Taxon: Gliricidia sepium (Jacq.) Kunth

Family: Fabaceae

Common Name(s): cacahuananche
madre de cacao
madriado
madricacao
mãe-do-cacau
mata ratón
Nicaraguan cocoashade
quick-stick

Synonym(s): Robinia sepium Jacq.

Assessor: Chuck Chimera **Status:** Approved **End Date:** 18 Oct 2023

WRA Score: 2.0 **Designation:** L **Rating:** Low Risk

Keywords: Tropical Tree, Naturalized, N-Fixing, Self-Incompatible, Explosive Dispersal

Qsn #	Question	Answer Option	Answer
101	Is the species highly domesticated?	y = -3, n = 0	y
102	Has the species become naturalized where grown?	y = 1, n = -1	y
103	Does the species have weedy races?	y = 1, n = -1	y
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	y
301	Naturalized beyond native range	y = 1*multiplier (see Appendix 2), n = question 205	y
302	Garden/amenity/disturbance weed	y = 1*multiplier (see Appendix 2), n = 0	y
303	Agricultural/forestry/horticultural weed		
304	Environmental weed		
305	Congeneric weed	y = 1*multiplier (see Appendix 2), n = 0	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	y = 1, n = -1	n
405	Toxic to animals		

Qsn #	Question	Answer Option	Answer
406	Host for recognized pests and pathogens		
407	Causes allergies or is otherwise toxic to humans		
408	Creates a fire hazard in natural ecosystems	y = 1, n = 0	n
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		
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	1
701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	y = 1, n = -1	n
702	Propagules dispersed intentionally by people	y = 1, n = -1	y
703	Propagules likely to disperse as a produce contaminant	y = 1, n = -1	n
704	Propagules adapted to wind dispersal	y = 1, n = -1	n
705	Propagules water dispersed		
706	Propagules bird dispersed	y = 1, n = -1	n
707	Propagules dispersed by other animals (externally)	y = 1, n = -1	n
708	Propagules survive passage through the gut	y = 1, n = -1	n
801	Prolific seed production (>1000/m2)	y = 1, n = -1	n
802	Evidence that a persistent propagule bank is formed (>1 yr)	y = 1, n = -1	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?	y
	Source(s)	Notes
	Simons, A.J. & Stewart, J.L. (1994). Gliricidia sepium − a multipurpose forage tree legume. Pp. 30-48 In: Gutteridge, R.C. & Shelton, H.M., (Eds.), Forage Tree Legumes in Tropical Agriculture. CAB International, Wallingford, UK	"Domestication of gliricidia has been in progress for several millennia and the multitude of indigenous common names from Mayan and Quiche peoples (Pertchik and Pertchik 1951) reveals the importance of this species to early occupants of the region."
	CAB International. (2005). Forestry Compendium. CAB International, Wallingford, UK	"The distribution of G. sepium within Mexico, Central and South America has undoubtedly been greatly altered and extended by a long history of local use, cultivation, incipient domestication, translocation and subsequent naturalization promoted by massive habitat disturbance making it now difficult to discern the true extent of the native distribution of this species (Hughes, 1987; Simons, 1996a)."

102	Has the species become naturalized where grown?	y
	Source(s)	Notes
	Parker, J.L. & Parsons, B. (2012). New Plant Records from the Big Island for 2010-2011. Bishop Museum Occasional Papers 113: 65-74	"Gliricidia sepium (Jacq.) Walp. New naturalized record madre de cacao trees, in their native range of Mexico and Central America, are planted to shelter young coffee and cacao plantations (staples & Herbst 2005). This species was seen rarely in surveys but sometimes in massive plantings of over 100 trees. These naturalized plants were most likely spread from an agricultural planting. Material examined. HAWAI'I: Hāmākua District. Pa'auilo, 2219436n 249862e. 15ft tall woody shrub seen naturalizing in pasture land. Flowering and fruiting when leafless. Long panicles of pink-lavender flowers and long, fleshy seedpods, 14 Jun 2010, J. Parker & R. Parsons BIED125."
	CAB International. (2005). Forestry Compendium. CAB International, Wallingford, UK	"It is recorded as a weed in Jamaica (Holm et al., 1979) and to be locally naturalized around Durban in South Africa."

103	Does the species have weedy races?	y
	Source(s)	Notes
	Plants for a Future. (2019). Gliricidia sepium. https://pfaf.org/. [Accessed 16 Dec 2019]	"It is fast-growing and has the potential to become a weed."
	CABI. (2019). Invasive Species Compendium. Wallingford, UK: CAB International. www.cabi.org/isc	[Weedy and a potential environmental weed] "G. sepium is an adaptable, fast growing, precociously seeding tree, with the ability to disperse seeds up to 40 m from the parent tree from exploding pods. This species has been widely introduced across tropical and subtropical regions to be used for fuel wood, animal feed, green manure, shade, poles, living fences, erosion control, soil improver, and as a boundary and support plant. It has escaped from cultivation and has become a successful colonizer of disturbed sites, roadsides, abandoned agricultural land and areas near cultivation (Elevitch and Francis, 2006). This species is listed as invasive in Australia, Hawaii, the Philippines, Cook Islands, French Polynesia, Tonga, Singapore, Comoros, and Trinidad and Tobago (Vos, 2004; PIER, 2016; Trinidad and Tobago Biodiversity, 2016; Weeds of Australia, 2016). It is also regarded as a potential weed and as a moderate or potentially invasive species in many countries across Asia, Africa, and the West Indies (Acevedo-Rodríguez and Strong, 2012; ILDIS, 2016; PROTA, 2016; USDA-ARS, 2016)."

201	Species suited to tropical or subtropical climate(s) - If island is primarily wet habitat, then substitute "wet tropical" for "tropical or subtropical"	High

Qsn #	Question	Answer
	Source(s)	**Notes**
	USDA, Agricultural Research Service, National Plant Germplasm System. (2019). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/. [Accessed 12 Dec 2019]	"Native Northern America Mexico (c. & s.) Southern America CENTRAL AMERICA: Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua"
	CAB International. (2005). Forestry Compendium. CAB International, Wallingford, UK	"The distribution of G. sepium within Mexico, Central and South America has undoubtedly been greatly altered and extended by a long history of local use, cultivation, incipient domestication, translocation and subsequent naturalization promoted by massive habitat disturbance making it now difficult to discern the true extent of the native distribution of this species (Hughes, 1987; Simons, 1996a)."

202	Quality of climate match data	High
	Source(s)	**Notes**
	USDA, Agricultural Research Service, National Plant Germplasm System. (2019). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/. [Accessed 12 Dec 2019]	

203	Broad climate suitability (environmental versatility)	y
	Source(s)	**Notes**
	CAB International. (2005). Forestry Compendium. CAB International, Wallingford, UK	"In its native range G. sepium grows mainly in subhumid, seasonally dry tropical climates with annual rainfall of 600–1500 mm and a 4–5 month dry season (Hughes, 1987; Parrotta, 1992; Simons, 1996a). However, it has been successfully grown in much wetter, humid, non-seasonal climates with annual rainfall as high as 3500 mm. It tolerates light night frosts, but not prolonged frosts and does not grow well in subtropical areas, where leaves are shed with the onset of winter, when night temperatures fall below 15°C (Whiteman et al., 1986; Wiersum and Nitis, 1997). G. sepium can be managed in a coppice system in areas with frost by cutting new growth before frosts occur (Stewart et al., 1992)." "Climatic amplitude (estimates) • Altitude range: 0 – 2000 m • Mean annual rainfall: 600 – 3500 mm • Rainfall regime: summer; bimodal; uniform • Dry season duration: 0 – 6 months • Mean annual temperature: 20 – 27ºC • Mean maximum temperature of hottest month: 27 – 36ºC"

204	Native or naturalized in regions with tropical or subtropical climates	y
	Source(s)	**Notes**
	CAB International. (2005). Forestry Compendium. CAB International, Wallingford, UK	"In its native range G. sepium grows mainly in subhumid, seasonally dry tropical climates with annual rainfall of 600–1500 mm and a 4–5 month dry season (Hughes, 1987; Parrotta, 1992; Simons, 1996a)."

Qsn #	Question	Answer
	Parker, J.L. & Parsons, B. (2012). New Plant Records from the Big Island for 2010-2011. Bishop Museum Occasional Papers 113: 65-74	"Madre de cacao trees, in their native range of Mexico and Central America, are planted to shelter young coffee and cacao plantations (staples & Herbst 2005). This species was seen rarely in surveys but sometimes in massive plantings of over 100 trees. These naturalized plants were most likely spread from an agricultural planting. Material examined. HAWAI'I: Hāmākua District. Pa'auilo, 2219436n 249862e. 15ft tall woody shrub seen naturalizing in pasture land. Flowering and fruiting when leafless. Long panicles of pink-lavender flowers and long, fleshy seedpods, 14 Jun 2010, J. Parker & R. Parsons BIED125."

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	"It is one of the commonest and best□known trees in Central America and now has a pantropical distribution cultivated in villages, farms, backyards and along fence lines, paddy bunds, roadsides and terrace boundaries. It is probably the most widely cultivated multipurpose agroforestry tree after Leucaena leucocephala (Simons and Stewart, 1994) and has become increasingly popular due to the problems caused to Leucaena by the psyllid defoliator, Heteropsylla cubana."
	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	"It was introduced to the Islands from the Philippines by F. M. Swanzy."
	Parker, J.L. & Parsons, B. (2012). New Plant Records from the Big Island for 2010-2011. Bishop Museum Occasional Papers 113: 65-74	"Madre de cacao trees, in their native range of Mexico and Central America, are planted to shelter young coffee and cacao plantations (staples & Herbst 2005). This species was seen rarely in surveys but sometimes in massive plantings of over 100 trees. These naturalized plants were most likely spread from an agricultural planting."
	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	A total of 2,064 trees were planted between the years of 1924 through 1927 on the island of Oahu, including in the Honolulu, Honouliuli, Round Top, Waiahole Forest Reserves.

301	Naturalized beyond native range	y
	Source(s)	**Notes**
	Wiersum, K.F. & Nitis, I.M. (1992). Gliricidia sepium (Jacq.) Kunth ex Walp.. In: Mannetje, L.'t and Jones, R.M. (Editors): Plant Resources of South-East Asia No 4: Forages. PROSEA Foundation, Bogor, Indonesia. https://www.prota4u.org/prosea/. [Accessed 12 Dec 2019]	"Gliricidia is a native of the seasonally dry Pacific Coast of Central America from sea-level to 1200 m, but has been long cultivated and naturalized in tropical Mexico, Central America and northern South America, up to 1500 m altitude."
	Parker, J.L. & Parsons, B. (2012). New Plant Records from the Big Island for 2010-2011. Bishop Museum Occasional Papers 113: 65-74	"Gliricidia sepium (Jacq.) Walp. New naturalized record madre de cacao trees, in their native range of Mexico and Central America, are planted to shelter young coffee and cacao plantations (staples & Herbst 2005). This species was seen rarely in surveys but sometimes in massive plantings of over 100 trees. These naturalized plants were most likely spread from an agricultural planting. Material examined. HAWAI'I: Hāmākua District. Pa'auilo, 2219436n 249862e. 15ft tall woody shrub seen naturalizing in pasture land. Flowering and fruiting when leafless. Long panicles of pink-lavender flowers and long, fleshy seedpods, 14 Jun 2010, J. Parker & R. Parsons BIED125."
	Woodson, R. et al. (1980). Flora of Panama. Part V. Family 83. Leguminosae. Subfamily Papilionoideae (Conclusion). Annals of the Missouri Botanical Garden, 67(3), 523-818	"Gliricidia sepium is native from Mexico to Colombia and in the West Indies. It is also widely cultivated in the New World and was early introduced into the Old World tropics where it has become naturalized, at least in some areas, e.g., the Philippines."

Qsn #	Question	Answer
	Simons, A.J. & Stewart, J.L. (1994). Gliricidia sepium − a multipurpose forage tree legume. Pp. 30-48 In: Gutteridge, R.C. & Shelton, H.M., (Eds.), Forage Tree Legumes in Tropical Agriculture. CAB International, Wallingford, UK	"Hughes (1987) was the first to distinguish between native and naturalized distributions of G. sepium in his comprehensive genecological survey of the native range. In his tentative distribution map, Atlantic coastal populations and northern South American populations were assigned as naturalised thus restricting native sites to only the dry forests of the Pacific coast in Mexico and Central America. The sites sampled by Hughes ranged in altitude from sea level to 1,100 m, and in annual rainfall from 650 to 3,500 mm."
	CAB International. (2005). Forestry Compendium. CAB International, Wallingford, UK	"It is recorded as a weed in Jamaica (Holm et al., 1979) and to be locally naturalized around Durban in South Africa."

302	Garden/amenity/disturbance weed	y
	Source(s)	**Notes**
	CAB International. (2005). Forestry Compendium. CAB International, Wallingford, UK	"G. sepium has the potential to colonize and invade a range of disturbed, ruderal sites, such as roadsides, abandoned fields and waste ground (Hughes, 1987; Hughes and Styles, 1989) and thus has the potential to become a weed (Holm et al., 1979). It is recorded as a weed in Jamaica (Holm et al., 1979) and to be locally naturalized around Durban in South Africa. As a strong light demander and colonizer, it may invade disturbed sites where it can set seed, but it is unlikely to invade closed forest communities or to ever become one of the world's worst weeds, as in many areas seed set is extremely low and natural regeneration poor."
	CABI. (2019). Invasive Species Compendium. Wallingford, UK: CAB International. www.cabi.org/isc	[A disturbance-adapted, light demanding tree with the potential to impact natural environments] "G. sepium is an adaptable, fast growing, precociously seeding tree, with the ability to disperse seeds up to 40 m from the parent tree from exploding pods. This species has been widely introduced across tropical and subtropical regions to be used for fuel wood, animal feed, green manure, shade, poles, living fences, erosion control, soil improver, and as a boundary and support plant. It has escaped from cultivation and has become a successful colonizer of disturbed sites, roadsides, abandoned agricultural land and areas near cultivation (Elevitch and Francis, 2006). This species is listed as invasive in Australia, Hawaii, the Philippines, Cook Islands, French Polynesia, Tonga, Singapore, Comoros, and Trinidad and Tobago (Vos, 2004; PIER, 2016; Trinidad and Tobago Biodiversity, 2016; Weeds of Australia, 2016). It is also regarded as a potential weed and as a moderate or potentially invasive species in many countries across Asia, Africa, and the West Indies (Acevedo-Rodríguez and Strong, 2012; ILDIS, 2016; PROTA, 2016; USDA-ARS, 2016)."
	Vos, P. (2004). Case Studies on the Status of invasive Woody Plant Species in the Western Indian Ocean: 2. The Comoros Archipelago (Union of the Comoros and Mayotte). FAO, Rome, Italy	[Classified among highly invasive plants. Impacts unspecified] "There are only a few isolated studies for the Comoros archipelago on this subject. According to these studies and from discussions with local environmental specialists, 16 woody species are estimated to be highly invasive in the Comoros archipelago: Acacia auriculiformis, Acacia mangium, Albizia lebbeck, Cinnamomum verum, Clidemia hirta, Gliricidia sepium, Jatropha curcas, Lantana camara, Leucaena leucocephala, Litsea glutinosa, Psidium guajava, Psidium cattleianum, Senna sp., Spathodea campanulata, Syzygium aromaticum and Syzygium jambos."

303	Agricultural/forestry/horticultural weed	
	Source(s)	**Notes**

Qsn #	Question	Answer
	CAB International. (2005). Forestry Compendium. CAB International, Wallingford, UK	"G. sepium has the potential to colonize and invade a range of disturbed, ruderal sites, such as roadsides, abandoned fields and waste ground (Hughes, 1987; Hughes and Styles, 1989) and thus has the potential to become a weed (Holm et al., 1979). It is recorded as a weed in Jamaica (Holm et al., 1979) and to be locally naturalized around Durban in South Africa."
	Galinato, M.I., Moody, K. & Piggin, C.M. 1999. Upland rice weeds of south and southeast Asia. International Rice Research Institute, Los Baños, Philippines	Reported as a weed of rice in the Philippines. Impacts unspecified

304	Environmental weed	
	Source(s)	**Notes**
	Elevitch, C. R. (ed.). (2006). Traditional Trees of Pacific Islands: Their Culture, Environment, and Use. Permanent Agriculture Resources, Honolulu, HI	"Moderate potential for invasiveness, has naturalized in many areas, but is usually not considered to be a pest."
	CABI. (2019). Invasive Species Compendium. Wallingford, UK: CAB International. www.cabi.org/isc	[A disturbance-adapted, light demanding tree with the potential to impact natural environments] "G. sepium is an adaptable, fast growing, precociously seeding tree, with the ability to disperse seeds up to 40 m from the parent tree from exploding pods. This species has been widely introduced across tropical and subtropical regions to be used for fuel wood, animal feed, green manure, shade, poles, living fences, erosion control, soil improver, and as a boundary and support plant. It has escaped from cultivation and has become a successful colonizer of disturbed sites, roadsides, abandoned agricultural land and areas near cultivation (Elevitch and Francis, 2006). This species is listed as invasive in Australia, Hawaii, the Philippines, Cook Islands, French Polynesia, Tonga, Singapore, Comoros, and Trinidad and Tobago (Vos, 2004; PIER, 2016; Trinidad and Tobago Biodiversity, 2016; Weeds of Australia, 2016). It is also regarded as a potential weed and as a moderate or potentially invasive species in many countries across Asia, Africa, and the West Indies (Acevedo-Rodríguez and Strong, 2012; ILDIS, 2016; PROTA, 2016; USDA-ARS, 2016)."

305	Congeneric weed	n
	Source(s)	**Notes**
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	No evidence

401	Produces spines, thorns or burrs	n
	Source(s)	**Notes**
	Woodson, R. et al. (1980). Flora of Panama. Part V. Family 83. Leguminosae. Subfamily Papilionoideae (Conclusion). Annals of the Missouri Botanical Garden, 67(3), 523-818	[No evidence] "Trees to 10 m tall with spreading crowns. Leaves usually alternate, subopposite or opposite, to ca. 30 cm long; leaflets 5-19, the lateral leaflets mostly opposite, oval to elliptic, 2-7 cm long, 1-3 cm wide, usually glabrous above, sparsely pubescent and lighter beneath, nearly always purple mottled beneath when dry; rachis and petiole lightly to evenly pubescent, petiolules pubescent; stipules minute, caducous"

402	Allelopathic	
	Source(s)	**Notes**

Qsn #	Question	Answer
	Oyun, M. B. (2006). Allelopathic potentialities of Gliricidia sepium and Acacia auriculiformis on the germination and seedling vigour of maize (Zea mays L.). American Journal of Agricultural and Biological Science, 1(3), 44-47	"Abstract: Decline in crop yield in cropping and agroforestry system in recent years has been attributed to allelopathic effects. Plants may favourably or adversely affect other plants through allelochemicals, which may be released directly or indirectly from live or dead plants. The objective of this study was to examine and quantify the nature of interference of leaf leachates of Gliricidia sepium and Acacia auriculiformis on seed germination and seedling vigour of maize and to identify morphological trait for allelopathic interference assessment of maize seedlings. Leaf leachates of both Gliricidia and Acacia significantly decreased germination percentage and increased mean germination time (P<0.05) and (P<0.01) of maize seeds particularly at leachate concentrations of 6 and 12% respectively. Similarly, all the seedling growth parameters including seedling vigour index (SVI) decreased significantly (P<0.05) and (P<0.01) with increasing level of leachate concentration compared with control. It was apparent that Gliricidia sepium perform the more inhibitory effect than Acacia auriculiformis. Shoot length (r = 0.792), root length (r = 0.920), shoot fresh weight (r = 0.873) and root dry weight (r = 0.828) were significantly correlated (P< 0.01) with SVI. Seedling root length appeared to be the strongest morphological trait for allelopathic assessment of maize seedling"
	Ramamoorthy, M., & Paliwal, K. (1993). Allelopathic compounds in leaves ofGliricidia sepium (Jacq.) kunth ex walp. and its effect onSorghum vulgare L. Journal of Chemical Ecology, 19(8), 1691-1701	"Abstract-Allelochemicals from Gliricidia sepium were extracted, identified, and quantified using HPLC. Fifteen toxic compounds, namely gallic acid, protocatechuic acid, p-hydroxybenzoic acid, gentisic acid, /3-resorcyclic acid, vanillic acid, syringic acid, p-coumaric acid, m-coumaric acid, o-coumaric acid, ferulic acid, sinapinic acid (trans and cis forms), coumarin, and myricetin were identified and quantified. These compounds from the plant extracts were tested on the seeds of the crop plant, Sorghum vulgare. Rate of germination of the seeds and root elongation were found to be inhibited by the various compounds of the extract. Different quantities of Gliricidia leaf mulch, viz., 400, 800, and 1200 g/m2 applied to the Sorghum grown fields, were found to effectively control weeds. Mulching improved the total yield of Sorghum. Leaf manuring and mulching showed better crop yield when applied up to 800 g of Gliricidia leaf/m2 . Crop yield was better in mulch-applied fields when compared to the manure-applied ones."
	Fujii, Y., Shibuya, T., Nakatani, K., Itani, T., Hiradate, S., & Parvez, M. M. (2004). Assessment method for allelopathic effect from leaf litter leachates. Weed Biology and Management, 4(1), 19-23	"In order to elucidate the allelopathic effect of leaf litter leachates under laboratory conditions, a modified ‘sandwich method’, which places leaves between two layers of agar, was used. Fifty mg of leaves was used per 10 cm2 cell. Agar concentrations at 0.5–1.0% were the best for gel support in determining radicle and hypocotyl elongation of lettuce. The optimum incubation time for bioassay was three days after imbibition onset. Among 20 typical tree species in Asia, Cymbopogon citratus and Derris scandens showed the strongest inhibitory activity determined by the sandwich method, followed by Piper betle, Tamarindus indica, and Gliricidia sepium. This bioassay seems to be a reliable method for screening allelopathic activity from leaf litter leachates."
	WRA Specialist. (2020). Personal Communication	Allelopathy documented using leachates and plant extracts. Field evaluation required to confirm allelopathic properties under natural conditions.

403	Parasitic	n
	Source(s)	**Notes**
	CAB International. (2005). Forestry Compendium. CAB International, Wallingford, UK	"G. sepium is an extremely versatile, fast□growing, nitrogen□fixing agroforestry tree" [Fabaceae. No evidence]

404	Unpalatable to grazing animals	n

Qsn #	Question	Answer
	Source(s)	Notes
	CAB International. (2005). Forestry Compendium. CAB International, Wallingford, UK	"However, palatability may be extremely problematic in some areas (e.g. West Africa, India and the Philippines, Simons and Stewart, 1994; Stewart, 1996), possibly due to anti‐nutritional factors such as flavonols and phenols. This means that ruminants unaccustomed to eating G. sepium may initially refuse it, and may take a long period to become accustomed to it; eventually ruminants may consume a high proportion in their diet for extended periods of time (Wiersum and Nitis, 1997). Poor palatability is thought to be caused by the odour of the leaves, possibly attributable to presence of coumarin or other volatile substances released from the leaf surface (Stewart, 1996). Poor palatability can be overcome in some situations by wilting foliage before feeding, using mature, rather than young foliage, offering solely Gliricidia for long periods, penning unaccustomed and adapted animals together, or temporarily adding molasses or salt to G. sepium fodder (Stewart, 1996)."
	Nellis, D.W. (1997). Poisonous plants and animals of Florida and the Caribbean. Pineapple Press Inc., Sarasota, FL	{Conflicts with reports of poor palatability in the Forestry Compendium] "The fresh or dried foliage has been used effectively as a protein fodder supplement for cattle and goats."

405	Toxic to animals	
	Source(s)	Notes
	Nellis, D.W. (1997). Poisonous plants and animals of Florida and the Caribbean. Pineapple Press Inc., Sarasota, FL	"Toxic properties. The leaves are poisonous to dogs and horses, but make nutritious fodder for cattle and goats. It seems likely that the microorganisms In the rumen chemically neutralize the toxic component as they do In the case of Leucaena. An unconfirmed claim is that although the roots, seeds and leaves are toxic to mice, they are not toxic to rats."
	CAB International. (2005). Forestry Compendium. CAB International, Wallingford, UK	[Potentially toxic in some studies and uses, especially to rodents and dogs] "Some toxicity effects have also been documented, possibly caused by conversion of coumarin to dicoumarol, a haemorrhagic compound, during fermentation (Simons and Stewart, 1994). Despite these mixed perceptions G. sepium remains an important high quality fodder for ruminants and there are many reports of improvements in animal production (survival, lambing or calving percentage, birth weight, live weight gains and milk yields) from feeding it as a supplement (reviewed by Smith and van Houtert, 1987; Stewart, 1996; Wiersum and Nitis, 1997). Its leaves are usually used as a high quality supplement to low quality grass, straw or other residues forming 20‐40% of the diet (Simons and Stewart, 1994; Stewart, 1996). However, results of using G. sepium as a fodder for non‐ruminants have generally been poor (Stewart, 1996)." … "As indicated by the generic name Gliricidia which means `mouse‐killer', the leaves, seeds and bark are poisonous to rats, mice and other rodents as well as dogs. Dried bark or leaves, ground up and mixed with cooked maize are used as a rat poison in parts of Central America (Standley, 1922; Standley and Steyermark, 1946; Glover, 1989; Stewart, 1996)."

406	Host for recognized pests and pathogens	
	Source(s)	Notes

Qsn #	Question	Answer
	Boa, E. R., & Lenne, J. M. (1996). Diseases and insect pests. Oxford Forestry Institute Tropical Forestry Paper No. 33: 73-76	"More than thirty fungal pathogens are listed for Gliricidia sepium (Lenne, 1990, 1992; Boa and Lenne, 1994). Although widely grown throughout the tropics, G. sepium has apparently remained free of serious diseases (Lenne, 1992). Its deciduous character in seasonally dry environments may reduce the development of foliar epidemics. However, surveys by the authors, in 1992 and 1993, of natural populations and nearby managed trees in Central America and Mexico revealed two previously unknown diseases, loosely classified as virus-like (mottle and shoestring leaves) and little leaf disease. These are reported briefly in Boa and Lenne (1994). This does suggest the possibility that significant problems may exist elsewhere which have not been identified because of a lack of specialist attention to diagnosis of disease and pest problems on G. sepium." … "In comparison to the information available on diseases of G. sepium, there is a noticeable dearth of observations concerning insect pests. Standard texts concerned with forest entomology in India, for example Beeson (1941), contain no reference to G. sepium. Roberts (1969) notes several insects, mostly beetles, on G. sepium in Nigeria but none of these records is of any economic significance."
	CAB International. (2005). Forestry Compendium. CAB International, Wallingford, UK	[Possibly] "Information presented here is derived largely from a survey of diseases and insect pests of G. sepium by Boa and Lenne (1996). Although there are more than 30 fungal pathogens listed for G. sepium (Boa and Lenne, 1994), it has so far remained remarkably free of serious diseases throughout its very extensive cultivated range (Lenne, 1992). However, two potentially serious diseases (see next paragraph), which adversely affect trees within the native range have the potential to cause serious problems if introduced elsewhere (Boa and Lenne, 1996). Recent surveys in the natural populations have revealed a new virus‐like disease and a serious 'little leaf' disease (Boa and Lenne, 1994, 1996). Little leaf disease, thought to be caused by a phytoplasma, is common in fenceline and natural populations, especially in Honduras and Guatemala, and is associated with extensive dieback and tree death. The exact cause of this disease remains unknown (Boa and Lenne, 1996). Virus‐like symptoms including leaf curl, foliar distortion, mosaic and mottle have been noted in several natural populations and could have serious implications for future development of G. sepium (Boa and Lenne, 1996). A number of foliage diseases have been recorded including: Cercosporidium gliricidiasis in Latin America, the Caribbean, South‐East Asia and the Pacific which can cause defoliation under humid conditions, leaf spot caused by Colletotrichium gloeosporoides in Africa, Sirosporium gliricidiae from Central America and the Caribbean is another foliage disease often associated with poor tree growth, Cladosporium sp. can cause defoliation in Costa Rica, Jamaica and Venezuela, scab caused by Sphaceloma sp. is a minor problem in natural populations, and Colletotrichum truncatum causes an anthracnose in India and Venezuela. There are a number of reports of insects attacking G. sepium (e.g. Janzen, 1983), but no serious insect pests have been encountered to date. In Puerto Rico G. sepium trees are attacked by aphids.They secrete large quantities of honey‐dew which attracts ants and growth of black sooty moulds on the shoots and leaves (Little and Wadsworth, 1964). Known minor insect pests are listed by Boa and Lenne (1996)."

407	Causes allergies or is otherwise toxic to humans	
	Source(s)	**Notes**
	Nellis, D.W. (1997). Poisonous plants and animals of Florida and the Caribbean. Pineapple Press Inc., Sarasota, FL	"The leaves are poisonous to dogs and horses, but make nutritious fodder for cattle and goats."

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	[Medicinal uses. Potentially toxic if consumed] "Toxins, poison, humans and animals; leaves and seeds used for the poisoning of noxious animals. Antimicrobial, hepatoprotective, antibacterial, antidysenteric, antipseudomonas, nematicidal, antifungal, insecticide, insect repellent, mosquito repellent, rodenticide, pesticidal, sedative, cytotoxic, expectorant, febrifuge, bark and leaves to treat human skin diseases, scabies, sores, boils, ulcers, wounds, burns, itch, sprains, rheumatism, gonorrhea, headache, cold, cough; sap of bark, leaves and roots for wound healing; powdered seed, bark and leaves used as a rat poison. Leaves decoction to bathe head for lice infestations. Veterinary medicine, crushed leaves to repel insects."

408	Creates a fire hazard in natural ecosystems	n
	Source(s)	**Notes**
	Duke, J. A. (1983). Gliricidia sepium. Handbook of Energy Crops. https://hort.purdue.edu/newcrop/duke_energy/Gliricidia_sepium.html. [Accessed 17 Dec 2019]	[Used as a firebreak] "In Indonesia, the tree is planted as a firebreak. This and other fast-growing leguminous trees have the vigor to outgrow or compete with the Imperata grass. In the shade of Gliricida, the grass finally dies, leaving nothing that can sustain a grass fire (NAS, 1980a)."

409	Is a shade tolerant plant at some stage of its life cycle	
	Source(s)	**Notes**
	CAB International. (2005). Forestry Compendium. CAB International, Wallingford, UK	"As a strong light demander and colonizer, it may invade disturbed sites where it can set seed, but it is unlikely to invade closed forest communities or to ever become one of the world's worst weeds, as in many areas seed set is extremely low and natural regeneration poor."
	Elevitch, C. R. (ed.). (2006). Traditional Trees of Pacific Islands: Their Culture, Environment, and Use. Permanent Agriculture Resources, Honolulu, HI	"The tree tolerates only light shade. Seedlings that are planted in heavy shade can survive but will not grow. Seedlings that have been suppressed by shade for even 3–4 years will recover and grow rapidly if the sheltering overstory is removed."

Qsn #	Question	Answer
410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y
	Source(s)	Notes
	CAB International. (2005). Forestry Compendium. CAB International, Wallingford, UK	"In its native range G. sepium is found on a wide range of soil types from pure sand, on coastal dunes to heavy black clay vertisols, but is most commonly found on freely drained, rocky, superficial, skeletal, unstratified regasols of volcanic or alluvial origin. It tolerates both alkaline and moderately acidic soils with pH in the range 4.5–11.0 and is more tolerant of acid soils and low fertility than Leucaena." "Soil descriptors • Soil texture: light; medium; heavy • Soil drainage: free • Soil reaction: acid; neutral; alkaline • Special soil tolerances: shallow; infertile • Soil types: alkaline soils; alluvial soils; arenosols; vertisols; clay soils; gravelly soils; regosols; sandy soils; tropical soils"
	Simons, A.J. & Stewart, J.L. (1994). Gliricidia sepium − a multipurpose forage tree legume. Pp. 30-48 In: Gutteridge, R.C. & Shelton, H.M., (Eds.), Forage Tree Legumes in Tropical Agriculture. CAB International, Wallingford, UK	"The 30 sites sampled by Hughes (1987) in his range-wide collection of populations of G. sepium, represent a great diversity of soil types. Most of the soils were highly eroded, of acid reaction (pH 4.5-6.2) originating from volcanic parent material but also included sands, heavy clays and calcareous limestone soils which were slightly alkaline. At exotic locations, such as Peru, Szott et al. (1991) suggested that G. sepium was suitable for acid, infertile soils. Furthermore, Whiteman et al. (1986) considered G. sepium to be well adapted to low calcium soils in Australia, although G. sepium was seen to have poor survival on Indonesian soils with high aluminium saturation (Dierolf and Yost 1989)."

411	Climbing or smothering growth habit	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.	"Tree, 3 to 9 meters high or larger, the trunk usually short and crooked"

412	Forms dense thickets	
	Source(s)	Notes
	CAB International. (2005). Forestry Compendium. CAB International, Wallingford, UK	"In its native range it often grows on coastal sand dunes, sometimes forming extensive thickets in large areas of shifting sand (e.g. coastal Oaxaca on the Tehuantepec Isthmus in southern Mexico) (Hughes, 1987)."
	Simons, A.J. & Stewart, J.L. (1994). Gliricidia sepium − a multipurpose forage tree legume. Pp. 30-48 In: Gutteridge, R.C. & Shelton, H.M., (Eds.), Forage Tree Legumes in Tropical Agriculture. CAB International, Wallingford, UK	"Its rapid growth makes it an aggressive pioneer capable of colonising secondary forest and fallow Imperata dominated grassland often forming dense, pure stands (Anoka et al. 1991)."
	Condit, R., Pérez, R. & Daguerre, N. (2010). Trees of Panama and Costa Rica. Princeton University Press, Princeton, NJ	"Recognition: Dense stands along fences and roads are learned from a distance." [Cultivated stands]
	Hall, J. S., & Ashton, M. S. (2016). Guide to early growth and survival in plantations of 64 tree species native to Panama and the neotropics. Smithsonian Tropical Research Institute, Balboa, Panama	“Due to its thin crown, it should not be used to create conditions of deep shade to eliminate aggressive grasses. However, its crown form may allow for the recruitment of shade-tolerant species and will help create forest structure over time in restoration and reforestation treatments, particularly as canopy species pass it.”
	WRA Specialist. (2020). Personal Communication	Ability to form dense stands may be temporary, or may not be sufficient to exclude other vegetation.

Qsn #	Question	Answer
501	Aquatic	n
	Source(s)	Notes
	CAB International. (2005). Forestry Compendium. CAB International, Wallingford, UK	[Terrestrial] "In its native range it often grows on coastal sand dunes, sometimes forming extensive thickets in large areas of shifting sand (e.g. coastal Oaxaca on the Tehuantepec Isthmus in southern Mexico) (Hughes, 1987)."

502	Grass	n
	Source(s)	Notes
	USDA, Agricultural Research Service, National Plant Germplasm System. (2019). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/. [Accessed 12 Dec 2019]	Family: Fabaceae (alt.Leguminosae) Subfamily: Faboideae Tribe: Robinieae

503	Nitrogen fixing woody plant	y
	Source(s)	Notes
	CAB International. (2005). Forestry Compendium. CAB International, Wallingford, UK	"G. sepium is nitrogen fixing and nodulation has been observed to occur widely both in its native range and where introduced in Asia (Allen and Allen, 1981)."
	USDA, Agricultural Research Service, National Plant Germplasm System. (2019). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/. [Accessed 12 Dec 2019]	Family: Fabaceae (alt.Leguminosae) Subfamily: Faboideae Tribe: Robinieae

504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	n
	Source(s)	Notes
	Woodson, R. et al. (1980). Flora of Panama. Part V. Family 83. Leguminosae. Subfamily Papilionoideae (Conclusion). Annals of the Missouri Botanical Garden, 67(3), 523-818	"Trees to 10 m tall with spreading crowns"

601	Evidence of substantial reproductive failure in native habitat	n
	Source(s)	Notes
	CAB International. (2005). Forestry Compendium. CAB International, Wallingford, UK	[No evidence] "The 30 sites sampled by Hughes (1987) in his range-wide collection of populations of G. sepium, represent a great diversity of soil types. Most of the soils were highly eroded, of acid reaction (pH 4.5-6.2) originating from volcanic parent material but also included sands, heavy clays and calcareous limestone soils which were slightly alkaline. At exotic locations, such as Peru, Szott et al. (1991) suggested that G. sepium was suitable for acid, infertile soils. Furthermore, Whiteman et al. (1986) considered G. sepium to be well adapted to low calcium soils in Australia, although G. sepium was seen to have poor survival on Indonesian soils with high aluminium saturation (Dierolf and Yost 1989)."

602	Produces viable seed	y

Qsn #	Question	Answer
	Source(s)	Notes
	CAB International. (2005). Forestry Compendium. CAB International, Wallingford, UK	"G. sepium can be propagated easily by seed or by cuttings. In many seasonally dry areas, G. sepium produces abundant crops of seed from as early as 1–3 years of age."
	Duke, J. A. (1983). Gliricidia sepium. Handbook of Energy Crops. https://hort.purdue.edu/newcrop/duke_energy/Gliricidia_sepium.html. [Accessed 17 Dec 2019]	"Soak seeds 24 hours in lukewarm water and sow directly in potting soil in prepared pots (10 x 15 mm) wrapped in polyethylene. Move to shade for three weeks after germination, watering as needed. Use insecticide/fungicide once a month or as needed. Hardened 2-3 month old seedlings may be outplanted, avoiding midday heat, at the beginning of the rainy season (Fabian, 1981). Roskoski et al. (1980) note that the tree is easily propagated from seeds (which require no special treatment) or cuttings. Cuttings are used to make living fences throughout the tropics."

603	Hybridizes naturally	
	Source(s)	Notes
	CAB International. (2005). Forestry Compendium. CAB International, Wallingford, UK	[Putative natural hybridization may occur] "Artificial hybrids between the two have been created and putative natural, or spontaneous, hybrids detected following sporadic cultivation of G. sepium within the native range of G. maculata (Dawson et al., 1996)."

604	Self-compatible or apomictic	n
	Source(s)	Notes
	CAB International. (2005). Forestry Compendium. CAB International, Wallingford, UK	"The flowering biology, breeding and mating systems of G. sepium have been investigated by Simons (1996a) and Dawson and Chamberlain (1996). It is an obligate outcrossing species with a strong self- incompatibility mechanism."

605	Requires specialist pollinators	n
	Source(s)	Notes
	CAB International. (2005). Forestry Compendium. CAB International, Wallingford, UK	"Flowers are insect pollinated, visited by a limited variety of insects, but large bees, such as Xylocopa fimbriata, rewarded by abundant nectar production, are the principal pollinators (Janzen, 1983; Simons, 1996a; Wiersum and Nitis, 1997) in the native range. Although such bees are capable of distributing pollen over distances of several kilometres, Dawson and Chamberlain (1996) detected pollen flow usually over 75 m or less, but occasionally more than 250 m."
	Elevitch, C. R. (ed.). (2006). Traditional Trees of Pacific Islands: Their Culture, Environment, and Use. Permanent Agriculture Resources, Honolulu, HI	"Gliricidia attracts honeybees, carpenter bees, and a wide range of insect pollinators, and it provides limited cover for birds and mammals. In areas with a pronounced dry season, it flowers profusely and is a very good honey plant for the nectar it produces."

606	Reproduction by vegetative fragmentation	n
	Source(s)	Notes

Qsn #	Question	Answer
	CAB International. (2005). Forestry Compendium. CAB International, Wallingford, UK	[No evidence of natural vegetative spread] "As intimated by the Jamaican name 'quick‐stick', vegetative propagation of shoot cuttings is easily achieved, as long as the cuttings are of sufficient size and age. Many experiments to determine the optimal age and size, and even lunar phase for taking cuttings have been carried out (Yamoah et al., 1986; several papers in: Withington et al., 1987; Duguma, 1988). This has shown that large cuttings or branches, at least 6 months old, 3–6 cm thick and 0.5–2 m long with the bark incised to promote rooting are needed. Cuttings should be taken from mature branches with brownish green bark and planted fresh. Such branch cuttings take root within 6 weeks allowing the tree to be readily established as living fence posts. However, trees established from cuttings have shallower roots and are less hardy than trees grown from seed (Liyanage and Jayasundera, 1989). Clark and Hellin (1996) describe how G. sepium can be readily propagated from horizontally placed cuttings, making it ideal for bio‐engineering plantings to establish fascines and live mini‐check dams. For fascines, ring‐barking of horizontal cuttings between nodes is recommended to promote root and shoot development along the whole length of a buried cutting, thereby imparting greater strength to the bio‐engineering structure."
	Elevitch, C. R. (ed.). (2006). Traditional Trees of Pacific Islands: Their Culture, Environment, and Use. Permanent Agriculture Resources, Honolulu, HI	[No evidence of natural vegetative spread] "Gliricidia propagated from cuttings produces an extensive, shallow, lateral root system. Seedlings develop taproots, but it is unclear if the taproots endure throughout the life of the plant. One study of trees from seedlings on coastal sands reported poorly developed taproots and well developed lateral roots."

607	Minimum generative time (years)	1
	Source(s)	**Notes**
	Elevitch, C. R. (ed.). (2006). Traditional Trees of Pacific Islands: Their Culture, Environment, and Use. Permanent Agriculture Resources, Honolulu, HI	"Flowering and fruiting may begin as early as the end of the first growing season and almost always begins by the fifth growing season. Flowering occurs during the dry season, depending on the local climate. If rainfall is evenly distributed throughout the year, flowering may occur at any time, irregularly throughout the year, but in lower quantities compared with seasonal climates."
	CAB International. (2005). Forestry Compendium. CAB International, Wallingford, UK	"Flowering may start at 6–24 months of age."

701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	n
	Source(s)	**Notes**
	Simons, A.J. & Stewart, J.L. (1994). Gliricidia sepium − a multipurpose forage tree legume. Pp. 30-48 In: Gutteridge, R.C. & Shelton, H.M., (Eds.), Forage Tree Legumes in Tropical Agriculture. CAB International, Wallingford, UK	"Seeds are shed from pods through explosive dehiscence with seed dispersal distances of up to 40 m (Simons and Dunsdon 1992)."
	CAB International. (2005). Forestry Compendium. CAB International, Wallingford, UK	"The pods are 10–17 cm long and 14–22 mm wide, strongly compressed, green sometimes tinged maroon and fleshy unripe, drying mid yellow‐brown when ripe, and opening explosively when dry with the pod valves twisting into tight spirals after dehiscence. There are 3–10 lenticular, round, yellow‐brown, aging darker orange‐brown, seeds, 8.5–11.5 mm in diameter, per pod." [No means of attachment]

702	Propagules dispersed intentionally by people	y
	Source(s)	**Notes**

Qsn #	Question	Answer
	CAB International. (2005). Forestry Compendium. CAB International, Wallingford, UK	"G. sepium was introduced from Mexico to the Philippines before 1815, probably much earlier, and possibly as early as the early 1600s (Wiersum and Dirdjosoemarto, 1987) along with at least 200 other tropical American species, including other woody legumes such as Acacia, Leucaena, Pithecellobium, Prosopis and Samanea, aboard one of the annual Spanish government galleons that sailed from Acapulco to Manila during the period from 1521 to 1815 (Merrill, 1912). An early introduction to many other countries, principally for use as a shade tree over cacao, coffee or tea plantations, has been documented: to the Caribbean before 1850 (Ford, 1987), and to Sri Lanka in the 1880s based on seed from a single tree from Trinidad (Hughes, 1987). G. sepium has subsequently spread to India, Indonesia (about 1900: Wiersum and Nitis, 1997), West Africa and Uganda in the early 20th Century (Tothill, 1940), and to Kenya from the Caribbean in 1930 (Streets, 1962). These sporadic early introductions have been supplemented by even more widespread pantropical distribution of seed to 55 countries for species trials, and later provenance trials (Hughes and Styles, 1984; Hughes, 1987) and G. sepium now has a pantropical distribution."

703	Propagules likely to disperse as a produce contaminant	n
	Source(s)	**Notes**
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	"Dispersed by: Humans, Escapee"
	Simons, A.J. & Stewart, J.L. (1994). Gliricidia sepium − a multipurpose forage tree legume. Pp. 30-48 In: Gutteridge, R.C. & Shelton, H.M., (Eds.), Forage Tree Legumes in Tropical Agriculture. CAB International, Wallingford, UK	"Seeds are shed from pods through explosive dehiscence with seed dispersal distances of up to 40 m (Simons and Dunsdon 1992)."

704	Propagules adapted to wind dispersal	n
	Source(s)	**Notes**
	CABI. (2019). Invasive Species Compendium. Wallingford, UK: CAB International. www.cabi.org/isc	[Wind may influence dispersal direction, but seeds dispersed explosively] "G. sepium pods open explosively, and can catapult seed up to 40 m from standing trees (Simons, 1996a), and wind and water flow also influences the direction in which seeds are dispersed (WAC, 2005). Long distance dispersal is by man, who has planted this species widely in agroforestry, particularly as a shade tree, and widescale repeated introduction to exotic ranges has led to a pantropical distribution."

705	Propagules water dispersed	
	Source(s)	**Notes**
	CABI. (2019). Invasive Species Compendium. Wallingford, UK: CAB International. www.cabi.org/isc	[Possible if cultivated in riparian areas, but not specifically adapted for water dispersal] "G. sepium pods open explosively, and can catapult seed up to 40 m from standing trees (Simons, 1996a), and wind and water flow also influences the direction in which seeds are dispersed (WAC, 2005)."

706	Propagules bird dispersed	n
	Source(s)	**Notes**
	Simons, A.J. & Stewart, J.L. (1994). Gliricidia sepium − a multipurpose forage tree legume. Pp. 30-48 In: Gutteridge, R.C. & Shelton, H.M., (Eds.), Forage Tree Legumes in Tropical Agriculture. CAB International, Wallingford, UK	"Seeds are shed from pods through explosive dehiscence with seed dispersal distances of up to 40 m (Simons and Dunsdon 1992)."

Qsn #	Question	Answer
	CAB International. (2005). Forestry Compendium. CAB International, Wallingford, UK	[No evidence] "The pods are 10–17 cm long and 14–22 mm wide, strongly compressed, green sometimes tinged maroon and fleshy unripe, drying mid yellow–brown when ripe, and opening explosively when dry with the pod valves twisting into tight spirals after dehiscence. There are 3–10 lenticular, round, yellow–brown, aging darker orange–brown, seeds, 8.5–11.5 mm in diameter, per pod."

707	Propagules dispersed by other animals (externally)	n
	Source(s)	**Notes**
	Simons, A.J. & Stewart, J.L. (1994). Gliricidia sepium − a multipurpose forage tree legume. Pp. 30-48 In: Gutteridge, R.C. & Shelton, H.M., (Eds.), Forage Tree Legumes in Tropical Agriculture. CAB International, Wallingford, UK	[No evidence] "Seeds are shed from pods through explosive dehiscence with seed dispersal distances of up to 40 m (Simons and Dunsdon 1992)."

708	Propagules survive passage through the gut	n
	Source(s)	**Notes**
	Simons, A.J. & Stewart, J.L. (1994). Gliricidia sepium − a multipurpose forage tree legume. Pp. 30-48 In: Gutteridge, R.C. & Shelton, H.M., (Eds.), Forage Tree Legumes in Tropical Agriculture. CAB International, Wallingford, UK	"Seeds are shed from pods through explosive dehiscence with seed dispersal distances of up to 40 m (Simons and Dunsdon 1992)." [No evidence]

801	Prolific seed production (>1000/m2)	n
	Source(s)	**Notes**
	Wiersum, K.F. & Nitis, I.M. (1992). Gliricidia sepium (Jacq.) Kunth ex Walp.. In: Mannetje, L.'t and Jones, R.M. (Editors): Plant Resources of South-East Asia No 4: Forages. PROSEA Foundation, Bogor, Indonesia. https://www.prota4u.org/prosea/. [Accessed 17 Dec 2019]	"In its native area seed production is usually abundant and can be predictably timed. In more humid zones, shoot growth tends to be continuous and the evergreen tree flowers only sporadically on the basal parts of twigs from which the leaves have fallen."
	Cook, B.G., et al. (2019). Tropical Forages: an interactive selection tool. CIAT & ILRI. https://apps.lucidcentral.org/tropical_forages. [Accessed 17 Dec 2019]	"Limited seed production in exotic locations due to lack of pollinators and unsuitable environments for seed set may limit weed risk." … "Produces abundant seed. Seeds are shed from pods through explosive dehiscence with seed dispersal distances of up to 40 m. Seed production varies with provenance, ranging from 75 kg/ha for Belen Rivas up to 180 kg/ha for Monterrico, based on 7 seeds/pod and a seed weight of 8,000 seeds/kg."
	CAB International. (2005). Forestry Compendium. CAB International, Wallingford, UK	[Probably No. Depends on climate] "Seed production in an 18–month–old seed orchard in Nigeria averaged 37 kg/ha (Sumberg, 1985), but can be much higher in climatically favourable areas (Simons, 1996b). However, seed production in more humid, non–seasonal environments can be very low (Hughes, 1987; Allison and Simons, 1996)."
	WRA Specialist. (2020). Personal Communication	Based on estimates of 138 g seeds per tree, 6000 seeds per pound (453.6 g), 2.27 m crown width: G. sepium seed production = (138 g seed*13.2 seeds/g seed)/((2.27 m diameter/2)2*3.141) = 1821.6 seeds/4.046 m2 = 450.2 Seeds/m2

802	Evidence that a persistent propagule bank is formed (>1 yr)	y
	Source(s)	**Notes**
	CAB International. (2005). Forestry Compendium. CAB International, Wallingford, UK	"Seeds are orthodox and can be stored without loss of viability for at least 5 years under normal seed storage conditions (<10% moisture content and <4°C in sealed containers) (Allison and Simons, 1996)."

Qsn #	Question	Answer
803	Well controlled by herbicides	
	Source(s)	Notes
	Cook, B.G., et al. (2019). Tropical Forages: an interactive selection tool. CIAT & ILRI. https://apps.lucidcentral.org/tropical_forages. [Accessed 17 Dec 2019]	"Herbicide effects. Unknown. Likely to be similar to Leucaena leucocephala ."

804	Tolerates, or benefits from, mutilation, cultivation, or fire	y
	Source(s)	Notes
	Elevitch, C. R. (ed.). (2006). Traditional Trees of Pacific Islands: Their Culture, Environment, and Use. Permanent Agriculture Resources, Honolulu, HI	"Gliricidia is native to areas of Central America prone to perennial fires. It is often top-killed by fire, but young trees readily regenerate by sprouting from the root collar." … "The tree regenerates rapidly following cutting or other top damage."
	CAB International. (2005). Forestry Compendium. CAB International, Wallingford, UK	"It withstands fire well by quickly resprouting after damage. This explains the abundance of trees in secondary vegetation and bush fallows in many parts of Central America (Hughes, 1987; Simons, 1996a)." ... "G. sepium resprouts quickly and vigorously after cutting and is usually managed by coppicing or pollarding."

805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	
	Source(s)	Notes
	Parker, J.L. & Parsons, B. (2012). New Plant Records from the Big Island for 2010-2011. Bishop Museum Occasional Papers 113: 65-74	[Unknown] "Madre de cacao trees, in their native range of Mexico and Central America, are planted to shelter young coffee and cacao plantations (staples & Herbst 2005). This species was seen rarely in surveys but sometimes in massive plantings of over 100 trees. These naturalized plants were most likely spread from an agricultural planting."

Summary of Risk Traits:

Gliricidia sepium (madre de cacao) is a fast-growing, small to medium-sized tree native to Central and South America. It is often used in agroforestry systems and is valuable in providing shade for crops and livestock. Its leaves can also be pruned and used as green manure, providing essential nutrients to the soil. Although it is reported to be locally naturalized on Hawaii island and may be regarded as moderately invasive in some locations where it has been cultivated, it is generally considered to have positive effects on environments where it has been introduced. In addition, reduced seed set due to possible pollinator and climatic limitations may minimize risk of accidental or long-distance dispersal and spread.

High Risk / Undesirable Traits
• Elevation range exceeds 1000 m, demonstrating environmental versatility
• Thrives in tropical climates
• Naturalized on Hawaii (Hawaiian Islands) and elsewhere worldwide
• A weedy, disturbance-adapted tree regarded as invasive in a number of locations
• A potential environmental weed
• Potentially allelopathic
• Palatability may be low under certain conditions (but sometimes uses as a fodder plant)
• Potentially yoxic to dogs, horses and possibly other animals
• Tolerates many soil types
• Potentially capable of forming dense thickets
• Reproduces by seed
• Hybridizes with other species
• Reaches maturity in 6-24 months or longer
• Seeds dispersed by explosive dehiscence and intentionally by people
• Seeds able to be stored for extended periods; May form a persistent seed bank
• Able to coppice and tolerates repeated cutting and fires

Low Risk Traits
• Despite naturalization and weediness, often cultivated intentionally and regarded as a desirable species
• Unarmed (no spines, thorns, or burrs)
• May be palatable
• Light-demanding (deep shade may inhibit spread)
• Self-incompatible
• Limited seed production in humid, non-seasonal environments may reduce risk of escape and spread

Second Screening Results for Tree/tree-like shrubs

(A) Shade tolerant or known to form dense stands?> Possibly. May tolerate some shade but thrives in full sun. Forms dense stands, but may not exclude other vegetation
(B) Bird or clearly Wind-dispersed?> No. Explosively dehisced seeds
(C) Life cycle <4 years? Yes. Reaches maturity from 6-24 months

Outcome = Accept (Low Risk)