

Taxon: <i>Caesalpinia coriaria</i>	Family: Fabaceae
Common Name(s): cascalote dibidibi divi divi guaracabuya guatapana	Synonym(s): Libidibia coriaria (Jacq.) Schltld. Poinciana coriaria Jacq.

Assessor: Chuck Chimera	Status: Assessor Approved	End Date: 2 Jan 2015
WRA Score: 6.0	Designation: EVALUATE	Rating: Evaluate

Keywords: Naturalized, Unarmed Tree, Tannin Source, N-Fixing, Coppicing

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)		
204	Native or naturalized in regions with tropical or subtropical climates	y=1, n=0	y
205	Does the species have a history of repeated introductions outside its natural range?	y=-2, ?=-1, n=0	y
301	Naturalized beyond native range	y = 1*multiplier (see Appendix 2), n= question 205	y
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)	y
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	y
406	Host for recognized pests and pathogens		
407	Causes allergies or is otherwise toxic to humans		

Qsn #	Question	Answer Option	Answer
408	Creates a fire hazard in natural ecosystems		
409	Is a shade tolerant plant at some stage of its life cycle		
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	y
504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	y=1, n=0	n
601	Evidence of substantial reproductive failure in native habitat	y=1, n=0	n
602	Produces viable seed	y=1, n=-1	y
603	Hybridizes naturally		
604	Self-compatible or apomictic	y=1, n=-1	n
605	Requires specialist pollinators	y=-1, n=0	n
606	Reproduction by vegetative fragmentation	y=1, n=-1	n
607	Minimum generative time (years)	1 year = 1, 2 or 3 years = 0, 4+ years = -1	>3
701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	y=1, n=-1	n
702	Propagules dispersed intentionally by people	y=1, n=-1	y
703	Propagules likely to disperse as a produce contaminant	y=1, n=-1	n
704	Propagules adapted to wind dispersal	y=1, n=-1	n
705	Propagules water dispersed	y=1, n=-1	n
706	Propagules bird dispersed		
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/m ²)		
802	Evidence that a persistent propagule bank is formed (>1 yr)	y=1, n=-1	y
803	Well controlled by herbicides		
804	Tolerates, or benefits from, mutilation, cultivation, or fire	y=1, n=-1	y
805	Effective natural enemies present locally (e.g. introduced biocontrol agents)		

Supporting Data:

Qsn #	Question	Answer
101	Is the species highly domesticated?	n
	Source(s)	Notes
	Jansen, P.C.M. 2005. <i>Caesalpinia coriaria</i> (Jacq.) Willd. In: Jansen, P.C.M. & Cardon, D. (Editors). PROTA 3: Dyes and tannins/Colorants et tanins. [CD-Rom]. PROTA, Wageningen, Netherlands	[No evidence of domestication] " <i>Caesalpinia coriaria</i> has been used in Central America for many centuries as a tanning material. Commercial supplies of divi-divi pods were obtained almost entirely from tropical America with Venezuela and Colombia as the major suppliers."

102	Has the species become naturalized where grown?	
	Source(s)	Notes
	WRA Specialist. 2014. Personal Communication	NA

103	Does the species have weedy races?	
	Source(s)	Notes
	WRA Specialist. 2014. 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
	Jansen, P.C.M. 2005. <i>Caesalpinia coriaria</i> (Jacq.) Willd. In: Jansen, P.C.M. & Cardon, D. (Editors). PROTA 3: Dyes and tannins/Colorants et tanins. [CD-Rom]. PROTA, Wageningen, Netherlands	" <i>Caesalpinia coriaria</i> is native to tropical America and the West Indies." ... "It grows on rich clay soils and poor sandy soils with pH 4.5–8.7, and thrives in dry (warm) temperate climates to wet tropical climates with an annual precipitation of 600 mm up to over 4000 mm, and a mean annual temperature of 15–28°C. "

202	Quality of climate match data	High
	Source(s)	Notes
	Jansen, P.C.M. 2005. <i>Caesalpinia coriaria</i> (Jacq.) Willd. In: Jansen, P.C.M. & Cardon, D. (Editors). PROTA 3: Dyes and tannins/Colorants et tanins. [CD-Rom]. PROTA, Wageningen, Netherlands	" <i>Caesalpinia coriaria</i> tolerates a wide range of soil types and climates..."

Qsn #	Question	Answer
203	Broad climate suitability (environmental versatility)	
	Source(s)	Notes
	CAB International, 2005. Forestry Compendium. CAB International, Wallingford, UK	"- Altitude range: 0 - 200 m - Mean annual rainfall: 650 - 2000 mm - Rainfall regime: summer; bimodal - Dry season duration: 2 - 6 months - Mean annual temperature: 18 - 26°C - Mean maximum temperature of hottest month: 20 - 32°C - Mean minimum temperature of coldest month: 8 - 16°C - Absolute minimum temperature: > -2°C"

204	Native or naturalized in regions with tropical or subtropical climates	y
	Source(s)	Notes
	Jansen, P.C.M. 2005. <i>Caesalpinia coriaria</i> (Jacq.) Willd. In: Jansen, P.C.M. & Cardon, D. (Editors). PROTA 3: Dyes and tannins/Colorants et tanins. [CD-Rom]. PROTA, Wageningen, Netherlands	" <i>Caesalpinia coriaria</i> is native to tropical America and the West Indies." ... " <i>Caesalpinia coriaria</i> tolerates a wide range of soil types and climates. It grows on rich clay soils and poor sandy soils with pH 4.5–8.7, and thrives in dry (warm) temperate climates to wet tropical climates with an annual precipitation of 600 mm up to over 4000 mm, and a mean annual temperature of 15–28 C. In natural conditions in Central and South America, it is found in semiarid, open country. Trees are reported to yield less under very moist tropical conditions than under drier conditions. At higher altitudes they do not yield well either. Management"

205	Does the species have a history of repeated introductions outside its natural range?	y
	Source(s)	Notes
	CAB International, 2005. Forestry Compendium. CAB International, Wallingford, UK	" <i>C. coriaria</i> is a shrub or small tree native to lowland Central America and northern South America. <i>C. coriaria</i> is best known for its rich tannin content of the seed pods, which may reach 50%, and for this reason it has been widely planted and become naturalized in much of the lowland tropics."
	Jansen, P.C.M. 2005. <i>Caesalpinia coriaria</i> (Jacq.) Willd. In: Jansen, P.C.M. & Cardon, D. (Editors). PROTA 3: Dyes and tannins/Colorants et tanins. [CD-Rom]. PROTA, Wageningen, Netherlands	" <i>Caesalpinia coriaria</i> is native to tropical America and the West Indies. It has been introduced as an ornamental in other tropical regions and sometimes also for tanning, e.g. in India. In tropical Africa it has been recorded from Ghana, DR Congo, Uganda, Tanzania, Mozambique and Mauritius, and is very locally naturalized (e.g. in Mauritius)."

301	Naturalized beyond native range	y
	Source(s)	Notes
	Jansen, P.C.M. 2005. <i>Caesalpinia coriaria</i> (Jacq.) Willd. In: Jansen, P.C.M. & Cardon, D. (Editors). PROTA 3: Dyes and tannins/Colorants et tanins. [CD-Rom]. PROTA, Wageningen, Netherlands	"In tropical Africa it has been recorded from Ghana, DR Congo, Uganda, Tanzania, Mozambique and Mauritius, and is very locally naturalized (e.g. in Mauritius)."

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

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

305	Congeneric weed	y
	Source(s)	Notes
	Weber, E. 2003. Invasive Plant Species of the World. A Reference Guide to Environmental Weeds. CABI Publishing, Wallingford, UK	" <i>Caesalpinia decapetala</i> ...This species is invasive because it forms dense impenetrable thickets and climbs over shrubs and trees, impeding their growth and regeneration."

401	Produces spines, thorns or burrs	n
	Source(s)	Notes
	Standley, P.C. 1922. Trees and Shrubs of Mexico (Fagaceae Fabaceae). Contributions from the United States National Herbarium Volume 23, Part 2. Smithsonian Institution, Washington, D.C.	"Unarmed shrub or tree, 3 to 9 meters high"
	Jansen, P.C.M. 2005. <i>Caesalpinia coriaria</i> (Jacq.) Willd. In: Jansen, P.C.M. & Cardon, D. (Editors). PROTA 3: Dyes and tannins/Colorants et tanins. [CD-Rom]. PROTA, Wageningen, Netherlands	[No evidence] "Crooked and spreading small tree, usually up to 10 m tall, but sometimes much taller. Leaves alternate, bipinnate, pinnae in 3–9 pairs; leaflets in 12–28 pairs per pinna, sessile, oblonglinear, 4–10 mm × 1–2.5 mm, with black dots beneath. Inflorescence an axillary raceme or panicle 2–4 cm long. Flowers bisexual, zygomorphic, 5merous, fragrant; sepals free, imbricate, usually unequal, the lowest one hoodshaped; petals free, unequal, 3–4 mm long, pale yellow, the upper one different in shape and size; stamens 10, free, subequal, filaments hairy at base; ovary superior, 1-celled, style slender, stigma truncate. Fruit an indehiscent pod, flexuous and twisted, (2–)5–8 cm × 1–3 cm, pale to blackish brown, 1–10-seeded. Seeds ellipsoid or reniform, 6–7 mm long, glossy brown."

402	Allelopathic	
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Qsn #	Question	Answer
	Source(s)	Notes
	Alshahrani, T.S. 2004. Interactions of allelopathy and competition affecting <i>Ziziphus spina-christi</i> and <i>Prosopis juliflora</i> seedlings. PhD Dissertation. West Virginia University, Morgantown, West Virginia	[Possibly] "Jayakumar et al. (1995) found that the aqueous extract of fresh leaves of <i>Caesalpinia coriaria</i> (Jacq.) inhibited the growth of <i>Parthenium hysterophorus</i> ; the decrease in plant dry weight, shoot height, and leaf area was proportional to the increase in concentration of leaf extract."

403	Parasitic	n
	Source(s)	Notes
	Jansen, P.C.M. 2005. <i>Caesalpinia coriaria</i> (Jacq.) Willd. In: Jansen, P.C.M. & Cardon, D. (Editors). PROTA 3: Dyes and tannins/Colorants et tanins. [CD-Rom]. PROTA, Wageningen, Netherlands	"Crooked and spreading small tree, usually up to 10 m tall, but sometimes much taller." [Fabaceae]

404	Unpalatable to grazing animals	
	Source(s)	Notes
	CAB International, 2005. Forestry Compendium. CAB International, Wallingford, UK	[Limited palatability] "...the use of its leaves for fodder is limited by the high lignin content."
	Ngulube, M.R. 1992. Evaluation of multipurpose trees for social forestry in Malawi. Forestry Research Record No. 65. Forestry Research Institute of Malawi, Zomba, Malawi	[Poor leaf fodder suggests poor palatability] "Appendix 3. Characteristics and end-uses of some of the potential multipurpose tree species for use in Malawi" [<i>Caesalpinia coriaria</i> - Fdl: Fodder - leaf = 1 poor]
	Vera, R.R. 2006. Country Pasture/Forage Resource Profiles. Bolivarian Republic of Venezuela. FAO, Rome, Italy	[Possibly palatable to goats] "Research on improved forages for the arid parts of this ecozone, along the coast, has been limited. Forages such as <i>Stylosanthes hamata</i> , <i>Leucaena leucocephala</i> , <i>Macroptilium lathyroides</i> , <i>Pennisetum typhoides</i> , <i>Cajanus cajan</i> and <i>Cenchrus ciliaris</i> have given promising experimental results. Buffel grass for example, has been shown (Matteucci and Colma, 1997) to support 10 goats/ha.year, which can potentially be complemented with some of the native leguminous trees (<i>Prosopis juliflora</i> , <i>Acacia tortuosa</i> , <i>Caesalpinia coriaria</i> ."

Qsn #	Question	Answer
405	Toxic to animals	y
	Source(s)	Notes
	The Garden Factory Inc. 2012. Plants Toxic to Dogs & Cats. http://www.gardenfactoryny.com/Images_Content/Site1/Files/Articles/ToxicPlants.pdf . [Accessed 31 Dec 2014]	"Caesalpinia coriaria" ... "What's Toxic? - All Parts"
	Knight, A. 2007. A Guide to Poisonous House and Garden Plants. CRC Press, Boca Raton, FL	[Generic Description] "A variety of toxic compounds are found in the genus <i>Caesalpinia</i> , including gallotannins, and titerpenoids. All parts of the plant are toxic, but especially the pods and seeds. The gallotannins are potent irritants, causing sever gastrointestinat disturbances, including vomiting, colic, and sever diarrhea." ... "Caesalpinia species are attractive shrubs and trees commonly grown as ornamentals in warmer climates. Consequently, domesticated animals can be exposed to the pods and seeds of these plants, at various times of the year. Poisoning has been experimentally produced in animals by feeding dried leaves and seeds."

406	Host for recognized pests and pathogens	
	Source(s)	Notes
	van Buurt, G. and Debrot, A.O. 2011. Introduced agricultural pests, plant and animals diseases and vectors in the Dutch Caribbean, with an "Alert species" list. Institute for Marine Resources & Ecosystem Studies, Wageningen, The Netherlands	"In the past there have been large die-offs of divi-divi or watapana trees (<i>Caesalpinia coriaria</i>), on all three Leeward Islands, Aruba, Curaçao and Bonaire, which were especially severe in Bonaire. In 1987 there was a large die-off in Bonaire; in some areas 100 % of all watapana trees had died by August 1990. It was estimated that about 60% of all the watapana trees on the island died. In 1992 there were similar die-offs in the Peninsula de Paraguaná and also in the area around Coro, Venezuela. At the Universidad Central de Venezuela (UCV) in Maracay, Venezuela fresh samples of living wood from diseased trees in Curaçao were analyzed and it was concluded that the die-offs were caused by an unidentified fungus belonging to the fungi imperfecti (Deuteromycota or "Deuteromycetes"); the green leafhopper (<i>Empoasca krameri</i>) being an important vector."
	Jansen, P.C.M. 2005. <i>Caesalpinia coriaria</i> (Jacq.) Willd. In: Jansen, P.C.M. & Cardon, D. (Editors). PROTA 3: Dyes and tannins/Colorants et tanins. [CD-Rom]. PROTA, Wageningen, Netherlands	"Some fungi are known to attack divi-divi: <i>Fomes lucidus</i> , <i>Micropeltis domingensis</i> and <i>Zignoella caesalpiniae</i> ."

407	Causes allergies or is otherwise toxic to humans	
	Source(s)	Notes

Qsn #	Question	Answer
	Jansen, P.C.M. 2005. <i>Caesalpinia coriaria</i> (Jacq.) Willd. In: Jansen, P.C.M. & Cardon, D. (Editors). PROTA 3: Dyes and tannins/Colorants et tanins. [CD-Rom]. PROTA, Wageningen, Netherlands	[Medicinal uses. Possibly toxic if taken at incorrect dosage] "The pods of <i>Caesalpinia coriaria</i> are very rich in tannin and are used in the tanning industry. The tan stuff from the pods is generally used as a blend for tanning leather, mixed with other tanning materials. Divi-divi is often used in rapid drum tanning of light leathers and in leather dressing. The pods are also used to prepare a blackish or bluish dye for cotton and wool and a black ink, used e.g. in the decoration of traditional potteries and gourds in Central America. They are sometimes employed as a mordant for dyeing vegetable fibres with other dyes. In medicine the pods are used as an antiperiodic and for dressing sores. The wood has been reported as having been used in Andhra Pradesh (India) as source of a red dye. <i>Caesalpinia coriaria</i> is used as an ornamental and shade plant and its leaves as a mulch."

408	Creates a fire hazard in natural ecosystems	
	Source(s)	Notes
	Jansen, P.C.M. 2005. <i>Caesalpinia coriaria</i> (Jacq.) Willd. In: Jansen, P.C.M. & Cardon, D. (Editors). PROTA 3: Dyes and tannins/Colorants et tanins. [CD-Rom]. PROTA, Wageningen, Netherlands	[Unknown] " <i>Caesalpinia coriaria</i> tolerates a wide range of soil types and climates. It grows on rich clay soils and poor sandy soils with pH 4.5–8.7, and thrives in dry (warm) temperate climates to wet tropical climates with an annual precipitation of 600 mm up to over 4000 mm, and a mean annual temperature of 15–28°C."

409	Is a shade tolerant plant at some stage of its life cycle	
	Source(s)	Notes
	Gardino Nursery. 2014. <i>Caesalpinia coriaria</i> . http://www.rareflora.com/caesalpiniacor.html . [Accessed 2 Jan 2015]	"LIGHT REQUIREMENTS: full to partial sun"
	Soriano, D., Orozco-Segovia, A., Márquez-Guzmán, J., Kitajima, K., Gamboa-de Buen, A., & Huante, P. 2011. Seed reserve composition in 19 tree species of a tropical deciduous forest in Mexico and its relationship to seed germination and seedling growth. <i>Annals of Botany</i> , 107 (6): 939-951	[Seedlings require bright sunlight] "TABLE 1. List of the studied species (nomenclature in accordance with Lott, 2002): seed storage tissue, germination speed (based on germination rate and lag time), cotyledon type and seedling light requirements." [<i>Caesalpinia coriaria</i> - Seedling light requirements = SH, strict heliophyte]

410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y
	Source(s)	Notes
	Kirk, T.K. 2009. <i>Tropical Trees of Florida and the Virgin Islands: A Guide to Identification, Characteristics and Uses</i> . Pineapple Press Inc., Sarasota, FL	" <i>Caesalpinia coriaria</i> is drought- and wind-resistant and fairly salt-tolerant, so it grows in windy seaside areas. It tolerates a variety of soils."
	Jansen, P.C.M. 2005. <i>Caesalpinia coriaria</i> (Jacq.) Willd. In: Jansen, P.C.M. & Cardon, D. (Editors). PROTA 3: Dyes and tannins/Colorants et tanins. [CD-Rom]. PROTA, Wageningen, Netherlands	" <i>Caesalpinia coriaria</i> tolerates a wide range of soil types and climates. It grows on rich clay soils and poor sandy soils with pH 4.5–8.7..."

411	Climbing or smothering growth habit	n
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Qsn #	Question	Answer
	Source(s)	Notes
	Jansen, P.C.M. 2005. <i>Caesalpinia coriaria</i> (Jacq.) Willd. In: Jansen, P.C.M. & Cardon, D. (Editors). PROTA 3: Dyes and tannins/Colorants et tanins. [CD-Rom]. PROTA, Wageningen, Netherlands	"Crooked and spreading small tree, usually up to 10 m tall, but sometimes much taller."

412	Forms dense thickets	y
	Source(s)	Notes
	Boshier, D. & Cordero, J. 2003. Árboles de Centroamérica. OFI/CATIE, Oxford/Turrialba	[Yes, in Central America] "Es una especie común y bien conocida en muchas partes de las planicies costeras del pacífico de América Central. Puede llegar a formar rodales puros densos, aunque en algunas áreas ha sido sobreexplotada y se ha vuelto poco común." [Translation: It is a common and well known species in many parts of the coastal plains of the Pacific of Central America. It can form pure dense stands , although in some areas has been overexploited and has become rare.]

501	Aquatic	n
	Source(s)	Notes
	Jansen, P.C.M. 2005. <i>Caesalpinia coriaria</i> (Jacq.) Willd. In: Jansen, P.C.M. & Cardon, D. (Editors). PROTA 3: Dyes and tannins/Colorants et tanins. [CD-Rom]. PROTA, Wageningen, Netherlands	[Terrestrial] "In natural conditions in Central and South America, it is found in semiarid, open country."

502	Grass	n
	Source(s)	Notes
	Jansen, P.C.M. 2005. <i>Caesalpinia coriaria</i> (Jacq.) Willd. In: Jansen, P.C.M. & Cardon, D. (Editors). PROTA 3: Dyes and tannins/Colorants et tanins. [CD-Rom]. PROTA, Wageningen, Netherlands	Fabaceae

503	Nitrogen fixing woody plant	y
	Source(s)	Notes
	Jansen, P.C.M. 2005. <i>Caesalpinia coriaria</i> (Jacq.) Willd. In: Jansen, P.C.M. & Cardon, D. (Editors). PROTA 3: Dyes and tannins/Colorants et tanins. [CD-Rom]. PROTA, Wageningen, Netherlands	Fabaceae

Qsn #	Question	Answer
504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	n
	Source(s)	Notes
	Jansen, P.C.M. 2005. <i>Caesalpinia coriaria</i> (Jacq.) Willd. In: Jansen, P.C.M. & Cardon, D. (Editors). PROTA 3: Dyes and tannins/Colorants et tanins. [CD-Rom]. PROTA, Wageningen, Netherlands	"Crooked and spreading small tree, usually up to 10 m tall, but sometimes much taller. Leaves alternate, bipinnate, pinnae in 3–9 pairs; leaflets in 12–28 pairs per pinna, sessile, oblonglinear, –10 mm × 1–2.5 mm, with black dots beneath. Inflorescence an axillary raceme or panicle 2–4 cm long."

601	Evidence of substantial reproductive failure in native habitat	n
	Source(s)	Notes
	Jansen, P.C.M. 2005. <i>Caesalpinia coriaria</i> (Jacq.) Willd. In: Jansen, P.C.M. & Cardon, D. (Editors). PROTA 3: Dyes and tannins/Colorants et tanins. [CD-Rom]. PROTA, Wageningen, Netherlands	" <i>Caesalpinia coriaria</i> is widespread and not in danger of genetic erosion. Germplasm collections are not known to exist."

602	Produces viable seed	y
	Source(s)	Notes
	CAB International, 2005. Forestry Compendium. CAB International, Wallingford, UK	" <i>C. coriaria</i> is often used for hedges because it is so easy to grow from direct-sown seeds or seedlings."
	Jansen, P.C.M. 2005. <i>Caesalpinia coriaria</i> (Jacq.) Willd. In: Jansen, P.C.M. & Cardon, D. (Editors). PROTA 3: Dyes and tannins/Colorants et tanins. [CD-Rom]. PROTA, Wageningen, Netherlands	"Divi-divi is propagated by seed."

603	Hybridizes naturally	
	Source(s)	Notes
	Clark, R. 2011. Royal Botanic Gardens, Kew. Pers. Comm.	[Unknown] "I am not aware of any hybridization occurring amongst <i>Mezoneurons</i> – however, it is almost certain that hybridisation does occur amongst <i>Caesalpinias</i> , and by extension is likely to occur amongst <i>Mezoneurons</i> also. I would say that there is therefore a reasonable chance that the introduced species could hybridise with <i>M. kauaiense</i> ."

Qsn #	Question	Answer
604	Self-compatible or apomictic	n
	Source(s)	Notes
	Jansen, P.C.M. 2005. <i>Caesalpinia coriaria</i> (Jacq.) Willd. In: Jansen, P.C.M. & Cardon, D. (Editors). PROTA 3: Dyes and tannins/Colorants et tanins. [CD-Rom]. PROTA, Wageningen, Netherlands	"Flowers bisexual, zygomorphic, 5merous, fragrant; sepals free, imbricate, usually unequal, the lowest one hoodshaped; petals free, unequal, 3–4 mm long, pale yellow, the upper one different in shape and size; stamens 10, free, subequal, filaments hairy at base; ovary superior, 1-celled, style slender, stigma truncate."
	Bullock, S. H. 1985. Breeding systems in the flora of a tropical deciduous forest in Mexico. <i>Biotropica</i> , 17(4): 287-301	"TABLE 2. Results offield experiments on compatibility. Family acronyms follow Weber (1982). Vouchers are SHB (collection number), deposited at MEXU. Fruit set is given as the proportion (P) of the number of treated flowers (N). ISI is the Index of Self-Incompatibility (see text). C is the designation as self-compatible (s) or self-incompatible" [<i>Caesalpinia coriaria</i> = self-incompatible (i)]
605	Requires specialist pollinators	n
	Source(s)	Notes
	Endress, P.K. 1996. Diversity and evolutionary biology of tropical flowers. Cambridge University Press, Cambridge, UK	" <i>Caesalpinia coriaria</i> has a similar flower form and is probably also bee-pollinated."
	Kirk, T.K. 2009. Tropical Trees of Florida and the Virgin Islands: A Guide to Identification, Characteristics and Uses. Pineapple Press Inc., Sarasota, FL	"The flowers attract bees."
606	Reproduction by vegetative fragmentation	n
	Source(s)	Notes
	CAB International, 2005. Forestry Compendium. CAB International, Wallingford, UK	[No evidence] " <i>C. coriaria</i> is often used for hedges because it is so easy to grow from direct-sown seeds or seedlings."
	Jansen, P.C.M. 2005. <i>Caesalpinia coriaria</i> (Jacq.) Willd. In: Jansen, P.C.M. & Cardon, D. (Editors). PROTA 3: Dyes and tannins/Colorants et tanins. [CD-Rom]. PROTA, Wageningen, Netherlands	[No evidence] "Divi-divi is propagated by seed."
607	Minimum generative time (years)	>3
	Source(s)	Notes
	Ngulube, M.R. 1992. Evaluation of multipurpose trees for social forestry in Malawi. Forestry Research Record No. 65. Forestry Research Institute of Malawi, Zomba, Malawi	" <i>Acacia pennatula</i> , <i>Enterolobium cyclocarpum</i> , <i>Albizia guachepele</i> , <i>Albizia caribae</i> , <i>Crescentia alata</i> and <i>Caesalpinia coriaria</i> have not flowered six years after planting."
	Jansen, P.C.M. 2005. <i>Caesalpinia coriaria</i> (Jacq.) Willd. In: Jansen, P.C.M. & Cardon, D. (Editors). PROTA 3: Dyes and tannins/Colorants et tanins. [CD-Rom]. PROTA, Wageningen, Netherlands	"Trees are relatively slow growing and generally commence flowering 5–7 years after sowing. Full crops of pods are produced after about 20 years."
701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	n

Qsn #	Question	Answer
	Source(s)	Notes
	Jansen, P.C.M. 2005. <i>Caesalpinia coriaria</i> (Jacq.) Willd. In: Jansen, P.C.M. & Cardon, D. (Editors). PROTA 3: Dyes and tannins/Colorants et tanins. [CD-Rom]. PROTA, Wageningen, Netherlands	"Fruit an indehiscent pod, flexuous and twisted, (2-)5-8 cm × 1-3 cm, pale to blackish brown, -10 seeded. Seeds ellipsoid or reniform, 6-7 mm long, glossy brown." [Pods and seeds rather large and without means of external attachment. Unlikely to be inadvertently dispersed]

702	Propagules dispersed intentionally by people	y
	Source(s)	Notes
	Jansen, P.C.M. 2005. <i>Caesalpinia coriaria</i> (Jacq.) Willd. In: Jansen, P.C.M. & Cardon, D. (Editors). PROTA 3: Dyes and tannins/Colorants et tanins. [CD-Rom]. PROTA, Wageningen, Netherlands	"It has been introduced as an ornamental in other tropical regions and sometimes also for tanning, e.g. in India. In tropical Africa it has been recorded from Ghana, DR Congo, Uganda, Tanzania, Mozambique and Mauritius, and is very locally naturalized (e.g. in Mauritius)."

703	Propagules likely to disperse as a produce contaminant	n
	Source(s)	Notes
	Jansen, P.C.M. 2005. <i>Caesalpinia coriaria</i> (Jacq.) Willd. In: Jansen, P.C.M. & Cardon, D. (Editors). PROTA 3: Dyes and tannins/Colorants et tanins. [CD-Rom]. PROTA, Wageningen, Netherlands	"Fruit an indehiscent pod, flexuous and twisted, (2-)5-8 cm × 1-3 cm, pale to blackish brown, 1-10 seeded. Seeds ellipsoid or reniform, 6-7 mm long, glossy brown." [Pods and seeds rather large. No direct evidence, and unlikely to be inadvertently dispersed]

704	Propagules adapted to wind dispersal	n
	Source(s)	Notes
	Jansen, P.C.M. 2005. <i>Caesalpinia coriaria</i> (Jacq.) Willd. In: Jansen, P.C.M. & Cardon, D. (Editors). PROTA 3: Dyes and tannins/Colorants et tanins. [CD-Rom]. PROTA, Wageningen, Netherlands	"Fruit an indehiscent pod, flexuous and twisted, (2-)5-8 cm × 1-3 cm, pale to blackish brown, 1-10 seeded. Seeds ellipsoid or reniform, 6-7 mm long, glossy brown." [No evidence that pods facilitate dispersal by wind]

705	Propagules water dispersed	n
	Source(s)	Notes
	Jansen, P.C.M. 2005. <i>Caesalpinia coriaria</i> (Jacq.) Willd. In: Jansen, P.C.M. & Cardon, D. (Editors). PROTA 3: Dyes and tannins/Colorants et tanins. [CD-Rom]. PROTA, Wageningen, Netherlands	[Unknown if pods float, but distribution in semiarid zones suggest water dispersal would be limited or uncommon] "Fruit an indehiscent pod, flexuous and twisted, (2-)5-8 cm × 1-3 cm, pale to blackish brown, -10-seeded. Seeds ellipsoid or reniform, 6-7 mm long, glossy brown." ... "In natural conditions in Central and South America, it is found in semiarid, open country."
	Condit, R., Pérez, R. & Daguerre, N. 2010. <i>Trees of Panama and Costa Rica</i> . Princeton University Press, Princeton, NJ	[Unlikely given dry habitat] "A medium-sized tree of dry zones."

706	Propagules bird dispersed	
	Source(s)	Notes

Qsn #	Question	Answer
	Bertsch, C., & Barreto, G. R. 2008. Diet of the yellow-knobbed curassow in the central Venezuelan llanos. The Wilson Journal of Ornithology, 120(4): 767-777	[Possibly dispersed by one species of bird in native range] "The Yellow-knobbed Curassow (<i>Crax dau bentoni</i>) occurs locally in the Llanos, dry woodlands, and gallery and deciduous forests in northern Venezuela and adjacent Colombia, being one of larger frugivores within its distribution" ... "TABLE 2. Diet of Yellow-knobbed Curassows in the Llanos of Venezuela based on fecal and stomach analyses, and field observations." [Observed eating "fruit" of <i>Caesalpinia coriaria</i>]

707	Propagules dispersed by other animals (externally)	n
	Source(s)	Notes
	Jansen, P.C.M. 2005. <i>Caesalpinia coriaria</i> (Jacq.) Willd. In: Jansen, P.C.M. & Cardon, D. (Editors). PROTA 3: Dyes and tannins/Colorants et tanins. [CD-Rom]. PROTA, Wageningen, Netherlands	"Fruit an indehiscent pod, flexuous and twisted, (2-)5-8 cm x 1-3 cm, pale to blackish brown, -10 seeded. Seeds ellipsoid or reniform, 6-7 mm long, glossy brown." [Pods and seeds rather large and without means of external attachment. Unlikely to be externally dispersed by animals]
	Sánchez-Rojas, G., Sánchez-Cordero, V., & Briones, M. 2004. Effect of plant species, fruit density and habitat on post-dispersal fruit and seed removal by spiny pocket mice (<i>Liomys pictus</i> , Heteromyidae) in a tropical dry forest in Mexico. Studies on Neotropical Fauna and Environment, 39(1): 1-6	[<i>Liomys</i> disregarded <i>C. coriaria</i> seeds, probably due to toxic metabolites. These may deter introduced rodents from scatter hoarding, and potentially dispersing seeds in the Hawaiian Islands] "We tested whether quality, habitat, and food patch density affected post-dispersal fruit and seed removal of common plants in a tropical deciduous forest in western Mexico (Chamela, Jalisco). To identify the quality of seed or fruit, caged spiny pocket mice (<i>Liomys pictus</i>) were fed monospecific diets of sunflower seeds (<i>Helianthus annuus</i>), seeds of <i>Delonix regia</i> , <i>Lonchocarpus eriocarinalis</i> , <i>Caesalpinia coriaria</i> , or fruits of <i>Spondias purpurea</i> ." ... "Fruit and seed removal values in experimental patches were high in sunflower (80%) and <i>D. regia</i> (70%) seeds, and moderate in <i>S. purpurea</i> fruits (50%); <i>L. eriocarinalis</i> (0.1%) and <i>C. coriaria</i> (0%) seeds were not removed."

708	Propagules survive passage through the gut	y
	Source(s)	Notes
	Johnson, C. D., & Siemens, D. H. 1996. Oviposition behavior, guilds, distribution and new host records for the genus <i>Mimosestes</i> Bridwell (Coleoptera: Bruchidae) from Colombia, Ecuador, Venezuela and Mexico. The Coleopterists' Bulletin, 50(2): 155-160	" <i>Caesalpinia coriaria</i> , <i>Prosopis juliflora</i> , and all species of <i>Acacia</i> Miller in Appendix 1 have indehiscent fruits (pods) that are fleshy and adhere tightly to seeds. These pods, which are apparently protected from other bruchids by the fleshy pod valves, are oviposited upon by species of <i>Mimosestes</i> . They may be dispersed to the ground where the valves rot. Vertebrate animals often feed on the fleshy pod valves directly from the plant or from the ground. They digest the pod valves but do not usually digest the seeds which are voided with the feces."

801	Prolific seed production (>1000/m2)	
	Source(s)	Notes

Qsn #	Question	Answer
	Boshier, D. & Cordero, J. 2003. Árboles de Centroamérica. OFI/CATIE, Oxford/Turrialba	[Unknown. Seed profusely] "Los árboles producen semilla profusamente y las vainas pueden recolectarse del suelo (si no hay ganado), pero no se abren naturalmente por lo que necesitan ser aplastadas para extraer la semilla. Cada kg contiene unas 22000 semillas." [Translation: Trees produce seed profusely and pods can be harvested from ground (if there are no cattle) but do not naturally open so need to be crushed to extract seed . Each kg contains about 22,000 seeds.]

802	Evidence that a persistent propagule bank is formed (>1 yr)	y
	Source(s)	Notes
	CAB International, 2005. Forestry Compendium. CAB International, Wallingford, UK	"- Seed storage orthodox"
	Boshier, D. & Cordero, J. 2003. Árboles de Centroamérica. OFI/CATIE, Oxford/Turrialba	"Las semillas pueden almacenarse hasta por 10 años en contenedores cerrados herméticamente a 4°C y 5% de contenido en humedad." [Translation: The seeds can be stored for up to 10 years in hermetically sealed containers at 4 ° C and 5% moisture content.]
	Soriano, D., Huante, P., Gamboa-deBuen, A., & Orozco-Segovia, A. 2014. Effects of burial and storage on germination and seed reserves of 18 tree species in a tropical deciduous forest in Mexico. <i>Oecologia</i> , 174(1): 33-44	[Physically dormant seeds with impermeable seed coats. Likely persist in soil] "Seven of the species tested had an impermeable seed coat (<i>Acacia farnesiana</i> , <i>Acacia</i> sp., <i>Caesalpinia coriaria</i> , <i>C. eriostachys</i> , <i>C. platyloba</i> , <i>Enterolobium cyclocarpum</i> , and <i>Ipomoea wolcottiana</i>) and were considered physically dormant." ... "At the time of dispersal, seeds from the seven species with impermeable seed coats did not germinate without scarification."

803	Well controlled by herbicides	
	Source(s)	Notes
	Motooka, P., Castro, L., Nelson, D., Nagai, G. & Ching, L. 2003. Weeds of Hawaii's Pastures and Natural Areas: An Identification and Management Guide. CTAHR, UH Manoa, Honolulu, HI	[Unknown for <i>C. coriaria</i> , but methods for control of <i>C. decapetala</i> may be effective] " <i>Caesalpinia decapetala</i> ...Sensitive to foliar applications of glyphosate and triclopyr, and to soil applications of tebuthiuron. Adequate coverage of catsclaw foliage in dense infestations is difficult. Timely repeat applications (3-9 months) of triclopyr ester at 0.25 lb/acre allows gradual reductions and opening of the canopy and eventual control. This strategy not only stresses the catsclaw over a longer period but also controls newly germinated catsclaw seedlings. Accessible stems may be treated basal bark with triclopyr ester at 20% product in diesel or crop oil in very-low volume applications"

Qsn #	Question	Answer
804	Tolerates, or benefits from, mutilation, cultivation, or fire	y
	Source(s)	Notes
	Ngulube, M.R. 1992. Evaluation of multipurpose trees for social forestry in Malawi. Forestry Research Record No. 65. Forestry Research Institute of Malawi, Zomba, Malawi	[Coppices] "The successful coppicing of <i>Albizia guachepele</i> , <i>Caesalpinia coriaria</i> and <i>Haematoxylon brasiletto</i> in the present case also provides useful information on their coppicing ability. Coppice biomass production was high with most coppicing species: ranging between 8.9 - 68.4 t ha ⁻¹ two years after cutting (Table 2.6). The ability to coppice and yield high biomass within a short period is an important aspect in multipurpose tree selection for green manure and! or fodder and wood production."

805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	
	Source(s)	Notes
	WRA Specialist. 2014. Personal Communication	Unknown

Summary of Risk Traits:

High Risk / Undesirable Traits

- Thrives in tropical climates
- Naturalized in Mauritius and perhaps elsewhere
- Other *Caesalpinia* species have become invasive
- Low palatability
- Reportedly toxic to animals
- Tolerates many soil types
- Forms pure stands in native range
- Seeds dispersed by gravity, possibly birds and animals & intentionally by people
- Seeds with physical dormancy, & able to be stored for extended periods; May form a persistent seed bank
- Able to coppice & resprout after cutting

Low Risk Traits

- No reports of detrimental impacts in natural or managed ecosystems
- Unarmed (no spines, thorns or burrs)
- Source of tannins
- Ornamental
- Self-incompatible
- Not reported to spread vegetatively
- Reaches maturity after 5-7 years
- Indehiscent pods make inadvertent seed dispersal unlikely

Second Screening Results for Tree/tree-like shrubs

(A) Shade tolerant or known to form dense stands?> Yes. Possibly shade intolerant, but forms pure stands in native range

(B) Bird or clearly wind-dispersed?> Possibly bird-dispersed in native range

(C) Life cycle <4 years? No

Outcome = Evaluate