preserves, syrups, beverages, and pickled products, while more acidic types are used in savory culinary preparations. Nutritional analyses indicate that maprang fruit contain appreciable levels of carbohydrates and dietary fiber, along with bioactive compounds exhibiting antioxidant activity. Vitamin C and carotenoid pigments contribute to nutritional value, with concentrations varying by genotype and maturity stage. In south Florida, cultivation is currently confined to private orchards and specialty collections, with no established commercial plantings; however, the species' edible peel, attractive fruit, manageable tree size, adaptation to local climatic conditions, and generally low observed pest pressure suggest potential for niche commercial production targeting fresh markets and direct-to-consumer sales (Lim 2015; Love and Paull 2025; Rajan et al. 2014; Sanchez, unpublished data; Subhadrabandhu 2001).

Environmental Requirements

Temperature

Maprang is adapted to humid tropical and warm subtropical temperatures, with optimal growth occurring at mean temperatures of 75°F–90°F (24°C–32°C). Under south Florida conditions, maprang trees seem to have cold tolerance comparable with mango, tolerating low temperature periods of 40°F–50°F (4°C–10°C) and short periods of exposures to temperatures near 30°F (–1°C) without tree mortality, although young trees are more vulnerable. Mild cool periods, with temperatures below 64°F (18°C), appear to promote flower induction, thus enhancing flowering. Higher temperatures seem to inhibit flowering, and mild drought stress does not promote flowering in the absence of cool temperatures (Mavuso and Yapwattanaphun 2017; Sanchez, unpublished data; Subhadrabandhu 2001).

Rainfall

Maprang trees respond positively to consistent soil moisture, particularly during establishment and during fruit set and fruit enlargement, provided the soil remains well drained. In their native range, vegetative growth is vigorous under annual rainfall of approximately 47–79 in (1,200–2,000 mm). This rainfall occurs primarily in the warmer months, followed by a cooler and relatively drier period of approximately two months, during which precipitation decreases (Love and Paull 2025; Sanchez, unpublished data; Subhadrabandhu 2001).

Flooding and Salinity

Maprang is native to areas with well-drained upland soils and is not described as flood-tolerant in its native range, although short-term waterlogging after heavy rainfall does not seem to affect the trees negatively. There are no published studies documenting salinity tolerance in maprang (Love and Paull 2025; Rifai 1991; Saw et al. 1991; Subhadrabandhu 2001).

Propagation

Maprang trees are propagated primarily by seed, which remains the standard practice throughout Southeast Asia and Hawaii, including for premium dessert types such as 'mayong chid'. Seeds should be removed from ripe fruit, thoroughly cleaned to remove adhering pulp, and planted within one to two days after extraction, as seed viability declines rapidly with desiccation. Seeds are typically planted in containers filled with well-drained, sterile potting media and covered by approximately 0.4–0.6 in (1–1.5 cm) of this media. Under warm conditions, germination generally occurs within four to eight weeks, with optimal temperatures near 80°F–90°F (27°C–32°C), and media should remain consistently moist but not waterlogged (Love and Paull 2025; Rifai 1991; Subhadrabandhu 2001).

Early growth of maprang is relatively slow, with seedlings requiring approximately one to two years to reach 12–24 in (30–60 cm) in height. During this establishment phase, seedlings should grow under approximately 50% shade or indirect light, as young plants do not tolerate full sunlight. Seedlings develop a strong taproot and exhibit intermittent vegetative flushing during early growth, with extended intervals between flushes characteristic of the juvenile phase.

Vegetative propagation methods are practiced selectively in maprang to maintain superior genotypes. Air-layering (marcotting), grafting, inarching (approach grafting), and, less commonly, stem cutting have been reported and used successfully, particularly for the propagation of selected types such as 'mayong chid', and to achieve earlier and more uniform fruit bearing relative to seed-propagated trees (Love and Paull 2025; Subhadrabandhu 2001).

Production (Crop Yields)

Maprang typically produces one main crop per year. In south Florida, flowering generally occurs from December to February, with fruit harvest concentrated from May to July, corresponding to an average fruit development period of approximately four months. Seedling-propagated trees commonly begin bearing after 7–10 years, whereas vegetatively propagated trees bear earlier at 5–6 years (Love and Paull 2025). Under favorable conditions, yields of mature, well-managed trees average 150–220 lb (70–100 kg) and have been reported to reach up to 440 lb per tree per year (200 kg per tree). Individual fruit typically

weigh 3.0–5.0 oz (80–140 g), depending on genotype and maturity (Jaikham et al. 2025; Love and Paull 2025; Rajan et al. 2014; Sanchez, unpublished data).

Recent production statistics from Thailand exemplify the commercial potential of maprang. For the 2021 production year, Thailand's Department of Agricultural Extension reported that maprang occupied 7,329 acres (2,965 ha) with a total annual production of 18.1 million lb (8,225 metric tons). This corresponds to an average productivity of approximately 2,470 lb per acre (2,770 kg per ha), reflecting aggregated yields across orchards of varying ages, cultivar types, and management intensities (Kantapan and Dechsupa 2023).

Spacing

Maprang is a medium- to large-sized evergreen tree that develops a broad, spreading canopy at maturity, although regular pruning can maintain tree size at a manageable scale. In traditional orchard systems in Southeast Asia, seedlings or clonally propagated plants are commonly planted in rows at a spacing of approximately 32 × 40 ft (10 × 12 m), equivalent to about 34 trees per acre (82 trees per ha), which accommodates full canopy development but can make harvesting more difficult. In contrast, higher-density systems are currently being used more commonly, with trees spaced at approximately 17 × 17 ft (5 × 5 m), or about 150 trees per acre (370 trees per ha), where regular and intensive pruning maintain compact canopies and allow management and harvesting from the ground (Love and Paull 2025; Rifai 1991; Subhadrabandhu 2001).

Soils

Maprang performs best in well-drained soils with moderate fertility and a soil pH of approximately 5.5–7.0. In south Florida, sandy soils and shallow calcareous limestone-based soils (Krome series), where soil pH often exceeds 7.0, may induce micronutrient deficiencies—particularly iron, manganese, and zinc—requiring targeted fertilization and foliar sprays. Under calcareous conditions, iron chelate drenches may be necessary to prevent chlorosis (Love and Paull 2025; Sanchez, unpublished data; Subhadrabandhu 2001).

Planting

Maprang trees are typically established in the field from container-grown seedlings or, less commonly, from vegetatively propagated plants. Trees are ready for transplanting when they reach 23.6–35.4 in (60–90 cm) in height and have a well-developed root system. Prior to field planting, trees should be gradually acclimatized to full sun over several weeks. Transplanting is best performed during the warm rainy season, which promotes rapid root establishment and reduces water stress. Plant trees at the same depth as in the nursery container, taking care to

avoid disturbance of the taproot (Love and Paull 2025; Sanchez, unpublished data; Subhadrabandhu 2001).

Site Selection

Maprang trees perform best in full sun while protected from strong winds and planted in well-drained soils. A location with deep, rich, and moist soil will provide ideal growing conditions. Sites with good air circulation reduce disease pressure during flowering and fruit development. Avoid low-lying areas prone to prolonged flooding. Select an open area of at least 25 ft (7.5 m) away from buildings, power lines, and other structures (Love and Paull 2025; Subhadrabandhu 2001).

Staking

Young maprang trees may require short-term staking in exposed or windy sites to limit trunk movement and minimize root disruption during establishment. Stakes can be maintained for six to nine months after transplanting to promote upright growth while the taproot system becomes established. The lower and middle portions of the trunk may be loosely secured to a bamboo or wooden stake using cotton string or biodegradable staking tape (Love and Paull 2025; Sanchez, unpublished data).

Planting in Sandy Soil

Remove existing grass sod or weeds to create a circular area approximately 5–10 ft (1.5–3 m) in diameter. Excavate a planting hole about four times wider and four times deeper than the dimensions of the nursery container. This approach improves initial root penetration in sandy soils while maintaining adequate drainage. The excavated native soil should be used to backfill the hole without amendment. Because sandy soils drain rapidly, frequent irrigation is required during the establishment period, especially during hot, dry weather.

Planting in Very Gravelly Loam (Krome) Soil

In areas where shallow topsoil overlies limestone bedrock, planting holes must be created using mechanical or hand tools such as an auger, backhoe, or digging bar. The planting hole should be at least four times the width and four times the depth of the nursery container. After the hole is prepared, the same planting procedures recommended for sandy soils should be followed.

Planting on a Mound

In sites that experience prolonged flooding lasting more than two to three days, maprang trees should be planted on raised mounds constructed from native soil. Mounds should be 2–3 ft (0.6–0.9 m) high to improve drainage. Following mound construction, planting should proceed using the same steps described for sandy soils.

Mulching

Mulching with pine bark or wood chips is recommended to help retain soil moisture, suppress weed growth, and increase soil organic matter content. A mulch layer 2–4 in (5–10 cm) thick should be maintained beneath the tree canopy; however, mulch should be kept approximately 10 in (25 cm) away from the trunk to reduce the risk of fungal diseases.

Maprang Tree Care in the Home Landscape

Fertilization

Formal fertilization guidelines for maprang under Florida conditions have not yet been established; however, practical recommendations can be developed from field observations, grower experience, and fertilization practices used for mango, a closely related species with comparable growth habits and flushing patterns (Table 1).

During the first two to three years after planting, young maprang trees should receive fertilizer applications every two to three months, beginning with 0.25 lb (114 g) per application (Table 1). After the establishment years, two to three fertilizer applications per year in amounts proportional to tree size are generally sufficient.

For young trees, fertilizer formulations containing 2%–6% nitrogen (N), 6%–10% available phosphoric acid (P_2O_5), 6%–12% potash (K_2O), and 4%–6% magnesium (Mg) have proven effective in promoting balanced growth. Commonly available formulations that fit these ranges include 6-6-6-2, 6-3-16, and similar blends.

In the calcareous, high-pH soils of south Miami-Dade County, maprang trees should receive annual foliar applications of copper, zinc, manganese, and boron during the summer months. Boron must be applied at very low rates (approximately 1/300 of the nitrogen rate) because it has a narrow margin between deficiency and toxicity. Commercial micronutrient mixes containing copper, zinc, manganese, magnesium, and boron are widely available and should be applied according to label directions. Iron should be applied as a chelated soil drench (FeEDDHA formulations preferred) three to four times per year to prevent iron chlorosis in high-pH soils.

In neutral-to-acidic soils, foliar sprays or soil-applied dry materials containing iron, zinc, boron, magnesium, and manganese may be used either individually or in combination. Under these conditions, iron may be applied in non-chelated forms, such as iron sulfate or ferrous sulfate, watered in three to four times per year, without the need for chelated formulations.

Irrigation

Newly planted maprang trees should be irrigated immediately after planting and watered every other day during the first four to six weeks as roots establish. During dry periods of more than four to seven consecutive days without rainfall, especially under hot and windy conditions, trees should be watered approximately once per week. Irrigation frequency can be reduced or temporarily discontinued during the rainy season. During the cooler months of December through March, irrigation may be reduced to encourage flowering and minimize disease pressure. Excessive irrigation can reduce fruit quality and may contribute to decline or poor tree vigor.

Pruning

Maprang is a slow-growing tree, and pruning should be minimized during the first three to five years to promote rapid canopy development. During this period, limit pruning to the removal of dead or diseased branches and light structural pruning to establish a vase-shaped canopy with several well-spaced primary branches. As trees mature, annual tip pruning of terminal shoots after harvest can help stimulate flowering and increase the number of fruiting terminals. After approximately the fifth year, the tips of long, upright branches should be pruned judiciously to maintain tree height at about 12–18 ft (4–6 m), facilitating harvest and routine canopy management. Severe pruning (removal of more than 20% of the canopy in a single event) is not recommended (Love and Paull 2025; Rifai 1991; Sanchez, unpublished data; Subhadrabandhu 2001).

Insect Pests

In south Florida, maprang has not exhibited any major or recurring insect pest problems in private orchards and collections. Systematic surveys of insect pests in Florida have not been conducted, although grower observations indicate generally low pest pressure (Sanchez, unpublished data). In Southeast Asia, surveys document maprang as a host to fruit-infesting tephritid fruit flies in Thailand and Malaysia, suggesting potential susceptibility where fruit fly populations are present (Chinajariyawong et al. 2000). Reports of localized superficial fruit injury also implicate thrips feeding in association with fungal infections under high disease pressure in Thailand (Chantarasiri and Boontanom 2023), but there is no evidence of major endemic insect pest complexes that consistently limit maprang productivity under field conditions.

Diseases

In south Florida maprang plantings, no consistent or severe disease issues have been observed under current growing conditions, and the species does not appear to be highly disease-prone when grown on well-drained soils with good canopy management (Sanchez, unpublished data). Published disease information for maprang is

otherwise limited. In Thailand, superficial fruit disorders characterized by scarred or scabbed symptoms have been associated with fungal organisms and insect feeding, but these have not been reported as systemic or yield-limiting problems (Chantarasiri and Boontanom 2023).

Harvest, Ripening, and Storage

Maprang fruit are considered non-climacteric (fruit that do not continue ripening once removed from the tree) and will not develop full sweetness or flavor if harvested unripe. Fruit should be harvested only after the peel has turned a yellow-to-orange color; fruit harvested at a greener or pale-yellow stage are edible but typically more acidic and astringent (Rifai 1991; Subhadrabandhu 2001; Love and Paull 2025). Once fully ripe, fruit quality is maintained for approximately 5–10 days, after which over-ripening results in softening and loss of flavor. Unlike some mango cultivars, mature maprang fruit do not readily abscise (fall off the tree) and must be harvested manually by clipping the peduncle approximately 0.4–0.6 in (1–1.5 cm) above the fruit. Harvest should be performed carefully to avoid skin abrasion and bruising. Storage and shelf-life characteristics, including temperature sensitivity and the potential to develop chilling injury, under Florida conditions require evaluation (Love and Paull 2025; Rifai 1991; Sanchez, unpublished data; Subhadrabandhu 2001).

References

- Chantarasiri, A., and P. Boontanom. 2023. "A Report of Fungi Associated With the Scarred-Scabbed Symptoms on Maprang (*Bouea macrophylla* Griffith) in Eastern Thailand." *Malaysian Applied Biology* 52 (3): 115–120.
<https://doi.org/10.55230/mabjournal.v52i3.2682>
- Chinajariyawong, A., A. R. Clarke, M. Jirasurat, et al. 2000. "Survey of Opiine Parasitoids of Fruit Flies (Diptera: Tephritidae) in Thailand and Malaysia." *The Raffles Bulletin of Zoology* 48 (1): 71–101. Accessed January 8, 2026, from QUT ePrints.
<https://eprints.qut.edu.au/110241/>
- Imada, C. T., G. W. Staples, and D. R. Herbst. 2025. *Annotated Checklist of Cultivated Plants of Hawai'i*. Bishop Museum.
- Jaikham, P., P. Leelapornpisid, K. Tragoolpua, P. Koonyosying, W.-C. Lin, and W. Poomanee. 2025. "Transethosomes-Encapsulated *Bouea macrophylla* Seed Extract for Anti-Acne Application: Formulation Optimization, Antibacterial Efficacy, and Safety Assessment." *Journal of Agriculture and Food Research* 20: 101764.
<https://doi.org/10.1016/j.jafr.2025.101764>
- Jensen, M. 2001. *Trees Commonly Cultivated in Southeast Asia: An Illustrated Field Guide*. 2nd ed. RAP publication: 1999/13. Food and Agriculture Organization of the United Nations (FAO), Regional Office for Asia and the Pacific.
<https://openknowledge.fao.org/server/api/core/bitstreams/7d4e8697-d604-4136-a5fd-2b5312ae09cc/content>
- Kantapan, J., and N. Dechsupa. 2023. "Plum Mango (*Bouea macrophylla*): Compositional Profile and Usage in Cancer." In *Ancient and Traditional Foods, Plants, Herbs and Spices Used in Cancer*, edited by R. Rajendram, V. Preedy, and V. Patel. CRC Press.
- Lim, T. K. 2015. *Edible Medicinal and Non Medicinal Plants*. Vol. 9. Springer Dordrecht.
<https://doi.org/10.1007/978-94-017-9511-1>
- Love, K., and R. E. Paull. 2025. "Maprang." Fruit, Nut, and Beverage Crops, F_N-68. Extension Publications. University of Hawai'i at Mānoa, College of Tropical Agriculture and Human Resilience (CTAHR).
- Mavuso, V. L., and C. Yapwattanaphun. 2017. "Effect of Environmental Conditions on Flower Induction of Marian Plum (*Bouea burmanica* Griff)." *Agriculture and Natural Resources* 51 (4): 243–246.
<https://doi.org/10.1016/j.anres.2017.01.004>
- Rajan, N. S., R. Bhat, and A. A. Karim. 2014. "Preliminary Studies on the Evaluation of Nutritional Composition of Unripe and Ripe 'Kundang' Fruits (*Bouea macrophylla* Griffith)." *International Food Research Journal* 21 (3): 985–990.
- Rifai, M. A. 1991. "*Bouea macrophylla* Griff." In *Plant Resources of South-East Asia*, edited by R. E. Coronel and E. W. M. Verheij. No. 2: Edible Fruits and Nuts. PROSEA Foundation.
- Saw, L. G., J. V. LaFrankie, K. M. Kochummen, and S. K. Yap. 1991. "Fruit Trees in a Malaysian Rain Forest." *Economic Botany* 45: 120–136.
<https://doi.org/10.1007/BF02860057>
- Subhadrabandhu, S. 2001. *Under-Utilized Tropical Fruits of Thailand*. RAP Publication: 2011/26. Food and Agriculture Organization of the United Nations (FAO), Regional Office for Asia and the Pacific.
- University of Florida, Institute of Food and Agricultural Sciences (UF/IFAS). 2018. "Assessment of Non-Native Plants in Florida's Areas."
<https://assessment.ifas.ufl.edu/>

Table 1. Suggested Fertilizer Program for Maprang Trees in the South Florida Home Landscape.

Year	Times per year	Amount/tree/application lb (kg) ¹	Total amount/tree/year lb (kg) ¹	Minor element sprays (times per year) ²	Iron chelate drenches oz/tree/year (g/tree/year) ³
1	6	0.25–0.5 (0.11–0.23)	1.5–3.0 (0.68–1.36)	6	0.5–0.75 (14–21)
2	6	0.5–1.0 (0.23–0.45)	3.0–6.0 (1.36–2.72)	6	0.75–1.0 (21–28)
3	6	1.0–1.5 (0.45–0.68)	6.0–9.0 (2.72–4.08)	6	1.0–1.5 (28–43)
4	4	1.5–2.5 (0.68–1.13)	9.0–10.0 (4.08–4.54)	6	1.5–2.0 (43–57)
5	4	2.5–3.5 (1.13–1.59)	10.0–14.0 (4.54–6.35)	4	2.0–4.0 (57–113)
6	4	3.5–4.0 (1.59–1.81)	14.0–16.0 (6.35–7.26)	4	2.0–4.0 (57–113)
7	4	3.5–4.0 (1.59–1.81)	14.0–16.0 (6.35–7.26)	4	2.0–4.0 (57–113)
8+	4	3.5–4.0 (1.59–1.81)	14.0–16.0 (6.35–7.26)	4	2.0–4.0 (57–113)

¹ For young maprang trees, use an N–P–K–Mg fertilizer mix of 6-6-6-2, 8-3-9-2, or a young-tree or slow-release fertilizer. For mature trees, use an N–P–K–Mg mix of 6-6-6-2, 8-3-9-2, or similar material.

² The foliar spray should contain zinc, manganese, boron, and molybdenum; it may also contain magnesium and iron.

³ Iron chelate soil drenches (iron plus water) will prevent iron deficiency; foliar sprays of iron materials are generally not effective.

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