Taxon: Premna serratifolia L. **Family:** Lamiaceae

Common Name(s): bastard guelder
coastal premna
creek premna

Synonym(s): Premna integrifolia L.
Premna obtusifolia R. Br.

Assessor: Chuck Chimera **Status:** Approved **End Date:** 24 Jul 2024

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

Keywords: Tropical Tree, Naturalized, Edible, Shade-Intolerant, Bird-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	y
302	Garden/amenity/disturbance weed		
303	Agricultural/forestry/horticultural weed		
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	y = 1, n = -1	n
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		
409	Is a shade tolerant plant at some stage of its life cycle	y = 1, n = 0	n

Qsn #	Question	Answer Option	Answer
410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y = 1, n = 0	n
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	y
605	Requires specialist pollinators	y = -1, n = 0	n
606	Reproduction by vegetative fragmentation		
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	y
706	Propagules bird dispersed	y = 1, n = -1	y
707	Propagules dispersed by other animals (externally)	y = 1, n = -1	n
708	Propagules survive passage through the gut	y = 1, n = -1	y
801	Prolific seed production (>1000/m2)		
802	Evidence that a persistent propagule bank is formed (>1 yr)	y = 1, n = -1	n
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**
	Source(s)	**Notes**
	Wu, Z. Y. & P. H. Raven, (eds). (1994). Flora of China. Vol. 17 (Verbenaceae through Solanaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis.	[No evidence of domestication] "Mixed and open forests on mountain slopes and along streams; 100-300 m. Guangdong, Guangxi, Taiwan [S and SE Asia, Australia, Pacific Islands]."

102	**Has the species become naturalized where grown?**	
	Source(s)	**Notes**
	WRA Specialist. (2024). 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**
	Wu, Z. Y. & P. H. Raven, (eds). (1994). Flora of China. Vol. 17 (Verbenaceae through Solanaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis.	"Mixed and open forests on mountain slopes and along streams; 100-300 m. Guangdong, Guangxi, Taiwan [S and SE Asia, Australia, Pacific Islands]."
	de Kok, R. (2013). The genus Premna L. (Lamiaceae) in the Flora Malesiana area. Kew Bulletin, 68(1), 55-84	"Widely distributed along the coasts and the islands of tropical and subtropical Asia, Africa, Australia and the Pacific (see Map 8). Often grown in gardens and as a street tree."

202	**Quality of climate match data**	**High**
	Source(s)	**Notes**
	Munir, A. A. (1984). A taxonomic revision of the genus Premna L.(Verbenaceae) in Australia. ournal of the Adelaide Botanic Garden, 7(1), 1-43	"In Australia, P. serratifolia is chiefly distributed in the tropical areas of Queensland and Northern Territory." ... "Collections from overseas have been examined from Papua New Guinea, New Britain, New Ireland, Java, the Moluccas, Malaysia, Philippines, Samoa, Fiji, Indochina and Japan. Lam (1919) gave distribution of the species as being from Madagascar, Mauritius, India to Malacca and Thailand, East Bengal, Ceylon, Andamans, Nicobar, Hong Kong, Malaya, Philippines and Polynesia. In addition to the above localities, Moldenke (1971) recorded it from East Africa, Southern China, Hainan, Taiwan, Ryukyu Archipelago and Melanesia. According to him, the fossilised records of this species were found from "Recent of Mariana Islands".
	Wu, Z. Y. & P. H. Raven, (eds). (1994). Flora of China. Vol. 17 (Verbenaceae through Solanaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis.	"Mixed and open forests on mountain slopes and along streams; 100-300 m. Guangdong, Guangxi, Taiwan [S and SE Asia, Australia, Pacific Islands]."
	de Kok, R. (2013). The genus Premna L. (Lamiaceae) in the Flora Malesiana area. Kew Bulletin, 68(1), 55-84	"Widely distributed along the coasts and the islands of tropical and subtropical Asia, Africa, Australia and the Pacific (see Map 8). Often grown in gardens and as a street tree."

Qsn #	Question	Answer
203	**Broad climate suitability (environmental versatility)**	**n**
	Source(s)	**Notes**
	Wu, Z. Y. & P. H. Raven, (eds). (1994). Flora of China. Vol. 17 (Verbenaceae through Solanaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis.	"Mixed and open forests on mountain slopes and along streams; 100-300 m."
	Top Tropicals. (2024). Premna serratifolia. https://toptropicals.com/catalog/uid/premna_serratifolia.htm. [Accessed 23 Jul 2024]	"This small tree is cultivated widely in gardens in USDA Zone 8-11e."
	de Kok, R. (2013). The genus Premna L. (Lamiaceae) in the Flora Malesiana area. Kew Bulletin, 68(1), 55-84	[Coastal tropics] "Widely distributed along the coasts and the islands of tropical and subtropical Asia, Africa, Australia and the Pacific (see Map 8). Often grown in gardens and as a street tree."

204	**Native or naturalized in regions with tropical or subtropical climates**	**y**
	Source(s)	**Notes**
	Munir, A. A. (1984). A taxonomic revision of the genus Premna L.(Verbenaceae) in Australia. ournal of the Adelaide Botanic Garden, 7(1), 1-43	"In Australia, P. serratifolia is chiefly distributed in the tropical areas of Queensland and Northern Territory. In Queensland, most localities are in the coastal parts from Rockhampton northwards to the tip of Cape York Peninsula. It has also been recorded from several off-shore islands of the State." ... "Collections from overseas have been examined from Papua New Guinea, New Britain, New Ireland, Java, the Moluccas, Malaysia, Philippines, Samoa, Fiji, Indochina and Japan. Lam (1919) gave distribution of the species as being from Madagascar, Mauritius, India to Malacca and Thailand, East Bengal, Ceylon, Andamans, Nicobar, Hong Kong, Malaya, Philippines and Polynesia. In addition to the above localities, Moldenke (1971) recorded it from East Africa, Southern China, Hainan, Taiwan, Ryukyu Archipelago and Melanesia. According to him, the fossilised records of this species were found from "Recent of Mariana Islands"."
	Wu, Z. Y. & P. H. Raven, (eds). (1994). Flora of China. Vol. 17 (Verbenaceae through Solanaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis.	"Mixed and open forests on mountain slopes and along streams; 100-300 m. Guangdong, Guangxi, Taiwan [S and SE Asia, Australia, Pacific Islands]."
	de Kok, R. (2013). The genus Premna L. (Lamiaceae) in the Flora Malesiana area. Kew Bulletin, 68(1), 55-84	"Widely distributed along the coasts and the islands of tropical and subtropical Asia, Africa, Australia and the Pacific (see Map 8). Often grown in gardens and as a street tree."
	Faccenda, K. (2024). Report of 24 new naturalized weeds across the islands of Hawai'i. Bishop Museum Occasional Papers 156: 71-110	[Oahu] "A single, mature Premna serratifolia tree was found in Mānoa growing from a crack in concrete under a bridge over Mānoa Stream. Given that the tree was growing from a crack in concrete, it was obviously not planted. The tree was flowering and fruiting heavily. The nearby area was not surveyed for more trees. Premna serratifolia was imported to Hawai'i in 1930 by the Lyon Arboretum from the Singapore Botanical Garden (Jesse Adams, pers. comm). Given that the plant was found in a streambed that drains from the Lyon Arboretum and is a close morphological match to specimens from those trees, the tree at Lyon was likely the parent of this naturalized individual."

205	**Does the species have a history of repeated introductions outside its natural range?**	**?**
	Source(s)	**Notes**
	de Kok, R. (2013). The genus Premna L. (Lamiaceae) in the Flora Malesiana area. Kew Bulletin, 68(1), 55-84	"Often grown in gardens and as a street tree."
	Faccenda, K. (2024). Report of 24 new naturalized weeds across the islands of Hawai'i. Bishop Museum Occasional Papers 156: 71-110	"Premna serratifolia was imported to Hawai'i in 1930 by the Lyon Arboretum from the Singapore Botanical Garden (Jesse Adams, pers. comm)."

Qsn #	Question	Answer
301	**Naturalized beyond native range**	**y**
	Source(s)	**Notes**
	Tassin, J., Riviere, J.-N., Cazanove, M. & Bruzzese, E. (2006). Ranking of invasive woody plant species for management on Reunion Island. Weed Research, 46(5): 388-403	"able 1 Woody non-indigenous plants to Reunion Island and their invasive status" [Premna serratifolia - known as a coloniser in Re´ union Island]
	Faccenda, K. (2024). Report of 24 new naturalized weeds across the islands of Hawai'i. Bishop Museum Occasional Papers 156: 71-110	[Oahu] "A single, mature Premna serratifolia tree was found in Mānoa growing from a crack in concrete under a bridge over Mānoa Stream. Given that the tree was growing from a crack in concrete, it was obviously not planted. The tree was flowering and fruiting heavily. The nearby area was not surveyed for more trees. Premna serratifolia was imported to Hawai'i in 1930 by the Lyon Arboretum from the Singapore Botanical Garden (Jesse Adams, pers. comm). Given that the plant was found in a streambed that drains from the Lyon Arboretum and is a close morphological match to specimens from those trees, the tree at Lyon was likely the parent of this naturalized individual." ... "Material examined. O'AHU: Mānoa, where Mānoa Stream runs under Pawaina St, growing from channelized area of Mānoa Stream, from crack in concrete placed to channelize stream, tree to 4 m tall, reaching up from stream bed to road level, flowers white, fruits pale green when immature, turning black when ripe, 73 m, 21.323151, -157.802536, 29 Sep 2022, K. Faccenda 2721."

302	**Garden/amenity/disturbance weed**	
	Source(s)	**Notes**
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	"References: southeast Asia-W-191, Global-N-85." [Cited as a weed of unspecified impacts]
	Waterhouse, D.F. (1997). The major invertebrate pests and weeds of agriculture and plantation forestry in the Southern and Western Pacific. The Australian Centre for International Agricultural Research (ACIAR), Canberra	[Listed as an agricultural weed in Kiribati. Other references do not describe any impacts] "Table 11 Major weeds of agriculture in the southern and western Pacific." [Premna obtusifolia (= P.serratifolia) R. Br. - Principal crops affected = coconut, pandanus] ... "Table 16. Ranking of the 53 top 5 weeds of agriculture in the southern and western Pacific." [Includes Premna serratifolia]
	Wunderlin, R. P., B. F. Hansen, A. R. Franck, and F. B. Essig. (2024). Atlas of Florida Plants. USF Water Institute.] Institute for Systematic Botany, University of South Florida, Tampa. http://florida.plantatlas.usf.edu/. [Accessed 23 Jul 2024]	[Premna serratifolia is not documented as a weed in this collection, in contrast to "Description:Cultivated for edible leaves. Notes: Cultivated."

303	**Agricultural/forestry/horticultural weed**	
	Source(s)	**Notes**
	Waterhouse, D.F. (1997). The major invertebrate pests and weeds of agriculture and plantation forestry in the Southern and Western Pacific. The Australian Centre for International Agricultural Research (ACIAR), Canberra	[Listed as an agricultural weed in Kiribati. Other references do not describe any impacts] "Table 11 Major weeds of agriculture in the southern and western Pacific." [Premna obtusifolia (= P.serratifolia) R. Br. - Principal crops affected = coconut, pandanus] ... "Table 16. Ranking of the 53 top 5 weeds of agriculture in the southern and western Pacific." [Includes Premna serratifolia]

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

Qsn #	Question	Answer
305	Congeneric weed	
	Source(s)	Notes
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	[Cited as a weed of unspecified impacts. Unverified with other sources] "Premna resinosa (Hochst.) Schauer Lamiaceae Total N° of Refs: 1 Preferred Climate/s: Tropical Major Pathway/s: Crop, Pasture References: Egypt-W-221."

401	Produces spines, thorns or burrs	n
	Source(s)	Notes
	Wu, Z. Y. & P. H. Raven, (eds). (1994). Flora of China. Vol. 17 (Verbenaceae through Solanaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis.	[No evidence] "Shrubs or trees, 1-8 m tall, erect or rarely climbing. Branchlets with elliptic yellowish lenticels, densely pubescent when young, subglabrescent. Petiole 0.3-5 cm, puberulent; leaf blade oblong to broadly ovate, 3-15 X 2.5-9.5 cm, papery, subglabrous or pubescent only along veins, base broadly cuneate, rounded, or truncate, margin entire, slightly undulate, or crenate, apex acute to rarely acuminate or obtuse. Inflorescences 1.5-15 X 2.5-24 cm; peduncle 0.8-3 cm; bracts linear to lanceolate, to 6 mm, puberulent. Calyx cup-shaped, 1.5-3 mm, 2-lipped, lower lip subentire to shortly 3-dentate, upper lip longer than lower lip and 2-dentate, outside puberulent and yellow glandular. Corolla yellowish green, outside glandular, villous in throat, slightly 2-lipped; lower lip 3-lobed, lobes subequal or middle lobe slightly longer and broader; upper lip entire or emarginate. Ovary glabrous, apically glandular. Style 3.5-4 mm. Fruit globose, 2-4 mm in diam."

402	Allelopathic	
	Source(s)	Notes
	WRA Specialist. (2024). Personal Communication	Unknown. No evidence found

403	Parasitic	n
	Source(s)	Notes
	Wu, Z. Y. & P. H. Raven, (eds). (1994). Flora of China. Vol. 17 (Verbenaceae through Solanaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis.	"Shrubs or trees, 1-8 m tall, erect or rarely climbing." [No evidence]

Qsn #	Question	Answer
404	Unpalatable to grazing animals	n
	Source(s)	**Notes**
	de Garine-Wichatitsky, M., Duncan, P., Suprin, B., Chardonnet, P., & Maillard, D. (2003). A review of the diet of Rusa Deer Cervus timorensis russa in New Caledonia: Are the endemic plants defenceless against this introduced, eruptive ruminant?. Pacific Conservation Biology, 9(2), 136-143	"Appendix 1. List of plants eaten or avoided by Rusa Deer in New Caledonia." [Premna serratifolia - Preference: + + = preferred or staple food]
	Worthington, D. J., Marshall, A. P., Wiles, G. J., & Kessler, C. C. (2001). Abundance and management of Mariana fruit bats and feral ungulates on Anatahan, Mariana Islands. Pacific Conservation Biology, 7(2), 134-142	"Browsing was evident on many plant species, including Premna and Pandanus. Goats were occasionally sighted browsing in treetops 3 m or more off the ground, as well as in tree ferns. Plants not eaten sometimes succumbed to erosion."

405	Toxic to animals	n
	Source(s)	**Notes**
	Quattrocchi, U. (2012). CRC World Dictionary of Medicinal and Poisonous Plants: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	"blue-black ripe berries, fruits eaten mixed with rice"
	de Garine-Wichatitsky, M., Duncan, P., Suprin, B., Chardonnet, P., & Maillard, D. (2003). A review of the diet of Rusa Deer Cervus timorensis russa in New Caledonia: Are the endemic plants defenceless against this introduced, eruptive ruminant?. Pacific Conservation Biology, 9(2), 136-143	[No evidence] "Appendix 1. List of plants eaten or avoided by Rusa Deer in New Caledonia." [Premna serratifolia - Preference: + + = preferred or staple food]
	Worthington, D. J., Marshall, A. P., Wiles, G. J., & Kessler, C. C. (2001). Abundance and management of Mariana fruit bats and feral ungulates on Anatahan, Mariana Islands. Pacific Conservation Biology, 7(2), 134-142	[No evidence] "Browsing was evident on many plant species, including Premna and Pandanus. Goats were occasionally sighted browsing in treetops 3 m or more off the ground, as well as in tree ferns. Plants not eaten sometimes succumbed to erosion."

406	Host for recognized pests and pathogens	
	Source(s)	**Notes**
	Lambkin, T. A. (1999). A host list for Aleurodicus dispersus Russell (Hemiptera: Aleyrodidae) in Australia. Australian Journal of Entomology, 38(4), 373-376	"A provisional host list for spiraling whitefly, Aleurodicus dispersus, in Australia is presented. A total of 104 plant species from 41 families is recorded from Torres Strait and Cape York Peninsula south to Weipa, Queensland. Just under half of these species are in the families Asteraceae, Euphorbiaceae, Fabaceae, Malvaceae and Solanaceae. Agricultural species most at risk in Australia from attack by A. dispersus are the solanaceous vegetable crops grown in the dry tropics." ... "Table 1 Hosts of Aleurodicus dispersus in Australia recorded from Torres Strait and Cape York Peninsula 1991-1998 (by genus)" [Includes Premna serratifolia]

407	Causes allergies or is otherwise toxic to humans	n
	Source(s)	**Notes**
	de Padua, L.S., Bunyapraphatsara, N. & Lemmens, R.H.M.J. (Eds.). (1999). Plant Resources of South-East Asia. No 12(1). Medicinal and Poisonous Plants 1. Backhuys Publishers, Leiden, The Netherlands	[No evidence] "The leaves and roots are used in traditional medicine in Indo-China as a diuretic, stomachic and febrifuge. The leaves are employed as a galactagogue in India and Indonesia, and also to treat rheumatic arthritis, colic and flatulence in India. A decoction of roots and leaves is used as a febrifuge in Peninsular Malaysia. Extracts of the leaves are used to treat cough, headache and fever in Papua New Guinea. A tea made from the boiled bark is used in Guam to treat neuralgia. The wood is used for implements and paddles, the bark as binding material. Cooked leaves are eaten as vegetable. The plant is used locally in hedges."

Qsn #	Question	Answer
	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] "Used in Ayurveda and Sidha. Whole plant for rheumatism and neuralgia, headache. Raw fruits or decoction for treatment of cough. Leaves hypoglycemic; leaf paste used externally for body pain; leaves juice stomachic; leaves rubbed with pepper and given in colds and fevers; leaf decoction given in fever and to treat cough and headache. Root decoction stomachic, tonic, for liver complaints, cardiac troubles, rheumatism, headache, neuralgia; contact therapy, root tied to the waist to cure rheumatism."

408	Creates a fire hazard in natural ecosystems	
	Source(s)	**Notes**
	3D Environmental. (2013). Profile For Ecological Fire Management Of Mabuaig Island. Torres Strait Regional Authority, Queensland, Australia	" Table A2 – 7. Fire behavior and recommended treatment for vegetation communities on Badu Island." [Premna serratifolia is a component of Communities of young coastal dunes (including some littoral thicket) . Fire Behaviour/ Recommendations = Hot fires will degrade habitats, particularly where they penetrate into grassland pockets. Preventative cool burns on the margins of habitat, particularly vine thicket components. Interspersed cool burns in grassland patches to prevent hot wildfire incursion and promote vine thicket expansion.]

409	Is a shade tolerant plant at some stage of its life cycle	n
	Source(s)	**Notes**
	Top Tropicals. (2024). Premna serratifolia. https://toptropicals.com/catalog/uid/premna_serratifolia.htm. [Accessed 23 Jul 2024]	"It can reach a height of 10 to 20 feet and prefers full sun with some semi-shade."
	Kuo, Y. L., & Yeh, C. L. (2015). Photosynthetic capacity and shade tolerance of 180 native broadleaf tree species in Taiwan. Taiwan Journal of Forest Science, 30(4), 229-243	"With reference to the experts' opinions, we divided Amax into 5 levels: ≥ 26.0, 25.9~21.0, 20.9~15.0, 14.9~12.5, and < 12.5 μmol CO2 m-2 s-1, corresponding to shade-tolerance levels 1, 2, 3, 4, and 5 (namely very intolerant, intolerant, moderately tolerant, tolerant, and very tolerant)." ... "Table 1. Shade-tolerance level of 180 subtropical broadleaf tree species in Taiwan" [Premna serratifolia - ST level = 1 (very intolerant)]

410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	n
	Source(s)	**Notes**
	Tropical Plants Database, Ken Fern. (2024). Premna serratifolia. https://tropical.theferns.info/viewtropical.php?id=Premna%20serratifolia. [Accessed 23 Jul 2024]	"Found in the wild on sandy soils and limestone [653]."
	Wang HsiungHua, W. H., Chen FenHui, C. F., Hseu ZengYei, H. Z., Kuo YaoLun, K. Y., & Jien ShihHao, J. S. (2012). Effects of soil properties on restoring indigenous plants in coral reef landscapes. Taiwan Journal of Forest Science, 27(3): 283-298	"Pongamia pinnata, Pittosporum pentandrum, Premna serratifolia, Hibiscus tiliaceus, and Planchonella obovata were sensitive to soil texture and moisture stress, and should be planted in the areas with sandy soils."

411	Climbing or smothering growth habit	n
	Source(s)	**Notes**
	Wu, Z. Y. & P. H. Raven, (eds). (1994). Flora of China. Vol. 17 (Verbenaceae through Solanaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis.	"Shrubs or trees, 1-8 m tall, erect or rarely climbing."

412	Forms dense thickets	n

Qsn #	Question	Answer
	Source(s)	**Notes**
	Wu, Z. Y. & P. H. Raven, (eds). (1994). Flora of China. Vol. 17 (Verbenaceae through Solanaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis.	"Mixed and open forests on mountain slopes and along streams; 100-300 m." [No evidence]
	de Kok, R. (2013). The genus Premna L. (Lamiaceae) in the Flora Malesiana area. Kew Bulletin, 68(1), 55-84	"Widely distributed along the coasts and the islands of tropical and subtropical Asia, Africa, Australia and the Pacific (see Map 8). Often grown in gardens and as a street tree."
	Selvam, V. (2007). Trees and shrubs of the Maldives. RAP Publication No. 2007/12. Food and Agriculture Organization (FAO) of the United Nations, Regional Office for Asia and the Pacific. Bangkok, Thailand	[No evidence] "It is well adapted to shallow, dry, alkaline coastal soil but better performance is seen in deep soil with high moisture content. It is also capable of growing in rocky areas near the shore. Its tolerance to drought and aerosol salt spray is high and tolerance to soil salinity is moderate."
	de Padua, L.S., Bunyapraphatsara, N. & Lemmens, R.H.M.J. (Eds.). (1999). Plant Resources of South-East Asia. No 12(1). Medicinal and Poisonous Plants 1. Backhuys Publishers, Leiden, The Netherlands	[No evidence] "P. serratifolia is extremely variable, particularly the leaves and calyces. It grows in brushwood and hedges, often near the sea."
	Mueller-Dombois, D. & Fosberg, F. R. (1998). Vegetation of the tropical Pacific islands. Springer-Verlag, New York, NY	[Reaches high densities, but does not form dense stands on Saipan. No evidence from other tropical Pacific islands] "Among the 27 canopy tree species, Pisonia grandis was clearly dominant, with a basal area of 575 m2 per ha. Other species with high basal areas included Dendrocnide latifolia (509 m2/ha), Cynometra ramiflora (464 m2/ha), Intsia bijuga (302 m2/ha), and Erythrina variegata (275 m2/ha). Canopy trees with moderately high basal areas, between 100 and 200m2 per ha included Premna serratifolia (= obtusifolia), Ficus prolixa, and F. tinctoria."

501	Aquatic	n
	Source(s)	**Notes**
	Wu, Z. Y. & P. H. Raven, (eds). (1994). Flora of China. Vol. 17 (Verbenaceae through Solanaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis.	[Terrestrial] "Mixed and open forests on mountain slopes and along streams; 100-300 m."

502	Grass	n
	Source(s)	**Notes**
	USDA, Agricultural Research Service, National Plant Germplasm System. (2024). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/gringlobal/taxon/taxonomysearch. [Accessed 22 Jul 2024]	"Family: Lamiaceae (alt. Labiatae) Subfamily: Viticoideae"

503	Nitrogen fixing woody plant	n
	Source(s)	**Notes**
	USDA, Agricultural Research Service, National Plant Germplasm System. (2024). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/gringlobal/taxon/taxonomysearch. [Accessed 22 Jul 2024]	"Family: Lamiaceae (alt. Labiatae) Subfamily: Viticoideae"

504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	n

Qsn #	Question	Answer
	Source(s)	**Notes**
	Wu, Z. Y. & P. H. Raven, (eds). (1994). Flora of China. Vol. 17 (Verbenaceae through Solanaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis.	"Shrubs or trees, 1-8 m tall, erect or rarely climbing."

601	Evidence of substantial reproductive failure in native habitat	n
	Source(s)	**Notes**
	de Kok, R. (2013). The genus Premna L. (Lamiaceae) in the Flora Malesiana area. Kew Bulletin, 68(1), 55-84	[No evidence] "Widely distributed along the coasts and the islands of tropical and subtropical Asia, Africa, Australia and the Pacific (see Map 8). Often grown in gardens and as a street tree."

602	Produces viable seed	y
	Source(s)	**Notes**
	Selvam, V. (2007). Trees and shrubs of the Maldives. RAP Publication No. 2007/12. Food and Agriculture Organization (FAO) of the United Nations, Regional Office for Asia and the Pacific. Bangkok, Thailand	"It is not cultivated in the Maldives though it can be propagated by seed and stem cuttings. Seeds can be removed from the fruit by crushing them in water and can be used for direct sowing. Seedling growth is moderate and requires regular watering but intolerant to excess watering."
	Yang, J. C., Kuo, S. R., & Lee, C. M. (2010). Germination and storage behavior of seeds of Garcinia subelliptica (Guttiferae), Drypetes littoralis (Euphorbiaceae), and Premna serratifolia (Verbenaceae). Taiwan Journal Forest Science, 25(4): 339-352	"Seed germination characteristics of 3 native coastal forest species in Taiwan were examined in this study. Effects of seed moisture contents (MCs) and storage temperatures on germination were investigated to determine their seed storage behavior. Results showed that seeds of Drypetes littoralis and Premna serratifolia exhibited no dormancy and germinated within 4 wk under fluctuating temperatures of 30/20□ with 8 h of light. In contrast, seeds of Garcinia subelliptica germinated slowly, and viable seeds took 22 wk for complete germination. At MCs of 2.3~11.3% (on a fresh- weight basis), P. serratifolia seeds maintained their viability after 24 mo of storage at -20~15□. The results suggest that P. serratifolia seeds show orthodox seed storage behavior. The larger fresh mature seeds of G. subelliptica and D. littoralis were extremely sensitive to desiccation and low temperatures. They lost viability when the MC dropped to about 30%, and seed germinability de- creased rapidly at storage temperatures of < 4□. Moreover, the maximum seed longevities of the 2 species were 28 and 60 d with 4□ wet storage. In addition, G. subelliptica seeds maintained their initial germinability for 0.5 yr when stored at 15□ with moist sphagnum. Thus, seeds of G. subelliptica and D. littoralis are defined as having tropical-recalcitrant storage behavior. Based on the above findings, we suggest that tropical-recalcitrant seeds with no dormancy should be sown im- mediately instead of being stored after depulping."

603	Hybridizes naturally	
	Source(s)	**Notes**
	WRA Specialist. (2024). Personal Communication	Unknown. No evidence found

604	Self-compatible or apomictic	y
	Source(s)	**Notes**
	Sow Exotic. (2024). La Cach (Premna serratifolia). https://sowexotic.com/products/la-cach. [Accessed]	"Self-Fertile: Yes"

Qsn #	Question	Answer
	Kumar, B. D., Deepika, D. S., & Raju, A. S. (2018). On the reproductive ecology of Premna latifolia L. and Premna tomentosa Willd.(Lamiaceae). Journal of Threatened Taxa, 10(1), 11105-11125	[Related species are self-compatible] "The result of breeding system indicates that the flowers are self-compatible and self-pollinating. The fruit set is absent in autonomous and un-manipulated autogamy, 20% in manipulated autogamy, 37% in geitonogamy, 59% in xenogamy and 42% in open pollinations. Seed set rate is constant and it is 25% in all modes of pollinations due to production of only one seed per fruit (Table 1). But, seeds produced from each mode of pollination were not examined for their viability and germination potential."

605	Requires specialist pollinators	n
	Source(s)	**Notes**
	Flora Fauna Web. (2024). Premna serratifolia. https://www.nparks.gov.sg/florafaunaweb/flora/4/6/4609. [Accessed 23 Jul 2024]	"Fauna Pollination Dispersal Associated Fauna Bird-Attracting (Fruits), Butterfly-Attracting, Bee-Attracting"
	Wu, Z. Y. & P. H. Raven, (eds). (1994). Flora of China. Vol. 17 (Verbenaceae through Solanaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis.	"Inflorescences 1.5-15 X 2.5-24 cm; peduncle 0.8-3 cm; bracts linear to lanceolate, to 6 mm, puberulent. Calyx cup-shaped, 1.5-3 mm, 2-lipped, lower lip subentire to shortly 3-dentate, upper lip longer than lower lip and 2-dentate, outside puberulent and yellow glandular. Corolla yellowish green, outside glandular, villous in throat, slightly 2-lipped; lower lip 3-lobed, lobes subequal or middle lobe slightly longer and broader; upper lip entire or emarginate."
	Atlas of Living Australia. (2024). Premna serratifolia L. https://bie.ala.org.au/species/https://id.biodiversity.org.au/node/apni/2890979. [Accessed 23 Jul 2024]	"Premna serratifolia is a species of small tree or shrub in the family Lamiaceae. It blooms and fruits between May and November. During flowering season, it attracts a large number of butterflies and bees."
	Kumar, B. D., Deepika, D. S., & Raju, A. S. (2018). On the reproductive ecology of Premna latifolia L. and Premna tomentosa Willd.(Lamiaceae). Journal of Threatened Taxa, 10(1), 11105-11125	[Other species in genus are not specialized] "In P. latifolia, the pollinators are wasps and butterflies while in P. tomentosa, in addition to wasps and butterflies, the bees and flies are also pollinators."

Qsn #	Question	Answer
606	**Reproduction by vegetative fragmentation**	
	Source(s)	**Notes**
	Liyagel, P. (2005). Propagation protocol for production of Container (plug) Premna obtusifolia plants 3L (1 gal) polybags; Yap Forestry Yap Islands, Federated States of Micronesia. In: Native Plant Network. US Department of Agriculture, Forest Service, National Center for Reforestation, Nurseries, and Genetic Resources. https://NativePlantNetwork.org. [Accessed 23 Jul 2024]	" Pre-Planting Propagule Treatments: Each cutting must have several shoot buds. These are cut to 15 cm (6.0 in) lengths, and all mature leaves are removed except the terminal leaves. Leaf buds in the axils of leaves are not removed and will form new leaves once the cuttings are well rooted. Cuttings are directly stuck into containers filled with moistened medium. We do not use rooting hormones. Growing Area Preparation / Annual Practices for Perennial Crops: The Yap Agroforestry nursery a year round growing season with periods of high rainfall. The facility is comprised of one large greenhouse, shade structures, and mist propagation beds, and an outdoor growing compound. All propagation environments are utilized at different stages of seedling growth to protect seedlings from heavy rains, and provide to temperature and shading variance during production. We irrigate all containers by hand, but are investigating a sub-irrigation system for the nursery. We use fertilizers if when they are available. Establishment Phase: Cuttings begin to form roots about 4 weeks after sticking. We plant them in polybags filled with a growing medium of 2:1:1 (v:v:v) sand, seaweed compost, and topsoil. Cuttings are kept evenly moist during establishment "
	Selvam, V. (2007). Trees and shrubs of the Maldives. RAP Publication No. 2007/12. Food and Agriculture Organization (FAO) of the United Nations, Regional Office for Asia and the Pacific. Bangkok, Thailand	"It is not cultivated in the Maldives though it can be propagated by seed and stem cuttings. Seeds can be removed from the fruit by crushing them in water and can be used for direct sowing. Seedling growth is moderate and requires regular watering but intolerant to excess watering. Stem cuttings 1 to 1.5 m height and 6 to 10 cm in diameter can be used for easy establishment."

607	**Minimum generative time (years)**	
	Source(s)	**Notes**
	Sow Exotic. (2024). La Cach (Premna serratifolia). https://sowexotic.com/products/la-cach. [Accessed 23 Jul 2024]	"Growth Rate: Fast" [Unknown]

701	**Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)**	**n**
	Source(s)	**Notes**
	Wandrag, E. M., Dunham, A. E., Miller, R. H., & Rogers, H. S. (2015). Vertebrate seed dispersers maintain the composition of tropical forest seedbanks. AoB Plants, 7, plv130.	"Table 1. Dispersal syndrome used in analyses for each species of seed recorded in the seedbank on each of the three islands, mean size of seeds and the island on which each species was recorded in the seedbank." [Premna obtusifolia - Dispersal syndrome = Bird/bat]

702	**Propagules dispersed intentionally by people**	**y**
	Source(s)	**Notes**
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	"Major Pathway/s: Crop, Herbal, Ornamental Dispersed by: Humans"
	de Kok, R. (2013). The genus Premna L. (Lamiaceae) in the Flora Malesiana area. Kew Bulletin, 68(1), 55-84	"Often grown in gardens and as a street tree."

703	**Propagules likely to disperse as a produce contaminant**	**n**

Qsn #	Question	Answer
	Source(s)	**Notes**
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	[No evidence] "Major Pathway/s: Crop, Herbal, Ornamental Dispersed by: Humans"

704	Propagules adapted to wind dispersal	n
	Source(s)	**Notes**
	de Kok, R. (2013). The genus Premna L. (Lamiaceae) in the Flora Malesiana area. Kew Bulletin, 68(1), 55-84	[No evidence. Fleshy-fruit] "Fruit globose, 3 - 8 x 3 - 5 mm, glabrous, outer surface sometimes warty, glossy, green turning sometimes white, then black, purple or dark red when mature, endocarp smooth. Seeds four, equally developed when mature."

705	Propagules water dispersed	y
	Source(s)	**Notes**
	Fall, P. L., Drezner, T. D., & Franklin, J. (2007). Dispersal ecology of the lowland rain forest in the Vava'u island group, Kingdom of Tonga. New Zealand Journal of Botany, 45(2): 393-417	"Appendix 1 Plant species in the lowland tropical hardwood forests of the Vava'u island group, Kingdom of Tonga analysed by Franklin et al. (1999)" [Premna serratifolia - Dispersal mechanisms = Br (bird) ,Bt (bat),En (endozoochory),Ma (non-volant mammal),Wa (water)]
	Wu, Z. Y. & P. H. Raven, (eds). (1994). Flora of China. Vol. 17 (Verbenaceae through Solanaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis.	[Along streams] "Mixed and open forests on mountain slopes and along streams; 100-300 m."
	Faccenda, K. (2024). Report of 24 new naturalized weeds across the islands of Hawai'i. Bishop Museum Occasional Papers 156: 71-110	[Growing along a stream. Possibly water dispersed] "A single, mature Premna serratifolia tree was found in Mānoa growing from a crack in concrete under a bridge over Mānoa Stream. Given that the tree was growing from a crack in concrete, it was obviously not planted. The tree was flowering and fruiting heavily"

706	Propagules bird dispersed	y
	Source(s)	**Notes**
	Caves, E. M., Jennings, S. B., HilleRisLambers, J., Tewksbury, J. J., & Rogers, H. S. (2013). Natural experiment demonstrates that bird loss leads to cessation of dispersal of native seeds from intact to degraded forests. PLoS One, 8(5), e65618	"Additionally, we have found seeds from two common species, Premna obtusifolia and Psychotria mariana, in bird scat, providing additional support for their status as 'bird-dispersed'." ... "On Saipan, however, nearly two-thirds of all bird-dispersed native seeds found in traps lacked fruit pulp. In a separate study, germination experiments in an outdoor nursery for two of the common bird-dispersed species, Premna obtusifolia and Psychotria mariana showed increased germination of handled seeds over whole fruit (Rogers, unpub.)." [Premna obtusifolia R. Br. - Synonym of Premna serratifolia L.]
	Fall, P. L., Drezner, T. D., & Franklin, J. (2007). Dispersal ecology of the lowland rain forest in the Vava'u island group, Kingdom of Tonga. New Zealand Journal of Botany, 45(2): 393-417	"Appendix 1 Plant species in the lowland tropical hardwood forests of the Vava'u island group, Kingdom of Tonga analysed by Franklin et al. (1999)" [Premna serratifolia - Dispersal mechanisms = Br (bird) ,Bt (bat),En (endozoochory),Ma (non-volant mammal),Wa (water)]

707	Propagules dispersed by other animals (externally)	n
	Source(s)	**Notes**
	Fall, P. L., Drezner, T. D., & Franklin, J. (2007). Dispersal ecology of the lowland rain forest in the Vava'u island group, Kingdom of Tonga. New Zealand Journal of Botany, 45(2): 393-417	[No evidence] "Appendix 1 Plant species in the lowland tropical hardwood forests of the Vava'u island group, Kingdom of Tonga analysed by Franklin et al. (1999)" [Premna serratifolia - Dispersal mechanisms = Br (bird) ,Bt (bat),En (endozoochory),Ma (non-volant mammal),Wa (water)]

Qsn #	Question	Answer
708	Propagules survive passage through the gut	y
	Source(s)	**Notes**
	Caves, E. M., Jennings, S. B., HilleRisLambers, J., Tewksbury, J. J., & Rogers, H. S. (2013). Natural experiment demonstrates that bird loss leads to cessation of dispersal of native seeds from intact to degraded forests. PLoS One, 8(5), e65618	"Additionally, we have found seeds from two common species, Premna obtusifolia and Psychotria mariana, in bird scat, providing additional support for their status as 'bird-dispersed'." ... "On Saipan, however, nearly two-thirds of all bird-dispersed native seeds found in traps lacked fruit pulp. In a separate study, germination experiments in an outdoor nursery for two of the common bird-dispersed species, Premna obtusifolia and Psychotria mariana showed increased germination of handled seeds over whole fruit (Rogers, unpub.)." [Premna obtusifolia R. Br. - Synonym of Premna serratifolia L.]
	Fall, P. L., Drezner, T. D., & Franklin, J. (2007). Dispersal ecology of the lowland rain forest in the Vava'u island group, Kingdom of Tonga. New Zealand Journal of Botany, 45(2): 393-417	"Appendix 1 Plant species in the lowland tropical hardwood forests of the Vava'u island group, Kingdom of Tonga analysed by Franklin et al. (1999)" [Premna serratifolia - Dispersal mechanisms = Br (bird) ,Bt (bat),En (endozoochory),Ma (non-volant mammal),Wa (water)]

801	Prolific seed production (>1000/m2)	
	Source(s)	**Notes**
	de Kok, R. (2013). The genus Premna L. (Lamiaceae) in the Flora Malesiana area. Kew Bulletin, 68(1), 55-84	"Fruit globose, 3 - 8 x 3 - 5 mm, glabrous, outer surface sometimes warty, glossy, green turning sometimes white, then black, purple or dark red when mature, endocarp smooth. Seeds four, equally developed when mature." [Densities unknown]

802	Evidence that a persistent propagule bank is formed (>1 yr)	n
	Source(s)	**Notes**
	Yang, J. C., Kuo, S. R., & Lee, C. M. (2010). Germination and storage behavior of seeds of Garcinia subelliptica (Guttiferae), Drypetes littoralis (Euphorbiaceae), and Premna serratifolia (Verbenaceae). Taiwan Journal Forest Science, 25(4): 339-352	[Can be stored, but germinate rapidly under natural conditions] "Premna serratifolia seeds displayed intolerance to moist storage at 4□. Statistically, an insignificant difference ($p > 0.05$) was observed after storage for 1 mo, although those seeds showed a substantially decreased germination percentage (59.4±13.5%) compared to fresh seeds (79.4%). However, after storage for 2 mo, the germination percentage had decreased to 25.6±8.2%, and the seeds had almost totally lost their viability after 4 mo (Fig. 8)." ... "Although P. serratifolia seeds of this study are orthodox seeds which can tolerate desiccation, they still adopt the survival strategy of rapid germination in humid environments after ripening. However, when P. serratifolia seeds were moistened, they only maintained their viability for 4 mo at a low temperature (Fig. 6). The results revealed that they are not like temperate seeds which are able to maintain viability for at least 2~3 yr in low-temperature environments, and they are not like tropical seeds which readily die in a few days after storage at a low temperature. In fact, their germination and desiccation tolerance are very similar to seeds of Scolopia oldhamii Hance (Yang et al. 2008). Obviously, such seed characteristics of these species have gradually evolved from the humid subtropical surroundings in which they grow."

803	Well controlled by herbicides	
	Source(s)	**Notes**
	WRA Specialist. (2024). Personal Communication	Unknown

Qsn #	Question	Answer
804	**Tolerates, or benefits from, mutilation, cultivation, or fire**	
	Source(s)	**Notes**
	WRA Specialist. (2024). Personal Communication	Unknown

805	**Effective natural enemies present locally (e.g. introduced biocontrol agents)**	
	Source(s)	**Notes**
	WRA Specialist. (2024). Personal Communication	Unknown

Summary of Risk Traits:

Premna serratifolia is a small to medium-sized tree or shrub native to tropical and subtropical regions, including parts of Asia (India, China, Southeast Asia), Australia, and the Pacific islands. It typically grows in coastal forests, mangroves, and other moist, tropical environments and is widely used in traditional medicine. Various parts of the plant, including the leaves, bark, and roots, are used to treat a range of ailments, such as headaches, fever, respiratory issues, and digestive problems. Perhaps because of its broad native range, it is not documented to be invasive anywhere in the world, although it has been documented as naturalized on the island of Oahu (Hawaiian Islands). With bird and water-dispersed seeds, and an ability to self-seed, it may continue to spread from cultivation, but is not predicted to have significant negative impacts in the Hawaiian Islands.

High Risk / Undesirable Traits
• Grows and can spread in regions with tropical and subtropical climates
• Naturalized on Oahu (Hawaiian Islands) and possibly Reunion Island
• Cited as an agricultural weed in Kiribati, but no specific impacts have been documented
• Reproduces by seeds
• Reported to be self-fertile
• Seeds dispersed by birds, fruit-eating bats (where present), other fruit-eating mammals, water, and through intentional cultivation

Low Risk Traits
• No documented negative impacts in native or introduced range (although cited as a weed in some references)
• Unarmed (no spines, thorns, or burrs)
• Palatable to browsing animals
• Reported to be non-toxic
• Grows best in high light environments (dense shade may inhibit spread)

Second Screening Results for Trees/tree-like shrubs

(A) Shade tolerant or known to form dense stands? No
Outcome = Accept (Low Risk)