



Renewed Potential for Caimito (*Chrysophyllum caimito*) and Guanábana (*Annona muricata*) in South Florida?

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Caimito and guanábana were first introduced into Florida in 1833 and sometime before 1879, respectively. Both species are cold and chill sensitive and were therefore recommended for only the warmest areas of south Florida (e.g., the Keys and along the extreme southeastern and southwestern coastal counties, Miami-Dade, Broward, Sarasota). Despite the environmental challenges, interest in these species has not declined over the years with re-assessments as to their potential periodically discussed and touted. Despite their intolerance to cold weather and windy conditions, small commercial plantings and scattered dooryard trees continued to be planted over the next 100+ years. The demand for caimito and guanábana fruit has grown along with the increase in immigrants from Latin America, the Caribbean, and S.E. Asia into the U.S. Until recently, the cool to freezing temperatures experienced in south Florida precluded commercial expansion of these fruit. However, as the climate has warmed, and the frequency of freeze events has decreased, renewed interest and planting of caimito and guanábana has increased. This paper will discuss the status, environmental conditions, and cultural practices that enhance chances for successful production of these fruits.

Caimito and guanábana have been grown in the warmest areas of Florida for over 100 years, mostly as specimen or dooryard trees due to their cold sensitivity and freeze intolerance (Grove, 1941; Lowe, 1937; Morton, 1987; Noonan, 1953; Wolfe, 1937). There is a demand for these fruits especially by people with a Latin[x] and Caribbean background or more recently by new generation of exotic fruit enthusiasts. Previously, planting caimito was recommended as a potential crop for south Florida and small plantings were established during the late 1980s and 1990s; however, chilling temperatures and periodic freezes precluded expansion of the acreage (Campbell, 1986). Recently, interest in planting these crops has increased and since about 2015, small groves have been established and trees appear to be growing and fruiting well (Campbell, 1986; Ledesma and Campbell, 2005).

This uptick in planting may be attributed to a lack of significant freeze events in south Florida during the last ten years and the general warming trend of the climate (Anonymous, 2021; USDA-Zones, 2021; AgroClimate, 2021; NOAA, 2021; IPCC, 2021). Especially during the last five years, monthly average temperatures have increased. This has been most notable during the fall and winter months. What is unknown is whether freezing events in south Florida will be a thing of the past or just less frequent, of less duration and/or of less intensity (cold). Thus, while there is enthusiasm for establishing additional acres, recommendations must be made with caution and freeze protection of these groves needs to be taken into consideration. Below the author discusses some of the basics for caimito and guanábana with basic parameters and recommendations.

Caimito (*Chrysophyllum caimito*) is in the Sapotaceae, originating in Mesoamerica (Central America and central to southern Mexico), is now distributed throughout the tropics (Morton, 1987; Petersen et al., 2012). Non-pruned trees are medium to large (25–100 ft tall) with a round canopy and weeping growth habit. The leaves are attractive, shiny green on the upper surface and golden-brown on the lower surface (Morton, 1987). The small

greenish-yellow bisexual flowers are held in clusters along leaf axils. Trees generally flower during late summer-early fall and fruit are harvested Feb. to June. The time from flowering to harvest ranges from 150–180 days and potential production ranges from ~130–250 lb/tree (Morton, 1987; Love and Paull, 2011). Fruit is round to oblate, two to four inches in dia. with either a purple or green peel (Fig. 2). The gelatinous pulp is sweet with a pleasant flavor, white, soft, and milky surrounding six to eleven seeds. Fruit size may increase with early fruit thinning. Trees may be planted from seed but there are named cultivars reproduced by vegetative propagation (Ledesma and Campbell, 2005).

Caimito is best adapted to hot tropical and warm-hot subtropical climates where freezing temperatures do not occur, temperatures average 65 °F or greater (Morton, 1987) and where temperatures remain above ~41 °F. Even chilling temperatures result in slowed plant and fruit development, defoliation, and sunburn damage on exposed fruit. Trees should be planted with wind protection to improve tree growth, potential fruit production, and reduce mechanical fruit injury (windscar). Suitable planting sites should not flood and should be surrounded by mature trees (or other suit-

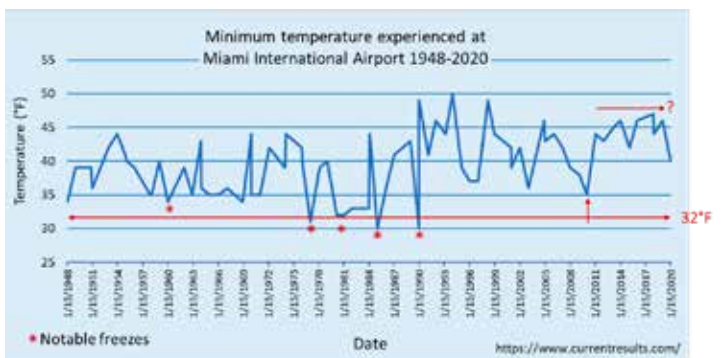


Fig. 1. Minimum temperatures experienced at the Miami International Airport from 1948–2020. In general, temperatures in the Miami-Dade agricultural area were colder. The last freeze event in the Homestead area was 2010 but since that time the low has been above ~39 °F.

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Fig. 2. Caimito fruit (purple type, top) and guanábana fruit (bottom). (Photo credits: J.H. Crane and I. Maguire, UF/IFAS TREC).

able plant material) for wind protection. Utilizing old established fruit groves where inner-grove trees are removed or planting adjacent to native habitat are ideal. An irrigation system for irrigation during dry periods and for freeze protection is critical.

Guanábana or soursop (*Annona muricata*) belongs to Annonaceae, originating in Central America, northern South America, and the Caribbean regions (Morton, 1987; Pinto et al., 2005). Non-pruned trees range from 15–35 ft tall with an erect oval to round canopy. The leaves are oblong to obovate and shiny dark green on the upper surface (lighter beneath); limbs and trunks are large (~1 1/4 to 1 1/2 inch dia) (Morton, 1987; Pinto et al. 2005). The bisexual fleshy flowers (usually single) emerge from stems and have three outer and inner petals surrounding a whirl of anthers and pistils on a common receptacle. Trees generally flower during late summer-early fall; fruit is harvested June to September, sometimes in spring. The time from flowering to harvest ranges from 105 to 180 days and is temperature dependent (Pinto et al., 2005; Worrell et al., 1994). The oval fruit is six to 14-inches long and weighs 34–140 oz or more. The pulp is off-white, granular, surrounding 100+ seeds scattered throughout the pulp. The flavor is sweet but more acid (sour) than sugar apple. Seedlings are common but there are named selections propagated by grafting and budding (Love and Paull, 2011; Pinto et al., 2005). Yields from mature trees range from 100–180 lb/tree with hand pollination, less without (Love and Paull, 2011; Koesriharti, 1991).

Guanábana is best adapted to tropical, humid to warm-hot subtropical climates where temperatures rarely dip below 60 °F (Pinto et al., 2005). Tree growth slows at or below 55 °F and chilling damage may occur at 41 °F or below. Chilling temperatures result in slow plant growth and fruit development and may result in defoliation. Tree establishment, growth and fruit production are greatly improved with wind protection. In general, well drained soils are preferred however guanábana does have some tolerance to excessively wet soils (Schaffer, 1998). Utilizing old established fruit groves where inner-grove trees are removed or adjacent to native habitat are ideal. An irrigation system for irrigation during dry periods and freeze protection is critical.

Conclusions

Caimito and guanábana are cold sensitive fruit crops that have been in Florida for over 100 years but only recently are being grown on a small but commercial scale. This is due to the niche local and national market demand for the fruit and the lack of freezing temperatures and cold weather over the last five to ten years in extreme southern Florida. Planting of small plots may be recommended with the caveat that freezing temperature and/or cold temperatures below 41 °F may periodically occur, threatening the health and survival of these fruit crops. A strong recommendation is made for planting trees within a wind break and establishing a functional high volume irrigation system for cold (freeze) protection.

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