

Figure 1. Inverted seed graft method for the Sapotaceae.

podilla also are slow to develop adequate root systems and require staking when planted in the field. Further investigation and field studies are needed to realize the full potential of the

cally important in South Florida, where these fruit are grown commercially and in home gardens. Smaller trees are easier to spray, prune and harvest resulting in greater economic returns. Smaller trees would also have benefits for the home gardener as they would allow for more trees in a given area and ease of harvest. In modest-sized home gardens, the potential of smaller trees could allow their usage where they were not previously feasible. Currently, field tests are underway for inverted seed grafts of mamey sapote, sapodilla and canistel. Long-term precocity and dwarfing are being evaluated. Additional grafting experiments are also being conducted. Results obtained from these preliminary experiments are incomplete, and the utility of this propagation method will only be determined following years of field evaluations and follow-up experiments. However, preliminary results do offer evidence of dwarfing and precocity that would be useful in these crops for commercial fruit production and in home garden use.

Literature Cited

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Campbell, R. J., G. Zill and H. Mahdeem. 1997b. New sapodilla cultivars with

Superior, named selections of sapodilla are clonally-propagated and marketed in Tropical America (Campbell et al., 1997). These selections are superior to seedlings in terms of their precocity, production consistency, total yield and fruit quality. Superior selections are also recognized throughout Asia, and are routinely sold in local markets and to a lesser extent for export. This is particularly true in India and Thailand. There is a need for further selection and evaluation of superior selections to meet the challenges facing commercial and home garden sapodilla production in South Florida.

'Makok' was selected in Thailand and is of considerable commercial importance as a locally-marketed fresh fruit. This cultivar has potential for use in South Florida and Tropical America due to its manageability, production and fruit quality. The objectives of this manuscript are to describe 'Makok' in the context of a possible home garden and commercial cultivar for South Florida and Tropical America.

Tree Characteristics

'Makok' in South Florida is slow-growing and semi-dwarf. Fifteen-year-old trees can be maintained at a height of 2 m, with a similar spread. Size can be maintained through annual tree management techniques modified for the hot tropics (Campbell and Wasielewski, 1999). These canopy management techniques involve the removal of 1 to 2 selected vertical limbs within the canopy each year, and select branch tipping to favor horizontal branch orientation and increased canopy complexity. 'Makok' has a favorable tree architecture that aids in its proper management. It readily forms horizontal limbs following pruning and forms wide crotch angles that resist breakage from heavy crop loads or severe winds. In general, sapodilla is well adapted to the growing conditions of South Florida, and 'Makok' trees have no special horticultural requirements in terms of mineral nutrition or protection from pests and diseases. Flowering occurs in whorls of 2 to 4 flowers on the new growth of the outer canopy. Flowers are bisexual and they open sequentially over 2 to 3 weeks, resulting in a significant difference in the age of the fruit within a single whorl. The main harvest season is April through October, although fruit may mature at other seasons following extremes in wet and dry cycles or with tree management.

Fruit Description

'Makok' fruit are spindle-shaped, with a smooth, brown or yellowish-tan color. Thinning to a single fruit per whorl enhances fruit size and overall fruit quality. Thinned fruit average 70 g, with a length of 57 mm and a width of 42 mm. Fruit range in weight from 40 to 150 g. Fruit from un-thinned trees will be significantly smaller than fruit from thinned trees. While on the tree, the fruit surface is covered by a rough, dark-brown scurf (peeling epidermal layer). This is easily removed by washing the fruit after harvest. The removal of the scurf improves the overall appearance of the fruit. The flesh is a light brown to tan, often with a slight greenish color. The flavor is sweet and aromatic and likened to brown sugar and cinnamon. Brix values range from 25 to 32. There are no stone cells in the flesh. The skin can be eaten, with no unpleasant taste. There are from 1 to 2 seeds within each fruit that average less than 10 g.

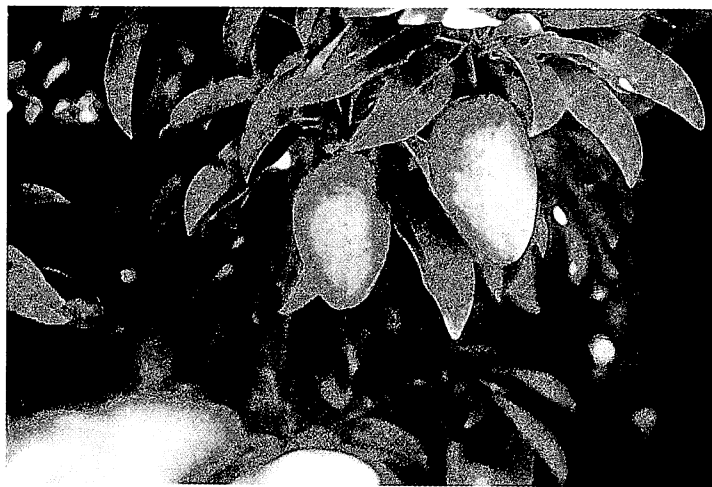


Figure 1. 'Makok' sapodilla fruit.

'Makok' is well suited for home garden use in South Florida and Tropical America, if proper horticultural management techniques are used. The trees respond favorably to pruning and shaping, and with a minimum of effort can be formed into a productive, semi-dwarf tree that provides an ample harvest of superior fruit. Each year the trees can be selectively pruned with hand-held pruning tools. A properly managed tree will bloom and set from 2 to 4 fruit per whorl of flowers. As discussed earlier, these fruit should be thinned in order to attain a large, quality fruit. Thinning should occur as soon as possible following fruit set, as the effect on fruit size will be enhanced. Productive trees can be maintained in 37.5 liter or greater containers for many years, and perhaps indefinitely.

Due to its superior fruit quality, 'Makok' is an important commercial cultivar in Thailand, and is sold in local markets throughout the country and occasionally as an export commodity. However, the small-scale commercial sapodilla industry of South Florida has a preference for large fruit. Even with proper fruit thinning, a 60 to 75 g fruit may not be of sufficient size to compete with larger sapodilla fruit in the market. There would also have to be a modification in orchard management philosophy among sapodilla growers to allow 'Makok' to be a commercially-competitive option. Currently in South Florida and Tropical America, there is a reluctance to hand-prune sapodilla trees, and even a greater reluctance to thin fruit. However, such practices will be necessary if 'Makok' is to be adapted to commercial production.

Given the distinctive appearance of the 'Makok' fruit, it would be advantageous to develop separate markets for the fruit. The superior appearance and eating quality of the 'Makok' in comparison with many other sapodilla cultivars should allow for market distinction to be successful. The success and market recognition of the 'Makok' throughout Thailand should provide an advantage in its market development in South Florida.

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