

**Taxon:** Calycophyllum candidissimum (Vahl) DC.

**Family:** Rubiaceae

**Common Name(s):** dagame  
lemonwood

**Synonym(s):** Macrocnemum candidissimum Vahl

**Assessor:** Chuck Chimera

**Status:** Assessor Approved

**End Date:** 17 Oct 2016

**WRA Score:** 1.0

**Designation:** EVALUATE

**Rating:** Evaluate

**Keywords:** Tropical Tree, Timber, Pure Stands, Self-Compatible, Wind-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	y
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	n=0, y = 1*multiplier (see Appendix 2)	n
303	Agricultural/forestry/horticultural weed	n=0, y = 2*multiplier (see Appendix 2)	n
304	Environmental weed	n=0, y = 2*multiplier (see Appendix 2)	n
305	Congeneric weed	n=0, y = 1*multiplier (see Appendix 2)	n
401	Produces spines, thorns or burrs	y=1, n=0	n
402	Allelopathic		
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		
409	Is a shade tolerant plant at some stage of its life cycle		

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	y
411	Climbing or smothering growth habit	y=1, n=0	n
412	Forms dense thickets	y=1, n=0	y
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	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	y
705	Propagules water dispersed		
706	Propagules bird dispersed	y=1, n=-1	n
707	Propagules dispersed by other animals (externally)	y=1, n=-1	n
708	Propagules survive passage through the gut	y=1, n=-1	n
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
	Source(s)	Notes
	Woodson, R. E., Schery, R. W., & Dwyer, J. D. (1980). Flora of Panama. Part IX. Family 179. Rubiaceae--Part 1. Annals of the Missouri Botanical Garden, 67(1), 1–256	[No evidence of domestication] "Calycophyllum candidissimum is widely distributed in Mexico and Central America, ranging south to Colombia and Venezuela. It also occurs in the West Indies. The hard, fine-grained wood has a variety of uses. In Panama it is used for charcoal"

102	Has the species become naturalized where grown?	
	Source(s)	Notes
	WRA Specialist. 2016. Personal Communication	NA

103	Does the species have weedy races?	
	Source(s)	Notes
	WRA Specialist. 2016. 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
	USDA, ARS, Germplasm Resources Information Network, 2016. National Plant Germplasm System [Online Database]. <a href="http://www.ars-grin.gov/npgs/index.html">http://www.ars-grin.gov/npgs/index.html</a> . [Accessed 13 Oct 2016]	"Native: Northern America Southern Mexico: Mexico - Chiapas Southern America Caribbean: Cuba Mesoamerica: Costa Rica; El Salvador; Guatemala; Honduras; Nicaragua; Panama Western South America: Colombia; Ecuador"

202	Quality of climate match data	High
	Source(s)	Notes
	USDA, ARS, Germplasm Resources Information Network, 2016. National Plant Germplasm System [Online Database]. <a href="http://www.ars-grin.gov/npgs/index.html">http://www.ars-grin.gov/npgs/index.html</a> . [Accessed 13 Oct 2016]	

Qsn #	Question	Answer
203	<b>Broad climate suitability (environmental versatility)</b>	<b>y</b>
	<b>Source(s)</b>	<b>Notes</b>
	Gargiullo, M.B., Magnuson, B.L & Kimball, L.D. 2008. A Field Guide to Plants of Costa Rica. Oxford University Press US, New York, NY	"Habitat: Seasonally dry forests. Altitude: Pacific lowlands, sea level to 400 m, occasionally to 800 m." [Elevation range ca. 400 m]
	Tropicos.org. 2016. Tropicos [Online Database]. Missouri Botanical Garden. <a href="http://www.tropicos.org/">http://www.tropicos.org/</a> . [Accessed 17 Oct 2016]	Collected from 0 - 20 m to 1400 m elevation and 00°33'00"S to 21°55'00"N latitude, potentially demonstrating environmental versatility

204	<b>Native or naturalized in regions with tropical or subtropical climates</b>	<b>y</b>
	<b>Source(s)</b>	<b>Notes</b>
	Woodson, R. E., Schery, R. W., & Dwyer, J. D. (1980). Flora of Panama. Part IX. Family 179. Rubiaceae--Part 1. Annals of the Missouri Botanical Garden, 67(1), 1–256	"Calycophyllum candidissimum is widely distributed in Mexico and Central America, ranging south to Colombia and Venezuela. It also occurs in the West Indies."

205	<b>Does the species have a history of repeated introductions outside its natural range?</b>	<b>?</b>
	<b>Source(s)</b>	<b>Notes</b>
	Staples, G.W. & Herbst, D.R. 2005. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI	"Lemonwood is a handsome ornamental that is not fussy about soil or location. It is planted as a street tree in some parts of Honolulu."
	Little Jr, E. L., Woodbury, R. O., & Wadsworth, F. H. (1974). Trees of Puerto Rico and the Virgin Islands. Second Volume. Agriculture Handbook 449, US Department of Agriculture, Washington, D.C.	"Uncommon as an ornamental in Puerto Rico. Grown also in Hawaii."
	Skolmen, R.G. 1980. Plantings on the forest reserves of Hawaii: 1910–1960. Institute of Pacific Islands Forestry, Pacific Southwest Forest & Range Experiment Station, US Forest Service, Honolulu, HI	11 trees reported as forestry plantings statewide

301	<b>Naturalized beyond native range</b>	<b>n</b>
	<b>Source(s)</b>	<b>Notes</b>
	Liogier, H.A. 1997. Descriptive Flora of Puerto Rico and Adjacent Islands: Spermatophyta, Volume V. Acanthaceae to Compositae. La Editorial, UPR, San Juan, Puerto Rico	"Uncommonly planted and persistent as an ornamental tree" [Persistent but not naturalized]
	Randall, R.P. 2012. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	No confirmed evidence to date
	Wagner, W.L., Herbst, D.R. & Lorence, D.H. 2016. Flora of the Hawaiian Islands. Smithsonian Institution, Washington, D.C. <a href="http://botany.si.edu/">http://botany.si.edu/</a> . [Accessed ]	No evidence to date

302	<b>Garden/amenity/disturbance weed</b>	<b>n</b>
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Qsn #	Question	Answer
	<b>Source(s)</b>	<b>Notes</b>
	Randall, R.P. 2012. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	No evidence

303	Agricultural/forestry/horticultural weed	n
	<b>Source(s)</b>	<b>Notes</b>
	Randall, R.P. 2012. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	No evidence

304	Environmental weed	n
	<b>Source(s)</b>	<b>Notes</b>
	Randall, R.P. 2012. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	No evidence

305	Congeneric weed	n
	<b>Source(s)</b>	<b>Notes</b>
	Randall, R.P. 2012. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	No evidence

401	Produces spines, thorns or burrs	n
	<b>Source(s)</b>	<b>Notes</b>
	Woodson, R. E., Schery, R. W., & Dwyer, J. D. (1980). Flora of Panama. Part IX. Family 179. Rubiaceae--Part 1. Annals of the Missouri Botanical Garden, 67(1), 1-256	[No evidence] "Trees to 15 (-40) m tall, the bark reddish brown, often exfoliate, the twiglets smooth, glabrous, rubescent. Leaves oblong rotund, obovate oblong and occasionally falcate, to 15 cm long, to 7 cm wide, obtuse at the apex, cuspidate, the cusp usually triangular, to 2.5 cm long, ca. 0.3-0.5 cm wide in the middle, basally attenuate cuneate or widely cuneate, often slightly inequilateral, the costa plane or immersed above, prominulous beneath, the lateral veins 8-10, arcuate, the intermediate veins parallel and branching near the margin, the intervenal areas spreading reticulate, papyraceous, often drying red brown, glabrescent or villosulose above and beneath, rarely with minute white raphides; petioles 3 (-4) cm long, slender, to 1.3 mm wide; stipules deciduous, oblong, ca. 2.5 cm long, obtuse, scarios, rubescent, villose."

402	Allelopathic	
	<b>Source(s)</b>	<b>Notes</b>
	WRA Specialist. 2016. Personal Communication	Unknown

403	Parasitic	n
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Qsn #	Question	Answer
	<b>Source(s)</b>	<b>Notes</b>
	Woodson, R. E., Schery, R. W., & Dwyer, J. D. (1980). Flora of Panama. Part IX. Family 179. Rubiaceae--Part 1. Annals of the Missouri Botanical Garden, 67(1), 1–256	"Trees to 15 (-40) m tall, the bark reddish brown, often exfoliate, the twiglets smooth, glabrous, rubescent." [Rubiaceae. No evidence]

404	Unpalatable to grazing animals	
	<b>Source(s)</b>	<b>Notes</b>
	Hogan, J. (2015). Florivory by <i>Cebus capucinus</i> : How variation in food abundance and colour vision affect foraging strategies. MSc Thesis. University of Calgary, Calgary, Alberta	"Table 2.1.1. Flower species recorded to be consumed by <i>C. capucinus</i> in Santa Rosa." [Includes <i>Calycophyllum candidissimum</i> ]
	Williams-Guillén, K. (2003). The Behavioral Ecology of Mantled Howling Monkeys ( <i>Alouatta palliata</i> ) Living in a Nicaraguan Shade Coffee Plantation. PhD Dissertation. New York University, NY	"Table 3.3. Composition of each group's annual diet by species." [Calycophyllum candidissimum - Parts Eaten = mature leaves]
	Garen, E. J., Saltonstall, K., Ashton, M. S., Slusser, J. L., Mathias, S., & Hall, J. S. (2011). The tree planting and protecting culture of cattle ranchers and small-scale agriculturalists in rural Panama: opportunities for reforestation and land restoration. <i>Forest Ecology and Management</i> , 261(10): 1684-1695	[Calycophyllum candidissimum used as W,PA,FW,LF. No edible uses listed] Table 1 Complete list of species mentioned and uses or values suggested by participant and non-participant farmers in Los Santos (LS) and Rio Hato (RH). Status refers to Introduced (I), Native(N), or Cultivated (C; as designated by Correa et al.,2004). Uses/Values: W=Wood, FR=Fruit/Food for humans, T=Traditional Use, FW=Firewood, PA=Physical Attributes, LF=Living Fence Posts, M=Medicinal, E=Environmental purpose, FL=Food for livestock."
	Stern, M., Quesada, M., & Stoner, K. E. (2002). Changes in composition and structure of a tropical dry forest following intermittent cattle grazing. <i>Revista de Biología Tropical</i> , 50(3-4), 1021-1034	[Common in ungrazed areas, suggesting possible palatability to cattle] "In contrast, several of the most common species in the ungrazed area included species characteristic of mature tropical dry forest ( Hartshorn, 1983 ) such as <i>Luehea candida</i> , <i>Calycophyllum candidissimum</i> , <i>Jacquinia spinosa</i> , and <i>Pachira quinata</i> ."

405	Toxic to animals	n
	<b>Source(s)</b>	<b>Notes</b>
	Williams-Guillén, K. (2003). The Behavioral Ecology of Mantled Howling Monkeys ( <i>Alouatta palliata</i> ) Living in a Nicaraguan Shade Coffee Plantation. PhD Dissertation. New York University, NY	[No evidence] "Table 3.3. Composition of each group's annual diet by species." [Calycophyllum candidissimum - Parts Eaten = mature leaves]
	Wagstaff, D.J. 2008. International poisonous plants checklist: an evidence-based reference. CRC Press, Boca Raton, FL	No evidence
	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. Other species in genus used medicinally

406	Host for recognized pests and pathogens	
	<b>Source(s)</b>	<b>Notes</b>

Qsn #	Question	Answer
	Baker, K. F., Davis, L. H., Durbin, R. D., & Snyder, W. C. (1977). Greasy blotch of carnation and flyspeck of apple: diseases caused by <i>Zygophiala jamaicensis</i> . <i>Phytopathology</i> , 67(5), 580-588	"Greasy blotch of carnation and flyspeck of apple are caused by the fungus, <i>Zygophiala jamaicensis</i> (perfect state, <i>Schizothyrium pomi</i> )." ... "The flyspeck fungus has an extensive host range on plants occurring in cool temperate to hot tropical areas." [Includes <i>Calycophyllum candidissimum</i> ]

407	Causes allergies or is otherwise toxic to humans	n
	Source(s)	Notes
	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
	Wagstaff, D.J. 2008. <i>International poisonous plants checklist: an evidence-based reference</i> . CRC Press, Boca Raton, FL	No evidence

408	Creates a fire hazard in natural ecosystems	
	Source(s)	Notes
	Condit, R., Pérez, R. & Daguerre, N. 2010. <i>Trees of Panama and Costa Rica</i> . Princeton University Press, Princeton, NJ	"This is one of the characteristic species of drier regions, common and conspicuous in farmland and along roads near the Pacific..." [May contribute to fuel load in drier, fire prone areas]

409	Is a shade tolerant plant at some stage of its life cycle	
	Source(s)	Notes
	Useful Tropical Plants Database. (2016). <i>Calycophyllum candidissimum</i> . <a href="http://tropical.theferns.info/viewtropical.php?id=Calycophyllum+candidissimum">http://tropical.theferns.info/viewtropical.php?id=Calycophyllum+candidissimum</a> . [Accessed 17 Oct 2016]	"Prefers a rich, deep, well-drained soil and a position in full sun"
	Uasuf, A., Tigabu, M., & Odén, P. C. (2009). Soil Seed Banks and Regeneration of Neotropical Dry Deciduous and Gallery Forests in Nicaragua. <i>Bois et Forêts des Tropiques</i> , 299(1): 50-62	[Germinates in shade] "The most suitable environmental conditions for the germination of <i>Calycophyllum candidissimum</i> were those with no direct sunlight (Morales, 2004). Some species respond positively to gaps, as their seeds require light to germinate (pioneer species)."

410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y
	Source(s)	Notes
	Staples, G.W. & Herbst, D.R. 2005. <i>A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places</i> . Bishop Museum Press, Honolulu, HI	"Lemonwood is a handsome ornamental that is not fussy about soil or location."
	Useful Tropical Plants Database. (2016). <i>Calycophyllum candidissimum</i> . <a href="http://tropical.theferns.info/viewtropical.php?id=Calycophyllum+candidissimum">http://tropical.theferns.info/viewtropical.php?id=Calycophyllum+candidissimum</a> . [Accessed 13 Oct 2016]	"Prefers a rich, deep, well-drained soil and a position in full sun"

411	Climbing or smothering growth habit	n
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Qsn #	Question	Answer
	<b>Source(s)</b>	<b>Notes</b>
	Woodson, R. E., Schery, R. W., & Dwyer, J. D. (1980). Flora of Panama. Part IX. Family 179. Rubiaceae--Part 1. Annals of the Missouri Botanical Garden, 67(1), 1-256	"Trees to 15 (-40) m tall, the bark reddish brown, often exfoliate, the twiglets smooth, glabrous, rubescent."

<b>412</b>	<b>Forms dense thickets</b>	<b>y</b>
	<b>Source(s)</b>	<b>Notes</b>
	Chudnoff, M. (1980). Tropical Timbers of the World. USDA Forest Service, Washington, D.C.	"Distribution: Occurs in Cuba and ranges from southern Mexico through Central America to Colombia and Venezuela. Degame may occur in pure stands and is common on shaded hillsides and along waterways."

<b>501</b>	<b>Aquatic</b>	<b>n</b>
	<b>Source(s)</b>	<b>Notes</b>
	Gargiullo, M.B., Magnuson, B.L & Kimball, L.D. 2008. A Field Guide to Plants of Costa Rica. Oxford University Press US, New York, NY	[Terrestrial] "Tree 5-18 m tall" ... "Habitat: Seasonally dry forests. Altitude: Pacific lowlands, sea level to 400 m, occasionally to 800 m."

<b>502</b>	<b>Grass</b>	<b>n</b>
	<b>Source(s)</b>	<b>Notes</b>
	USDA, ARS, Germplasm Resources Information Network, 2016. National Plant Germplasm System [Online Database]. <a href="http://www.ars-grin.gov/npgs/index.html">http://www.ars-grin.gov/npgs/index.html</a> . [Accessed 13 Oct 2016]	Family: Rubiaceae Subfamily: Ixoroideae Tribe: Condamineae

<b>503</b>	<b>Nitrogen fixing woody plant</b>	<b>n</b>
	<b>Source(s)</b>	<b>Notes</b>
	USDA, ARS, Germplasm Resources Information Network, 2016. National Plant Germplasm System [Online Database]. <a href="http://www.ars-grin.gov/npgs/index.html">http://www.ars-grin.gov/npgs/index.html</a> . [Accessed 13 Oct 2016]	Family: Rubiaceae Subfamily: Ixoroideae Tribe: Condamineae

<b>504</b>	<b>Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)</b>	<b>n</b>
	<b>Source(s)</b>	<b>Notes</b>
	Woodson, R. E., Schery, R. W., & Dwyer, J. D. (1980). Flora of Panama. Part IX. Family 179. Rubiaceae--Part 1. Annals of the Missouri Botanical Garden, 67(1), 1-256	"Trees to 15 (-40) m tall, the bark reddish brown, often exfoliate, the twiglets smooth, glabrous, rubescent."

<b>601</b>	<b>Evidence of substantial reproductive failure in native habitat</b>	<b>n</b>
	<b>Source(s)</b>	<b>Notes</b>



Qsn #	Question	Answer
	USDA, ARS, Germplasm Resources Information Network, 2016. National Plant Germplasm System [Online Database]. <a href="http://www.ars-grin.gov/npgs/index.html">http://www.ars-grin.gov/npgs/index.html</a> . [Accessed 17 Oct 2016]	[No evidence. Widely distributed] "Native: Northern America Southern Mexico: Mexico - Chiapas Southern America Caribbean: Cuba Mesoamerica: Costa Rica; El Salvador; Guatemala; Honduras; Nicaragua; Panama Western South America: Colombia; Ecuador"

602	Produces viable seed	y
	Source(s)	Notes
	Useful Tropical Plants Database. (2016). <i>Calycophyllum candidissimum</i> . <a href="http://tropical.theferns.info/viewtropical.php?id=Calycophyllum+candidissimum">http://tropical.theferns.info/viewtropical.php?id=Calycophyllum+candidissimum</a> . [Accessed 13 Oct 2016]	"Propagation Seed"
	González-Rivas, B., Tigabu, M., Castro-Marín, G., & Odén, P. C. (2009). Seed germination and seedling establishment of Neotropical dry forest species in response to temperature and light conditions. <i>Journal of Forestry Research</i> , 20(2), 99-104	"The results presented here illustrate that light is an absolute requirement for the germination of <i>C. candidissimum</i> seeds. Seed of this species also germinated in a wide range of constant temperature regimes."

603	Hybridizes naturally	
	Source(s)	Notes
	WRA Specialist. 2016. Personal Communication	Unknown

604	Self-compatible or apomictic	y
	Source(s)	Notes
	Hilje, B., Calvo-Alvarado, J., Jiménez-Rodríguez, C., & Sánchez Azofeifa, A. (2015). Tree species composition, breeding systems, and pollination and dispersal syndromes in three forest successional stages in a tropical dry forest in Mesoamerica. <i>Tropical Conservation Science</i> , 8(1), 76-94	"Appendix 1. Tree species observed in numbers and percentages, including diameter at breast height (DBH), their breeding system, and pollination and seed dispersal syndrome in three tropical dry forest stages in Santa Rosa National Park, Guanacaste, Costa Rica." [Calycophyllum candidissimum - Breeding system = Monoecious]
	Bawa, K. S. (1974). Breeding systems of tree species of a lowland tropical community. <i>Evolution</i> , 28: 85-92	Calycophyllum candidissimum - SC = Self-compatible

605	Requires specialist pollinators	n
	Source(s)	Notes
	Hilje, B., Calvo-Alvarado, J., Jiménez-Rodríguez, C., & Sánchez Azofeifa, A. (2015). Tree species composition, breeding systems, and pollination and dispersal syndromes in three forest successional stages in a tropical dry forest in Mesoamerica. <i>Tropical Conservation Science</i> , 8(1), 76-94	"Appendix 1." [Calycophyllum candidissimum - Pollination Syndrome = Lepidopterophily]

Qsn #	Question	Answer
	Little Jr, E. L., Woodbury, R. O., & Wadsworth, F. H. (1974). Trees of Puerto Rico and the Virgin Islands. Second Volume. Agriculture Handbook 449, US Department of Agriculture, Washington, D.C.	"The flowers are in large branched, flattened clusters (corymbs) at ends of twigs, mostly stalkless in 3's from narrow pointed buds. The hairy cylindrical base bears a minute calyx and white corolla with short tube and 4 spreading lobes; 4 short stamens attached on the hairy end of tube and alternate with lobes ; and pistil with inferior 2-celled ovary, slender style, and 2-forked stigma. A few flowers in a large cluster produce from the calyx an enlarged <i>Calycophyllum candidissimum</i> (Vahl) DC.* rounded or broadly ovate long-stalked thin white lobe or blade, which makes the display of color." ... "Where native, classed as an important honey plant."
	Haber, W. A., Frankie, G. W., Baker, H. G., Baker, I., & Koptur, S. (1981). Ants like flower nectar. <i>Biotropica</i> , 13(3) 211-214	TABLE 1. <i>Calycophyllum candidissimum</i> - Pollinators = generalist

606	Reproduction by vegetative fragmentation	n
	Source(s)	Notes
	Useful Tropical Plants Database. (2016). <i>Calycophyllum candidissimum</i> . <a href="http://tropical.theferns.info/viewtropical.php?id=Calycophyllum+candidissimum">http://tropical.theferns.info/viewtropical.php?id=Calycophyllum+candidissimum</a> . [Accessed 17 Oct 2016]	"Propagation - Seed"

607	Minimum generative time (years)	
	Source(s)	Notes
	Useful Tropical Plants Database. (2016). <i>Calycophyllum candidissimum</i> . <a href="http://tropical.theferns.info/viewtropical.php?id=Calycophyllum+candidissimum">http://tropical.theferns.info/viewtropical.php?id=Calycophyllum+candidissimum</a> . [Accessed 17 Oct 2016]	"Growth Rate, Medium"

701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	n
	Source(s)	Notes
	Woodson, R. E., Schery, R. W., & Dwyer, J. D. (1980). Flora of Panama. Part IX. Family 179. Rubiaceae--Part 1. <i>Annals of the Missouri Botanical Garden</i> , 67(1), 1-256	"Trees to 15 (-40) m tall" ... "Fruits sessile or subsessile, oblong, 0.5-1 cm long, truncate or rounded apically, usually obtuse or rounded at the base, lignose, villosulose, often with minute white raphides, drying tan, with ca. 8 delicate ribs, splitting from the apex, the margins of the valves wide; seeds to 5 mm long, the wing acuminate at each pole." [Fruit & seeds lack means of external attachment]

702	Propagules dispersed intentionally by people	y
	Source(s)	Notes
	Little Jr, E. L., Woodbury, R. O., & Wadsworth, F. H. (1974). Trees of Puerto Rico and the Virgin Islands. Second Volume. Agriculture Handbook 449, US Department of Agriculture, Washington, D.C.	"Uncommon as an ornamental in Puerto Rico. Grown also in Hawaii."

703	Propagules likely to disperse as a produce contaminant	n
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Qsn #	Question	Answer
	<b>Source(s)</b>	<b>Notes</b>
	Woodson, R. E., Schery, R. W., & Dwyer, J. D. (1980). Flora of Panama. Part IX. Family 179. Rubiaceae--Part 1. Annals of the Missouri Botanical Garden, 67(1), 1–256	"Trees to 15 (-40) m tall" ... "Fruits sessile or subsessile, oblong, 0.5-1 cm long, truncate or rounded apically, usually obtuse or rounded at the base, lignose, villosulose, often with minute white raphides, drying tan, with ca. 8 delicate ribs, splitting from the apex, the margins of the valves wide; seeds to 5 mm long, the wing acuminate at each pole." [Possible, but unlikely given relatively large size of wind dispersed seeds]

704	Propagules adapted to wind dispersal	y
	<b>Source(s)</b>	<b>Notes</b>
	Condit, R., Pérez, R. & Daguerre, N. 2010. Trees of Panama and Costa Rica. Princeton University Press, Princeton, NJ	"Fruits are capsules that split to release winged seeds."
	Woodson, R. E., Schery, R. W., & Dwyer, J. D. (1980). Flora of Panama. Part IX. Family 179. Rubiaceae--Part 1. Annals of the Missouri Botanical Garden, 67(1), 1–256	"Fruits sessile or subsessile, oblong, 0.5-1 cm long, truncate or rounded apically, usually obtuse or rounded at the base, lignose, villosulose, often with minute white raphides, drying tan, with ca. 8 delicate ribs, splitting from the apex, the margins of the valves wide; seeds to 5 mm long, the wing acuminate at each pole."

705	Propagules water dispersed	
	<b>Source(s)</b>	<b>Notes</b>
	Chudnoff, M. (1980). Tropical Timbers of the World. USDA Forest Service, Washington, D.C.	"Degame may occur in pure stands and is common on shaded hillsides and along waterways." [Produces wind-dispersed seeds which might be buoyant and dispersed by water when in proximity to waterways]

706	Propagules bird dispersed	n
	<b>Source(s)</b>	<b>Notes</b>
	Woodson, R. E., Schery, R. W., & Dwyer, J. D. (1980). Flora of Panama. Part IX. Family 179. Rubiaceae--Part 1. Annals of the Missouri Botanical Garden, 67(1), 1–256	"Fruits sessile or subsessile, oblong, 0.5-1 cm long, truncate or rounded apically, usually obtuse or rounded at the base, lignose, villosulose, often with minute white raphides, drying tan, with ca. 8 delicate ribs, splitting from the apex, the margins of the valves wide; seeds to 5 mm long, the wing acuminate at each pole."
	Hilje, B., Calvo-Alvarado, J., Jiménez-Rodríguez, C., & Sánchez Azofeifa, A. (2015). Tree species composition, breeding systems, and pollination and dispersal syndromes in three forest successional stages in a tropical dry forest in Mesoamerica. Tropical Conservation Science, 8(1), 76-94	Seed dispersal Syndrome = Anemochory

Qsn #	Question	Answer
707	Propagules dispersed by other animals (externally)	n
	Source(s)	Notes
	Woodson, R. E., Schery, R. W., & Dwyer, J. D. (1980). Flora of Panama. Part IX. Family 179. Rubiaceae--Part 1. Annals of the Missouri Botanical Garden, 67(1), 1-256	[No evidence. Fruit & seeds lack means of external attachment] "Fruits sessile or subsessile, oblong, 0.5-1 cm long, truncate or rounded apically, usually obtuse or rounded at the base, lignose, villosulose, often with minute white raphides, drying tan, with ca. 8 delicate ribs, splitting from the apex, the margins of the valves wide; seeds to 5 mm long, the wing acuminate at each pole."

708	Propagules survive passage through the gut	n
	Source(s)	Notes
	Woodson, R. E., Schery, R. W., & Dwyer, J. D. (1980). Flora of Panama. Part IX. Family 179. Rubiaceae--Part 1. Annals of the Missouri Botanical Garden, 67(1), 1-256	[Wind-dispersed] "Fruits sessile or subsessile, oblong, 0.5-1 cm long, truncate or rounded apically, usually obtuse or rounded at the base, lignose, villosulose, often with minute white raphides, drying tan, with ca. 8 delicate ribs, splitting from the apex, the margins of the valves wide; seeds to 5 mm long, the wing acuminate at each pole."

801	Prolific seed production (>1000/m2)	
	Source(s)	Notes
	González-Rivas, B. (2005). Tree species Diversity and Regeneration of Tropical Dry Forests in Nicaragua. PhD Diss. Swedish University of Agricultural Sciences, Umea, Sweden	"C. candidissimum is a pioneer species producing a large quantity of small seeds due to highly synchronized flowering with little annual variation (Rivera & Borchert, 2001)."
	Little Jr, E. L., Woodbury, R. O., & Wadsworth, F. H. (1974). Trees of Puerto Rico and the Virgin Islands. Second Volume. Agriculture Handbook 449, US Department of Agriculture, Washington, D.C.	"The 2-celled capsules contain many minute winged brown seeds."

Qsn #	Question	Answer
802	<b>Evidence that a persistent propagule bank is formed (&gt;1 yr)</b>	
	<b>Source(s)</b>	<b>Notes</b>
	Sautu, A., Baskin, J. M., Baskin, C. C., Deago, J., & Condit, R. (2007). Classification and ecological relationships of seed dormancy in a seasonal moist tropical forest, Panama, Central America. <i>Seed Science Research</i> , 17(2), 127–140	"Table 1. Class of seed dormancy for 94 species native to the Panama Canal Watershed and basis of assignment of each species to that class. ND, non-dormant;" [ <i>Calycophyllum candidissimum</i> - Dormancy class = ND]
	Sautu, A., Baskin, J. M., Baskin, C. C., & Condit, R. 2006. Studies on the seed biology of 100 native species of trees in a seasonal moist tropical forest, Panama, Central America. <i>Forest Ecology and Management</i> , 234(1): 245-263	[Seeds considered long-lived in storage trials] "Table 1 Results of germination and other studies of seeds of 100 species native to the Panama Canal watershed" [ <i>Calycophyllum candidissimum</i> - Longevity (months) = +15] "Ninety species were evaluated for seed longevity. Seeds were stored in paper bags at 20 8C and 60% relative humidity. Storage conditions were chosen considering the best conditions in many local field projects, where cold rooms are not available. Since many seeds had high moisture content, paper bags were preferred to plastic ones to avoid fungal growth." ... "We considered seeds with a viability period of 1 month or less to be very short-lived, those with a viability period between 1 and 4 months short-lived, and those with a viability period more than 4 months long-lived."

803	<b>Well controlled by herbicides</b>	
	<b>Source(s)</b>	<b>Notes</b>
	WRA Specialist. 2016. Personal Communication	Unknown. No information on herbicide efficacy or chemical control of this species

804	<b>Tolerates, or benefits from, mutilation, cultivation, or fire</b>	
	<b>Source(s)</b>	<b>Notes</b>
	WRA Specialist. 2016. Personal Communication	Unknown

805	<b>Effective natural enemies present locally (e.g. introduced biocontrol agents)</b>	
	<b>Source(s)</b>	<b>Notes</b>
	Staples, G.W. & Herbst, D.R. 2005. <i>A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places</i> . Bishop Museum Press, Honolulu, HI	[Unknown] "Lemonwood is a handsome ornamental that is not fussy about soil or location. It is planted as a street tree in some parts of Honolulu."

**Summary of Risk Traits:**

High Risk / Undesirable Traits

- Elevation range exceeds 1000 m, demonstrating environmental versatility
- Thrives in tropical climates
- Tolerates many soil types
- Forms pure stands in Cuba
- Reproduces by seeds
- Self-compatible
- Growth rate – medium (time to maturity unknown)
- Seeds dispersed by wind & intentionally by people
- Seeds might be able to persist in seed bank for 15 months

Low Risk Traits

- No reports of invasiveness or naturalization
- Unarmed (no spines, thorns or burrs)
- Non-toxic
- Ornamental
- Not reported to spread vegetatively

Second Screening Results for Tree/tree-like shrubs

(A) Shade tolerant or known to form dense stands?> Yes. Forms pure stands in parts of native range

(B) Bird or clearly wind-dispersed?> Yes. Wind-dispersed

(C) Life cycle <4 years? Unknown

Outcome = Evaluate Further