Family: ***Fabaceae***

Taxon: ***Calliandra calothyrsus***

Synonym: *Anneslea acapulcensis Britton & Rose*
Calliandra acapulcensis (Britton & Rose) Sta
Calliandra confusa Sprague & L. Riley
Calliandra houstoniana var. acapulcensis (M

Common Name: calliandra
red calliandra

Questionaire : current 20090513 **Assessor:** Patti Clifford **Designation:** H(HPWRA)
Status: Assessor Approved **Data Entry Person:** Patti Clifford **WRA Score 11**

101	**Is the species highly domesticated?**	**y=-3, n=0**	**n**
102	**Has the species become naturalized where grown?**	**y=1, n=-1**	**y**
103	**Does the species have weedy races?**	**y=1, n=-1**	**n**
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**	**n=0, y = 1*multiplier (see Appendix 2)**	
303	**Agricultural/forestry/horticultural weed**	**n=0, y = 2*multiplier (see Appendix 2)**	**y**
304	**Environmental weed**	**n=0, y = 2*multiplier (see Appendix 2)**	**n**
305	**Congeneric weed**	**n=0, y = 1*multiplier (see Appendix 2)**	**n**
401	**Produces spines, thorns or burrs**	**y=1, n=0**	**n**
402	**Allelopathic**	**y=1, n=0**	
403	**Parasitic**	**y=1, n=0**	**n**
404	**Unpalatable to grazing animals**	**y=1, n=-1**	**n**
405	**Toxic to animals**	**y=1, n=0**	**n**
406	**Host for recognized pests and pathogens**	**y=1, n=0**	
407	**Causes allergies or is otherwise toxic to humans**	**y=1, n=0**	**n**
408	**Creates a fire hazard in natural ecosystems**	**y=1, n=0**	
409	**Is a shade tolerant plant at some stage of its life cycle**	**y=1, n=0**	**y**

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**	
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**	**y=1, n=-1**	**y**
604	**Self-compatible or apomictic**	**y=1, n=-1**	**y**
605	**Requires specialist pollinators**	**y=-1, n=0**	
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**	**y**
702	**Propagules dispersed intentionally by people**	**y=1, n=-1**	**y**
703	**Propagules likely to disperse as a produce contaminant**	**y=1, n=-1**	**n**
704	**Propagules adapted to wind dispersal**	**y=1, n=-1**	**n**
705	**Propagules water dispersed**	**y=1, n=-1**	**y**
706	**Propagules bird dispersed**	**y=1, n=-1**	**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**	
803	**Well controlled by herbicides**	**y=-1, n=1**	
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)**	**y=-1, n=1**	

Designation: H(HPWRA) **WRA Score** **11**

Supporting Data:

101	2011. WRA Specialist. Personal Communication.	[Is the species highly domesticated? No] No evidence of domestication to reduce invasiveness.
102	2011. WRA Specialist. Personal Communication.	[Has the species become naturalized where grown? NA]
103	2011. WRA Specialist. Personal Communication.	[Does the species have weedy races? NA]
201	2011. USDA, ARS, National Genetic Resources Program. Germplasm Resources Information Network (GRIN) [Online Database Index]. National Germplasm Resources Laboratory, Beltsville, Maryland. http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl	[Species suited to tropical or subtropical climate(s) - If island is primarily wet habitat, then substitute "wet tropical" for "tropical or subtropical"? High] Native range: Mexico - Chiapas, Colima, Guerrero, Jalisco, Oaxaca, Veracruz; Belize; Costa Rica; El Salvador; Guatemala; Honduras; Nicaragua; Panama
202	2011. USDA, ARS, National Genetic Resources Program. Germplasm Resources Information Network (GRIN) [Online Database Index]. National Germplasm Resources Laboratory, Beltsville, Maryland. http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl	[Quality of climate match data? High] Native range: Mexico - Chiapas, Colima, Guerrero, Jalisco, Oaxaca, Veracruz; Belize; Costa Rica; El Salvador; Guatemala; Honduras; Nicaragua; Panama
203	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	[Broad climate suitability (environmental versatility)? Yes] Climatic amplitude (estimates) - Altitude range: 0 - 1850 m - Mean annual rainfall: 700 - 4000 mm - Rainfall regime: summer - Dry season duration: 0 - 6 months - Mean annual temperature: 22 - 28ºC - Mean maximum temperature of hottest month: 19 - 30ºC - Mean minimum temperature of coldest month: 9 - 26ºC
203	2005. Cook, B.G./Pengelly, B.C./Brown, S.D.et al.. Tropical Forages: an interactive selection tool., [CD-ROM],. SIRO, DPI&F(Qld), CIAT and ILRI, http://www.tropicalforages.info/index.htm	[Broad climate suitability (environmental versatility)? Yes] Adapted to altitudes from 0-1,850 m asl . Mean monthly maximum temperatures of 24-28ºC, and mean minimum temperatures of 18-24ºC. C. calothyrsus is frost susceptible but possesses considerable cool tolerance for a tropical species, growing naturally to 1,800 m asl in Guatemala and exotically to 2,000 m asl in Indonesia and Kenya.
204	2008. Imada, C.. Hawaiian flowering plants checklist: main Hawaiian islands. Bishop Museum, Available at: http://www.bishopmuseum.org/research/natsci/botany/dbandkeys/ Main%20Islands%20Report.pdf. Available at: http://www.bishopmuseum.org/research/	[Native or naturalized in regions with tropical or subtropical climates? Yes] Naturalized on Maui and Lanai Islands, Hawaii.
204	2011. USDA, ARS, National Genetic Resources Program. Germplasm Resources Information Network (GRIN) [Online Database Index]. National Germplasm Resources Laboratory, Beltsville, Maryland. http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl	[Native or naturalized in regions with tropical or subtropical climates? Yes] Native range: Mexico - Chiapas, Colima, Guerrero, Jalisco, Oaxaca, Veracruz; Belize; Costa Rica; El Salvador; Guatemala; Honduras; Nicaragua; Panama
205	1998. Palmer, B./Macqueen, D.J./Gutteridge, R.C.. Calliandra calothyrus - a multipurpose tree legume for humid locations In: Forage tree legumes in tropical agriculture. The Tropical Grassland Society of Australia, St. Lucia, Queensland http://www.fao.org	[Does the species have a history of repeated introductions outside its natural range? Yes] Introduced to Java, Indonesia, Africa, Australia, Brazil, Bolivia and Hawaii.
205	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	[Does the species have a history of repeated introductions outside its natural range? Yes] Widely cultivated in Asia; Indonesia; Pacific Islands; South America; Africa and the Caribbean.
301	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	[Naturalized beyond native range? Yes] Naturalized in Indonesia.

301	2008. Imada, C.. Hawaiian flowering plants checklist: main Hawaiian islands. Bishop Museum, Available at: http://www.bishopmuseum.org/research/natsci/botany/dbandkeys/ Main%20Islands%20Report.pdf. Available at: http://www.bishopmuseum.org/research/	[Naturalized beyond native range? Yes] Naturalized on Maui and Lanai Islands, Hawaii.
302	2003. Kairo, M./Ali, B./Cheesman, O./Haysom, K./Murphy, S.. Invasive Species Threats in the Caribbean Region – Report to the Nature Conservancy. CAB International, Curepe, Trinidad& Tobago http://www.invasivespecies.net/database/species/reference_files/Ka	[Garden/amenity/disturbance weed?] Calliandra calothyrsus is considered invasive in the Dominican Republic. [no management is mentioned]
303	2006. Hauser, S./Nyajou, M./Zapfack, L.. Farmer's perception and use of planted Calliandra calothyrsus fallow in southern Cameroon. http://www.tropentag.de/2006/abstracts/full/321.pdf	[Agricultural/forestry/horticultural weed? Yes] "The invasive character of Calliandra is a concern to many farmers who have abandoned this fallow. While the initial establishment was problematic, requiring scarifying seed and raising trees in nurseries, the species is capable to spread and establish in the surrounding fallows and crop. Strong superficial roots impede tools and Calliandra is perceived by many farmers as a weed. Calliandra can be controlled by herbicides such as glyphosate yet, under the usual manual control regime of farmers it re-sprouts rather quickly."
304	2011. WRA Specialist. Personal Communication.	[Environmental weed? No] No evidence of control.
305	2011. WRA Specialist. Personal Communication.	[Congeneric weed? No] No evidence.
401	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	[Produces spines, thorns or burrs? No] Calliandra calothyrsus is a thornless shrub or small tree, single or multiple stemmed, to 12 m tall; stems to 20 cm diameter at base.
402	1995. Thijssen, R.. Weeds and trees. ILEIA. 11: 20.http://ip.aaas.org/tekindex.nsf/2a9c4e44835b04ea85256a7200577a64/fd60347508a7ffe785256bd4006b8c4c/Body/M1?OpenElement	[Allelopathic?] "An exciting new finding by KWAP in western Kenya is that Calliandra calothyrsus, a popular agroforestry species for animal fodder and firewood production, can considerably reduce infestation of maize fields with the parasitic weed Striga. A pot experiment with Calliandra green manure showed a reduction in the presence of the, for this area, most important agricultural pest with almost 70% (Table 2). Field observations of this species interplanted with maize confirmed this finding."
403	2005. Staples, G.W./Herbst, D.R.. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI	[Parasitic? No] Fabaceae.
404	2005. Staples, G.W./Herbst, D.R.. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI	[Unpalatable to grazing animals? No] Cultivated as a livestock forage plant in Java.
405	2005. Cook, B.G./Pengelly, B.C./Brown, S.D.et al.. Tropical Forages: an interactive selection tool., [CD-ROM],. SIRO, DPI&F(Qld), CIAT and ILRI, http://www.tropicalforages.info/index.htm	[Toxic to animals? No] No known toxicity to ruminants.
405	2005. Staples, G.W./Herbst, D.R.. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI	[Toxic to animals? No] Cultivated as a livestock forage plant in Java.
406	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	[Host for recognized pests and pathogens?] "In Powell (1997), Boa reviewed pests and diseases of C. calothyrsus and concluded that there are few serious problems in either the native range or where the species is planted as an exotic. The most serious threats appear to be fungal infections with Camptomeris calliandrae (leaf drop and dieback in Honduras), and Armillaria mellea subsp. africana (limited outbreak of root rot at cool high altitude sites in Kenya), and attacks upon seeds by bruchid beetles."

406	2005. Cook, B.G./Pengelly, B.C./Brown, S.D.et al.. Tropical Forages: an interactive selection tool., [CD-ROM],. SIRO, DPI&F(Qld), CIAT and ILRI, http://www.tropicalforages.info/index.htm	[Host for recognized pests and pathogens?] Significant pests and diseases are starting to appear on calliandra in east Africa, particularly Uganda, including heavy infestation by a scale insect (Pulvinarisca jacksoni), severe and sudden dieback (of uncertain cause) on unpruned trees at about two years old. In Indonesia, a scale insect occasionally infests branches and stems, termites and borers attack the stem , and a looper eats the leaves. Fungal diseases (e.g. Corticium salmonicola and Xylaria spp.) may infect and kill stems made susceptible through harvest wounds.
409	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	[Is a shade tolerant plant at some stage of its life cycle? Yes] Shade tolerant.
409	2005. Cook, B.G./Pengelly, B.C./Brown, S.D.et al.. Tropical Forages: an interactive selection tool., [CD-ROM],. SIRO, DPI&F(Qld), CIAT and ILRI, http://www.tropicalforages.info/index.htm	[Is a shade tolerant plant at some stage of its life cycle? Yes] Intolerant of heavy shade. In Uganda and Tanzania it is being adopted in home garden systems where it is planted under banana with moderate shade.
410	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	[Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)? Yes] Soil descriptors - Soil texture: light; medium - Soil drainage: free - Soil reaction: acid; neutral; alkaline - Special soil tolerances: infertile - Soil types: acrisols; cambisols; ferralsols; fluvisols; gleysols; luvisols; nitisols; regosols; rendzinas; ultisols; vertisols; volcanic soils
410	2005. Cook, B.G./Pengelly, B.C./Brown, S.D.et al.. Tropical Forages: an interactive selection tool., [CD-ROM],. SIRO, DPI&F(Qld), CIAT and ILRI, http://www.tropicalforages.info/index.htm	[Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)? Yes] Grows well on a wide range of soil types ranging from deep volcanic loams to more acidic metamorphic sandy clays. Naturally well suited to the light-textured slightly acidic soils of volcanic origin. Well adapted to acid infertile soils but will respond to fertiliser application on such soils. It does not tolerate waterlogged conditions, and does not grow well on poorly drained calcareous soils.
411	2005. Cook, B.G./Pengelly, B.C./Brown, S.D.et al.. Tropical Forages: an interactive selection tool., [CD-ROM],. SIRO, DPI&F(Qld), CIAT and ILRI, http://www.tropicalforages.info/index.htm	[Climbing or smothering growth habit? No] Small, perennial, thornless leguminous tree growing 2-12 m high.
412	2011. World Agroforestry Centre. Calliandra calothyrsus. http://www.worldagroforestrycentre.org/sea/Products/AFDbases/af/asp/SpeciesInfo.asp?SpID=410	[Forms dense thickets?] In its natural habitat, Calliandra calothyrsus occurs in secondary vegetation, often in thickets.
501	2005. Cook, B.G./Pengelly, B.C./Brown, S.D.et al.. Tropical Forages: an interactive selection tool., [CD-ROM],. SIRO, DPI&F(Qld), CIAT and ILRI, http://www.tropicalforages.info/index.htm	[Aquatic? No] Terrstrial; tree.
502	2005. Cook, B.G./Pengelly, B.C./Brown, S.D.et al.. Tropical Forages: an interactive selection tool., [CD-ROM],. SIRO, DPI&F(Qld), CIAT and ILRI, http://www.tropicalforages.info/index.htm	[Grass? No] Fabaceae.
503	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	[Nitrogen fixing woody plant? Yes] "Calliandra calothyrsus is a nitrogen-fixing tree legume which has recently become popular for use in small-scale tropical agroforestry due largely to its provision of fuelwood and animal fodder, and its tolerance of acidic soils."
503	2005. Cook, B.G./Pengelly, B.C./Brown, S.D.et al.. Tropical Forages: an interactive selection tool., [CD-ROM],. SIRO, DPI&F(Qld), CIAT and ILRI, http://www.tropicalforages.info/index.htm	[Nitrogen fixing woody plant? Yes] A multipurpose species grown primarily for forage as a supplement to low quality roughages for ruminant livestock.
504	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	[Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)? No] Tree.
504	2005. Cook, B.G./Pengelly, B.C./Brown, S.D.et al.. Tropical Forages: an interactive selection tool., [CD-ROM],. SIRO, DPI&F(Qld), CIAT and ILRI, http://www.tropicalforages.info/index.htm	[Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)? No] Tree.
601	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	[Evidence of substantial reproductive failure in native habitat? No] In its native range C. calothyrsus is widespread and most provenances are not under immediate threat of extinction.

602	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	[Produces viable seed? Yes] Pretreatment of seed is not essential if the seed is fresh although soaking in cold water for 12 hours may assist germination. Inoculation of the seeds or nursery soil with mychorrizas and Rhizobium should be encouraged and appears to be particularly important for marginal sites.
602	2005. Cook, B.G./Pengelly, B.C./Brown, S.D.et al.. Tropical Forages: an interactive selection tool., [CD-ROM],. SIRO, DPI&F(Qld), CIAT and ILRI, http://www.tropicalforages.info/index.htm	[Produces viable seed? Yes] Seed requires scarification. Good results are achieved by soaking seed in cold water for 48 hours. Hot water treatment can be used but there is a risk of killing seed through excessive exposure to high temperature. Mechanical scarification is also used. Use scarified seed planted at 1-3cm depth or seedlings raised in nurseries when the plants are 20-50cm tall.
603	1992. MacQueen, D.J.. Calliandra calothyrsus: implications of plant taxonomy, ecology and biology for seed collection. Commonwealth Forestry Review. 71: 20 - 34.http://www.dfid.gov.uk/R4D/PDF/Outputs/Forestry/CFR71_Calliandra.pdf	[Hybridizes naturally? Yes] Hernandez presents evidence from various herbarium specimens that hybrids naturally occur between Calliandra calothyrsus and Calliandra houstoniana.
603	1996. Evans, D.O.. International workshop on the genus Calliandra. Winrock International, Morrilton, Arkansas http://www.nzdl.org/gsdlmod?e=d-00000-00---off-0hdl--00-0----0-10-0---0---0direct-10---4-------0-1l--11-en-50---20-about---00-0-1-00-0-0-11-1-0ut	[Hybridizes naturally? Yes] Putative hybrids in the native range of these species have only been documented between C. calothyrsus and C. houstoniana.
604	2000. Chamberlain, J.R.. Improving seed production in Calliandra calothyrsus - a field manual for researchers and extension workers. Oxford Forest Institute University of Oxford, http://ww.sl.kvl.dk/dfsc/Extensionstudy/050%20Improving%20Seed%20Production	[Self-compatible or apomictic? Yes] Calliandra has a mixed mating system. It is mainly outcrossing but can also self fertilize.
604	2005. Cook, B.G./Pengelly, B.C./Brown, S.D.et al.. Tropical Forages: an interactive selection tool., [CD-ROM],. SIRO, DPI&F(Qld), CIAT and ILRI, http://www.tropicalforages.info/index.htm	[Self-compatible or apomictic? Yes] Flowers are andromonoecious, bearing both hermaphrodite (bisexual) and staminate (male) flowers. Predominantly outcrossing with a weak, possibly late-acting, self-incompatibility system. The level of selfing is influenced by provenance, age, floral phenology, population size and pollinator behaviour.
605	1998. Palmer, B./Macqueen, D.J./Gutteridge, R.C.. Calliandra calothyrus - a multipurpose tree legume for humid locations In: Forage tree legumes in tropical agriculture. The Tropical Grassland Society of Australia, St. Lucia, Queensland http://www.fao.org	[Requires specialist pollinators? No] Pollination is achieved in the native range by hawkmoths and bats of the genus Glossophaga.
605	2000. Chamberlain, J.R.. Improving seed production in Calliandra calothyrsus - a field manual for researchers and extension workers. Oxford Forest Institute University of Oxford, http://ww.sl.kvl.dk/dfsc/Extensionstudy/050%20Improving%20Seed%20Production	[Requires specialist pollinators? No] Pollinated by bats and large moths.
605	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	[Requires specialist pollinators?] The principal pollinating agents - nectivorous bats, which require free movement around the crown - are not present in all areas. Even in regions where bats are endemic it may take some time for them to identify and begin to visit new populations of C. calothyrsus. Pollination is by bats and moths.
605	2005. Cook, B.G./Pengelly, B.C./Brown, S.D.et al.. Tropical Forages: an interactive selection tool., [CD-ROM],. SIRO, DPI&F(Qld), CIAT and ILRI, http://www.tropicalforages.info/index.htm	[Requires specialist pollinators? No] Pollination is achieved by hawkmoths, bats of the genus Glossophaga and other less specialised fruit bats.
606	1998. Palmer, B./Macqueen, D.J./Gutteridge, R.C.. Calliandra calothyrus - a multipurpose tree legume for humid locations In: Forage tree legumes in tropical agriculture. The Tropical Grassland Society of Australia, St. Lucia, Queensland http://www.fao.org	[Reproduction by vegetative fragmentation? No] Calliandra calothyrsus does not take well from stakes and is therefore best propagated from seed in the field or raised in a nursery.
606	2005. Cook, B.G./Pengelly, B.C./Brown, S.D.et al.. Tropical Forages: an interactive selection tool., [CD-ROM],. SIRO, DPI&F(Qld), CIAT and ILRI, http://www.tropicalforages.info/index.htm	[Reproduction by vegetative fragmentation? No] Does not establish well from cuttings.

607	1998. Palmer, B./Macqueen, D.J./Gutteridge, R.C.. Calliandra calothyrus - a multipurpose tree legume for humid locations In: Forage tree legumes in tropical agriculture. The Tropical Grassland Society of Australia, St. Lucia, Queensland http://www.fao.org	[Minimum generative time (years)? 1] Seed production may commence in the first year but usually the plant fruits well only after the second year
607	2000. Chamberlain, J.R.. Improving seed production in Calliandra calothyrsus - a field manual for researchers and extension workers. Oxford Forest Institute University of Oxford, http://ww.sl.kvl.dk/dfsc/Extensionstudy/050%20Improving%20Seed%20Production	[Minimum generative time (years)? 1] Seed is produced in the first year of growth. Although not all trees will flower and produce seed at the same time.
701	1998. Palmer, B./Macqueen, D.J./Gutteridge, R.C.. Calliandra calothyrus - a multipurpose tree legume for humid locations In: Forage tree legumes in tropical agriculture. The Tropical Grassland Society of Australia, St. Lucia, Queensland http://www.fao.org	[Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)? Yes]Calliandra calothyrsus is a riverine colonist with relatively rapid early growth. It is outcompeted in later successional stages but may often invade areas of continual disturbance such as roadsides or shifting cultivations
702	1998. Palmer, B./Macqueen, D.J./Gutteridge, R.C.. Calliandra calothyrus - a multipurpose tree legume for humid locations In: Forage tree legumes in tropical agriculture. The Tropical Grassland Society of Australia, St. Lucia, Queensland http://www.fao.org	[Propagules dispersed intentionally by people? Yes] Introduced to Java, Indonesia, Africa, Australia, Brazil, Bolivia and Hawaii.
702	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	[Propagules dispersed intentionally by people? Yes] Widely cultivated in Asia; Indonesia; Pacific Islands; South America; Africa and the Caribbean.
703	2011. WRA Specialist. Personal Communication.	[Propagules likely to disperse as a produce contaminant? No] No evidence.
704	2005. Cook, B.G./Pengelly, B.C./Brown, S.D.et al.. Tropical Forages: an interactive selection tool., [CD-ROM],. SIRO, DPI&F(Qld), CIAT and ILRI, http://www.tropicalforages.info/index.htm	[Propagules adapted to wind dispersal? No] Seed dispersal is through explosive apical dehiscence of the pods.
705	1998. Palmer, B./Macqueen, D.J./Gutteridge, R.C.. Calliandra calothyrus - a multipurpose tree legume for humid locations In: Forage tree legumes in tropical agriculture. The Tropical Grassland Society of Australia, St. Lucia, Queensland http://www.fao.org	[Dispersed by water? Yes] Calliandra calothyrsus is a riverine colonist with relatively rapid early growth. It is outcompeted in later successional stages but may often invade areas of continual disturbance such as roadsides or shifting cultivations
705	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	[Dispersed by water? Yes] Vegetation types: riparian forests; secondary forests.
706	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	[Propagules bird dispersed? No] Pods.
707	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	[Propagules dispersed by other animals (externally)? No] Pods to 142 x 18 mm, occasionally rostrate, thickly membranous, pale to dark brown, glabrous, rarely densely pubescent with multicellular conical or filiform capitate hairs. Seeds 8, ovate, 7-8 x 5-6 mm, brown, dark mottled.
708	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	[Propagules survive passage through the gut? No] Pods. [unlikely to be eaten by animals]
801	2000. Chamberlain, J.R.. Improving seed production in Calliandra calothyrsus - a field manual for researchers and extension workers. Oxford Forest Institute University of Oxford, http://ww.sl.kvl.dk/dfsc/Extensionstudy/050%20Improving%20Seed%20Production	[Prolific seed production (>1000/m2)? No] At least 110 g of seed per tree (1700 seeds) can be produced each season, (250-300) pods per tree0, however this will vary with the age and size of the tree and the location.
801	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	[Prolific seed production (>1000/m2)? No] Calliandra does not produce large quantities of seed which can be a drawback for propagation programmes.
802	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	[Evidence that a persistent propagule bank is formed (>1 yr)?] Seed storage orthodox.
802	2005. Cook, B.G./Pengelly, B.C./Brown, S.D.et al.. Tropical Forages: an interactive selection tool., [CD-ROM],. SIRO, DPI&F(Qld), CIAT and ILRI, http://www.tropicalforages.info/index.htm	[Evidence that a persistent propagule bank is formed (>1 yr)?] Seed requires scarification. Good results are achieved by soaking seed in cold water for 48 hours. Hot water treatment can be used but there is a risk of killing seed through excessive exposure to high temperature. Mechanical scarification is also used. Use scarified seed planted at 1-3cm depth or seedlings raised in nurseries when the plants are 20-50cm tall.

803	2011. WRA Specialist. Personal Communication.	[Well controlled by herbicides? Unknown]
804	2000. Chamberlain, J.R.. Improving seed production in Calliandra calothyrsus - a field manual for researchers and extension workers. Oxford Forest Institute University of Oxford, http://ww.sl.kvl.dk/dfsc/Extensionstudy/050%20Improving%20Seed%20Production	[Tolerates, or benefits from, mutilation, cultivation, or fire? Yes] Calliandra responds well to coppicing and pollarding.
804	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	[Tolerates, or benefits from, mutilation, cultivation, or fire? Yes] Tolerates pruning; coppices.
805	2011. WRA Specialist. Personal Communication.	[Effective natural enemies present locally (e.g. introduced biocontrol? Unknown]