

LOCAL NAMES

Creole (grand sapotillier, otier jaune d'oeuf); English (mamee, lava-zapote, mamee sapote, mamee zapote, mamey Colorado, mamey rojo, mamey sapote, zapotillo, mamee apple, marmalade plum, red sapote, sapota, marmalade fruit, zapote mamey, zapote, zapote Colorado); French (sapotier jaune d'oeuf, grand sapotillier); Malay (chico-mamei, chico-mamey); Portuguese (zapote de carne, mamey mamey de la tierra); Spanish (mamey sapote, sapote, mamey rojo, mamey Colorado)

BOTANIC DESCRIPTION

Pouteria sapota grows into a handsome, open tree with a thick central trunk and a few large limbs. Mamey sapote trees are large, erect to spreading trees which may grow to a height of about 12.2 m and may exceed 18.3 m in more tropical regions.

Leaves large, up to 30.5 cm long, 10.2 cm wide, simple, and obovate to oblanceolate. The underside is lighter green or brownish and pubescent (hairy) when young but becomes glabrous (smooth) when mature. The leaves are clustered at the ends of the small branches. Depending on the cultivar (variety) and recent crop load, trees will shed most of the leaves in late winter or spring, but develop new leaves rapidly.

Flowers small, perfect, whitish, almost sessile flowers are produced abundantly along smaller branches 1.3 to 5.1 cm, and tend to cluster towards the ends.

Fruit a berry, ovoid to ellipsoid in shape, with a persistent calyx at the base. Most vary from 7.6 to 20.3 cm in length. The skin is thick and woody with a russet brown, somewhat scurfy surface. The pulp of mature fruits is salmon pink, orange, red or reddish-brown in color, soft and smooth to finely granular in texture, usually low in fiber. The pulp has a sweet, almond-like, unique flavor. Normally, the fruit contains a single, large, elliptical seed but it may have up to four. The seed has a shiny, hard, dark brown surface with a light brown hilum on the ventral side. Seeds may crack and sprout in over mature fruits. Fruit weight ranges from 0.3-2.7 kg. The name "Mamey" originated from the confusion with *Mammea americana*.

BIOLOGY

The bloom season depends on the cultivar (variety). Trees may have flowers, immature fruit and mature fruit all at the same time. It takes from 13-24 months for fruit to reach maturity. Seedling trees begin to bear fruit after 7 years or longer. Grafted trees begin to bear in 3 to 5 years. Mamey sapotes are very prolific. Mature trees may bear 200 to 500 fruit per year. Twice this amount may be obtained from large trees.



It is a tropical American fruit containing a large, shiny brown seed. The fruit in this photo is about 20 cm long. The salmon-red pulp is eaten fresh or made into preserves, sherbets, ice creams and drinks. (Armstrong W.P.)



A seed necklace from the Rio Napo, a tributary of the Amazon River in Ecuador. The large, dark brown seeds are from the sapote. Some of the seeds have been sectioned and stuffed with colorful feathers. The half-red, half-black seeds are from a species of *Ormosia* (possibly *Ormosia monosperma*), a large leguminous tree of the tropical rain forest. The small gray seeds are from a tall, annual grass called Job's tears (*Coix lacryma-jobi* L.) that grows wild throughout the Old and New World tropics. (Armstrong W.P.)



Near ripe fruit (Trade winds fruit)

ECOLOGY

The mamey sapote is a tropical tree and is not tolerant of freezing temperatures. Young trees are very vulnerable to cold and are injured at air temperatures below 0°C. Mature trees can withstand -2.2°C for several hours with only slight damage but are killed if the temperature goes down below 5.6 deg C for very long.

BIOPHYSICAL LIMITS

Altitude: 600-1 500 m

Mean annual rainfall: about 2000 mm.

Soil type: The mamey sapote grows well in a wide variety of well-drained soils, from heavy clays to the limestone and sandy soils. It is intolerant of constantly wet or flooded soil conditions. The wet soil conditions decrease the oxygen content in the soil, causing roots to die which weakens the tree. In addition, weakened roots are more susceptible to attack by root rotting fungi (e.g., *Pythium* spp.).

DOCUMENTED SPECIES DISTRIBUTION

Native: Guatemala, Mexico, Nicaragua, Puerto Rico

Exotic: Australia, Barbados, Cuba, Dominican Republic, Guadeloupe, Israel, Jamaica, Malaysia, Martinique, Philippines, Spain, Trinidad and Tobago, United States of America, Venezuela, Vietnam



The map above shows countries where the species has been planted. It does neither suggest that the species can be planted in every ecological zone within that country, nor that the species can not be planted in other countries than those depicted. Since some tree species are invasive, you need to follow biosafety procedures that apply to your planting site.

PRODUCTS

Food: The mamey sapote is usually eaten in preparations where the fresh or frozen pulp is mixed with other ingredients to make milkshakes or ice cream. It also may be eaten fresh directly from the fruit by cutting it lengthwise and removing the seed. It is also excellent for use in jellies, pastes, and preserves. The seed can be milled to prepare a bitter chocolate.

Apiculture: The nectar of the flowers is gathered by honeybees.

Timber: The trees are seldom cut for timber, unless they bear poor quality fruit. There is very little sapwood. The heartwood is buff or brown when fresh, becoming reddish with age; sometimes resembles mahogany but is redder and more or less mottled with darker tones. It is fine-grained, compact, generally hard and fairly heavy, strong, easy to work and fairly durable. It is rated as suitable for cabinetwork and is made into furniture, but mostly serves for building carts, and for shelving and house frames.

Tannin or dyestuff: It was used in olden times to fix the colors on painted gourds and other articles of handicraft.

Lipids: The seed kernel yields 45 to 60% of a white, semi-solid, vaseline-like oil which is edible when freshly extracted and refined. It is sometimes used in soap and considered to have a greater potential in the soap industry, in cosmetics and pharmaceutical products

Poison: The seed has stupefying properties, and this may be due to its HCN content. One is cautioned not to rub the eyes after handling the green fruit because of the sap exuding from the cut or broken stalk. The milky sap of the tree is highly irritant to the eyes and caustic and vesicant on the skin. The leaves are reportedly poisonous.

Medicine: The seed kernel oil is used as a skin ointment and as a hair dressing believed to stop falling hair. In 1970, clinical tests at the University of California at Los Angeles failed to reveal any hair-growth promoting activity but confirmed that the oil of sapote seed is effective in stopping hair-fall caused by seborrheic dermatitis. The oil is employed as a sedative in eye and ear ailments. The seed residue after oil extraction is applied as a poultice on painful skin afflictions.

A seed infusion is used as an eyewash in Cuba. In Mexico, the pulverized seed coat is reported to be a remedy for coronary trouble and, taken with wine, is said to be helpful against kidney stones and rheumatism. The Aztecs employed it against epilepsy. The seed kernel is regarded as a digestive; the oil is said to be diuretic. The bark is bitter and astringent and contains lucumin, a cyanogenic glycoside. A decoction of the bark is taken as a pectoral. In Costa Rica a "tea" of the bark and leaves is administered in arteriosclerosis and hypertension. The milky sap is emetic and anthelmintic and has been used to remove warts and fungal growths on the skin.

SERVICES

Ornamental: The mamey sapote is a worthy fruit not only for commercial production but also as a fruit tree for the home landscape, if space is not limiting.

TREE MANAGEMENT

The best time for planting is the beginning of the rainy season, especially if there is no irrigation system or if watering trees takes too long in large plantings. The field should be well-prepared, free of weeds, and the irrigation system should be functional at planting.

Plant spacing should be planned so as to provide adequate room for normal growth for several years. Distances of at least 7.6 to 9.1 m between rows and 4.6 to 6.1 m between trees in the row are recommended.

Weed control is essential when the trees are young, and a 5.2 to 10.2 cm mulch around the trees is recommended to conserve moisture and reduce weeds. Weeds should be mowed or killed with approved herbicides.

Grafted mamey sapote trees may have one or more leaders (main trunks) with narrow, V-shaped crotch angles. The strongest and best situated leader should be encouraged to grow by removing all other leaders when the tree is first planted, or preferably in the nursery. In addition, mamey sapote trees have a tendency to produce three to four branches close to one another on the trunk. When this occurs, it is advisable to remove some of them so that the trees will develop a good framework of strong branches.

Maintenance pruning involves removal of narrow-angled (V-shaped) main branches which tend to split with heavy fruit loads. Wide-angled branches should be selected instead. Maintenance pruning of mature trees to remove dead or diseased branches and to limit tree size should be done periodically.

Trees kept to a height of 4.9 to 5.5 m are easier to care for and are less susceptible to severe wind damage than trees allowed to grow continuously in height.

GERMPLASM MANAGEMENT

Seeds lose viability within 7 to 14 days and there is no good method for storing seeds.

PESTS AND DISEASES

Few insects attack the mamey sapote, and the damage they cause is seldom significant. Insect pests associated include Cuban May beetle (*Phyllophaga bruneri*), the Sugarcane Rootstalk Borer (*Diaprepes abbreviatus*), white peach scale (*Pseudaulacaspis pentagona*), Philephedra scale (*Philephedra* sp.), green scale (*Coccus viridis*) etc.

Diseases include Anthracnose (*Colletotrichum gloeosporioides* Penz), red alga (*Cephaleuros virescens* Kunze). Roots may be attacked by various fungi (e.g., *Rhizoctonia* sp., *Pythium splendens*) which may cause a general decline in tree vigor.

FURTHER READING

J.E. Hernáudo Bermejo and J. León (eds.). 1994. Neglected Crops: 1492 from a Different Perspective. Plant Production and Protection Series No. 26. FAO, Rome, Italy. p. 103-109.

Morton J. 1987. Sapote. p. 398–402. In: Fruits of warm climates. Julia F. Morton, Miami, FL.

Narciso A and Franklin WM. 1976. Cultivation of neglected tropical fruits with promise Part 2. The Mamey sapote. Agricultural Research Service, US Department of Agriculture.

SUGGESTED CITATION

Orwa C, A Mutua, Kindt R, Jamnadass R, S Anthony. 2009 Agroforestry Database: a tree reference and selection guide version 4.0 (<http://www.worldagroforestry.org/sites/treedbs/treedatabases.asp>)