Taxon: Pouteria torta (Mart.) Radlk. **Family:** Sapotaceae

Common Name(s): abiu piloso
abiurana
cabo-de-machado
red abiurana
wooly abiu

Synonym(s): Labatia torta Mart.

Assessor: Chuck Chimera **Status:** Approved **End Date:** 7 Jul 2023

WRA Score: -3.0 **Designation:** L **Rating:** Low Risk

Keywords: Tropical Tree, Edible Fruit, Shade-Tolerant, Self-Sterile, Animal-Dispersed

Qsn #	Question	Answer Option	Answer
101	Is the species highly domesticated?	y = -3, n = 0	n
102	Has the species become naturalized where grown?		
103	Does the species have weedy races?		
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	?
301	Naturalized beyond native range	y = 1*multiplier (see Appendix 2), n = question 205	n
302	Garden/amenity/disturbance weed	y = 1*multiplier (see Appendix 2), n = 0	n
303	Agricultural/forestry/horticultural weed	y = 2*multiplier (see Appendix 2), n = 0	n
304	Environmental weed	y = 2*multiplier (see Appendix 2), n = 0	n
305	Congeneric weed		
401	Produces spines, thorns or burrs	y = 1, n = 0	n
402	Allelopathic		
403	Parasitic	y = 1, n = 0	n
404	Unpalatable to grazing animals		
405	Toxic to animals	y = 1, n = 0	n
406	Host for recognized pests and pathogens		
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

Qsn #	Question	Answer Option	Answer
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		
604	Self-compatible or apomictic	y = 1, n = -1	n
605	Requires specialist pollinators	y = -1, n = 0	n
606	Reproduction by vegetative fragmentation	y = 1, n = -1	n
607	Minimum generative time (years)		
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		
706	Propagules bird dispersed	y = 1, n = -1	n
707	Propagules dispersed by other animals (externally)		
708	Propagules survive passage through the gut	y = 1, n = -1	y
801	Prolific seed production (>1000/m2)	y = 1, n = -1	n
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	y
804	Tolerates, or benefits from, mutilation, cultivation, or fire	y = 1, n = -1	y
805	Effective natural enemies present locally (e.g. introduced biocontrol agents)		

Supporting Data:

Qsn #	Question	Answer
101	Is the species highly domesticated?	n
	Source(s)	Notes
	Pennington, T. D. (1990). Sapotaceae. Flora Neotropica, 52, 1-770	[No evidence of domestication] "Distribution. From Veracruz, Mexico, through Central America, throughout tropical South America as far south as Paraguay."

102	Has the species become naturalized where grown?	
	Source(s)	Notes
	WRA Specialist. (2023). Personal Communication	NA

103	Does the species have weedy races?	
	Source(s)	Notes
	WRA Specialist. (2023). Personal Communication	NA

201	Species suited to tropical or subtropical climate(s) - If island is primarily wet habitat, then substitute "wet tropical" for "tropical or subtropical"	High
	Source(s)	Notes
	Pennington, T. D. (1990). Sapotaceae. Flora Neotropica, 52, 1-770	"Distribution. From Veracruz, Mexico, through Central America, throughout tropical South America as far south as Paraguay."

202	Quality of climate match data	High
	Source(s)	Notes
	Pennington, T. D. (1990). Sapotaceae. Flora Neotropica, 52, 1-770	"Distribution. From Veracruz, Mexico, through Central America, throughout tropical South America as far south as Paraguay."

Qsn #	Question	Answer
203	Broad climate suitability (environmental versatility)	n
	Source(s)	**Notes**
	Alves-Araújo, A., Swenson, U., & Alves, M. (2014). A Taxonomic Survey of Pouteria (Sapotaceae) from the Northern Portion of the Atlantic Rainforest of Brazil. Systematic Botany, 39(3), 915-938	"Distribution-It is widely distributed in wet forests in the Neotropics [Amazonian and Atlantic (Bahia) forests, and gallery forest in Cerrado]."
	Clark, J. L., Neill, D. A., & Asanza, M. (2006). Floristic checklist of the Mache-Chindul mountains of Northwestern Ecuador. Contributions from the United States National Herbarium, 54: 1-180	"Subcanopy tree. 100-500 m. Common name: “Mamey silvestre.” Amazonia, Choco, Mesoamerica."
	Osa Conservation. (2023). Pouteria torta. https://osa-arboretum.org/plant/pouteria-torta/. [Accessed 29 Jun 2023]	"This tree is found growing in mature, humid forests and is distributed from Mexico to Brazil; in Costa Rica, it grows widely along both the Pacific and Atlantic slopes."
	Pennington, T. D. (1990). Sapotaceae. Flora Neotropica, 52, 1-770	[subsp. tuberculata] "Present on the wet Atlantic drainage of Veracruz, Mexico, Guatemala, Belize and N Honduras, Nicaragua to Colombia, Ecuador and Peru, and adjacent Amazonian Brazil; a single record from French Guiana. A component of evergreen lowland rainforest throughout its range, usually on non-flooded land; also in wet lower montane forest in the Andes of Colombia, and occasionaly found in seasonal semievergreen forest in Panama. Altitudinal range sea level to 700 metres."

204	Native or naturalized in regions with tropical or subtropical climates	y
	Source(s)	**Notes**
	Pennington, T. D. (1990). Sapotaceae. Flora Neotropica, 52, 1-770	"Distribution. From Veracruz, Mexico, through Central America, throughout tropical South America as far south as Paraguay."

205	Does the species have a history of repeated introductions outside its natural range?	?
	Source(s)	**Notes**
	Trade Winds Fruit. (2023). Pouteria torta - Wooly Abiu. https://www.tradewindsfruit.com/pouteria-torta-wooly-abiu-seeds. [Accessed 7 Jul 2023]	"Fruits are usually gathered from wild growing trees although there is some limited cultivation."
	Wildlands Farm and Nursery. (2023). Pouteria torta subsp. pilosa. https://www.wildlandsplants.com/pouteria-torta-subsp-pilosa. [Accessed 7 Jul 2023]	"This fruit has largely been neglected in cultivated settings but has major potential in subtropical and tropical gardens. " [This website appears to be representative of those that specialize in cultivated tropical fruit trees]

301	Naturalized beyond native range	n
	Source(s)	**Notes**
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	No evidence
	Gallaher, T.J., Brock, K., Kennedy, B.H., Imada, C.T., Imada, K., & Walvoord, N. (2023). Plants of Hawai‘i. http://www.plantsofhawaii.org.. [Accessed 29 Jun 2023]	No evidence

302	Garden/amenity/disturbance weed	n
	Source(s)	**Notes**
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	No evidence

Qsn #	Question	Answer
	CABI. (2023). Invasive Species Compendium. Wallingford, UK: CAB International. https://www.cabidigitallibrary.org/product/qi. [Accessed 6 Jul 2023]	No evidence

303	Agricultural/forestry/horticultural weed	n
	Source(s)	**Notes**
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	No evidence
	CABI. (2023). Invasive Species Compendium. Wallingford, UK: CAB International. https://www.cabidigitallibrary.org/product/qi. [Accessed 6 Jul 2023]	No evidence

304	Environmental weed	n
	Source(s)	**Notes**
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	No evidence
	CABI. (2023). Invasive Species Compendium. Wallingford, UK: CAB International. https://www.cabidigitallibrary.org/product/qi. [Accessed 6 Jul 2023]	No evidence

305	Congeneric weed	
	Source(s)	**Notes**
	Morton, J.F. (1976). Pestiferous spread of many ornamental and fruit species in South Florida. Proceedings of the Florida State Horticultural Society 89: 348-353	[Possibly. P. campechiana controlled in Florida, but rated as Low Risk by HPWRA] "Abstract. The massive invasion of large tracts of South Florida by Melaleuca quinquenervia and Casuarina equisetifolia from Australia and Schinus terebinthifolius from Brazil is an environmental problem now receiving serious attention. There are dozens of other introduced ornamental plants and fruit trees which have been multiplying spontaneously in our area for many years or have recently become conspicuous as weeds on private and public properties–some because of seed distribution by exotic birds new to our fauna. Outstanding examples are Cestrum diurnum, Bischofia javanica, Washingtonia robusta, Ptychosperma elegans, Aaurraya paniculata, Eriobotrya japonica, Pouteria campechiana and Pithecellobium dulce. We should try to discourage the planting of some undesirable species and warn of the need to control the spread of others, in order to reduce the maintenance load of cultivated grounds and the threat to undeveloped areas which are being overrun by vigorous alien vegetation."
	Langeland, K.A.& Stocker, R.K. (2001). Control of Non-native Plants in Natural Areas of Florida. SP 242. Institute of Food & Agricultural Sciences, University of Florida, Gainesville, FL	[Possibly. P. campechiana controlled in Florida, but rated as Low Risk by HPWRA] "Pouteria campechiana ... Treatment: Hand pull seedlings; basal bark application of 10% Garlon 4…Comments: Small to medium tree; yellow, edible fruit; prolific invader of hammocks but local in distribution; fruit eaten by raccoons and opossums."

401	Produces spines, thorns or burrs	n
	Source(s)	**Notes**

Qsn #	Question	Answer
	Alves-Araújo, A., Swenson, U., & Alves, M. (2014). A Taxonomic Survey of Pouteria (Sapotaceae) from the Northern Portion of the Atlantic Rainforest of Brazil. Systematic Botany, 39(3), 915-938	[No evidence] "Trees up to 40 m tall, shoots glabrate to pilose, trichomes ferruginous, lenticels absent. Leaves 6-35 x 2.5-12.0 cm, spirally arranged, oblanceolate to elliptic, chartaceous to coriaceous, upper surface glabrous to pilose on midrib, lower surface glabrous to pubescent; margin plane; venation eucamptodromous (rarely eucampto-brochidodromous); petiole 1-7 cm long, channeled, glabrous to pilose. Flowers 4-merous, 3-10 per fascicle, axillary or ramiflorous, bisexual; pedicel 0.5-0.6 cm, pubescent. Sepals 3-10 mm long, ovate, chartaceous, glabrous inside, pubescent outside, apex obtuse to rounded; margin ciliate. Corolla tubular, 5-15 mm long; tube 4-10 mm long; lobes 1-5 mm long, ovate to oblong, glabrous, greenish, apex rounded to truncate; margin ciliate. Stamens 3.0-6.5 mm long, inserted at the middle of corolla tube; filaments and anthers glabrous. Staminodes 0.5-2.0 mm long, subulate, glabrous. Ovary 4-locular, 3-5 mm long, pilose, trichomes ferruginous; stipe absent; style 3-12 mm long, glabrous, basal restriction absent; stigma 4-lobed. Fruit 1-4-seeded, 3-9 cm long, globoid, glabrous to puberulent, yellowish to orange; seeds 2-5 cm long, smooth; seed scar 1.0-3.1 cm long, narrow to wide."

402	Allelopathic	
	Source(s)	**Notes**
	Nasctmento, M., Alcantara, S. F., Haddad, C. R. B., & Martins, F. R. (2007). Allelopathic potential of Pouteriu tortu (Mart.) Radlk., a species of the Brazilian cerrado. Allelopathy Journal, 20(2), 279-286	[Possibly Yes. Demonstrated in lettuce seed germination tests] "We investigated the effects of 1, 5 and 10% of extracts from green and senesced leaves of P. tor/a on the germination and growth of lettuce. The higher concentration of extracts affected these processes most. To test whether the inhibition resulted from the acidity of the extracts, lettuce seeds were germinated in the presence of buffered extracts and of an acetic-acid solution with a pH similar to that of the most-concentrated extracts. Adjusting the pH of the extracts did not annul the inhibition of germination and growth of lettuce. and an acetic acid solution with the same pH did not affect these processes. The osmotic effect was evaluated using polyethyleneglycol 6000 solutions, with osmotic potentials similar to the I 0% extracts. The ionic effect was determined using leaf ashes solutions with conductivity identical to the I 0% extracts. The ash solutions and the polyethyleneglycol did not inhibit the germination or growth of lettuce. Therefore, the inhibitory effects of extracts cannot be attributed to their higher acidity, or to higher concentration of toxic ions, or to the lower osmotic potential. We conclude that allelopathic compounds may be present in the leaves of P. torta, which may explain the spatial pattern of this specie in the Brazilian cerrado." ... "In Cerrado areas of Itirapina city, Sao Paulo, Pouteria torta (Mart.) Radlk. Plants grow in groups, with no herbaceous vegetation beneath them and large amounts of leaf litter (ca. 20 - 40 cm) accumulate beneath the trees. The absence of herbaceous plants beneath these trees may be owing to (i) a mechanical impediment from abundant litter, (ii) shading, or (iii) release of allelopathic substances from wetting or decomposition of P. torta leaves."

403	Parasitic	n
	Source(s)	**Notes**
	Condit, R., Pérez, R. & Daguerre, N. (2010). Trees of Panama and Costa Rica. Princeton University Press, Princeton, NJ	"Pouteria torta. A tall forest tree. Leaves are simple, alternate, bunched at branch ends, and somewhat rounded. Veins are yellowish and raised below. Petioles are cylindrical and swollen. Any broken part drips white latex. Flowers are like those of other Pouteria. Fruits are bizarre, covered with long, soft filaments." [Sapotaceae. No evidence]

Qsn #	Question	Answer
404	Unpalatable to grazing animals	
	Source(s)	Notes
	WRA Specialist. (2023). Personal Communication	Unknown if foliage is palatable. Fruit consumed by animals and humans.

405	Toxic to animals	n
	Source(s)	Notes
	Tropical Plants Database, Ken Fern. (2023). Pouteria torta. https://tropical.theferns.info/viewtropical.php?id=Pouteria+torta. [Accessed 7 Jul 2023]	"Known Hazards - None known"
	Quattrocchi, U. (2012). CRC World Dictionary of Medicinal and Poisonous Plants: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	No evidence, although another species, Pouteria sapota, has " milky sap from the bark and green fruit irritant to the eyes, caustic and vesicant to the skin"

406	Host for recognized pests and pathogens	
	Source(s)	Notes
	Taira, T. L., Abot, A. R., Nicácio, J., Uchôa, M. A., Rodrigues, S. R., & Guimarães, J. A. (2013). Fruit flies (Diptera, Tephritidae) and their parasitoids on cultivated and wild hosts in the Cerrado-Pantanal ecotone in Mato Grosso do Sul, Brazil. Revista Brasileira de Entomologia, 57, 300-308	"ABSTRACT. Fruit flies (Diptera, Tephritidae) and their parasitoids on cultivated and wild hosts in the Cerrado-Pantanal ecotone in Mato Grosso do Sul, Brazil. Information on frugivorous flies in cultivated or wild host plants and their parasitoids in the Cerrado-Pantanal ecotone in Aquidauana, Mato Grosso do Sul is presented and discussed. Fruit fly samples were collected weekly in specific fruit trees, and McPhail® traps were installed in the same trees for a period of two years. The fruit flies infested ripe and unripe fruits of Averrhoa carambola L., Schoepfia sp., Psidium guajava L. and Pouteria torta (Mart.) Radlk and mature fruits of Anacardium occidentale L. and Inga laurina (Sw.) Willd. Nineteen fruit fly species were obtained with the combination of sampling methods (collecting fruits and trapping), nine of them obtained with both methods, five found only in fruits and five only in traps. This is the first record of Anastrepha striata Schiner in a species of Sapotaceae, as well as for A. castanea Norrbom and A. daciformes Bezzi in Schoepfia sp. (Olacaceae), and for A. distincta Greene in fruits of P. guajava in the state of Mato Grosso do Sul. Fruit collections simultaneously associated with capture of fruit flies by McPhail traps in the same host plants are essential to understand the diversity of fruit flies and their relationship with hosts and parasitoids. Species of Braconidae and Pteromalidae were recovered, where Doryctobracon areolatus (Szépligeti) was the most abundant parasitoid in larvae of tephritids infesting both cultivated and wild host fruits."
	Sunshine Seeds. (2022). Pouteria torta sp.*. https://www.sunshine-seeds.de/Pouteria-torta-sp-*-54562p.html. [Accessed 7 Jul 2023]	"Pests: Spider mites > especially under glass"

Qsn #	Question	Answer
407	**Causes allergies or is otherwise toxic to humans**	**n**
	Source(s)	**Notes**
	Tropical Plants Database, Ken Fern. (2023). Pouteria torta. https://tropical.theferns.info/viewtropical.php?id=Pouteria+torta. [Accessed 7 Jul 2023]	"Known Hazards None known"
	Quattrocchi, U. (2012). CRC World Dictionary of Medicinal and Poisonous Plants: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	No evidence, although another species, Pouteria sapota, has " milky sap from the bark and green fruit irritant to the eyes, caustic and vesicant to the skin"

408	**Creates a fire hazard in natural ecosystems**	**n**
	Source(s)	**Notes**
	Cianciaruso, M. V., Silva, I. A., Batalha, M. A., Gaston, K. J., & Petchey, O. L. (2012). The influence of fire on phylogenetic and functional structure of woody savannas: moving from species to individuals. Perspectives in Plant Ecology, Evolution and Systematics, 14(3), 205-216	[Occurs in areas that burn regularly, and resprouts after fire. May contribute to fuel load, but no evidence that this species increases fire risk or is otherwise highly flammable] "The Emas National Park (ENP) is located in the Brazilian Central Plateau, southwestern Goiás State (17◦49′–18◦28′S and 52◦39′–53◦10′W), and is one of the largest and most important savanna reserves in South America, covering ca. 133,000 ha. Regional climate is tropical and humid, with a wet summer and dry winter, classified as Aw following Köppen (1931). The dry season is from June to August and the wet season from September to May. Annual rainfall and mean temperature lie around 1,745 mm and 24.6 ◦C, respectively. In the park, we find a gradient from open (68.1% of its area) to closed savannas (25.1%), as well as wet grasslands (4.9%) and riparian and semideciduous forests (1.2%) (Ramos-Neto and Pivello, 2000). Historically, ENP was exploited by farmers for cattle ranching, and dry season burnings were used to promote forage regrowth every year. In 1984, the park was completely fenced, cattle were no longer allowed inside, and a fire exclusion policy was established (Ramos-Neto and Pivello, 2000). As a consequence, uncontrolled wildfires occurred every 3–4 years, burning on average 80% of its total area (Ramos-Neto and Pivello, 2000; Franc¸a et al., 2007). Since 1994, when a catastrophic fire burned almost 95% of ENP's area, approximately 10 km2 of preventive firebreaks are burned annually in the dry season, and a fire brigade is permanently stationed in the park to prevent anthropogenic fires during this period (Franc¸a et al., 2007). As a result, nowadays there are few occurrences of anthropogenic burnings inside the park (almost all fires are lightning fires), and fire frequency at a given point is around 6–7 years on average." ... "Appendix 1." [Pouteria torta - top = resprouting due to top-kill (frequency). high (HiFi) = 0.53, intermediate (MidFi) = 0.60 and low (LowFi) fire frequencies = 0.50]

Qsn #	Question	Answer
409	Is a shade tolerant plant at some stage of its life cycle	y
	Source(s)	**Notes**
	Tropical Plants Database, Ken Fern. (2023). Pouteria torta. https://tropical.theferns.info/viewtropical.php?id=Pouteria+torta. [Accessed 7 Jul 2023]	"A fast-growing tree that is tolerant of full sun and supplies a food appreciated by humans and many other species, this tree could be very useful in a mixed planting for restoring native woodland and also for establishing woodland gardens"
	Wildlands Farm and Nursery. (2023). Pouteria torta subsp. pilosa. https://www.wildlandsplants.com/pouteria-torta-subsp-pilosa. [Accessed 7 Jul 2023]	"Sun: Full Sun/Part Shade"
	Cárate-Tandalla, D., Leuschner, C., & Homeier, J. (2015). Performance of seedlings of a shade-tolerant tropical tree species after moderate addition of N and P. Frontiers in Earth Science, 3:75. doi: 10.3389/feart.2015.00075	"The locally most abundant tree species of the old-growth forests at Bombuscaro, Pouteria torta subsp. glabra T. P. Penn., is a late successional shade-tolerant tree species (Wittich et al., 2015; Homeier, own observations), accounting for 9.5% of the stems ≥ 10 cm dbh or about 69 stems ha−1 in the NUMEX plots."

410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y
	Source(s)	**Notes**
	Tropical Plants Database, Ken Fern. (2023). Pouteria torta. https://tropical.theferns.info/viewtropical.php?id=Pouteria+torta. [Accessed 7 Jul 2023]	"Grows best in moist soils"

411	Climbing or smothering growth habit	n
	Source(s)	**Notes**
	Alves-Araújo, A., Swenson, U., & Alves, M. (2014). A Taxonomic Survey of Pouteria (Sapotaceae) from the Northern Portion of the Atlantic Rainforest of Brazil. Systematic Botany, 39(3), 915-938	"Trees up to 40 m tall, shoots glabrate to pilose, trichomes ferruginous, lenticels absent."

412	Forms dense thickets	n
	Source(s)	**Notes**
	Pennington, T. D. (1990). Sapotaceae. Flora Neotropica, 52, 1-770	"Distribution. From Veracruz, Mexico, through Central America, throughout tropical South America as far south as Paraguay." [No evidence in this or other cited literature]

501	Aquatic	n
	Source(s)	**Notes**
	Alves-Araújo, A., Swenson, U., & Alves, M. (2014). A Taxonomic Survey of Pouteria (Sapotaceae) from the Northern Portion of the Atlantic Rainforest of Brazil. Systematic Botany, 39(3), 915-938	[Terrestrial] "Distribution-It is widely distributed in wet forests in the Neotropics [Amazonian and Atlantic (Bahia) forests, and gallery forest in Cerrado]."

Qsn #	Question	Answer
502	Grass	n
	Source(s)	Notes
	USDA, Agricultural Research Service, National Plant Germplasm System. (2023). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/. [Accessed 29 Jun 2023]	Family: Sapotaceae Subfamily: Chrysophylloideae

503	Nitrogen fixing woody plant	n
	Source(s)	Notes
	USDA, Agricultural Research Service, National Plant Germplasm System. (2023). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/. [Accessed 29 Jun 2023]	Family: Sapotaceae Subfamily: Chrysophylloideae

504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	n
	Source(s)	Notes
	Alves-Araújo, A., Swenson, U., & Alves, M. (2014). A Taxonomic Survey of Pouteria (Sapotaceae) from the Northern Portion of the Atlantic Rainforest of Brazil. Systematic Botany, 39(3), 915-938	"Trees up to 40 m tall, shoots glabrate to pilose, trichomes ferruginous, lenticels absent."

601	Evidence of substantial reproductive failure in native habitat	n
	Source(s)	Notes
	Pennington, T. D. (1990). Sapotaceae. Flora Neotropica, 52, 1-770	"Distribution. From Veracruz, Mexico, through Central America, throughout tropical South America as far south as Paraguay."

602	Produces viable seed	y
	Source(s)	Notes

Qsn #	Question	Answer
	Oliveira, A. K. M., & Pina, J. C. (2019). Seed Germination of Pouteria torta (Mart.) Radlk. subesp. torta in Different Environmental Conditions. Floresta, 50(1), 923-932	"Germination is considered a critical step in the seedling production process aiming the recovery of environments. Thus, understanding the germination behavior of native species with potential for economic use contributes to the development of the forest seed and seedling chain. Considering the limited information on the tree species Pouteria torta subesp. torta, this study aimed to evaluate its seed germination and formation of normal seedlings using different temperatures and substrates. The experiment was conducted in germination chamber in a research laboratory using two substrates (paper and vermiculite) and six temperatures (20, 25, 30, 35, 20-30 and 25-35 °C) in a completely randomized design in a 2x6 factorial arrangement. Daily evaluation was conducted to verify primary root emission, seed vigor, and seedling formation. The results indicated that the primary root protrusion process began after 20 days of testing under the best conditions, with germination time lasting longer than two months. The results obtained also showed that there was interaction between factors, with use of the vermiculite substrate and the temperatures of 35 and 25-35 °C producing the best germination rates and germination speed index, and use of the paper substrate and the temperatures of 30 and 35 °C showing the best mean germination time. Considering the analyzed variables (germination, germination speed index, and formation of normal seedlings), the temperatures of 35 and 25-35 °C and the vermiculite substrate are the most suitable for the production of Pouteria torta subesp. torta seedlings."
	Tropical Plants Database, Ken Fern. (2023). Pouteria torta. https://tropical.theferns.info/viewtropical.php?id=Pouteria+torta. [Accessed 29 Jun 2023]	"Seed - it has a very short viability in storage and so is best sown as soon as it is ripe in individual pots [419]. Germination usually occurs in 3 - 7 weeks, the germination rate is above 80% if the seed is sown fresh [420]."

603	Hybridizes naturally	
	Source(s)	**Notes**
	Pennington, T. D. (1990). Sapotaceae. Flora Neotropica, 52, 1-770	Unknown. No evidence found.

604	Self-compatible or apomictic	n
	Source(s)	**Notes**
	Gama, L. U., Barbosa, A. A. A., & Oliveira, P. E. A. M. D. (2011). Sistema sexual e biologia floral de Pouteria ramiflora e P. torta (Sapotaceae). Brazilian Journal of Botany, 34, 375-387	"Pouteria ramiflora and P. torta are tree species sympatric in the Cerrado and were studied in the Natural Reserve of Clube Caça e Pesca Itororó (Uberlândia-MG) in order to compare various aspects of their reproductive biology. The phenophases were evaluated weekly and their intensity was quantified. The floral biology, breeding system, sexual system and floral visitors were studied in the field and/or laboratory. In both species, leaf fall occurred in the end of the dry season, leaf flushing between the dry and the rainy season, flowering in the dry season and fruit maturation during the rainy season. They have tubular small greenish flowers, with small amounts of nectar and high pollen viability. They are self-sterile, non-agamospermic and had low fruiting success from natural pollination. P. torta is a hermaphrodite species, with protogynous and hercogamous flowers, while P. ramiflora is morphologically gynomonoecious but functionally unisexual. The apparently low pollen flow and the abortion of young fruits resulted in low fruit set from natural pollinations. Both species are visited by several small insects, including butterflies, moths, flies and bees."

605	Requires specialist pollinators	n

Qsn #	Question	Answer
	Source(s)	**Notes**
	Gama, L. U., Barbosa, A. A. A., & Oliveira, P. E. A. M. D. (2011). Sistema sexual e biologia floral de Pouteria ramiflora e P. torta (Sapotaceae). Brazilian Journal of Botany, 34, 375-387	"Both species are visited by several small insects, including butterflies, moths, flies and bees."
	Pennington, T. D. (1990). Sapotaceae. Flora Neotropica, 52, 1-770	"Flowers bisexual. Sepals four 0.3-1.5 (-2) cm long, broadly ovate or elliptic, apex obtuse to rounded, crisped pubescent to sericeous outside, subglabrous inside. Corolla tubular, (0.4-)0.7-1.6 cm long, tube (0.3)0.4-1.3 cm long, lobes four, (1-)2-4 mm long, broadly oblong to suborbicular, apex rounded or truncate, often ciliate. Stamens four, fixed halfway to three-quarters up the corolla tube; filaments 2-4. 5 mm long, glabrous; anthers 1.25-2 mm long, lanceolate, oblong or ovate, often flattened, sometimes apiculate, glabrous. Staminodes four, 1-3 mm long, lanceolate or subulate, glabrous. Disk absent. Ovary ovoid to depressed globose, four-locular, densely long-strigose; style 0.5-1.6 cm long after anthesis, exserted, glabrous; style-head simple or minutely four-lobed."
	Osa Conservation. (2023). Pouteria torta. https://osa-arboretum.org/plant/pouteria-torta/. [Accessed 29 Jun 2023]	"Its yellowish flowers are likely pollinated by insects, and its brown or yellowish fruits, covered by peculiar protrusions and brown hairs, are desired by some birds and arboreal mammals, especially monkeys. "
	Pereira, C. C., Arruda, D. M., Soares, F. D. F. S., & Fonseca, R. S. (2022). The importance of pollination and dispersal syndromes for the conservation of Cerrado Rupestre fragments on ironstone outcrops immersed in an agricultural landscape. Neotropical Biology and Conservation, 17(1), 87-102	[Pouteria torta - Pollination = generalist] "Table 1. Plant species abundances, life form, fruit type, and pollination and dispersion syndromes at the five fragments of Cerrado Rupestre immersed in an agricultural landscape in Rio Paranaíba, Minas Gerais. N° ind.: number of individuals; cantharophily: beetle pollination; generalist: pollination by many groups of pollinators; melittophily: bee pollination; ornithophily: bird pollination; phalenophily: moth pollination; psychophilly: butterfly pollination; quiropterophilly: bat pollination; sphingophily: hawk moth pollination; anemochory: wind dispersal; autochory: dispersion carried out by the plant itself; zoochory: animal dispersal."

606	Reproduction by vegetative fragmentation	n
	Source(s)	**Notes**
	Tropical Plants Database, Ken Fern. (2023). Pouteria torta. https://tropical.theferns.info/viewtropical.php?id=Pouteria+torta. [Accessed 7 Jul 2023]	"Propagation Seed - it has a very short viability in storage and so is best sown as soon as it is ripe in individual [419]. Germination usually occurs in 3 - 7 weeks, the germination rate is above 80% if the seed is sown fresh [420]."

607	Minimum generative time (years)	
	Source(s)	**Notes**
	Tropical Plants Database, Ken Fern. (2023). Pouteria torta. https://tropical.theferns.info/viewtropical.php?id=Pouteria+torta. [Accessed 7 Jul 2023]	"Plants have a fast rate of growth"

Qsn #	Question	Answer
701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	n
	Source(s)	Notes
	Pennington, T. D. (1990). Sapotaceae. Flora Neotropica, 52, 1-770	"Fruit 3-6.5 cm long, ellipsoid, ovoid or globose, apex obtuse to rounded, base rounded to truncate, smooth to verrucose, finely pubescent to densely covered in short hairy processes. Seeds 1-4, 1.7-3.5 cm long, ellipsoid, usually rounded at base and apex, often planoconvex, sometimes slightly laterally compressed, testa smooth, shining, 0.5-0.75 mm thick" [No evidence. Fruit and seeds large and lack means of external attachment]

702	Propagules dispersed intentionally by people	y
	Source(s)	Notes
	Trade Winds Fruit. (2023). Pouteria torta - Wooly Abiu. https://www.tradewindsfruit.com/pouteria-torta-wooly-abiu-seeds. [Accessed 30 Jun 2023]	[Yes, but apparently rarely cultivated] "1 seed per pack. An uncommon sapote, native to transitional rainforest-savannah zones through Central and South America. The fruits are edible raw, with a sticky and sweet flavored pulp. Fruits are usually gathered from wild growing trees although there is some limited cultivation. A fast-growing, medium sized tree up to 60 ft / 18 m. Unknown frost tolerance. #4629 "

703	Propagules likely to disperse as a produce contaminant	n
	Source(s)	Notes
	Alves-Araújo, A., Swenson, U., & Alves, M. (2014). A Taxonomic Survey of Pouteria (Sapotaceae) from the Northern Portion of the Atlantic Rainforest of Brazil. Systematic Botany, 39(3), 915-938	"Fruit 1-4-seeded, 3-9 cm long, globoid, glabrous to puberulent, yellowish to orange; seeds 2-5 cm long, smooth; seed scar 1.0-3.1 cm long, narrow to wide."
	WRA Specialist. (2023). Personal Communication	No evidence. Fruit and seeds relatively large and unlikely to be accidentally dispersed as a produce contaminant.

704	Propagules adapted to wind dispersal	n
	Source(s)	Notes
	Alves-Araújo, A., Swenson, U., & Alves, M. (2014). A Taxonomic Survey of Pouteria (Sapotaceae) from the Northern Portion of the Atlantic Rainforest of Brazil. Systematic Botany, 39(3), 915-938	"Fruit 1-4-seeded, 3-9 cm long, globoid, glabrous to puberulent, yellowish to orange; seeds 2-5 cm long, smooth; seed scar 1.0-3.1 cm long, narrow to wide."

705	Propagules water dispersed	
	Source(s)	Notes
	de Assis, R. L., Wittmann, F., Luize, B. G., & Haugaasen, T. (2017). Patterns of floristic diversity and composition in floodplain forests across four Southern Amazon river tributaries, Brazil. Flora, 229, 124-140	"Table A1. Absolute abundance of each tree species recorded in floristic inventories in floodplain forests along the Purus, Tefé, Juruá and Jutaí rivers, central-western Amazonia, Brazil." [Buoyance of animal-dispersed seeds unknown. Pouteria torta occurs along the Tefé RIver. Seeds might be secondarily dispersed by water along riparian habitats]

706	Propagules bird dispersed	n
	Source(s)	Notes

Qsn #	Question	Answer
	Terborgh, J., Nuñez-Iturri, G., Pitman, N. C., Valverde, F. H. C., Alvarez, P., Swamy, V., ... & Paine, C. T. (2008). Tree recruitment in an empty forest. Ecology, 89(6), 1757-1768	"TABLE 3. Species included in the 25 top ranks of the adult tree stands at CC and BM and their respective dispersal modes" [Pouteria torta - Dispersal mode = LP= large primate. Birds are not listed as a disperser of this species, although they are identified as dispersers of several other species.]
	Ragusa-Netto, J. (2011). Pre-dispersal seed predation by Blue-and-Yellow Macaw (Ara ararauna, Psittacidae), on fruit crops of the Pequi (Caryocar brasiliense, Caryocariaceae), in the Brazilian cerrado. Ornitologia Neotropical, 22, 329-338	[Macaws are seed predators] "At the ENP cerrado, the Blueand-Yellow Macaw also exploits species (mainly Pouteria torta, Anacardium humile, Geonoma geraensis, and Dimorphandra mollis) with large and nutritive seeds, within which the Pequi seeds are among their major food resource (JRN unpubl.)."
	Osa Conservation. (2023). Pouteria torta. https://osa-arboretum.org/plant/pouteria-torta/. [Accessed 29 Jun 2023]	[Reported to be bird-dispersed by this website, but other literature identify primates and other megafaunal mammals as the dispersal agents] "Its yellowish flowers are likely pollinated by insects, and its brown or yellowish fruits, covered by peculiar protrusions and brown hairs, are desired by some birds and arboreal mammals, especially monkeys."

707	Propagules dispersed by other animals (externally)	
	Source(s)	**Notes**
	WRA Specialist. (2023). Personal Communication	In its native range, seed caching animals are reported to carry and disperse seeds. In the Hawaiian Islands, rodents, and possibly mongoose, feral pigs, and larger game birds may consume fruit pulp, or possibly carry fruit away to consume pulp or seeds away from the parent tree.
	Gottsberger, G., & Silberbauer-Gottsberger, I. (1983). Dispersal and distribution in the cerrado vegetation of Brazil. Sonderbänd des Naturwissenschaftlichen Vereins in Hamburg, 7(2), 315-352	In Table 1, Pouteria torta is identified as having synchory. Synzoochory is the dispersal of seeds by seed-caching animals. The dispersers identified in this study are non-flying mammals and bats.

708	Propagules survive passage through the gut	y
	Source(s)	**Notes**
	Motta Júnior, J. C., & Martins, K. (2002). The Frugivorous Diet of the Maned Wolf, Chrysocyon brachyurus, in Brazil: Ecology and Conservation. Pp 291-303 in Seed Dispersal and Frugivory: Ecology, Evolution and Conservation. CABI, Wallingford, UK	"Appendix Fruit species eaten by the maned wolf in south-eastern Brazil, with some of their characteristics. The scientific names and classifications by habitat are according to Mendonça et al. (1998), Lorenzi (1998) and Motta-Junior et al. (1996)." [Includes Pouteria torta]
	Julliot, C. (1997). Impact of Seed Dispersal by Red Howler Monkeys Alouatta Seniculus on the Seedling Population in the Understorey of Tropical Rain Forest. Journal of Ecology, 85(4), 431-440	"Six plant species were selected: Parahancornia fasciculata (Hub.) Ducke (Apocynaceae), Virola michelii R. Benoist (Myristicaceae), M inquartia guianensis Aublet (Olacaceae), Quiina obovata Tulasne (Quiinaceae), Chrysophyllum lucentifolium Cronguist (Sapotaceae), Pouteria torta ssp. glabra Pennington (Sapotaceae). These six species amounted to 17.9% of the fruit consumption of the troop and 15.4% of the number of seeds retrieved from faecal samples (n = 7175, for 189 faecal samples), during the first year of observation, that were able to germinate in the understorey."
	Pereira, C. C., Arruda, D. M., Soares, F. D. F. S., & Fonseca, R. S. (2022). The importance of pollination and dispersal syndromes for the conservation of Cerrado Rupestre fragments on ironstone outcrops immersed in an agricultural landscape. Neotropical Biology and Conservation, 17(1), 87-102	[Pouteria torta - Dispersion = zoochory] "Table 1. Plant species abundances, life form, fruit type, and pollination and dispersion syndromes at the five fragments of Cerrado Rupestre immersed in an agricultural landscape in Rio Paranaíba, Minas Gerais."

Qsn #	Question	Answer
	van Zonneveld, M., Larranaga, N., Blonder, B., Coradin, L., Hormaza, J. I., & Hunter, D. (2018). Human diets drive range expansion of megafauna-dispersed fruit species. Proceedings of the National Academy of Sciences, 115 (13), 3326-3331	[Primarily Megafauna dispersed] "Two Pouteria species that were exclusively part of megafauna diets, Pouteria torta and Pouteria venosa, stand out because they have wider geographic ranges compared with their wild-producing congeneric species. It could be that these species are not consumed anymore by humans, or are still consumed very locally by humans, even though they are not registered in the New World Fruit Database. Humans from the Peruvian Amazon, however, do not prefer to consume P. torta compared with wild-producing Pouteria species (31). Alternatively, it could be that a few megafauna-dispersed fruit species, such as these two Pouteria species, have successfully attracted other dispersers than humans to maintain or expand their distributions."

801	Prolific seed production (>1000/m2)	n
	Source(s)	**Notes**
	Gama, L. U., Barbosa, A. A. A., & Oliveira, P. E. A. M. D. (2011). Sistema sexual e biologia floral de Pouteria ramiflora e P. torta (Sapotaceae). Brazilian Journal of Botany, 34, 375-387	[Low fruit set from natural pollination] "P. torta is a hermaphrodite species, with protogynous and hercogamous flowers, while P. ramiflora is morphologically gynomonoecious but functionally unisexual. The apparently low pollen flow and the abortion of young fruits resulted in low fruit set from natural pollinations. Both species are visited by several small insects, including butterflies, moths, flies and bees."

802	Evidence that a persistent propagule bank is formed (>1 yr)	n
	Source(s)	**Notes**
	Oliveira, A. K. M., & Pina, J. C. (2019). Seed Germination of Pouteria torta (Mart.) Radlk. subesp. torta in Different Environmental Conditions. Floresta, 50(1), 923-932	"According to Carvalho (2008), the longevity of Pouteria torta seeds is very short, with rapid loss of vigor after harvest and seeds presenting recalcitrant characteristics, with water loss leading to physiological damage."
	Tropical Plants Database, Ken Fern. (2023). Pouteria torta. https://tropical.theferns.info/viewtropical.php?id=Pouteria+torta. [Accessed 29 Jun 2023]	"Seed - it has a very short viability in storage and so is best sown as soon as it is ripe in individual pots [419]. Germination usually occurs in 3 - 7 weeks, the germination rate is above 80% if the seed is sown fresh [420]."

803	Well controlled by herbicides	y
	Source(s)	**Notes**

Qsn #	Question	Answer
	Rezende-Silva, S. L., Costa, A. C., Dyszy, F. H., Batista, P. F., Crispim-Filho, A. J., Nascimento, K. J. T., & da Silva, A. A. (2019). Pouteria torta is a remarkable native plant for biomonitoring the glyphosate effects on Cerrado vegetation. Ecological Indicators, 102, 497-506	[Highly sensitive to glyphosate. Presumably well controlled if glyphosate-based herbicides were used] "Cerrado is a Brazilian savannah ecosystem that has a high diversity of flora and fauna and originally covered 2 million km2, but in recent years more than 50% of its area has been converted to grain crops and pastures. The intensive grain production in Cerrado has been accompanied by an increase in pesticide and herbicide use, glyphosate is the most common. This may have implications for biodiversity loss that are still unknown. Seeking this understanding, we assessed biochemical changes in two native Cerrado plants species subjected to glyphosate. The aim of this study was to identify biomarkers in Pouteria torta and Alibertia edulis treated with glyphosate and evaluate their use as phytoindicators of the herbicide on the Cerrado vegetation. The plants were challenged with glyphosate [Roundup Transorb®, containing 480 g L−1 acid equivalent (a. e.)] in two independent experiments. In both, glyphosate was used at 0, 200, 400, and 800 g a. e. ha−1. The activities of the enzymes phenylalanine ammonia lyase (PAL), peroxidase (POX), polyphenol oxidase (PPO), and 5-enolpyruvylshikimate- 3-phosphate synthase (EPSPS), as well as the concentrations of shikimic acid, phenolic compounds, amino acids, proteins, and malondialdehyde (MDA) were evaluated at 1 and 13 and at 1 and 72 days post-application in P. torta and A. edulis leaves, respectively. Glyphosate had reduced EPSPS activity and blocks the shikimate pathway in P. torta and A. edulis. Thus, this biochemical changes can be biomarkers of glyphosate in both native Cerrado plants. The activity of the PAL and PPO enzymes also showed this potential. Glyphosate caused leaf chlorosis and necrosis in P. torta, in addition, the concentrations of phenolic compounds, proteins, and amino acids were altered only in this species. Thus, concentrations of these cell compounds can be biomarkers of glyphosate stress in susceptible plants. The herbicide did not have the same effects on A. edulis. The changes in P. torta leaves occurred more quickly than in A. edulis. Thus, A. edulis plants may be used as a glyphosate biosensor. P. torta were susceptible and can be a phytoindicator of the herbicide. Its high sensitivity is useful for monitoring the initial effects of glyphosate on native Cerrado vegetation."

804	Tolerates, or benefits from, mutilation, cultivation, or fire	y
	Source(s)	**Notes**
	Cianciaruso, M. V., Silva, I. A., Batalha, M. A., Gaston, K. J., & Petchey, O. L. (2012). The influence of fire on phylogenetic and functional structure of woody savannas: moving from species to individuals. Perspectives in Plant Ecology, Evolution and Systematics, 14(3), 205-216	[Resprouts after fires] "Appendix 1." [Pouteria torta - top = resprouting due to top-kill (frequency). high (HiFi) = 0.53, intermediate (MidFi) = 0.60 and low (LowFi) fire frequencies = 0.50]

805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	
	Source(s)	**Notes**
	WRA Specialist. (2023). Personal Communication	Unknown

Summary of Risk Traits:

Pouteria torta is a species of tree native to Central and South America. The type subspecies Pouteria torta subsp. torta is found largely in the Brazilian cerrado. It is a deciduous tree with an open globose crown that grows 6 - 18 meters tall. The edible fruit is small, egg-shaped with a green to brownish skin and soft, white pulp. It is capable of being dispersed by frugivorous animals, although the fruits and seeds may be too large for many of the potential dispersers that occur in the Hawaiian Islands. It is not reported to be naturalized or invasive anywhere in the world, although records of cultivation outside its native range are limited.

High Risk / Undesirable Traits
• Thrives and could spread in regions with tropical climates
• Potentially allelopathic
• Shade tolerant (could potentially invade intact forest).
• Tolerates many soil types.
• Reproduces by seeds.
• Fast growth rate (but time to maturity unknown).
• Seeds dispersed by fruit-eating animals, and through intentional cultivation.
• Tolerates and resprouts after fires in its native range.

Low Risk Traits
• No reports of naturalization or invasiveness, but there are limited reports of cultivation outside its native range.
• Unarmed (no spines, thorns, or burrs).
• Non-toxic
• Self-sterile
• Not documented to spread vegetatively.
• Relatively large fruit and seeds may limit risk of long-distance or accidental dispersal.
• Limited seed production under natural pollination.
• Seeds reported to lose viability quickly (unlikely to form a persistent seed bank).
• Sensitive to glyphosate. Herbicides would likely be effective if control was necessary.