

<b>Taxon:</b> <i>Sterculia monosperma</i> Vent.	<b>Family:</b> Malvaceae
<b>Common Name(s):</b> China chestnut noble bottle tree nut Phoenix eyes seven sister's fruit Thai chestnut	<b>Synonym(s):</b> <i>Southwellia nobilis</i> Salisb. <i>Sterculia nobilis</i> (Salisb.) Sm.

<b>Assessor:</b> Chuck Chimera	<b>Status:</b> Assessor Approved	<b>End Date:</b> 27 Jun 2023
<b>WRA Score:</b> -3.0	<b>Designation:</b> L	<b>Rating:</b> <span style="background-color: yellow;">Low Risk</span>

**Keywords:** Tropical Tree, Unarmed, Edible Seeds, Follicle (Fruit), Gravity-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	n
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		
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	y = 1, n = -1	n
706	Propagules bird dispersed		
707	Propagules dispersed by other animals (externally)	y = 1, n = -1	n
708	Propagules survive passage through the gut		
801	Prolific seed production (>1000/m2)		
802	Evidence that a persistent propagule bank is formed (>1 yr)		
803	Well controlled by herbicides		
804	Tolerates, or benefits from, mutilation, cultivation, or fire		
805	Effective natural enemies present locally (e.g. introduced biocontrol agents)		

**Supporting Data:**

Qsn #	Question	Answer
101	Is the species highly domesticated?	n
	<b>Source(s)</b>	<b>Notes</b>
	Lim, T.K. (2012). Edible Medicinal and Non-Medicinal Plants. Volume 3, Fruits. Springer, New York	"The species is found from South China (southeast Fujian, south Guangdong, Guangxi and south Yunnan), Taiwan to Malaysia. The tree occurs mostly in the state of Perak in Malaysia." [No evidence]
102	Has the species become naturalized where grown?	
	<b>Source(s)</b>	<b>Notes</b>
	WRA Specialist. (2023). Personal Communication	NA
103	Does the species have weedy races?	
	<b>Source(s)</b>	<b>Notes</b>
	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
	<b>Source(s)</b>	<b>Notes</b>
	Wu, Z. Y., P. H. Raven & D. Y. Hong, eds. (2007). Flora of China. Vol. 12 (Hippocastanaceae through Theaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis	"Dense forests, also often cultivated. SE Fujian, S Guangdong, Guangxi, Taiwan, S Yunnan [India, Indonesia, Malaysia, Thailand, Vietnam]."
	Lim, T.K. (2012). Edible Medicinal and Non-Medicinal Plants. Volume 3, Fruits. Springer, New York	"The species is found from South China (southeast Fujian, south Guangdong, Guangxi and south Yunnan), Taiwan to Malaysia. The tree occurs mostly in the state of Perak in Malaysia."
202	Quality of climate match data	High
	<b>Source(s)</b>	<b>Notes</b>
	Lim, T.K. (2012). Edible Medicinal and Non-Medicinal Plants. Volume 3, Fruits. Springer, New York	"The species is found from South China (southeast Fujian, south Guangdong, Guangxi and south Yunnan), Taiwan to Malaysia. The tree occurs mostly in the state of Perak in Malaysia."
203	Broad climate suitability (environmental versatility)	n
	<b>Source(s)</b>	<b>Notes</b>
	Martin, F.W., Campbell, C.W. & Puberté, R.M. (1987). Perennial Edible Fruits of the Tropics: An Inventory. Agriculture Handbook No. 642. U.S. Department of Agriculture, Washington, DC	"Cultural requirements: Hot, wet tropical lowlands. Tolerates a variety of soil conditions."
	Earth & Jungle. (2023). Sterculia Monosperma Care & Growing Guide. <a href="https://www.earthandjungle.com/variety/cHgDA3vh/sterculia-monosperma">https://www.earthandjungle.com/variety/cHgDA3vh/sterculia-monosperma</a> . [Accessed 23 Jun 2023]	"Sterculia monosperma is hardy in zones 10a - 10b. 10a: 30 to 35 °F / -1.1 to 1.7 °C 10b: 35 to 40 °F / 1.7 to 4.4 °C"
	Lim, T.K. (2012). Edible Medicinal and Non-Medicinal Plants. Volume 3, Fruits. Springer, New York	"The species thrives in the warm tropics and subtropics."

Qsn #	Question	Answer
204	<b>Native or naturalized in regions with tropical or subtropical climates</b>	y
	<b>Source(s)</b>	<b>Notes</b>
	Lim, T.K. (2012). Edible Medicinal and Non-Medicinal Plants. Volume 3, Fruits. Springer, New York	"The species is found from South China (southeast Fujian, south Guangdong, Guangxi and south Yunnan), Taiwan to Malaysia. The tree occurs mostly in the state of Perak in Malaysia."

205	<b>Does the species have a history of repeated introductions outside its natural range?</b>	?
	<b>Source(s)</b>	<b>Notes</b>
	Gallaher, T.J., Brock, K., Kennedy, B.H., Imada, C.T., Imada, K., & Walvoord, N. (2023). Plants of Hawai'i. <a href="http://www.plantsofhawaii.org..">http://www.plantsofhawaii.org..</a> [Accessed 26 Jun 2023]	"Only found in cultivation"
	Lim, T.K. (2012). Edible Medicinal and Non-Medicinal Plants. Volume 3, Fruits. Springer, New York	"The species thrives in the warm tropics and subtropics. In south China, it is found mostly in dense lowland and hilly forests. It is also cultivated." [Extent of introduction outside native range unclear]

301	<b>Naturalized beyond native range</b>	n
	<b>Source(s)</b>	<b>Notes</b>
	Gallaher, T.J., Brock, K., Kennedy, B.H., Imada, C.T., Imada, K., & Walvoord, N. (2023). Plants of Hawai'i. <a href="http://www.plantsofhawaii.org..">http://www.plantsofhawaii.org..</a> [Accessed 22 Jun 2023]	"Only found in cultivation"
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	No evidence

302	<b>Garden/amenity/disturbance weed</b>	n
	<b>Source(s)</b>	<b>Notes</b>
	Gallaher, T.J., Brock, K., Kennedy, B.H., Imada, C.T., Imada, K., & Walvoord, N. (2023). Plants of Hawai'i. <a href="http://www.plantsofhawaii.org..">http://www.plantsofhawaii.org..</a> [Accessed 23 Jun 2023]	"Only found in cultivation"
	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. <a href="https://www.cabidigitallibrary.org/product/qi.">https://www.cabidigitallibrary.org/product/qi.</a> [Accessed 23 Jun 2023]	No evidence

303	<b>Agricultural/forestry/horticultural weed</b>	n
	<b>Source(s)</b>	<b>Notes</b>
	Gallaher, T.J., Brock, K., Kennedy, B.H., Imada, C.T., Imada, K., & Walvoord, N. (2023). Plants of Hawai'i. <a href="http://www.plantsofhawaii.org..">http://www.plantsofhawaii.org..</a> [Accessed 23 Jun 2023]	"Only found in cultivation"
	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. <a href="https://www.cabidigitallibrary.org/product/qi.">https://www.cabidigitallibrary.org/product/qi.</a> [Accessed 23 Jun 2023]	No evidence

304	<b>Environmental weed</b>	n
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Qsn #	Question	Answer
	<b>Source(s)</b>	<b>Notes</b>
	Gallaher, T.J., Brock, K., Kennedy, B.H., Imada, C.T., Imada, K., & Walvoord, N. (2023). Plants of Hawai'i. <a href="http://www.plantsofhawaii.org..">http://www.plantsofhawaii.org..</a> [Accessed 23 Jun 2023]	"Only found in cultivation"
	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. <a href="https://www.cabidigitallibrary.org/product/qi.">https://www.cabidigitallibrary.org/product/qi.</a> [Accessed 23 Jun 2023]	No evidence

305	Congeneric weed	
	<b>Source(s)</b>	<b>Notes</b>
	Vélez-Gavilán, J. (2023). <i>Sterculia foetida</i> (Java olive). CABI Compendium. <a href="https://doi.org/10.1079/cabicompendium.51446.">https://doi.org/10.1079/cabicompendium.51446.</a> [Accessed 22 Jun 2023]	[Possibly invasive] " <i>Sterculia foetida</i> is a tree native to the tropical regions of east Africa, tropical Asia and Australia. It is reported as invasive in Cuba. Although initially reported as invasive for Brazil, it has since been clarified that the species is not considered as an invasive in the country. In Cuba, it is regarded as a transformer species, with a tendency to spread in some parts of the country. It is listed as a weed in Egypt and Puerto Rico, but with no evidence of impacts or any control of the species. Further details about the invasiveness of the species are not provided."
	Vélez-Gavilán, J. (2023). <i>Sterculia apetala</i> (Panama tree). CABI Compendium. <a href="https://doi.org/10.1079/cabicompendium.51431.">https://doi.org/10.1079/cabicompendium.51431.</a> [Accessed 22 Jun 2023]	[Possibly] " <i>Sterculia apetala</i> is a tree native the tropics and subtropics of North, Central and South America, grown as an ornamental and shade tree and cultivated for its timber and edible seeds. It is reported as invasive in Puerto Rico, Cuba and Hawaii. In Hawaii, numerous seedlings and saplings that were originally growing close to pineapple plantations are now slowly spreading into nearby areas. Without seed predation or animal dispersal the seeds fall close to the parental plant, leading to almost pure stands of seedlings and saplings. In Cuba it is regarded as a transformer species, due to its high seed production and high dispersal capacity."

401	Produces spines, thorns or burrs	n
	<b>Source(s)</b>	<b>Notes</b>
	Wu, Z. Y., P. H. Raven & D. Y. Hong, eds. (2007). Flora of China. Vol. 12 (Hippocastanaceae through Theaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis	[No evidence] "Trees; bark brown-black. Branchlets at first minutely stellate. Leaves simple; stipules caducous; petiole 2-3.5 cm; leaf blade oblong or elliptic, 8-25 × 5-15 cm, thinly leathery, glabrous, base rounded or obtuse, apex acute or obtuse. Inflorescence terminal or axillary, paniculate, slender and lax, to 20 cm, pubescent. Pedicels much longer than flowers. Calyx cream-white, becoming reddish, campanulate, ca. 10 mm, abaxially pubescent, lobes linear-lanceolate, as long as calyx tube, apex acuminate, incurved and cohering apically, as long as calyx tube. Male flowers many, androgynophore curved, glabrous, anthers yellow. Female flowers fewer, slightly larger. Ovary globose, with 5 grooves, densely hairy; style curved; stigma shallowly 5-lobed. Follicles red, oblong ovate, ca. 5 × 2-3 cm, 1-4-seeded, thickly leathery, apex beaked. Seeds black-brown, ellipsoid or oblong, ca. 1.5 cm."

402	Allelopathic	
	<b>Source(s)</b>	<b>Notes</b>
	WRA Specialist. (2023). Personal Communication	Unknown. No evidence found

Qsn #	Question	Answer
403	Parasitic	n
	Source(s)	Notes
	Lim, T.K. (2012). Edible Medicinal and Non-Medicinal Plants. Volume 3, Fruits. Springer, New York	"Tree medium to large, 10-30 m tall, with blackish-brown bark and thick, glabrous twigs. Leaves simple, entire, oblong, base rounded or obtuse, apex obtusely acuminate, coriaceous, 8.5-30 by 4-15 cm, petiole 2-6 cm" [No evidence]

404	Unpalatable to grazing animals	
	Source(s)	Notes
	WRA Specialist. (2023). Personal Communication	Unknown. The leaves of another species ( <i>Sterculia foetida</i> ) are reported to be browsed by animals such as deer, goats, and elephants.

405	Toxic to animals	n
	Source(s)	Notes
	Tropical Plants Database, Ken Fern. (2023). <i>Sterculia monosperma</i> . <a href="https://tropical.theferns.info/viewtropical.php?id=Sterculia+monosperma">https://tropical.theferns.info/viewtropical.php?id=Sterculia+monosperma</a> . [Accessed 26 Jun 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 other <i>Sterculia</i> species are reported to have stinging or irritating hairs.

406	Host for recognized pests and pathogens	
	Source(s)	Notes
	Wulandari, N. F., & To-anun, C. (2014). <i>Phyllosticta Capitalensis</i> , <i>P. helicteres</i> , <i>P. sterculiae</i> and other <i>Phyllosticta</i> Species from Sterculiaceae. <i>Journal of Agricultural Technology</i> , 10(1), 133-146	" <i>Phyllosticta</i> as an important plant pathogenic genus associated with plants as endophytes, pathogens or saprobes. <i>Phyllosticta sterculiae</i> occurs on <i>Sterculia foetida</i> (Sterculiaceae) in the Philippines, where it causes a leaf blight. The holotype of <i>P. sterculiae</i> is redescribed and compared with a <i>Phyllosticta</i> species collected on <i>Sterculia monosperma</i> in Thailand. <i>P. sterculiae</i> has oblong to obovoid ascospores whereas the fungus from Thailand has ellipsoidal ascospores that are swollen in the middle and possess polar appendages. The comparison between other <i>Phyllosticta</i> species on Sterculiaceae revealed <i>Phyllosticta</i> species from Thailand collection is different in ascospores dimension. Furthermore, the anamorph in culture compare to the Thailand collections with <i>Phyllosticta melochiae</i> from Indonesia on host substrate possesses similar character. The BLAST result showed that the Thailand species is belonging <i>Phyllosticta capitalensis</i> . The need of epitypification for all the <i>Phyllosticta</i> spp. occurs in Sterculiaceae is needed here to clarify the species name. The Thailand fungus is described, illustrated and discussed."

Qsn #	Question	Answer
	Liao, Y. C., Liu, F. L., Rugman-Jones, P. F., Husein, D., Liang, H. H., Yang, Y. H., ... & Stouthamer, R. (2023). The <i>Euwallacea fornicatus</i> species complex (Coleoptera: Curculionidae); emerging economic pests of tea in Taiwan. <i>Crop Protection</i> , 168, 106226	"The <i>Euwallacea fornicatus</i> species complex, commonly referred to as shothole borers (SHB), is native to South- and Southeast Asia, but has invaded many locations around the globe (CABI, 2022). This complex currently includes four cryptic species, <i>E. fornicatus sensu stricto</i> (s.s.) Eichhoff, <i>E. fornicator</i> Eggers, <i>E. kuroshio</i> Gomez & Hulcr, and <i>E. perbrevis</i> Schedl (Smith et al., 2019). Collectively, this SHB complex infests a wide range of plant species, across more than 70 plant families (Eskalen et al., 2013; Gomez et al., 2019), and may cause significant economic losses to a host of agricultural crops. For example, after invading the U.S. (California and Florida) and Israel, the complex came to prominence as economic pests of avocado ( <i>Persea americana</i> ) (Eskalen et al., 2012; Mendel et al., 2012; Carrillo et al., 2016). Prior to this, the complex was known mainly as a pest of tea in parts of its native range, and indeed, its nature as a complex of species rather than as a single species, was unknown (Stouthamer et al., 2017)." ... "In conducting our surveys, we found both longan ( <i>Dimocarpus longan</i> ) and Chinese chestnut ( <i>Sterculia monosperma</i> ) that were heavily infested by SHB, interspersed among the tea gardens, particularly in the Zhushan area (data not shown)."

407	Causes allergies or is otherwise toxic to humans	n
	Source(s)	Notes
	Tropical Plants Database, Ken Fern. (2023). <i>Sterculia monosperma</i> . <a href="https://tropical.theferns.info/viewtropical.php?id=Sterculia+monosperma">https://tropical.theferns.info/viewtropical.php?id=Sterculia+monosperma</a> . [Accessed 26 Jun 2023]	"Known Hazards None known"
	Lim, T.K. (2012). <i>Edible Medicinal and Non-Medicinal Plants. Volume 3, Fruits</i> . Springer, New York	"Seeds (nuts) are boiled and eaten."
	Quattrocchi, U. (2012). <i>CRC World Dictionary of Medicinal and Poisonous Plants: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology</i> . CRC Press, Boca Raton, FL	No evidence, although other <i>Sterculia</i> species are reported to have stinging or irritating hairs.

408	Creates a fire hazard in natural ecosystems	n
	Source(s)	Notes
	Martin, F.W., Campbell, C.W. & Puberté, R.M. (1987). <i>Perennial Edible Fruits of the Tropics: An Inventory</i> . Agriculture Handbook No. 642. U.S. Department of Agriculture, Washington, DC	"Cultural requirements: Hot, wet tropical lowlands." [No evidence. Occurs in wet habitats]
	Lim, T.K. (2012). <i>Edible Medicinal and Non-Medicinal Plants. Volume 3, Fruits</i> . Springer, New York	"The species thrives in the warm tropics and subtropics. In south China, it is found mostly in dense lowland and hilly forests. It is also cultivated."

409	Is a shade tolerant plant at some stage of its life cycle	n
	Source(s)	Notes
	Tropical Plants Database, Ken Fern. (2023). <i>Sterculia monosperma</i> . <a href="https://tropical.theferns.info/viewtropical.php?id=Sterculia+monosperma">https://tropical.theferns.info/viewtropical.php?id=Sterculia+monosperma</a> . [Accessed 23 Jun 2023]	"Grows best in a fertile, well-drained soil in a sunny, sheltered position [200]."
	Flora Fauna Web. (2023). <i>Sterculia monosperma</i> Vent. <a href="https://www.nparks.gov.sg/florafauweb/flora/3/1/3139">https://www.nparks.gov.sg/florafauweb/flora/3/1/3139</a> . [Accessed 23 Jun 2023]	"Light Preference - Full Sun"

410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y
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Qsn #	Question	Answer
	<b>Source(s)</b>	<b>Notes</b>
	Flora Fauna Web. (2023). <i>Sterculia monosperma</i> Vent. <a href="https://www.nparks.gov.sg/florafaunaweb/flora/3/1/3139">https://www.nparks.gov.sg/florafaunaweb/flora/3/1/3139</a> . [Accessed 23 Jun 2023]	"Cultivation: Plant this species in fertile, well-drained soil."
	Martin, F.W., Campbell, C.W. & Puberté, R.M. (1987). <i>Perennial Edible Fruits of the Tropics: An Inventory</i> . Agriculture Handbook No. 642. U.S. Department of Agriculture, Washington, DC	"Cultural requirements: Hot, wet tropical lowlands. Tolerates a variety of soil conditions."

411	Climbing or smothering growth habit	n
	<b>Source(s)</b>	<b>Notes</b>
	Wu, Z. Y., P. H. Raven & D. Y. Hong, eds. (2007). <i>Flora of China</i> . Vol. 12 (Hippocastanaceae through Theaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis	"Trees; bark brown-black. Branchlets at first minutely stellate. Leaves simple; stipules caducous; petiole 2-3.5 cm; leaf blade oblong or elliptic, 8-25 × 5-15 cm, thinly leathery, glabrous, base rounded or obtuse, apex acute or obtuse. Inflorescence terminal or axillary, paniculate, slender and lax, to 20 cm, pubescent."

412	Forms dense thickets	n
	<b>Source(s)</b>	<b>Notes</b>
	Wu, Z. Y., P. H. Raven & D. Y. Hong, eds. (2007). <i>Flora of China</i> . Vol. 12 (Hippocastanaceae through Theaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis	"Dense forests, also often cultivated."
	Lim, T.K. (2012). <i>Edible Medicinal and Non-Medicinal Plants</i> . Volume 3, Fruits. Springer, New York	"The species thrives in the warm tropics and subtropics. In south China, it is found mostly in dense lowland and hilly forests. It is also cultivated."
	Dayong, L., Yuan, P., Krzton, A., Huang, C., & Zhou, Q. (2016). Dietary adaptation of white-headed langurs in a fragmented limestone habitat. <i>Mammalia</i> , 80(2), 153-162	[Abundant, but not forming dense thickets] "Table 4: Frequency, density, and dominance of the ten most dominant plant species in vegetation quadrants at Banli." [ <i>Sterculia monosperma</i> - Density (individuals/ha) = 1628]
	WRA Specialist. (2023). Personal Communication	<i>Sterculia monosperma</i> generally grows as a single tree or occurs in small groups rather than forming dense stands or thickets.

501	Aquatic	n
	<b>Source(s)</b>	<b>Notes</b>
	Wu, Z. Y., P. H. Raven & D. Y. Hong, eds. (2007). <i>Flora of China</i> . Vol. 12 (Hippocastanaceae through Theaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis	[Terrestrial] "Dense forests, also often cultivated."

502	Grass	n
	<b>Source(s)</b>	<b>Notes</b>
	USDA, Agricultural Research Service, National Plant Germplasm System. (2023). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. <a href="https://npgsweb.ars-grin.gov/">https://npgsweb.ars-grin.gov/</a> . [Accessed 22 Jun 2023]	"Genus: <i>Sterculia</i> Family: Malvaceae Subfamily: Sterculioideae "

503	Nitrogen fixing woody plant	n
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Qsn #	Question	Answer
	<b>Source(s)</b>	<b>Notes</b>
	USDA, Agricultural Research Service, National Plant Germplasm System. (2023). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. <a href="https://npgsweb.ars-grin.gov/">https://npgsweb.ars-grin.gov/</a> . [Accessed 22 Jun 2023]	"Genus: <i>Sterculia</i> Family: Malvaceae Subfamily: Sterculioideae "

504	<b>Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)</b>	n
	<b>Source(s)</b>	<b>Notes</b>
	Lim, T.K. (2012). Edible Medicinal and Non-Medicinal Plants. Volume 3, Fruits. Springer, New York	"Tree medium to large, 10-30 m tall, with blackish-brown bark and thick, glabrous twigs. Leaves simple, entire, oblong, base rounded or obtuse, apex obtusely acuminate, coriaceous, 8.5-30 by 4-15 cm, petiole 2-6 cm"

601	<b>Evidence of substantial reproductive failure in native habitat</b>	n
	<b>Source(s)</b>	<b>Notes</b>
	Wu, Z. Y., P. H. Raven & D. Y. Hong, eds. (2007). Flora of China. Vol. 12 (Hippocastanaceae through Theaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis	"Dense forests, also often cultivated. SE Fujian, S Guangdong, Guangxi, Taiwan, S Yunnan [India, Indonesia, Malaysia, Thailand, Vietnam]."
	Lim, T.K. (2012). Edible Medicinal and Non-Medicinal Plants. Volume 3, Fruits. Springer, New York	[No evidence] "The species is found from South China (southeast Fujian, south Guangdong, Guangxi and south Yunnan), Taiwan to Malaysia. The tree occurs mostly in the state of Perak in Malaysia."

602	<b>Produces viable seed</b>	y
	<b>Source(s)</b>	<b>Notes</b>
	Martin, F.W., Campbell, C.W. & Puberté, R.M. (1987). Perennial Edible Fruits of the Tropics: An Inventory. Agriculture Handbook No. 642. U.S. Department of Agriculture, Washington, DC	"Description: Tree to 13 m. Propagation by seed. Fruit 9 cm long, 5 cm in diameter, in clusters of 12 or more; external color red; seeds black."
	Flora Fauna Web. (2023). <i>Sterculia monosperma</i> Vent. <a href="https://www.nparks.gov.sg/florafanaweb/flora/3/1/3139">https://www.nparks.gov.sg/florafanaweb/flora/3/1/3139</a> . [Accessed 23 Jun 2023]	"Propagation: Propagate by seed or stem cuttings."

603	<b>Hybridizes naturally</b>	
	<b>Source(s)</b>	<b>Notes</b>
	WRA Specialist. (2023). Personal Communication	Unknown. <i>Sterculia monosperma</i> is generally considered to be a distinct species within the <i>Sterculia</i> genus. While hybridization can occur between different species within the same genus, there is limited information available specifically on hybridization involving <i>Sterculia monosperma</i> .

604	<b>Self-compatible or apomictic</b>	
	<b>Source(s)</b>	<b>Notes</b>
	Lim, T.K. (2012). Edible Medicinal and Non-Medicinal Plants. Volume 3, Fruits. Springer, New York	"Male flowers many, androgynophore curved, glabrous, anthers yellow. Female flowers fewer, slightly larger with globose, 5-grooved ovary, densely hairy; style curved; stigma shallowly 5-lobed." {Monoecious. Self-compatibility unknown, but the potential for self-pollination exists}

Qsn #	Question	Answer
	Taroda, N., & Gibbs, P. E. (1982). Floral Biology and Breeding System of <i>Sterculia chicha</i> St. Hil. (Sterculiaceae). <i>The New Phytologist</i> , 90(4), 735-743	{Related species may be self-incompatible} "In the initial series of controlled pollination experiments carried out with the two trees of <i>Sterculia chicha</i> growing at Campinas all self-pollinations failed to produce any fruit set. Although these results strongly indicated the existence of self-incompatibility in <i>S. chicha</i> they were not unequivocal because crosspollinations between these two trees also failed so that some other factor, such as a problem in the experimental technique, could not be ruled out. This uncertainty was resolved with the success of the cross-pollinations (84 % fruit set) when pollen from the third tree growing in Sao Paulo was used on pistillate flowers of the trees at Campinas. It would appear, therefore, that <i>S. chicha</i> has some kind of genetic self-incompatibility mechanism in addition to the floral monoecy, and that the two trees in cultivation at Campinas consist of genotypes which are largely reciprocally inter-incompatible."

605	Requires specialist pollinators	n
	Source(s)	Notes
	Lim, T.K. (2012). <i>Edible Medicinal and Non-Medicinal Plants</i> . Volume 3, Fruits. Springer, New York	"Panicles axillary or terminal, lax, pendant, nearly glabrous, 15-40 cm, axes thin and red, pedicels pubescent and red. Calyx creamy white or pale yellowish-red, calyx tube campanulate-turbinate, with incurved linear-lanceolate lobes (Plate 2). Male flowers many, androgynophore curved, glabrous, anthers yellow. Female flowers fewer, slightly larger with globose, 5-grooved ovary, densely hairy; style curved; stigma shallowly 5-lobed."
	Singh, V. & Jain, D.K. (2008). <i>Text Book of Botany: Angiosperms</i> . Third Edition. Rastogi Publications, Meerut, India	"The Sterculiaceae are usually pollinated by insects."

606	Reproduction by vegetative fragmentation	n
	Source(s)	Notes
	Flora Fauna Web. (2023). <i>Sterculia monosperma</i> Vent. <a href="https://www.nparks.gov.sg/florafauanaweb/flora/3/1/3139">https://www.nparks.gov.sg/florafauanaweb/flora/3/1/3139</a> . [Accessed 26 Jun 2023]	"Propagation: Propagate by seed or stem cuttings." [No evidence]

607	Minimum generative time (years)	n
	Source(s)	Notes
	Flora Fauna Web. (2023). <i>Sterculia monosperma</i> Vent. <a href="https://www.nparks.gov.sg/florafauanaweb/flora/3/1/3139">https://www.nparks.gov.sg/florafauanaweb/flora/3/1/3139</a> . [Accessed 26 Jun 2023]	"Plant Growth Rate Moderate" [Time to maturity unspecified]

701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	n
	Source(s)	Notes
	Wu, Z. Y., P. H. Raven & D. Y. Hong, eds. (2007). <i>Flora of China</i> . Vol. 12 (Hippocastanaceae through Theaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis	"Follicles red, oblong-ovate, ca. 5 × 2-3 cm, 1-4-seeded, thickly leathery, apex beaked. Seeds black-brown, ellipsoid or oblong, ca. 1.5 cm." [No means of external attachment]
	Flora Fauna Web. (2023). <i>Sterculia monosperma</i> Vent. <a href="https://www.nparks.gov.sg/florafauanaweb/flora/3/1/3139">https://www.nparks.gov.sg/florafauanaweb/flora/3/1/3139</a> . [Accessed 22 Jun 2023]	"Seed or Spore Dispersal Abiotic (Gravity)"

702	Propagules dispersed intentionally by people	y
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Qsn #	Question	Answer
	<b>Source(s)</b>	<b>Notes</b>
	Wu, Z. Y., P. H. Raven & D. Y. Hong, eds. (2007). Flora of China. Vol. 12 (Hippocastanaceae through Theaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis	"Dense forests, also often cultivated. SE Fujian, S Guangdong, Guangxi, Taiwan, S Yunnan [India, Indonesia, Malaysia, Thailand, Vietnam]."
	Gallaher, T.J., Brock, K., Kennedy, B.H., Imada, C.T., Imada, K., & Walvoord, N. (2023). Plants of Hawai'i. <a href="http://www.plantsofhawaii.org..">http://www.plantsofhawaii.org..</a> [Accessed 22 Jun 2023]	"Only found in cultivation"
	Lim, T.K. (2012). Edible Medicinal and Non-Medicinal Plants. Volume 3, Fruits. Springer, New York	"The species thrives in the warm tropics and subtropics. In south China, it is found mostly in dense lowland and hilly forests. It is also cultivated."

703	Propagules likely to disperse as a produce contaminant	n
	<b>Source(s)</b>	<b>Notes</b>
	Lim, T.K. (2012). Edible Medicinal and Non-Medicinal Plants. Volume 3, Fruits. Springer, New York	"Follicles 1-5, oblong-ovate, velvety, green turning red, 3.5-10 cm long, 1-4 seeded, thickly leathery, apex beaked (Plates 3 - 5 ). Seeds glossy, black-brown, ellipsoid or oblong, 2-2.5 cm." [No evidence. Unlikely. Fruit and seeds relatively large]
	Flora Fauna Web. (2023). <i>Sterculia monosperma</i> Vent. <a href="https://www.nparks.gov.sg/florafaunaweb/flora/3/1/3139">https://www.nparks.gov.sg/florafaunaweb/flora/3/1/3139</a> . [Accessed 23 Jun 2023]	"Seed or Spore Dispersal Abiotic (Gravity)"
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	No evidence

704	Propagules adapted to wind dispersal	n
	<b>Source(s)</b>	<b>Notes</b>
	Wu, Z. Y., P. H. Raven & D. Y. Hong, eds. (2007). Flora of China. Vol. 12 (Hippocastanaceae through Theaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis	"Follicles red, oblong-ovate, ca. 5 × 2-3 cm, 1-4-seeded, thickly leathery, apex beaked. Seeds black-brown, ellipsoid or oblong, ca. 1.5 cm."
	Flora Fauna Web. (2023). <i>Sterculia monosperma</i> Vent. <a href="https://www.nparks.gov.sg/florafaunaweb/flora/3/1/3139">https://www.nparks.gov.sg/florafaunaweb/flora/3/1/3139</a> . [Accessed 27 Jun 2023]	"Seed or Spore Dispersal Abiotic (Gravity)"

705	Propagules water dispersed	n
	<b>Source(s)</b>	<b>Notes</b>
	Flora Fauna Web. (2023). <i>Sterculia monosperma</i> Vent. <a href="https://www.nparks.gov.sg/florafaunaweb/flora/3/1/3139">https://www.nparks.gov.sg/florafaunaweb/flora/3/1/3139</a> . [Accessed 27 Jun 2023]	"Seed or Spore Dispersal Abiotic (Gravity)" [Buoyancy of seeds unknown, but no evidence that water is an important means of dispersal]

Qsn #	Question	Answer
706	Propagules bird dispersed	
	Source(s)	Notes
	Lim, T.K. (2012). Edible Medicinal and Non-Medicinal Plants. Volume 3, Fruits. Springer, New York	"Follicles 1-5, oblong-ovate, velvety, green turning red, 3.5-10 cm long, 1-4 seeded, thickly leathery, apex beaked (Plates 3 - 5). Seeds glossy, black-brown, ellipsoid or oblong, 2-2.5 cm." [Red color may attract birds, although no direct evidence of bird dispersal has been found]
	Snow, D. W. (1981). Tropical frugivorous birds and their food plants: a world survey. Biotropica, 13(1): 1-14	"Table 1. Plant genera recorded" in the diets of frugivorous birds in the tropics (including subtropical South Africa and Australasia, and excluding oceanic islands and Madagascar)." [Sterculia reported to be bird-dispersed in Africa and Southeast Asia]

707	Propagules dispersed by other animals (externally)	n
	Source(s)	Notes
	Lim, T.K. (2012). Edible Medicinal and Non-Medicinal Plants. Volume 3, Fruits. Springer, New York	"Follicles 1-5, oblong-ovate, velvety, green turning red, 3.5-10 cm long, 1-4 seeded, thickly leathery, apex beaked (Plates 3 - 5). Seeds glossy, black-brown, ellipsoid or oblong, 2-2.5 cm." [Seeds lack means of external attachment. No evidence found that seeds are carried externally by seed dispersers or seed predators]

708	Propagules survive passage through the gut	
	Source(s)	Notes
	Snow, D. W. (1981). Tropical frugivorous birds and their food plants: a world survey. Biotropica, 13(1): 1-14	"Table 1. Plant genera recorded" in the diets of frugivorous birds in the tropics (including subtropical South Africa and Australasia, and excluding oceanic islands and Madagascar)." [Sterculia reported to be bird-dispersed in Africa and Southeast Asia]
	WRA Specialist. (2023). Personal Communication	Unknown. Other species are bird-dispersed and presumably survive gut passage.

801	Prolific seed production (>1000/m2)	
	Source(s)	Notes
	Lim, T.K. (2012). Edible Medicinal and Non-Medicinal Plants. Volume 3, Fruits. Springer, New York	"Follicles 1-5, oblong-ovate, velvety, green turning red, 3.5-10 cm long, 1-4 seeded, thickly leathery, apex beaked (Plates 3 - 5). Seeds glossy, black-brown, ellipsoid or oblong, 2-2.5 cm." [Densities and numbers unknown]

802	Evidence that a persistent propagule bank is formed (>1 yr)	
	Source(s)	Notes
	Baskin, C.C. & Baskin, J.M. (2014). Seeds Ecology, Biogeography, and Evolution of Dormancy and Germination. Second Edition. Academic Press, San Francisco, CA	Unknown. Several Sterculia species are reported to have non-dormant seeds.

803	Well controlled by herbicides	
	Source(s)	Notes
	WRA Specialist. (2023). Personal Communication	Unknown. No information on herbicide efficacy or chemical control of this species.

Qsn #	Question	Answer
804	Tolerates, or benefits from, mutilation, cultivation, or fire	
	<b>Source(s)</b>	<b>Notes</b>
	WRA Specialist. (2023). Personal Communication	Unknown

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

**Summary of Risk Traits:**

*Sterculia monosperma* is a deciduous tropical nut-bearing tree also known as China chestnut, Thai chestnut, seven sisters' fruit, and phoenix eyes fruit. The species is native to China and Taiwan to Malaysia where it occurs in the dense humid forests at low and medium altitude. The seeds are edible and have a taste like almonds or cashews, although they are not widely consumed. There are no reports that this tree has become naturalized or invasive worldwide. The relatively large seeds may limit long-distance dispersal and minimize risk of naturalization in the Hawaiian Islands.

**High Risk / Undesirable Traits**

- Thrives and could spread in regions with tropical climates
- Tolerates many soil types (potential spread not limited by substrate).
- Reproduces by seeds.
- Seeds dispersed by gravity and through intentional cultivation.
- Red follicle (fruit) color may be an adaptation for bird dispersal (as has been reported in other *Sterculia* species), but no evidence was found.

**Low Risk Traits**

- No reports of naturalization or invasiveness have been reported, although there is limited evidence of cultivation outside its native range.
- Unarmed (no spines, thorns, or burrs)
- Non-toxic
- Grows best in high light environments (dense shade may inhibit spread)
- Relatively large fruit and seeds may limit potential for long-distance or accidental dispersal.