HS1070

UF UNIVERSITY of FLORIDA
IFAS Extension

Mamoncillo (Genip) Growing in the Florida Home Landscape[1]

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Scientific Name: *Melicoccus bijugatus*

Common Names: ackee, genip, ginep, guenepa, and Spanish lime (English), limoncillo, macao, maco, mammon, mauco, quenepa (Spanish).

Family: Sapindaceae

Related Fruit Crops: lychee, longan, and rambutan.

Origin: Mamoncillo is native to northern South America and the Island of Margarita.

Distribution: Mamoncillo has been distributed throughout the lowlands of Central America, northern and western South America, the Caribbean, the Philippines, and U.S. (Florida, Hawaii, and California).

History: The time of introduction of mamoncillo to Florida is not known, however, it has been grown in south Florida for at least 75 years.

Importance: Mamoncillo is generally not grown in formal plantings (orchards) but is harvested and sold commercially.

Description

Tree

Medium to large tree, up to 85 ft (up to 26 m) with a round or oval canopy.

Leaves

Leaves are alternate and compound with 4 opposite, elliptic leaflets, 2 to 5 inches long (5-13 cm) and 1 1/4 to 2 1/2 inches wide (3.2-6.3 cm).

Inflorescence (Flowers)

Flowers are produced in 1- to 4-inch long (2.5-10 cm) terminal racemes. Flowers are small, white, with 4 petals and 8 stamens. Male and female flowers are usually borne on separate trees (dioecious), although some trees are partly polygamous (i.e., have both male and female flowers on the same tree).

Fruit

The fruit is a drupe, and fruit are borne in loose clusters. Individual fruit range in size from 0.3 to 0.8

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oz (9 to 22 g) and 40 to 59% pulp. The fruit peel is smooth, green and thin but leathery and brittle. The edible portion of the fruit (pulp) is called an aril. It is succulent, pinkish to white to yellowish and translucent. The pulp is sweet (18.5 to 26% total soluble solids; higher numbers are sweeter) and usually clings to the large seed. Some fruit have two seeds. Fruit must be ripened on the tree for best flavor.

Pollination

In general, two trees, one functionally male and the other functionally female, are needed to insure good fruit production. Some trees possess functionally male and female flowers and do not require another tree. The flowers are pollinated by flying insects including honey bees.

Varieties

There are a number of mamoncillo varieties available in Florida including 'Large', 'Jose Pabon', and 'Montgomery'.

Climate

Mamoncillo trees are well-adapted to tropical and warm subtropical areas. Trees are not freeze tolerant. Young trees are damaged or killed at temperatures below 32°F (0°C). Mature trees may be damaged or killed by temperatures of 27 to 28°F (-2.8 to -2.2°C). Leaves and small branches may be killed at 30°F (1.1°C). Trees are tolerant of prolonged drought but intolerant of flooding.

Propagation

Mamoncillo may be propagated by seed, however, varieties do not come true to seed and seedling trees may not begin fruit production for 8 to 10 years. Trees may be vegetatively propagated by marcottage (air-layering branches of 2 inches of diameter during the warm part of the year, rooting in 5 to 6 weeks). Grafting or budding onto seedling rootstock may not always be successful.

Production (crop yield)

Fruit production may be erratic and is dependent upon successful pollination and fertilization of the flowers. The season in Florida is generally from June to September.

Spacing

Mamoncillo trees should be planted at least 25 ft (7.6 m) from nearby trees and structures because mature trees not regularly pruned may become quite large.

Soils

Mamoncillo trees appear well-adapted to a wide range of well-drained soils including sandy soils with high or low pH, and high-pH, calcareous soils found in Miami-Dade County.

Planting a Mamoncillo Tree

Proper planting is one of the most important steps in successfully establishing and growing a strong, productive tree. The first step is to choose a healthy nursery tree. Commonly, nursery mamoncillo trees are grown in 3-gallon (11-liter) containers and trees stand 2 to 4 ft (0.6-0.9 m) from the soil media. Large trees in smaller containers should be avoided because the root system may be "root bound." This means all the available space in the container has been filled with roots to the point that the tap root is growing along the edge of the container in a circular fashion. Root bound root systems may not grow properly once planted in the ground. Inspect the tree for insect pests and diseases, and inspect the trunk of the tree for wounds and constrictions. Select a healthy tree and water it regularly in preparation for planting in the ground.

Site Selection

In general, mamoncillo trees should be planted in full sun for best growth and fruit production. Select a part of the landscape away from other trees, buildings and structures, and power lines. Remember mango trees can become very large if not pruned to contain their size. Select the warmest area of the landscape that does not flood (or remain wet) after typical summer rains.

Planting in Sandy Soil

Many areas in Florida have sandy soil. Remove a 3- to 10-ft-diameter ring of grass sod (0.9- 3.1-m). Dig a hole 3 to 4 times the diameter and 3 times as deep as the container the tree came in. Making a large hole loosens the soil next to the new tree, making it easy for the roots to expand into the adjacent soil. It is not necessary to apply fertilizer, topsoil, or compost to the hole. In fact, placing topsoil or compost in the hole first and then planting on top of it is not desirable. If you wish to add topsoil or compost to the native soil, mix it with the excavated soil in no more than a 50-50 ratio.

Backfill the hole with some of the excavated soil. Remove the tree from the container and place it in the hole so that the top of the soil media from the container is level with or slightly above the surrounding soil level. Fill soil in around the tree roots and tamp slightly to remove air pockets. Immediately water the soil around the tree and tree roots. Staking the tree with a wooden or bamboo stake is optional. However, do not use wire or nylon rope to tie the tree to the stake because they may eventually damage the tree trunk as it grows. Use a cotton or natural fiber string that will degrade slowly.

Planting in Rockland Soil

Many areas in Miami-Dade County have a very shallow soil, and several inches below the soil surface is hard, calcareous bedrock. Remove a 3- to 10-ft-diameter ring of grass sod (0.9- 3.1-m). Make a hole 3 to 4 times the diameter and 3 times as deep as the container the tree came in. To dig a hole, use a pick and digging bar to break up the rock or contract with a company that has auguring equipment or a backhoe. Plant the tree as described for sandy soils.

Planting on a Mound

Many areas in Florida are within 7 ft (2.1 m) or so of the water table and experience occasional flooding after heavy rains. To improve plant survival, consider planting fruit trees on a 2 to 3 ft (0.6-0.9 m) high by 4 to 10 ft (1.2-3.1 m) diameter mound of native soil. After the mound is made, dig a hole 3 to 4 times the diameter and 3 times as deep as the container the tree came in. In areas where the bedrock nearly comes to the surface (rockland soil) follow the recommendations for the previous section. In areas with sandy soil follow the recommendations from the section on planting in sandy soil.

Care of a Mamoncillo Tree in the Home Landscape

A calendar outlining the month-to-month cultural practices for mamoncillo is shown in Table 1.

Fertilizer

Young trees (less than 4 years old) should be fertilized with 0.25 to 0.50 lbs (0.11 to 0.22 kg) of a complete fertilizer every 8 weeks (Table 2). Complete fertilizer mixtures contain at least nitrogen, phophrous, potash and magnesium. Fertilizers containing 6 to 8% nitrogen, 2 to 4% available phosphorus, 6 to 8% potash, and 3 to 4% magnesium are satisfactory. Twenty to 50% of the nitrogen should be in organic form.

In acid to neutral-pH soils, micronutrients such as manganese, zinc, and iron may be applied in dry applications to the soil. However, foliar applications of manganese and zinc should be made to trees growing in high-pH, calcareous soils. One to two applications of micronutrients should be made during the growing season (March to November).

Soil applications of iron sulfate may be effective in acid to neutral-pH soils. However, in high-pH, calcareous soils, chelated (Fe-EDDHA) iron in a soil drench should be applied. For young trees, mix 0.5 to 2.0 ounces (14 to 57 g) of iron chelate in sufficient water to move the material into the soil around the base of the tree. For mature trees, mix 0.5 to 4.0 ounces (14 to 113 g) of iron chelate per tree per application. Iron should be applied 1 to 2 times during the growing season.

Once trees are 4 or more years old and begin fruit production, applications of nitrogen-containing fertilizer from August until early spring (February-March) should be avoided. Nitrogen applications during this time may stimulate new vegetative growth (i.e., leaves and shoots) and reduce or eliminate the potential for flowering and fruit production.

Irrigation (Watering)

Young trees should be irrigated regularly to facilitate tree establishment and growth. Once trees begin to bear (3 to 4 years after planting), trees should be watered during dry periods from flowering through harvest. Mature mamoncillo trees appear to be quite tolerant of dry soil conditions but may benefit from periodic watering during prolonged dry periods that coincide with flowering and fruit development.

Mamoncillo Trees and Lawn Care

Mamoncillo trees in the home landscape are susceptible to trunk injury caused by lawn mowers and weed eaters. Maintain a grass-free area 2 to 5 or more feet (0.6-1.5 m or more) away from the trunk of the tree. Never hit the tree trunk with lawn mowing equipment and never use a weed eater near the tree trunk. Mechanical damage to the trunk of the tree will weaken the tree and, if severe enough, can cause dieback or kill the tree.

Roots of mature mamoncillo trees spread beyond the drip-line of the tree canopy, and heavy fertilization of the lawn next to mamoncillo trees is not recommended because it may reduce fruiting and or fruit quality. The use of lawn sprinkler systems on a timer may result in over watering and cause mamoncillo trees to decline. This is because too much water too often applied causes root rot.

Pruning

Young trees should not be pruned their first year but should be allowed to grow. During the spring of the second year, branching should be encouraged by heading back the main stem and selecting 4 or 5 well-placed branches. Once new shoots reach 3 ft (0.9 m) in length, they may be tipped back to encourage further branching. After the third year, trees should be pruned to remove poorly placed limbs and dead wood.

As trees mature, most of the pruning is done to control tree height and width and to remove damaged or dead wood. Trees should be kept at a maximum of about 12 to 15 ft (3.7-4.6 m). If the canopy becomes too dense, removing some inner branches will help in air circulation and light penetration. Another pruning objective is to remove dead, damaged or diseased branches. Low branches should not be cut, however, unless they touch the soil. Cultural practices e.g., picking, spraying, and pruning are easier on small trees.

For mature, very large mamoncillo trees in the home landscape that may pose a risk of damaging adjacent buildings or trees, we recommend a professional arborist provide the pruning services. Make sure the arborist is licensed, has insurance, and knows the local ordinances pertaining to fruit tree pruning in your area.

Mulch

Mulching mamoncillo trees in the home landscape helps retain soil moisture, reduces weed problems next to the tree trunk, and improves the soil near the surface. Mulch with a 2- to 6-nch (5-15-cm) layer of bark, wood chips, or similar mulch material. Keep mulch 8 to 12 inches (20-30 cm) from the trunk.

Insect Pests and Diseases

In general, mamoncillo has few insect pests; however, trees should be monitored periodically for insect problems. Contact your local county cooperative extension agent for current control recommendations.

Mamoncillo has few disease problems. A root rotting fungus (*Clitocybe tabescens*) may weaken or kill trees but this is not a common problem. Several fungi cause leaf spots (*Fusarium* spp. And *Phyllosticta* spp.) and red algae may attack leaves, stems, and limbs, causing dieback. Contact your local county cooperative extension agent for current control recommendations.

Harvest, Ripening, and Storage

Mamoncillo fruit should be harvested when fully ripe. Ripe fruit undergo no real color change and remain green in color. Ripeness may be determined by fruit size and flavor. The entire fruiting cluster should be clipped from the tree and individual fruit separated by clipping. Technical information on the storage of mamoncillo is lacking, however, fruit may

be held at room temperature (78-82°F; 26-28°C) or refrigerated for a few days prior to consumption.

Uses and Nutritional Value

Mamoncillo is eaten as a fresh fruit, although the pulp may be used to make jams and jelly. The fruit contains a small amount of calcium and phosphorus (Table 3).

Table 1. Suggested calendar of cultural practices for mature mamoncillo trees in the home landscape.

Operation	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
General[1]			Two NPK applications may be made during the fruit development period. Avoid applying nitrogen after August because it may stimulate excessive shoot growth and reduce flowering the next late winter/spring period.									
Nutritional sprays[2]			Apply 1 to 2 nutritional sprays to the leaves any time from March through October. These sprays should include magnesium, manganese, zinc, molybdenum, and boron.									
Iron applications				The period from April through Sept. is generally the best time to apply 1 to 2 soil drenches of chelated iron material. Dry granular applications of iron sulfate to trees growing in acidic sandy soil may substitute for drenches of chelated iron material. Chelated iron material should be applied to trees growing in high-pH, calcareous soils (i.e., Miami-Dade Co.).								
Watering			Mature mamoncillo trees appear to be quite tolerant of dry soil conditions but may benefit from periodic watering during prolonged dry periods that coincide with flowering and fruit development. Watering during the summer may be unnecessary unless drought conditions prevail. Stop watering trees by the end of Aug. and do not water trees unless there is extreme drought from Sept. until spring flowering.									
Insect and disease control		Monitor for insect pests and treat if necessary.				Monitor trees for red alga and treat if necessary.						
Pruning						After harvest, selectively prune to limit tree size.						

[1] NPK, nitrogen-phosphorus-potassium; apply granular fertilizer 1-2 times per year. Reduce the amount of NPK application during late summer, early fall to slow plant growth in preparation for flowering in the late fall.

[2] Foliar nutritional spray materials should contain magnesium, manganese, zinc and possibly other micronutrients.

Table 2. Suggested fertilizer program for mamoncillo in the Florida landscape.

Year	Times per year	Amount/tree/ application (lbs)[1]	Total amount/tree/ year[1]	Nutritional sprays (times/year)[2]	Iron chelate drenches (oz/tree/application)[3]
1	5-6	0.25-0.5	1.25-3.0	2	0.5-0.75
2	5-6	0.5-1.0	2.5-6.0	2	0.75-1.0
3	5-6	0.5-1.0	2.5-6.0	2	1.0-1.5
4	1-2	2.0	2.0-4.0	1-2	1.5-2.0
5	1-2	2.5-3.0	2.5-6.0	1-2	2-4
6	1-2	3.0-3.5	3.0-7.0	1-2	2-4
7	1-2	4.0-4.5	4.0-8.0	1-2	2-4
8+	1-2	4.5-5.0	9.0-10.0	1-2	2-4

[1] Use 6-6-6-2, 8-3-8-3, 4-4-8-3 or similar materials.
[2] The nutritional spray should contain magnesium, zinc, manganese, molybdenum, and boron; it may also contain iron. Foliar sprays are most effective from April through September/October.
[3] Iron chelate soil drenches (iron plus water) will prevent iron deficiency; foliar iron sprays are generally not effective. Apply soil drenches from June through Sept. See the text under 'Fertilizer' for more information.

Table 3. Food value of 100 g (3.5 oz) of fresh mamoncillo.[z]

Constituent	Value	Constituent	Value
Water	68-83%	Fiber	0.1-2.6 g
Calories	58-73 kcal	Calcium	3.4-15 mg
Protein	0.5-1.0 g	Phosphorus	10-24 mg
Fat	0.1-0.2 g	Iron	0.5-1.2 mg
Carbohydrate	14-19 g	Ascorbic acid	0.8-10 mg

[z]Morton, J.F. 1987. The mamoncillo. In: Fruits of warm climates. J.F. Morton Publ., Miami, Fla. P.267-269.