

Key Words: Low Risk, Neotropical Tree, Edible Fruit, Fleshy Fruit, Mammal-dispersed

Family: *Malvaceae*

Taxon: *Matisia cordata*

Synonym: *Quararibea cordata* (Humb. & Bonpl.) Vische **Common Name:** chupa chupa
 South American sapote
 sapote
 sapotillo
 zapote

Questionnaire : Status:	current 20090513 Assessor Approved	Assessor: Data Entry Person:	Chuck Chimera Chuck Chimera	Designation: L WRA Score	L -6
101	Is the species highly domesticated?	y=-3, n=0		y	
102	Has the species become naturalized where grown?	y=1, n=-1		n	
103	Does the species have weedy races?	y=1, n=-1		n	
201	Species suited to tropical or subtropical climate(s) - If island is primarily wet habitat, then substitute "wet tropical" for "tropical or subtropical"	(0-low; 1-intermediate; 2-high) (See Appendix 2)		High	
202	Quality of climate match data	(0-low; 1-intermediate; 2-high) (See Appendix 2)		High	
203	Broad climate suitability (environmental versatility)	y=1, n=0		n	
204	Native or naturalized in regions with tropical or subtropical climates	y=1, n=0		y	
205	Does the species have a history of repeated introductions outside its natural range?	y=-2, ?=-1, n=0		y	
301	Naturalized beyond native range	y = 1*multiplier (see Appendix 2), n= question 205		n	
302	Garden/amenity/disturbance weed	n=0, y = 1*multiplier (see Appendix 2)		n	
303	Agricultural/forestry/horticultural weed	n=0, y = 2*multiplier (see Appendix 2)		n	
304	Environmental weed	n=0, y = 2*multiplier (see Appendix 2)		n	
305	Congeneric weed	n=0, y = 1*multiplier (see Appendix 2)		n	
401	Produces spines, thorns or burrs	y=1, n=0		n	
402	Allelopathic	y=1, n=0			
403	Parasitic	y=1, n=0		n	
404	Unpalatable to grazing animals	y=1, n=-1			
405	Toxic to animals	y=1, n=0		n	
406	Host for recognized pests and pathogens	y=1, n=0		n	
407	Causes allergies or is otherwise toxic to humans	y=1, n=0		n	
408	Creates a fire hazard in natural ecosystems	y=1, n=0		n	
409	Is a shade tolerant plant at some stage of its life cycle	y=1, n=0		y	

410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y=1, n=0	y
411	Climbing or smothering growth habit	y=1, n=0	n
412	Forms dense thickets	y=1, n=0	n
501	Aquatic	y=5, n=0	n
502	Grass	y=1, n=0	n
503	Nitrogen fixing woody plant	y=1, n=0	n
504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	y=1, n=0	n
601	Evidence of substantial reproductive failure in native habitat	y=1, n=0	n
602	Produces viable seed	y=1, n=-1	y
603	Hybridizes naturally	y=1, n=-1	
604	Self-compatible or apomictic	y=1, n=-1	y
605	Requires specialist pollinators	y=-1, n=0	n
606	Reproduction by vegetative fragmentation	y=1, n=-1	n
607	Minimum generative time (years)	1 year = 1, 2 or 3 years = 0, 4+ years = -1	>3
701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	y=1, n=-1	n
702	Propagules dispersed intentionally by people	y=1, n=-1	y
703	Propagules likely to disperse as a produce contaminant	y=1, n=-1	n
704	Propagules adapted to wind dispersal	y=1, n=-1	n
705	Propagules water dispersed	y=1, n=-1	
706	Propagules bird dispersed	y=1, n=-1	n
707	Propagules dispersed by other animals (externally)	y=1, n=-1	y
708	Propagules survive passage through the gut	y=1, n=-1	y
801	Prolific seed production (>1000/m2)	y=1, n=-1	
802	Evidence that a persistent propagule bank is formed (>1 yr)	y=1, n=-1	n
803	Well controlled by herbicides	y=-1, n=1	
804	Tolerates, or benefits from, mutilation, cultivation, or fire	y=1, n=-1	
805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	y=-1, n=1	
		Designation: L	WRA Score -6

Supporting Data:

101	1989. Clement, C.R.. A Center of Crop Genetic Diversity in Western Amazonia. <i>BioScience</i> . 39(9): 624-631.	[Is the species highly domesticated? Possibly Yes] "Sapota (<i>Quararibea cordata</i> [Humb. and Bonpl.] Vischer, Bombacaceae). The sapota's 150-1000 g fruits, with thick, leathery rinds, have a juicy, fibrous, orange, sweet pulp (Cavalcante 1988, Clement 1982, FAO 1986). Fully mature trees, when grown on fertile soils, may bear 1000 fruit averaging 300-400 g. One of the landraces is defined by fruit size (Figure 3c)." "Table 2. Some western Amazonian fruit species that present significant modifications due to domestication" [Includes <i>Quararibea cordata</i>]
101	2008. Janick, J./Paull, R.E.. <i>The Encyclopedia of Fruit & Nuts</i> . Cabi Publishing, Wallingford, UK	[Is the species highly domesticated? Yes] "The fruit from wild trees are smaller and weigh less than those from domesticated or semi-domesticated trees growing in good soil conditions." [Smaller fruit would be more easily dispersed than the larger, domestic variety]
102	2012. Randall, R.P.. <i>A Global Compendium of Weeds</i> . 2nd Edition. Department of Agriculture and Food, Western Australia	[Has the species become naturalized where grown? No evidence]
103	2012. Randall, R.P.. <i>A Global Compendium of Weeds</i> . 2nd Edition. Department of Agriculture and Food, Western Australia	[Does the species have weedy races? No evidence]
201	1964. Robyns, A.. <i>Flora of Panama</i> . Part VI. Family 116. Bombacaceae. <i>Annals of the Missouri Botanical Garden</i> . 51(1/4): 37-68.	[Species suited to tropical or subtropical climate(s) 2-High] "Panama and northwestern South America (Colombia to Peru); the sapote is sometimes cultivated for its edible fruits."
201	2012. USDA ARS National Genetic Resources Program. Germplasm Resources Information Network - (GRIN). http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl	[Species suited to tropical or subtropical climate(s) 2-High] "Native: SOUTHERN AMERICA Mesoamerica: Costa Rica; Panama Brazil: Brazil [w.] Western South America: Bolivia; Colombia; Ecuador; Peru"
202	1964. Robyns, A.. <i>Flora of Panama</i> . Part VI. Family 116. Bombacaceae. <i>Annals of the Missouri Botanical Garden</i> . 51(1/4): 37-68.	[Quality of climate match data 2-High]
203	1960. Hodge, W.H.. <i>The South American "Sapote"</i> . <i>Economic Botany</i> . 14(3): 203-206.	[Broad climate suitability (environmental versatility)? No] " <i>Quararibea cordata</i> appears to be native primarily to lowland areas in northwestern South America-on the littoral, in warm intermont valleys, and in the drainage system of Amazon tributaries close to the Andes." ... "It appears that lowland rain forest areas represent the original home of the species and that it may have been carried and planted by man as a dooryard tree elsewhere, particularly at higher elevations in the northern ranges of the Andes. Popenoe (2) describes the species as one of the commonest fruit trees of the Ecuadorian lowlands (littoral)"
203	2008. Janick, J./Paull, R.E.. <i>The Encyclopedia of Fruit & Nuts</i> . Cabi Publishing, Wallingford, UK	[Broad climate suitability (environmental versatility)? No] "The sapote prefers humid rainforest areas, with more than 2500 mm average rainfall and no dry months. When rainfall is less than 2000 mm/year productivity can be affected. Near freezing temperatures are fatal. The sapote flourishes between sea level and 1000 m, with decreased productivity above this."
204	1964. Robyns, A.. <i>Flora of Panama</i> . Part VI. Family 116. Bombacaceae. <i>Annals of the Missouri Botanical Garden</i> . 51(1/4): 37-68.	[Native or naturalized in regions with tropical or subtropical climates? Yes] "Panama and northwestern South America (Colombia to Peru); the sapote is sometimes cultivated for its edible fruits."
205	1960. Hodge, W.H.. <i>The South American "Sapote"</i> . <i>Economic Botany</i> . 14(3): 203-206.	[Does the species have a history of repeated introductions outside its natural range? Not in 1960] " <i>Quararibea cordata</i> has apparently not been transported widely in the tropics outside of its natural range. It is undoubtedly tender and would probably not thrive in subtropical areas like southern Florida."
205	2008. Janick, J./Paull, R.E.. <i>The Encyclopedia of Fruit & Nuts</i> . Cabi Publishing, Wallingford, UK	[Does the species have a history of repeated introductions outside its natural range? Possibly Yes] "It is restricted to lowland tropical America, although it has been introduced into Australia and some other Old World tropical countries."
205	2011. Guézou, A. et al.. CDF Checklist of Galapagos Introduced Plants. In: Bungartz, F. et al. (eds.). <i>CDF Galapagos Species Checklist</i> . Charles Darwin Foundation, Puerto Ayora, Galapagos http://www.darwinfoundation.org/datazone/checklists/ecological-group	[Does the species have a history of repeated introductions outside its natural range? Galapagos] "Origin: Introduced, Cultivated."
301	2010. Guezou, A./Trueman, M./Buddenhagen, C.E./Chamorro, S./Guerrero, A.M. et al.. An Extensive Alien Plant Inventory from the Inhabited Areas of Galapagos. <i>PLoS ONE</i> . 5(4): e10276: doi:10.1371/journal.pone.0010276.	[Naturalized beyond native range? Not in Galapagos] "Cu) Cultivated (introduced for cultivation, not naturalized)" [<i>Matisia cordata</i> - Introduction status in Galapagos = Cu]

301	2011. Guézou, A. et al.. CDF Checklist of Galapagos Introduced Plants. In: Bungartz, F. et al. (eds.). CDF Galapagos Species Checklist. Charles Darwin Foundation, Puerto Ayora, Galapagos http://www.darwinfoundation.org/datazone/checklists/ecological-group	[Naturalized beyond native range? Not in Galapagos] "Origin: Introduced, Cultivated."
301	2012. Randall, R.P.. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	[Naturalized beyond native range? No evidence]
301	2012. Wagner, W.L./Herbst, D.R./Khan, N./Flynn, T.. Hawaiian Vascular Plant Updates: A Supplement to the Manual of the Flowering Plants of Hawai'i & Hawai'i's Ferns & Fern Allies. http://botany.si.edu/pacificislandbiodiversity/hawaiianflora/supplement.htm	[Naturalized beyond native range? No evidence]
302	2012. Randall, R.P.. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	[Garden/amenity/disturbance weed? No evidence]
303	2012. Randall, R.P.. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	[Agricultural/forestry/horticultural weed? No evidence]
304	2012. Randall, R.P.. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	[Environmental weed? No evidence]
305	2012. Randall, R.P.. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	[Congeneric weed? No evidence]
401	1964. Robyns, A.. Flora of Panama. Part VI. Family 116. Bombacaceae. Annals of the Missouri Botanical Garden. 51(1/4): 37-68.	[Produces spines, thorns or burrs? No] "Trees or shrubs, unarmed."
402	2004. Bentley, J.W./Boa, E./Stonehouse, J.. Neighbor Trees: Shade, Intercropping, and Cacao in Ecuador. Human Ecology. 32(2): 241-270.	[Allelopathic? No evidence] "Combines well with cacao and does not impede flowering or fruiting"
402	2012. Morikawa, C.I.O./Miyaura, R./Tapia Y Figueroa, M.D.L./Rengifo Salgado, E.L./Fujii, Y.. Screening of 170 Peruvian plant species for allelopathic activity by using the Sandwich Method. Weed Biology and Management. 12: 1-11.	[Allelopathic? Yes in laboratory trials] "In this study, the species with the highest inhibitory activity (i.e. >80% radicle inhibition) belonged to six species from five families: Asteraceae (A. ballii and D. foliosissimum), Anacardiaceae (S. mombin), Fabaceae (P. vulgaris cv. Canario and cv. Nuña), Solanaceae (L. peruvianum), and Bombacaceae (Matisia cordata)." ... "Matisia cordata (synonym Quararibea cordata) showed 82% radicle inhibition, but low hypocotyl inhibition (15%), in the lettuce seedlings. This tropical fruit has the local name of "sapote" and grows wild or it is cultivated in the tropical regions of Peru (Macbride 1956; Reynel et al. 2003)."
403	1964. Robyns, A.. Flora of Panama. Part VI. Family 116. Bombacaceae. Annals of the Missouri Botanical Garden. 51(1/4): 37-68.	[Parasitic? No] "Tree up to 30 m. high..."
404	1986. Forest Resources Development Branch. Food and Fruit-bearing Forest Species: Examples from Latin America. Food and Agriculture Organization of the United Nations, Rome, Italy	[Unpalatable to grazing animals? Fruit edible. Palatability of foliage to browsing or grazing animals unknown] "The fruit is avidly consumed by animals, both domesticated and wild."
404	2008. Paine, C.E.T./Harms, K.E./Schnitzer, S.A./Carson, W.P.. Weak Competition Among Tropical Tree Seedlings: Implications for Species Coexistence. Biotropica. 40(4): 432-440.	[Unpalatable to grazing animals? Unknown] "Brosimum and Pouteria, protected from mammalian herbivores, had substantially lower mortality rates than did Matisia, which was unprotected, suggesting that mammals may have killed some seedlings. The fall of debris from the canopy was also probably an important source of mortality, as many seedlings of all three species disappeared 'without a trace'."
405	1986. Forest Resources Development Branch. Food and Fruit-bearing Forest Species: Examples from Latin America. Food and Agriculture Organization of the United Nations, Rome, Italy	[Toxic to animals? No evidence] "The fruit is avidly consumed by animals, both domesticated and wild."

406	2008. Janick, J./Paull, R.E.. The Encyclopedia of Fruit & Nuts. Cabi Publishing, Wallingford, UK	[Host for recognized pests and pathogens? No evidence] "Main Diseases and Pests. Sapote fruit are occasionally attacked by fruit flies and in some locations in South America they can be important (Hackett and Carolane, 1982). These authors point out, however, there is no information about economic losses due to this problem. But exports from the western Amazon will only be accepted elsewhere if they are free of flies. No other phytosanitary problems have been reported to date."
407	1960. Hodge, W.H.. The South American "Sapote". Economic Botany. 14(3): 203-206.	[Causes allergies or is otherwise toxic to humans? No evidence] "Fruits of the South American Sapote are sweet flavored and apparently always eaten out-of-hand. They are apparently widely relished in their areas of production, particularly by country folk"
407	2001. Hanelt, P. (ed.). Mansfeld's encyclopedia of agricultural and horticultural crops: (except ornamentals). Angiospermae - monocotyledones: orchidaceae - pandanaceae, Volume 5. Springer-Verlag, Berlin, Heidelberg, New York	[Causes allergies or is otherwise toxic to humans? No evidence] "The sweet apricot like fruits and seeds are eaten."
407	2008. Wagstaff, D.J.. International poisonous plants checklist: an evidence-based reference. CRC Press, Boca Raton, FL	[Causes allergies or is otherwise toxic to humans? No evidence]
408	2008. Janick, J./Paull, R.E.. The Encyclopedia of Fruit & Nuts. Cabi Publishing, Wallingford, UK	[Creates a fire hazard in natural ecosystems? No evidence] "The sapote prefers humid rainforest areas, with more than 2500 mm average rainfall and no dry months. When rainfall is less than 2000 mm/year productivity can be affected." [Unlikely given rain forest habitat]
409	2008. Swamy, V.. Fruit to Sapling: An Ontogenetically Integrated Study of Tree Recruitment in an Amazonian Rainforest. PhD Dissertation. Duke University, Durham, NC	[Is a shade tolerant plant at some stage of its life cycle? Yes. Seedlings can establish in the shade] "Table 1. Summary of important life-history traits of study species" [Matisia cordata - RG: Regeneration guild = 2 - High light levels critical for seedling-to-sapling transition; but not for seed germination and seedling establishment; rare as saplings]
410	1987. Morton, J.F.. Fruits of warm climates - Chupa-Chupa (Quararibea cordata). J.F. Morton, Miami, FL http://www.hort.purdue.edu/newcrop/morton/chupa-chupa.html	[Tolerates a wide range of soil conditions ? Yes] "The tree attains maximum dimensions in the low, wet, deep soils of South American forests, yet it does well in cultivation on the slopes of the Andes and seems to tolerate the dry, oolitic limestone of South Florida's coastal ridge when enriched with topsoil and fertilizer."
410	2008. Janick, J./Paull, R.E.. The Encyclopedia of Fruit & Nuts. Cabi Publishing, Wallingford, UK	[Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)? Possibly] "The best edaphic conditions for sapote are deep, well-drained, non-flooding, clay soils with good fertility and organic matter content. The most productive trees, with the largest fruit, are found on Amazonian dark earth soils, which are anthropogenic in origin. These soils are rich in carbonized organic matter and have high levels of phosphorous, calcium and magnesium (Lehmann et al., 2003)."
411	1964. Robyns, A.. Flora of Panama. Part VI. Family 116. Bombacaceae. Annals of the Missouri Botanical Garden. 51(1/4): 37-68.	[Climbing or smothering growth habit? No] "Tree up to 30 m. high, the trunk straight and cylindric, the branches horizontal, the bark cinereous and rugose."
412	2001. Alonso, A./Dallmeier, F./Campbell, P. (eds.). Urubamba: The Biodiversity of a Peruvian Rainforest, SI/MAB Series #7. Smithsonian Institution, Washington, DC	[Forms dense thickets? Canopy dominant, but no evidence of thicket formation] "The forests surrounding the two sites are nonflooded, lowland, primary tropical rainforest with a bamboo-dominated understory (Guadua sarcocarpa). The canopy at San Martin-3 is high (> 30 m) and dominated by Iriartea deltoidea and Matisia cordata, while the lower canopy (< 30 m) at Cashiriari 3 is dominated by I. deltoidea, Miconia triplinervis and Pseudolmedia laevis (Comiskey et al. this volume). Cashiriari-3 contains many components of montane forests in the region."
501	2008. Janick, J./Paull, R.E.. The Encyclopedia of Fruit & Nuts. Cabi Publishing, Wallingford, UK	[Aquatic? No] Terrestrial
502	2012. USDA ARS National Genetic Resources Program. Germplasm Resources Information Network - (GRIN). http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl	[Grass? No] "Family: Malvaceae subfamily: Bombacoideae. Also placed in: Bombacaceae"
503	2012. USDA ARS National Genetic Resources Program. Germplasm Resources Information Network - (GRIN). http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl	[Nitrogen fixing woody plant? No] "Family: Malvaceae subfamily: Bombacoideae. Also placed in: Bombacaceae"

504	1964. Robyns, A.. Flora of Panama. Part VI. Family 116. Bombacaceae. Annals of the Missouri Botanical Garden. 51(1/4): 37-68.	[Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)? No] "Tree up to 30 m. high, the trunk straight and cylindrical, the branches horizontal, the bark cinereous and rugose. Leaves long-petiolate, the petiole terete, slightly enlarged at both ends, 7.5-20 cm. long and ca. 2.5-4 mm. thick, glabrous or nearly so; blade cordate suborbicular or ovate-cordate, 18-21 cm. long and 13-24 cm. wide, chartaceous to subcoriaceous, glabrous or nearly so above, glabrous to shortly stellate-puberulous beneath, 7- to 9-palminerved, the nervation prominent beneath."
601	2008. Janick, J./Paull, R.E.. The Encyclopedia of Fruit & Nuts. Cabi Publishing, Wallingford, UK	[Evidence of substantial reproductive failure in native habitat? No evidence] "Sapote is native to the foothills of the Andes, perhaps in the transitional region between what is now the Amazon tropical rainforest and the sub-montane humid forest in Colombia, Ecuador and Peru. It is, therefore, common throughout these lowland rainforests and adjacent areas of Brazil, especially around the mouth of the Javari River, where Clement (1989) hypothesized the existence of a domesticated landrace."
602	2008. Janick, J./Paull, R.E.. The Encyclopedia of Fruit & Nuts. Cabi Publishing, Wallingford, UK	[Produces viable seed? Yes] "The sapote is commonly propagated by seeds, but vegetative propagation is possible."
603	2008. Janick, J./Paull, R.E.. The Encyclopedia of Fruit & Nuts. Cabi Publishing, Wallingford, UK	[Hybridizes naturally? Unknown] No evidence of hybridization mentioned
604	2008. Janick, J./Paull, R.E.. The Encyclopedia of Fruit & Nuts. Cabi Publishing, Wallingford, UK	[Self-compatible or apomictic? Yes] "The flowers are hermaphrodite and open during the night, and are receptive from 7:00 a.m. until 5:30 p.m. In the afternoon (after 3:00 p.m.) some trees become self-compatible, with 10-15% of self-pollination, so may be considered to have a mixed system tending to allogamy."
605	1981. Janson, C.H./Terborgh, J./Emmons, L.H.. Non-Flying Mammals as Pollinating Agents in the Amazonian Forest. Biotropica. 13(2) Supplement: Reproductive Botany: 1-6.	[Requires specialist pollinators? No. Mammals, birds, and butterflies visit flowers] "Diurnal Visitation: Quararibea cordata is visited relatively more than Combretum by the larger primates (Cebus spp.), and suffers proportionately greater flower loss. However, in view of the sizable (5 cm) fruits produced by this species, it is probable that flowers are borne in great excess over the number of fruits that could be ripened. Cebus apella, the principal diurnal user of Q. cordata flowers, visited as many as five different trees during a day (table 1). Non-primates observed at the flowers in the daytime include many of the same birds that visited Combretum and a variety of butterflies" ... "Nocturnal "Nocturnal Visitation.- Quararibea cordata was intensively exploited by nocturnal mammals. Species identified feeding at the flowers at night included the opossums Caluromysiops irrupta (10 observations), Didelphis marsupialis (five obs.), and Caluromys lanatus (one obs.); the night monkey, Aotus trivirgatas (nine obs.); and the procyonids, Potos flavus (10 obs.), and Bassaricyon alleni (three obs.) . During 17 h of observation divided between two trees, as well as many spot checks of other blooming trees, bats were only twice seen visiting flowers of Q. cordata. Large hawkmoths always circled the inflorescences at night, frequently landing on them" ... "The creamy flowers of Quararibea cordata and Ceiba pentandra, though not brightly colored, are nevertheless highly visible in the leafless, often emergent crowns of these species, and are strongly attractive to both diurnal and nocturnal mammalian visitors."
605	2008. Janick, J./Paull, R.E.. The Encyclopedia of Fruit & Nuts. Cabi Publishing, Wallingford, UK	[Requires specialist pollinators? No] "The flowers are visited and pollinated by hummingbirds, bees and wasps, and possibly by bats (FAO, 1986; Rogerio Gribel, INPA, personal communication) suggesting a high degree of cross-pollination."
606	2008. Janick, J./Paull, R.E.. The Encyclopedia of Fruit & Nuts. Cabi Publishing, Wallingford, UK	[Reproduction by vegetative fragmentation? No] "The sapote is commonly propagated by seeds, but vegetative propagation is possible. Side veneer grafting is the most successful method, followed by top cleft grafting. However, most of the trees propagated by this method do not yield earlier seedlings. Hence, seed propagation is still the norm."
607	1989. Clement, C.R.. A Center of Crop Genetic Diversity in Western Amazonia. BioScience. 39(9): 624-631.	[Minimum generative time (years)? 5+] "Table 2. Some western Amazonian fruit species that present significant modifications due to domestication" [Quararibea cordata - Reproductive strategy and duration of reproductive cycle = 5-8 years]
607	2008. Janick, J./Paull, R.E.. The Encyclopedia of Fruit & Nuts. Cabi Publishing, Wallingford, UK	[Minimum generative time (years)? 6+] "The juvenile period is from 6 to 8 years."
701	1964. Robyns, A.. Flora of Panama. Part VI. Family 116. Bombacaceae. Annals of the Missouri Botanical Garden. 51(1/4): 37-68.	[Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)? No evidence] "Capsule leathery, globose, mammillate, ca. 7.5 cm. long and 6-6.5 cm. in diam., shortly appressed-tomentellous, 2- to 5 celled, 2- to 5-seeded, the fructiferous calyx cupuliform, ca. 2.5 cm. long and 4.5 cm. in diam.; seeds up to 5 cm. long, 2 cm. wide and 1.8 cm. thick." [Unlikely. Fruit and seeds relatively large and lack means of external attachment]

702	2008. Janick, J./Paull, R.E.. The Encyclopedia of Fruit & Nuts. Cabi Publishing, Wallingford, UK	[Propagules dispersed intentionally by people? Yes] "It is restricted to lowland tropical America, although it has been introduced into Australia and some other Old World tropical countries."
703	1964. Robyns, A.. Flora of Panama. Part VI. Family 116. Bombacaceae. Annals of the Missouri Botanical Garden. 51(1/4): 37-68.	[Propagules likely to disperse as a produce contaminant? No evidence] "Capsule leathery, globose, mammillate, ca. 7.5 cm. long and 6-6.5 cm. in diam., shortly appressed-tomentellous, 2- to 5 celled, 2- to 5-seeded, the fructiferous calyx cupuliform, ca. 2.5 cm. long and 4.5 cm. in diam.; seeds up to 5 cm. long, 2 cm. wide and 1.8 cm. thick." [Unlikely. Fruit and seeds relatively large and not likely to contaminate produce]
704	1960. Hodge, W.H.. The South American "Sapote". Economic Botany. 14(3): 203-206.	[Propagules adapted to wind dispersal? No] "Fruits are the size of a large pear, are elliptical in shape and mammillate at the blossom end. The thick leathery skin is pubescent and brownish-green in color. A heavy woody stalk joins the fruit to the branch."
704	1964. Robyns, A.. Flora of Panama. Part VI. Family 116. Bombacaceae. Annals of the Missouri Botanical Garden. 51(1/4): 37-68.	[Propagules adapted to wind dispersal? No] "Capsule leathery, globose, mammillate, ca. 7.5 cm. long and 6-6.5 cm. in diam., shortly appressed-tomentellous, 2- to 5 celled, 2- to 5-seeded, the fructiferous calyx cupuliform, ca. 2.5 cm. long and 4.5 cm. in diam.; seeds up to 5 cm. long, 2 cm. wide and 1.8 cm. thick."
705	1987. Morton, J.F.. Fruits of warm climates - Chupa-Chupa (<i>Quararibea cordata</i>). J.F. Morton, Miami, FL http://www.hort.purdue.edu/newcrop/morton/chupa-chupa.html	[Propagules water dispersed? Possibly that large fruits may be buoyant, but unlikely to be as important a dispersal vector as mammals] "The tree grows wild in lowland rainforests of Peru, Ecuador and adjacent areas of Brazil, especially around the mouth of the Javari River. It is common in the western part of Amazonas, southwestern Venezuela, and in the Cauca and Magdalena Valleys of Colombia. It flourishes and produces especially well near the sea at Tumaco, Colombia."
706	1995. Kelly, C.K.. Seed Size in Tropical Trees: A Comparative Study of Factors Affecting Seed Size in Peruvian Angiosperms. <i>Oecologia</i> . 102(3): 377-388.	[Propagules bird dispersed? No] "Appendix 1 Taxonomic arrangement of species using Cronquist's (1981) scheme as an organizational template" [<i>Quararibea cordata</i> - Dispersal Agent = Mammal. Fruits and seeds of this species too large for the suite of frugivorous birds present in the Hawaiian and other Pacific Islands]
707	1995. Kelly, C.K.. Seed Size in Tropical Trees: A Comparative Study of Factors Affecting Seed Size in Peruvian Angiosperms. <i>Oecologia</i> . 102(3): 377-388.	[Propagules dispersed by other animals (externally)? Presumably Yes. Could be carried by non-native rodents, mongoose, or feral pigs in tropical island ecosystems] "Appendix 1 Taxonomic arrangement of species using Cronquist's (1981) scheme as an organizational template" [<i>Quararibea cordata</i> - Dispersal Agent = Mammal]
707	2008. Terborgh, J./Nuñez-Iturri, G./Pitman, N.C.A./Cornejo Valverde, F.H./Alvarez, P./Swamy, V./Pringle, C. E. Timothy Paine, E.G.. Tree Recruitment in an Empty Forest. <i>Ecology</i> . 89(6): 1757-1768.	[Propagules dispersed by other animals (externally)? Yes] "Table 3. Species included in the 25 top ranks of the adult tree stands at CC and BM and their respective dispersal modes." [<i>Matisia cordata</i> - Dispersal mode = LP = large primate]
708	1995. Kelly, C.K.. Seed Size in Tropical Trees: A Comparative Study of Factors Affecting Seed Size in Peruvian Angiosperms. <i>Oecologia</i> . 102(3): 377-388.	[Propagules survive passage through the gut? Presumably Yes. Could be dispersed by feral pigs in tropical island ecosystems] "Appendix 1 Taxonomic arrangement of species using Cronquist's (1981) scheme as an organizational template" [<i>Quararibea cordata</i> - Dispersal Agent = Mammal]
708	2006. Link, A./Di Fiore, A.. Seed Dispersal by Spider Monkeys and Its Importance in the Maintenance of Neotropical Rain- Forest Diversity. <i>Journal of Tropical Ecology</i> . 22(3): 235-246.	[Propagules survive passage through the gut? Yes] "Table 1. Plant species whose seeds are swallowed by wild spider monkeys in Yasuni National Park, Ecuador and for which retention times and/or dispersal distances could be estimated." [Includes seeds of <i>Matisia cordata</i>]
801	1986. Forest Resources Development Branch. Food and Fruit-bearing Forest Species: Examples from Latin America. Food and Agriculture Organization of the United Nations, Rome, Italy	[Prolific seed production (>1000/m ²)? Possibly for larger and older trees] "On good soils with good climatic conditions, a mature tree can produce up to 6000 fruit, though these will be smaller than normal. These high yields only occur sporadically (and may be followed by several poor years. This uneven yielding pattern may average out to 700 to 1000 fruit per year. Yield and fruit time will be smaller on poor soils or in dry climatic conditions."
802	2008. Janick, J./Paull, R.E.. The Encyclopedia of Fruit & Nuts. Cabi Publishing, Wallingford, UK	[Evidence that a persistent propagule bank is formed (>1 yr)? No] "Seeds are classified as recalcitrant due to their fleshiness and rapid loss of viability."
803	2012. WRA Specialist. Personal Communication.	[Well controlled by herbicides? Unknown] No information on herbicide efficacy or chemical control of this species
804	2012. WRA Specialist. Personal Communication.	[Tolerates, or benefits from, mutilation, cultivation, or fire? Unknown]
805	2012. WRA Specialist. Personal Communication.	[Effective natural enemies present locally (e.g. introduced biocontrol agents)? Unknown]

Summary of Risk Traits

High Risk / Undesirable Traits

- Thrives in tropical climates
- Shade tolerant
- Tolerates many soil conditions (and potentially able to exploit many different habitat types)
- Self-compatible (self-fertile)
- Viable seeds dispersed by mammals (possibly pigs, rodents and mongoose in Hawaiian Islands)

Low Risk / Desirable Traits

- No evidence of naturalization or negative impacts have been documented
- Unarmed (no spines, thorns or burrs)
- Non-toxic
- Landscaping and ornamental value
- Edible Fruit
- Relatively long time to reproductive maturity (5+ years)
- Large fruits and seeds unlikely to be inadvertently dispersed
- Seeds recalcitrant, lose viability quickly and not likely to form a persistent seed bank