

A WORD OR TWO ABOUT GARDENING

Drought tolerant trees can be both ornamental and edible

The present article is a continuation of a survey of drought tolerant trees that provide not only shade and/or ornamental appeal, but the additional dividend of edible fruit. Most readers should be familiar with at least some of the fruit trees described below. Other trees may be of more immediate interest to committed fruit tree collectors, however one or more of these lesser known trees may have just the combination of features you are looking for with regard to size, appearance, shade, and type of fruit. The term drought tolerant refers to established trees (those that have been in the ground for at least a year) which, under Miami-Dade's seasonally wet/dry climate, should no longer require supplemental water. As in the previous publication, the trees to be discussed are grouped by family.

The rose family (**Rosaceae**) contains not only the world's most familiar fruit tree, the apple but others such as plums, peaches, cherries and pears. These are all trees/shrubs grown in predominantly temperate to Mediterranean climates. The loquat *Eriobotrya japonica*, also in the rose family, will grow in temperate climates such as the U.K., but requires a milder winter climate to bare fruit. Trees are not uncommon in Miami-Dade and given our sub-tropical climate (hot summers and frost-free winters) they fruit reliably each year. Growing to about 20' loquats are highly ornamental small trees having large, stiff, broadly oblanceolate, dentate leaves of a strongly corrugated texture. The upper surface is dark green and glossy and the underside covered in a rust-colored tomentum. During late fall into winter upright woolly panicles of small, off-white, highly fragrant flowers appear followed rapidly by clusters of orangey yellow pomaceous fruits. Resembling small round to pear-shaped apricots, the flesh is soft, sweet to sub-acid and contains several large angular seeds (the latter are poisonous, more so if chewed).

Fruit size and quality is improved if clusters are thinned to contain 3-4 fruit each. Trees are easy to grow from fresh seed (readily volunteers in landscape), but for superior fruit grafted varieties should be used. Once established the tree is highly drought tolerant, surviving on as little as 26" of rain annually, and requires little care. Avoid practices that promote excessive development of soft succulent growth (such as applying too much nitrogen or heavy pruning) as this increase the risk of fireblight. This is a serious bacterial disease of many plants within the Rosaceae that can destroy blossoms, cause severe leaf scorch and result in limb die-back.

The **Sapindaceae** contains several important tropical fruit trees including lychee and longan as well as the akee. One of the most drought-tolerant is the **Spanish lime, genip** or **mamoncillo** *Melicoccus bijugatus* from northern S. America. This is a slow growing, potentially large tree (locally to 40-50') that develops a full, rounded canopy. However where it is grown for fruit (and shade is not of special concern), maintain trees at no more than 15'. This is especially important if space is limited, since dependable fruit production requires two trees; one as pollinator and the other fruit bearing (separate functionally male and female flowering trees). Trees of known type grown from air layers are preferable to those raised from seed. Rarely a single

tree will have both kinds of flowers and bear a crop. Clusters of small, white, sweetly fragrant flowers are produced in late spring with fruit (a leathery skinned, green drupe) ripening through summer. A layer of somewhat gelatinous flesh (the aril) adheres to a hard seed and has a pleasantly sweet/sour taste, though if picked too soon it is far more astringent. Fruit needs to be left on the tree to fully ripen.

Spanish lime is well adapted to local limestone soils, but will not survive inundation, and where flooding is likely should be planted on a berm. Young trees can be damaged by low temperatures; however as they mature they can survive brief exposure to temperatures just below freezing. The closely related **cotopriz** or **yellow genip** *Talisia oliviformis* (syn. *Melicoccus oliviformis*) is endemic from southern Mexico into northern S. America. It is found in both wet and seasonally dry tropical forests, often associated with outcrops of limestone. Growing slowly to about 40', the tree develops a more cone shaped canopy than Spanish lime. Like the latter tree, flowers are sweet smelling, borne in clusters with male and female flowers usually on separate trees. Fruits are drupaceous, yellow when ripe with a leathery skin and contain a large seed (edible if roasted) surrounded by thin sweet flesh. Little known outside areas to which it is endemic, yellow genip is often preferred to Spanish lime. A limited number of local fruit tree nurseries carry cotopriz.

The **Moraceae** (mulberry family) contains a diverse range of plants, mostly from tropical to warm temperate climates, nearly all of which contain copious amounts of milky white latex a characteristic (but by no means diagnostic) feature. Probably the **edible fig** *Ficus carica* is the best known of the fruit trees. Endemic to semi-arid areas of SW Asia it adapts well to those parts of the world that experience a Mediterranean type climate. Although edible figs can be grown in Miami-Dade, local humid wet summers can cause severe problems with leaf spotting diseases (rust and anthracnose) and fruit splitting. The **jackfruit** *Artocarpus heterophyllus* is better adapted to local conditions, though since it is found in tropical/sub-tropical areas where rainfall is evenly distributed throughout the year drought tolerance is limited. It is the least tropical of *Artocarpus* spp.; the more highly esteemed bread fruit *A. altilis* is far more tender requiring year round temperatures above 55°F and locally is only reliable in Key West.

Also found in the Moraceae is a far less familiar fruit tree, the **ramón** or **Mayan breadnut tree** *Brosimum alicastrum*, an attractive, potentially large, fast growing tree to more than 60' found in much of Central America as well as Cuba and Jamaica. The tree has a straight upright trunk with a distinct flare (becoming buttressed with age) and thin, grey, peeling bark. Limbs are arched with drooping branchlets forming a spreading dense canopy of dark green leaves. Like other members of the Moraceae it produces copious amounts of latex; sticky and slightly sweet it is occasionally tapped and used as a milk substitute. Although originating in tropical rainforest, *B. alicastrum* is highly drought tolerant, surviving on as little as 25" of rain annually, but can also endure flooding. Adapted to thin limestone soils it should be more widely used as a shade tree, though for public areas – size precludes its use in all but the largest of private residences. The fruit is a yellow to pale orange berry with sweet tasting pulp and a large single seed which is boiled or roasted and is similar to a chestnut. The seeds are also ground, mixed with corn

meal and used as flour. A word of caution – breadnut has been noted as being weedy in some tropical areas and at least one report identified volunteer specimen(s) in undeveloped areas of both Miami-Dade and Monroe Counties.

The **Fabaceae** contains relatively few fruit trees, however the most widely known, the **tamarind** *Tamarindus indica* is such an outstanding tree in so many respects, it is surprising that it is not used more widely in local landscapes. The tamarind has already been described in [a previous article](#) on drought tolerant trees, where attention was drawn to its' utility as an attractive, large, storm fast shade tree. What remains are a few words that deal more with the tamarind as a fruit tree.

The name tamarind is derived from the Arabic tamar hindi (date of India, though the tree is believed to be originally from sub Saharan Africa). The fruit is an indehiscent oblong pod, approximately 5" x 3/4", rounded at both ends with a grayish brown, somewhat scurfy, epicarp (shell) which becomes brittle at maturity. Within each pod are up to 12 large, hard, reddish seeds and a chocolate colored, paste-like, edible pulp. Where tamarind is commercially important (e.g., India) several different cultivars have been developed; the fruit though is basically of two types – sweet or tart. Enquire at local fruit tree nurseries which type they currently offer. Tamarind trees flower late May into July, with fruit ripening through the summer and becoming fully mature in about 10 months – it is considered ready for consumption when the shell becomes brittle and the pod sounds hollow. The latter indicator reflects the loss of moisture that occurs as the pod matures and the pulp becomes more concentrated around the seeds, drawing away from the shell.

Tamarind flowers are perfect (male and female structures present) but protogynous (stigmas receptive before pollen released) and therefore the period when they are amenable to pollination is limited. In addition trees exhibit a high degree of self incompatibility, that is, fruit set is greatly improved where cross pollination with other trees is possible. For backyard purposes however a single tree will provide an acceptable crop. It takes at least 7 years for a seed grown tree to commence fruiting, compared to only 3-4 years for those propagated vegetatively. The latter includes cuttings (tip, softwood, semi ripe wood but not hardwood) with misting, air layering (2-3 months for layers to form roots) and both budding and grafting (used more where tamarind is grown commercially). With the latter, correct choice of rootstocks permits some dwarfing, which eases tree care and harvesting.

When installing select an open site in full sun and leave at least 25' between the tamarind and other trees or structures. Vegetatively propagated trees develop less height and spread than those raised from seed. Young trees require protection from the cold, but become more tolerant as they mature able to withstand brief exposure to temperatures just below freezing. Tamarinds are slow growing so do not require frequent pruning. Early formative pruning to promote 3-5 principal scaffold branches (as the main framework of the tree) and removal of low growing side branches will help to develop a more compact canopy.

Inga feuillei (the ice cream bean tree), is mentioned in passing more for its novelty value - the fruit, a large fluted pod contains a sweet white cottony pulp which to some has a taste similar to vanilla ice cream. It is one of many *Inga* spp.,

leguminous trees all of which grow in humid tropical to sub-tropical areas of South and Central America. Found as part of the rainforest or near swamps or river banks, drought tolerance is limited (most species are found in areas that experience rainfall evenly distributed throughout the year, with at most a short dry season). *Inga* spp. are also self incompatible, and need to be cross pollinated with a genetically different tree in order to produce fruit. The **carob**, *Ceratonia siliqua* is another leguminous tree with pods that contain an edible, sweet-tasting pulp. It is highly drought tolerant and thrives on calcareous soils but is suited to a warm Mediterranean type climate and is poorly adapted to our local hot wet summers.

The **Clusiaceae** includes what some consider one of the most delicious of all tropical fruits, the mangosteen, *Garcinia mangostana*. This is an ultra-tropical tree found from the Malayan peninsular to New Guinea. All of the several attempts to establish it in south Florida ultimately failed; both local climate and soil conditions have proved unsuitable (fruiting trees have been successfully grown at Fairchild Tropical Garden in an enclosed structure that permits control of soil, temperature and moisture). Most other *Garcinia* spp. are able to adapt to drought; this includes the **imbe** or **African mangosteen** *Garcinia livingstonei* which can survive on annual rainfall of 20 – 40", and suited to a sub-tropical climate with a distinct dry season (up to 5 months). It is relatively easy to grow being more tolerant of local rocky calcareous soil, suited to coastal locations (salt tolerant) and able to withstand brief exposure to near freezing temperatures.

Growing slowly to 15-20' (locally), the imbe is of a size suitable for most residential yards. The tree branches low to the ground to form 3-5 leaders. The larger side branches carry smaller lateral branches held at right angles, usually in whorls of three; at each node arise three, small, stiff almost stem-less bluish green leaves. A spreading canopy develops with a rigid, asymmetric pattern of branching, making for a striking addition to the landscape, especially suited to the clean geometric lines found in contemporary architecture. Slow growing for the first 3-4 years, after which the growth rate increases somewhat so that within 10 years the tree should attain a height of 10'. Its' low branching habit, dense canopy and at most moderate growth rate suggest that imbe could also be useful as an attractive hedge.

The fruit, a 1" globose berry has a thin orangey red skin when ripe that covers a layer of flavorful, slightly tart, juicy, yellowish flesh. Unfortunately the presence of 1-2 relatively large seeds limits the amount of flesh contained in each fruit. The imbe is dioecious (male/female flowers on separate trees), but bisexual flowers are sometimes found and it is likely that reproduction by apomixis also occurs (as in other *Garcinia* spp), that is female flowers produce viable seed without being pollinated. What this means for the backyard grower is that a single tree should produce some fruit but the presence of female flowering trees plus a pollinator tree will produce far heavier crops of better quality fruit.

The **gamboge** or **false mangosteen** *G. xanthochymus* is another highly ornamental species, slow growing to at least 20' with a low, wide, pyramidal canopy of large, drooping, linear to lanceolate leaves. The fruit is a large yellow berry, to 2" almost $\frac{3}{4}$ consisting of an edible acidic pulp. Native to Northern India and the western

Himalayas, this is a fairly hardy tree (surviving brief exposure to a few degrees of frost). Gamboge grows well in south Florida and, given Miami-Dade's seasonally wet/dry climate, can be considered drought tolerant; flowering occurs after a period of dry weather. Both above garcinias are available in local fruit tree nurseries; there are other drought tolerant species though there is insufficient information as to hardiness relative to winter temperatures in south Florida.

The **Rubiaceae** is another mostly tropical plant family, though compared to those above it contains few trees grown for edible fruit: coffee is all too familiar (the "beans" are roasted berries from the shrub *Coffea arabica*). There are a few minor fruits such as the genipa or jagua *Genipa americana*, the blackberry jam fruit *Randia formosa* and the **African peach**, *Sarcocephalus latifolius*. The genipa is a large upright tree but difficult to grow in south Florida, while *R. formosa* requires growing conditions similar to those for gardenia, to which it is related, and is not especially drought tolerant. The African peach is a sprawling drought tolerant tree or shrub found in open savannah from west to central Africa. It is little known outside of Africa where it finds multiple uses. The fruit is an orangey red syncarp (a type of aggregate fruit) with a leathery knobby surface and sweet watery flesh containing many seeds.

Color aside, the fruit of the African peach is similar to that of another member of the Rubiaceae, *Morinda citrifolia* the **noni**. A dense, shrubby plant usually grown as a small tree, noni is occasionally seen in local landscapes. Native to an area from Indonesia to northern Australia and now of pan-tropical distribution, noni grows to about 20' with opposite, large, more or less elliptic dark green leaves. Small tubular white flowers are borne in tight rounded panicles, followed by a 2-4" pale yellow syncarp which when ripe contains white juicy flesh with a rancid cheesy odor. The fruit is barely edible for apart from the smell it tastes bitter; nevertheless the juice is widely consumed largely because of perceived health benefits. Commercially grown noni is all processed: dried then powdered, or juiced (fresh or fermented).

Noni contributes handsome foliage to the landscape (especially the variegated cv. 'Potteri'). The fact that it is suited to infertile rocky soils, including limestone, and highly tolerant of salt, give noni utility in settings where most other trees would fail. It is ideal for ocean front sites; preferably where there is some protection from wind (branches are brittle). Noni will survive in areas of both heavy rainfall and extreme drought (surviving at least 6 months without water, and on no more than 10" rainfall annually). Select a site in full sun with limited surface root competition from other plants especially turf grass. Make occasional applications of a slow release or organic fertilizer, additional amounts of phosphate are recommended should you wish to increase yields of fruit. Fruit that falls should be removed – not only for the pervasive odor but to avoid attracting insects and rats. Trace element deficiencies (especially iron) may develop on limestone. Insect pests such as scale insects and whitefly can occasionally infest noni, plus fungal leaf spots and blights during prolonged wet weather. By far the most damaging pests are root knot nematodes (*Meloidogyne* spp.); the risk can be lessened by choosing sites with rocky as opposed to sandy soils (in the latter case especially, adding fresh compost to the soil and mulching is recommended). Trees recover well from storm damage/ severe

pruning and can be kept lightly pruned to reduce flowering and limit fruit set. Although posing so far no serious invasive threat, noni can be locally weedy and volunteers should be removed as they sprout.

The **Apocynaceae** is another plant family little known for edible fruits (better known for highly poisonous plants such as *Ochrosia* spp and oleander). Several *Carissa* spp. produce edible fruit with **karanda** *Carissa carandas* being most widely grown. Native to drier areas of India and Burma, karanda was an early introduction to Florida but has remained of minor interest. A spiny, much branched, scandent shrub that prefers support (artificial or a neighboring tree), it has opposite, leathery, glossy leaves, fragrant tubular white flowers and clusters of red to deep purple (when ripe) ½ - 1" berries. Karanda bears fruit from early summer into fall; quality from seed grown plants is variable, from highly acidic to sweet – if possible choose selected vegetatively propagated plants. Sweet fruit can be eaten fresh; otherwise it is better used in jams, jellies and fillings, or used as a syrup to flavor cold beverages.

Far more familiar in local landscapes the **Natal plum** *C. macrocarpa* is drought tolerant like karanda but far less rank growing, forming an attractive, dense, mounding shrub that can be clipped as a hedge. Of interest principally as an ornamental shrub, the Natal plum also produces edible fruit. The fruit is larger than karanda (up to 2"), bright red, with acid to sub-acid flesh and copious amounts of non-toxic milky white latex, leading to it being referred to as strawberries and cream. Due principally to pollination problems, fruit production locally is far less compared to karanda – hand pollination may improve fruit set. There are many cultivars of *C. macrocarpa* but apart from some of the earliest that were developed for superior fruit, most of those currently available have been selected for ornamental features so that fruit if any is often of poor quality.

The **Flacourtiaceae** is a family of mostly tropical shrubs and trees that includes several of minor interest for their edible fruit. The governor's plum, *Flacourtia indica* is a large, fast growing, sprawling, spiny, shrub with deep purple fleshy berries, acidic to sweet, often somewhat bitter. Considered invasive, sale and propagation of governor's plum is prohibited in Miami-Dade. Even so, the fruit finds favor with some residents and cultivated plants can still be found. Several species of *Dovyalis* (most are large spiny shrubs) are occasionally grown for their acidic fruit. A chance cross between two of these, *D. carpa* (**Ceylon gooseberry**) and *D. abyssinica* (**Abyssinian gooseberry**) produced a hybrid which was promoted under the name of **Florida apricot** (cross arose in Homestead). The fruit resembles a miniature apricot with fuzzy, burnt orange skin and orangey yellow acidic flesh and makes excellent preserves. Unlike its' parents, there is no need to plant more than a single Florida apricot to produce copious amounts of fruit. Seeds are usually infertile so volunteers are not a problem, though failure to remove root suckers can lead to a mini thicket around the base of the shrub. The scattered spines and vigorous growth make Florida apricot a useful large screen/ barrier plant that can survive without the need for supplemental water and with minimal amounts of fertilizer.