Taxon: Acacia angustissima (Mill.) Kuntze

Family: Fabaceae

Common Name(s): fern acacia
prairie acacia
Prairie wattle
whiteball acacia

Synonym(s): Acacia boliviana Rusby
Acacia suffrutescens Rose
Acaciella angustissima (Mill.) Britton
Acaciella suffrutescens (Rose) Britton
Mimosa angustissima Mill.
Senegalia angustissima (Mill.) Pedley

Assessor: Chuck Chimera **Status:** Assessor Approved **End Date:** 28 Jan 2016

WRA Score: 9.0 **Designation:** H(HPWRA) **Rating:** High Risk

Keywords: Tropical Shrub, Weedy, Thicket-Forming, N-Fixing, Coppices

Qsn #	Question	Answer Option	Answer
101	Is the species highly domesticated?	y=-3, n=0	n
102	Has the species become naturalized where grown?		
103	Does the species have weedy races?		
201	Species suited to tropical or subtropical climate(s) - If island is primarily wet habitat, then substitute "wet tropical" for "tropical or subtropical"	(0-low; 1-intermediate; 2-high) (See Appendix 2)	High
202	Quality of climate match data	(0-low; 1-intermediate; 2-high) (See Appendix 2)	High
203	Broad climate suitability (environmental versatility)	y=1, n=0	y
204	Native or naturalized in regions with tropical or subtropical climates	y=1, n=0	y
205	Does the species have a history of repeated introductions outside its natural range?	y=-2, ?=-1, n=0	y
301	Naturalized beyond native range	y = 1*multiplier (see Appendix 2), n= question 205	y
302	Garden/amenity/disturbance weed		
303	Agricultural/forestry/horticultural weed	n=0, y = 2*multiplier (see Appendix 2)	n
304	Environmental weed		
305	Congeneric weed		
401	Produces spines, thorns or burrs	y=1, n=0	n
402	Allelopathic	y=1, n=0	n
403	Parasitic	y=1, n=0	n
404	Unpalatable to grazing animals	y=1, n=-1	n
405	Toxic to animals		
406	Host for recognized pests and pathogens		

Qsn #	Question	Answer Option	Answer
407	Causes allergies or is otherwise toxic to humans		
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	y
607	Minimum generative time (years)		
701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)		
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		
705	Propagules water dispersed		
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/m2)	y=1, n=-1	y
802	Evidence that a persistent propagule bank is formed (>1 yr)	y=1, n=-1	y
803	Well controlled by herbicides	y=-1, n=1	y
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**
	Csurhes, S. & Navie, S. 2009. Weed Risk Assessment. White ball acacia. Acaciella angustissima (syn. Acacia angustissima, Acacia boliviana). The State of Queensland, Department of Employment, Economic Development and Innovation	[High levels of variability, but no evidence of domestication] "Because A. angustissima displays a high degree of morphological variability over its natural range and consists of several reasonably distinct varieties or a complex of several closely related species, there has been considerable confusion over its identity. This has led to a large number of alternative names or synonyms being applied to it."
	Cook, B.G., Pengelly, B.C., Brown, S.D., Donnelly, J.L., Eagles, D.A., Franco, M.A., Hanson, J., Mullen, B.F., Partridge, I.J., Peters, M, & Schultze-Kraft, R. 2005. Tropical Forages: an interactive selection tool., [CD-ROM], SIRO, DPI&F(Qld), CIAT and ILRI. http://www.tropicalforages.info/index.htm. [Accessed 27 Jan 2016]	[No evidence of domestication] "Genetics/breeding: No breeding programs are being undertaken. A large number of accessions/provenances from across the native range are held by ILRI."

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

103	**Does the species have weedy races?**	
	Source(s)	**Notes**
	WRA Specialist. 2016. Personal Communication	NA

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

Qsn #	Question	Answer
	USDA, ARS, Germplasm Resources Information Network, 2016. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html. [Accessed 27 Jan 2016]	"Native: Northern America North-Central U.S.A.: United States - Kansas, - Oklahoma Northern Mexico: Mexico - Chihuahua, - Coahuila, - Durango, - Nuevo Leon, - San Luis Potosi, - Sinaloa, - Sonora, - Tamaulipas, - Zacatecas, - Baja Sur South-Central U.S.A.: United States - New Mexico, - Texas Southeastern U.S.A.: United States - Arkansas, - Florida, - Kentucky, - Louisiana Southern Mexico: Mexico - Aguascalientes, - Campeche, - Chiapas, - Colima, - Guanajuato, - Guerrero, - Hidalgo, - Jalisco, - Mexico, - Michoacan, - Morelos, - Nayarit, - Oaxaca, - Puebla, - Queretaro, - Quintana Roo, - Tabasco, - Veracruz, - Yucatan, - Federal District Southwestern U.S.A.: United States - Arizona, - California Southern America Mesoamerica: Costa Rica; El Salvador; Guatemala; Honduras; Nicaragua; Panama Northern South America: Venezuela Southern South America: Argentina - Jujuy, - Salta Western South America: Bolivia; Colombia; Ecuador; Peru"

202	Quality of climate match data	High
	Source(s)	**Notes**
	USDA, ARS, Germplasm Resources Information Network, 2016. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html. [Accessed 27 Jan 2016]	

203	Broad climate suitability (environmental versatility)	y
	Source(s)	**Notes**
	Csurhes, S. & Navie, S. 2009. Weed Risk Assessment. White ball acacia. Acaciella angustissima (syn. Acacia angustissima, Acacia boliviana). The State of Queensland, Department of Employment, Economic Development and Innovation	"Acaciella angustissima prefers tropical climates but can persist in warmer sub-tropical areas. It is best adapted to seasonally dry areas within these climate zones." ... "Acaciella angustissima grows naturally from near sea level to 2800 m. It can also tolerate cold climates once established, including occasional temperatures below freezing (Cook et al. 2005)."
	Orwa C,, Mutua, A., Kindt R., Jamnadass, R, & Anthony, S. 2009 Agroforestree Database: a tree reference and selection guide version 4.0. http://www.worldagroforestry.org. [Accessed 26 Jan 2016]	"Altitude: 0-2600 m Mean annual temperature: 5-30 deg C. Mean annual rainfall: 895-2870 mm" [Elevation range exceeds 2000 m, demonstrating environmental versatility]
	CAB International, 2005. Forestry Compendium. CAB International, Wallingford, UK	"This species is originally from Central America and tolerates a wide range of soils and climates, from high altitude pine-oak forests to extremely dry habitats in the lowlands of Mexico."

204	Native or naturalized in regions with tropical or subtropical climates	y

Qsn #	Question	Answer
	Source(s)	**Notes**
	Csurhes, S. & Navie, S. 2009. Weed Risk Assessment. White ball acacia. Acaciella angustissima (syn. Acacia angustissima, Acacia boliviana). The State of Queensland, Department of Employment, Economic Development and Innovation	"Acaciella angustissima prefers tropical climates but can persist in warmer sub-tropical areas. It is best adapted to seasonally dry areas within these climate zones."
	Orwa C,, Mutua, A., Kindt R., Jamnadass, R, & Anthony, S. 2009 Agroforestree Database: a tree reference and selection guide version 4.0. http://www.worldagroforestry.org. [Accessed 27 Jan 2016]	"Native: Costa Rica, Mexico, Panama, US Exotic: Australia, Brazil, Ethiopia, Haiti, Indonesia, Papua New Guinea, Zimbabwe

205	Does the species have a history of repeated introductions outside its natural range?	y
	Source(s)	**Notes**
	Csurhes, S. & Navie, S. 2009. Weed Risk Assessment. White ball acacia. Acaciella angustissima (syn. Acacia angustissima, Acacia boliviana). The State of Queensland, Department of Employment, Economic Development and Innovation	"Acaciella angustissima has also been introduced to Brazil, the Dominican Republic, India, Pakistan, Thailand, Indonesia, the Philippines, Australia and Papua New Guinea (ILDIS, 2005; Rico Arce and Bachman, 2006)."
	Queensland Government. 2011. Weeds of Australia - Bolivian wattle Acaciella angustissima. http://keyserver.lucidcentral.org/weeds/data/03030800-0b07-490a-8d04-0605030c0f01/media/Html/Acaciella_angustissima.htm. [Accessed 27 Jan 2016]	"Cultivation: This species has been cultivated in a few locations as part of fodder tree trials (e.g. Millaroo Research Station, Walkamin Research Station and on a grazing property in Central Queensland). These trials demonstrated that it had moderate palatability to grazing cattle, however research was not continued due to its perceived risk as a potential weed. It is generally not grown as an ornamental species, but at least one specimen has been reported from a botanic garden."
	USDA, ARS, Germplasm Resources Information Network, 2016. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html. [Accessed 27 Jan 2016]	"Naturalized: Asia-Tropical Indo-China: Thailand Malesia: Indonesia; Papua New Guinea; Philippines Australasia Australia: Australia Cultivated: Southern America Brazil: Brazil Caribbean: Dominican Republic"

301	Naturalized beyond native range	y
	Source(s)	**Notes**
	Queensland Government. 2011. Weeds of Australia - Bolivian wattle Acaciella angustissima. http://keyserver.lucidcentral.org/weeds/data/03030800-0b07-490a-8d04-0605030c0f01/media/Html/Acaciella_angustissima.htm. [Accessed 27 Jan 2016]	"Bolivian wattle (Acaciella angustissima) was introduced into Queensland as part of research to find new fodder shrubs for cattle. It has so far only become sparingly naturalised along a short section of Witton Creek in Indooroopilly in suburban Brisbane."

Qsn #	Question	Answer
	Odenyo, A. A., Osuji, P. O., Reed, J. D., Smith, A. H., Mackie, R. I., McSweeney, C. S., & Hanson, J. (2003). Acacia angustissima: Its anti-nutrients constituents, toxicity and possible mechanisms to alleviate the toxicity–a short review. Agroforestry Systems, 59(2), 141-147	"In Asia one of the thornless acacias has been naturalized and grow extensively in the eastern islands of Indonesia E. Wina, Pers. Comm. but it is not clear whether this is A. angustissima or A. vilosa."
	McSweeney, C. S., Gough, J., Conlan, L. L., Hegarty, M. P., Palmer, B., & Krause, D. O. (2005). Nutritive value assessment of the tropical shrub legume Acacia angustissima: anti-nutritional compounds and in vitro digestibility. Animal Feed Science and Technology, 121(1), 175-190	"It has also been naturalised in Southeast Asia particularly Indonesia where it is called A. vilosa (Lowry et al., 1992)."
	USDA, ARS, Germplasm Resources Information Network, 2016. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html. [Accessed 27 Jan 2016]	"Naturalized: Asia-Tropical Indo-China: Thailand Malesia: Indonesia; Papua New Guinea; Philippines Australasia Australia: Australia"

302	Garden/amenity/disturbance weed	
	Source(s)	**Notes**
	Cook, B.G., Pengelly, B.C., Brown, S.D., Donnelly, J.L., Eagles, D.A., Franco, M.A., Hanson, J., Mullen, B.F., Partridge, I.J., Peters, M, & Schultze-Kraft, R. 2005. Tropical Forages: an interactive selection tool., [CD-ROM], SIRO, DPI&F(Qld), CIAT and ILRI. http://www.tropicalforages.info/index.htm. [Accessed 27 Jan 2016]	"Weed potential: The ability to tolerate repeated coppicing, in combination with its prolific seed production, rapid growth and low palatability to ruminant livestock has enabled A. angustissima to become a weed in its native range and in exotic locations, forming thickets along roadsides and on free draining soils in rangelands. Extreme caution should be exercised in introducing A. angustissima to exotic environments."
	Csurhes, S. & Navie, S. 2009. Weed Risk Assessment. White ball acacia. Acaciella angustissima (syn. Acacia angustissima, Acacia boliviana). The State of Queensland, Department of Employment, Economic Development and Innovation	[Disturbance-adapted] "Field observations of this species in disturbed coastal riparian habitats in south-eastern Queensland (i.e. subtropical climates) and disturbed coastal open dry woodlands in northern Queensland (i.e. tropical climates) tend to support a conclusion that it is able to invade disturbed sites in open forests, dry scrubs (including deciduous scrubs) and certain riparian habitats."

303	Agricultural/forestry/horticultural weed	n
	Source(s)	**Notes**
	Csurhes, S. & Navie, S. 2009. Weed Risk Assessment. White ball acacia. Acaciella angustissima (syn. Acacia angustissima, Acacia boliviana). The State of Queensland, Department of Employment, Economic Development and Innovation	No evidence
	Randall, R.P. 2012. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	No evidence

Qsn #	Question	Answer
304	**Environmental weed**	
	Source(s)	**Notes**
	Dyer, R. (2008). Investing in weed research in northern Australia: a livestock industry perspective. In Proceedings of the 16th Australian Weeds Conference, Cairns Convention Centre, North Queensland, Australia, 18-22 May, 2008. (pp. 17-22). Queensland Weed Society	"During the 1980s and 1990s many exotic legume species were evaluated for their potential as pasture plants within short-term, small-plot plant evaluation programs, conducted mainly in Queensland (Cook and Dias 2006). Of these species four perennial legumes, Acacia angustissima (Mill.) Ktze, Aeschynomene paniculata Willd. ex Vogel, Indigofera schimperi Jaub. & Spach and Aeschynomene brasiliana (Poir.) DC. (in decreasing order of weed threat) were identified as posing serious threats to northern Australia and therefore being priority plants for eradication or control (Cox 2006). These target legumes are extremely well geo-climatically adapted to large areas of northern Australia and have the potential to threaten coastal and sub coastal grasslands of Queensland, the Northern Territory and Western Australia. All have low palatability, can form dense stands and can persist in soil through dormant seed for over 10 years."
	Queensland Government. 2011. Weeds of Australia - Bolivian wattle Acaciella angustissima. http://keyserver.lucidcentral.org/weeds/data/03030800-0b07-490a-8d04-0605030c0f01/media/Html/Acaciella_angustissima.htm. [Accessed 27 Jan 2016]	[Potentially Yes] "Bolivian wattle (Acaciella angustissima) is not yet causing any significant environmental damage in Australia, but it is thought to have the potential to cause significant harm if it is allowed to become widely naturalised. Even prior to when it become naturalised it was considered to be a potential environmental weed and was listed as a candidate species for preventative control in Queensland. This led to the cessation of all fodder trials involving this species. Subsequent reports of its naturalisation confirmed these predictions and, due mainly to its potential invasiveness, it was recently included in the list of the 200 most significant invasive naturalised plants of south-eastern Queensland."

305	Congeneric weed	
	Source(s)	**Notes**
	Le Maitre, D. C., Gaertner, M., Marchante, E., Ens, E. J., Holmes, P. M., Pauchard, A., O'Farrell, P. J., Rogers, A. M., Blanchard, R., Blignaut, J. & Richardson, D. M. (2011). Impacts of invasive Australian acacias: implications for management and restoration. Diversity and Distributions, 17(5): 1015-1029	[Possibly, but considered Acaciella angustissima in some treatments] "Case studies are used to identify similarities and differences between three regions severely affected by invasions of Australian acacias: Acacia dealbata in Chile, Acacia longifolia in Portugal and Acacia saligna in South Africa." ... "Australian acacias have a wide range of impacts on ecosystems that increase with time and disturbance, transform ecosystems and alter and reduce ecosystem service delivery. A shared trait is the accumulation of massive seed banks, which enables them to become dominant after disturbances. Ecosystem trajectories and recovery potential suggest that there are important thresholds in ecosystem state and resilience. When these are crossed, options for restoration are radically altered; in many cases, autogenic (self-driven and self-sustaining) recovery to a preinvasion condition is inhibited, necessitating active intervention to restore composition and function."
	Randall, R.P. 2012. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	Several Acacia species are invasive. No evidence for Acaciella

Qsn #	Question	Answer
401	**Produces spines, thorns or burrs**	**n**
	Source(s)	**Notes**
	CAB International, 2005. Forestry Compendium. CAB International, Wallingford, UK	"A. angustissima is a thornless shrub up to 4 m in height."

402	Allelopathic	n
	Source(s)	**Notes**
	Cook, B.G., Pengelly, B.C., Brown, S.D., Donnelly, J.L., Eagles, D.A., Franco, M.A., Hanson, J., Mullen, B.F., Partridge, I.J., Peters, M, & Schultze-Kraft, R. 2005. Tropical Forages: an interactive selection tool., [CD-ROM], SIRO, DPI&F(Qld), CIAT and ILRI. http://www.tropicalforages.info/index.htm. [Accessed 27 Jan 2016]	"Compatibility (with other species): Compatible with a wide range of native and exotic pasture grasses. Limited palatability may result in excessive growth of A.angustissima and shading of understorey species." ... "In an alley cropping system intercropped with sweet potato (Ipomoea batatas) in Papua New Guinea, A. angustissima provided enough N, P and K for the crop, but inhibited the tuber yield due to the rapid tree growth, which shaded the crop."
	Orwa C,, Mutua, A., Kindt R., Jamnadass, R, & Anthony, S. 2009 Agroforestree Database: a tree reference and selection guide version 4.0. http://www.worldagroforestry.org. [Accessed 26 Jan 2016]	"Reclamation: Although A. angustissima may not grow into a large tree, it can be extremely valuable for use as pioneer species for rejuvenating degraded lands, and as a nurse crop for more-valuable tree species." [No evidence]

403	Parasitic	n
	Source(s)	**Notes**
	Orwa C,, Mutua, A., Kindt R., Jamnadass, R, & Anthony, S. 2009 Agroforestree Database: a tree reference and selection guide version 4.0. http://www.worldagroforestry.org. [Accessed 26 Jan 2016]	"Acacia angustissima grows as a thornless shrub or small tree mostly 2-7 m tall with a single short trunk." [Fabaceae. No evidence]

404	Unpalatable to grazing animals	n
	Source(s)	**Notes**
	Orwa C,, Mutua, A., Kindt R., Jamnadass, R, & Anthony, S. 2009 Agroforestree Database: a tree reference and selection guide version 4.0. http://www.worldagroforestry.org. [Accessed 26 Jan 2016]	"Fodder: A. angustissima produces large amounts of foliage with fodder potential." ... "Research shows that A. angustissima cuttings contain high levels of N, P and K, but due to a high tannin content (6% DM), the protein is less accessible to the livestock. Tests have shown that A. angustissima leaves degrade poorly in the rumen of cows (48% after 48 hours of incubation. A. angustissima has been found to produce significantly more leaves than other shrub legumes, notably Leucaena spp., Calliandra calothyrsus, Gliricidia sepium, Cajanus cajan, and Sesbania spp. However, the high tannin content and low palatability means it is of limited nutritional value to livestock."
	CAB International, 2005. Forestry Compendium. CAB International, Wallingford, UK	"It is a useful browse species, and may also be planted on acid soils."

Qsn #	Question	Answer
	Cook, B.G., Pengelly, B.C., Brown, S.D., Donnelly, J.L., Eagles, D.A., Franco, M.A., Hanson, J., Mullen, B.F., Partridge, I.J., Peters, M, & Schultze-Kraft, R. 2005. Tropical Forages: an interactive selection tool., [CD-ROM], SIRO, DPI&F(Qld), CIAT and ILRI. http://www.tropicalforages.info/index.htm. [Accessed 27 Jan 2016]	"Palatability/acceptability: Reports conflict, but generally considered to be of low to moderate palatability. Very low palatability in some areas of Indonesia but moderate in Zimbabwe (in short-term trials). Moderate palatability of A. boliviana in short-term trials in Australia. A. villosa , in Timor, Indonesia, has shown moderate palatability ."
	USDA NRCS. 2008. Plant Fact Sheet - Prairie Acacia - Acacia angustissima. USDA NRCS Plant Materials Center. http://plants.usda.gov/factsheet/pdf/fs_acan.pdf. [Accessed 28 Jan 2016]	"Wildlife: Prairie acacia is browsed by white-tail deer. It is a prolific seed producer. Quail and other birds will utilize the seed for food and the vegetation provides cover for small animals and wild birds."

405	Toxic to animals	
	Source(s)	**Notes**
	Cook, B.G., Pengelly, B.C., Brown, S.D., Donnelly, J.L., Eagles, D.A., Franco, M.A., Hanson, J., Mullen, B.F., Partridge, I.J., Peters, M, & Schultze-Kraft, R. 2005. Tropical Forages: an interactive selection tool., [CD-ROM], SIRO, DPI&F(Qld), CIAT and ILRI. http://www.tropicalforages.info/index.htm. [Accessed 27 Jan 2016]	"Toxicity: Contains approximately6–11% of anti-nutritive condensed tannins. Also contains toxic compounds such as low molecular weight phenolic compounds and non-protein amino acids."
	USDA NRCS. 2008. Plant Fact Sheet - Prairie Acacia - Acacia angustissima. USDA NRCS Plant Materials Center. http://plants.usda.gov/factsheet/pdf/fs_acan.pdf. [Accessed 28 Jan 2016]	[Possibly toxic to some animals] "The leaves of prairie acacia contain tannins and non-protein amino acids. These compounds are toxic to some animals. Sudden dietary supplementation with prairie acacia fodder at high concentrations caused death in sheep. The signs of toxicity from prairie acacia are similar to those exhibited by sheep fed flat pea (Lathyrus sylvestris) hay. Rabbits fed prairie acacia leaves (20% of the diet) exhibited a progressive reduction of intake and weight reduction. All rabbits consuming prairie acacia showed central nervous system disturbances. Researchers, in Stephenville, Texas, compared 15 native perennial herbaceous legumes for herbage production, crude protein percentage, and laboratory measurements of digestibility. Prairie acacia exhibited high, compared to the other species, herbage yield and crude protein percentage. The laboratory measurements suggested that prairie acacia is more digestible to livestock than other species tested"
	Odenyo, A. A., Osuji, P. O., Reed, J. D., Smith, A. H., Mackie, R. I., McSweeney, C. S., & Hanson, J. (2003). Acacia angustissima: Its anti-nutrients constituents, toxicity and possible mechanisms to alleviate the toxicity–a short review. Agroforestry Systems, 59(2), 141-147	[Potentially toxic to sheep] "Nutritional deficiencies of these feeds can be alleviated by supplementation with fodder trees such as Acacia angustissima, which are multipurpose, have outstanding agronomical attributes and are rich in nitrogen 33.2- 40.8 g/kg DM. However, feeding A. angustissima without adaptation caused toxicity to sheep." ... "Feeding A. angustissima to sheep by gradually increasing levels in the diet prevented toxicity. Additionally, transfer of rumen contents from adapted to non-adapted sheep prevented toxicity of A. angustissima. These observations suggested that adaptation was at the microbial level. Current work to alleviate the toxicity of A. angustissima is therefore focused on microbial adaptation and detoxification."

406	Host for recognized pests and pathogens	

Qsn #	Question	Answer
	Source(s)	**Notes**
	Orwa C,, Mutua, A., Kindt R., Jamnadass, R, & Anthony, S. 2009 Agroforestree Database: a tree reference and selection guide version 4.0. http://www.worldagroforestry.org. [Accessed 27 Jan 2016]	"In its native habitat A. angustissima is eaten by the Acacia skipper butterfly, Cogia hippalus, and by the moth larva of Sphingicampa blanchardi and S. raspa. Two local birds also eat the seeds, the masked bobwhite and the Arizona scaled quail. In trials in Hawaii the tree has been shown to be naturally resistant to attack from the Chinese rose beetle (Adoretus sinicus Burmeister)."
	USDA NRCS. 2008. Plant Fact Sheet - Prairie Acacia - Acacia angustissima. USDA NRCS Plant Materials Center. http://plants.usda.gov/factsheet/pdf/fs_acan.pdf. [Accessed 28 Jan 2016]	"Pests and Potential Problems: No Pest or potential problems were found on prairie acacia while growing at the NRCS/James E. „Bud" Smith Plant Materials Center near Knox City, Texas."

407	**Causes allergies or is otherwise toxic to humans**	
	Source(s)	**Notes**
	Pollen Library. 2016. Prairie Wattle (Acacia angustissima). http://www.pollenlibrary.com/Specie/Acacia+angustissima/. [Accessed 28 Jan 2016]	"Allergenicity: Prairie Wattle (Acacia angustissima) is a mild allergen." [Potential allergen to susceptible individuals]
	Cook, B.G., Pengelly, B.C., Brown, S.D., Donnelly, J.L., Eagles, D.A., Franco, M.A., Hanson, J., Mullen, B.F., Partridge, I.J., Peters, M, & Schultze-Kraft, R. 2005. Tropical Forages: an interactive selection tool., [CD-ROM], SIRO, DPI&F(Qld), CIAT and ILRI. http://www.tropicalforages.info/index.htm. [Accessed 28 Jan 2016]	"Toxicity: Contains approximately6–11% of anti-nutritive condensed tannins. Also contains toxic compounds such as low molecular weight phenolic compounds and non-protein amino acids." [Potentially toxic to grazing animals. Unlikely to poison humans unless consumed]

408	**Creates a fire hazard in natural ecosystems**	
	Source(s)	**Notes**
	Cook, B.G., Pengelly, B.C., Brown, S.D., Donnelly, J.L., Eagles, D.A., Franco, M.A., Hanson, J., Mullen, B.F., Partridge, I.J., Peters, M, & Schultze-Kraft, R. 2005. Tropical Forages: an interactive selection tool., [CD-ROM], SIRO, DPI&F(Qld), CIAT and ILRI. http://www.tropicalforages.info/index.htm. [Accessed 28 Jan 2016]	[Ability to form thickets could contribute to fuel load & fire risk] "Tolerant of annual burning of rangelands once mature." ... "The ability to tolerate repeated coppicing, in combination with its prolific seed production, rapid growth and low palatability to ruminant livestock has enabled A. angustissima to become a weed in its native range and in exotic locations, forming thickets along roadsides and on free-draining soils in rangelands. "

Qsn #	Question	Answer
409	**Is a shade tolerant plant at some stage of its life cycle**	
	Source(s)	**Notes**
	Miller, G.O. 2007. Landscaping with Native Plants of the Southwest. Voyageur Press, St. Paul, MN	"Exposure: full sun, partial shade." ... "It grows equally well on rocky, sunny slopes or in mottled shade under an open shrub or tree."
	Cook, B.G., Pengelly, B.C., Brown, S.D., Donnelly, J.L., Eagles, D.A., Franco, M.A., Hanson, J., Mullen, B.F., Partridge, I.J., Peters, M, & Schultze-Kraft, R. 2005. Tropical Forages: an interactive selection tool., [CD-ROM], SIRO, DPI&F(Qld), CIAT and ILRI. http://www.tropicalforages.info/index.htm. [Accessed 27 Jan 2016]	"Light: Unknown. May have moderate shade tolerance being native to oak/pine forests."
	CAB International, 2005. Forestry Compendium. CAB International, Wallingford, UK	"Tolerates drought; shade; frost"

410	**Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)**	**y**
	Source(s)	**Notes**
	Csurhes, S. & Navie, S. 2009. Weed Risk Assessment. White ball acacia. Acaciella angustissima (syn. Acacia angustissima, Acacia boliviana). The State of Queensland, Department of Employment, Economic Development and Innovation	"Acaciella angustissima prefers free-draining, infertile, acidic soils in its native range (including black and red acid soils). However, it has been cultivated on a wide range of soils, including vertisols of slightly alkaline pH. It responds well to fertiliser when grown on acidic infertile soils (Cook et al. 2005)."
	Orwa C,, Mutua, A., Kindt R., Jamnadass, R, & Anthony, S. 2009 Agroforestree Database: a tree reference and selection guide version 4.0. http://www.worldagroforestry.org. [Accessed 26 Jan 2016]	"Soil type: A. angustissima is well adapted to free draining acidic, infertile soils and shows an excellent drought tolerance."
	CAB International, 2005. Forestry Compendium. CAB International, Wallingford, UK	"This species is originally from Central America and tolerates a wide range of soils and climates, from high altitude pine-oak forests to extremely dry habitats in the lowlands of Mexico."

411	**Climbing or smothering growth habit**	**n**
	Source(s)	**Notes**
	CAB International, 2005. Forestry Compendium. CAB International, Wallingford, UK	"A. angustissima is a thornless shrub up to 4 m in height."

412	**Forms dense thickets**	**y**
	Source(s)	**Notes**
	Orwa C,, Mutua, A., Kindt R., Jamnadass, R, & Anthony, S. 2009 Agroforestree Database: a tree reference and selection guide version 4.0. http://www.worldagroforestry.org. [Accessed 27 Jan 2016]	"A. angustissima grows rapidly and responds well to regular cutting. However, it produces weak branches that break off in moderate winds. This ability to grow quickly has resulted in A. angustissima becoming weedy and forming thickets, especially along roadsides and in sandy soil in pastures in its native range. This weed potential has created concern among some researchers about the advisability of its use in agroforestry or agricultural systems."

Qsn #	Question	Answer
	Dyer, R. (2008). Investing in weed research in northern Australia: a livestock industry perspective. In Proceedings of the 16th Australian Weeds Conference, Cairns Convention Centre, North Queensland, Australia, 18-22 May, 2008. (pp. 17-22). Queensland Weed Society	"All have low palatability, can form dense stands and can persist in soil through dormant seed for over 10 years."
	Csurhes, S. & Navie, S. 2009. Weed Risk Assessment. White ball acacia. Acaciella angustissima (syn. Acacia angustissima, Acacia boliviana). The State of Queensland, Department of Employment, Economic Development and Innovation	"This study was unable to find clear evidence that A. angustissima was a major weed elsewhere in the world. However, there is little doubt that it has weed risk, since it is documented to form thickets along roadsides and within rangelands within its native range and elsewhere. Ecologically, it has a number of attributes that confer weed risk: a history of successful naturalisation outside its native range, high fecundity, long-lived (hard coated) seeds and a propensity to quickly colonise gaps within open woodland and dry scrub."

501	Aquatic	n
	Source(s)	**Notes**
	Orwa C,, Mutua, A., Kindt R., Jamnadass, R, & Anthony, S. 2009 Agroforestree Database: a tree reference and selection guide version 4.0. http://www.worldagroforestry.org. [Accessed 26 Jan 2016]	[Terrestrial] "In its natural range A. angustissima is found on hillsides, rock slopes, summits, and in grassland with other shrubs. It is often found in tropical deciduous or semi-deciduous forest."

502	Grass	n
	Source(s)	**Notes**
	USDA, ARS, Germplasm Resources Information Network, 2016. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html. [Accessed 26 Jan 2016]	"Family: Fabaceae (alt.Leguminosae) Subfamily: Mimosoideae Tribe: Acacieae"

503	Nitrogen fixing woody plant	y
	Source(s)	**Notes**
	CAB International, 2005. Forestry Compendium. CAB International, Wallingford, UK	"A. angustissima is a deep-rooted nitrogen fixing pioneer, and is valuable in reducing soil erosion."

504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	n
	Source(s)	**Notes**
	Orwa C,, Mutua, A., Kindt R., Jamnadass, R, & Anthony, S. 2009 Agroforestree Database: a tree reference and selection guide version 4.0. http://www.worldagroforestry.org. [Accessed 26 Jan 2016]	"Acacia angustissima grows as a thornless shrub or small tree mostly 2-7 m tall with a single short trunk. It exhibits much variation in pubescence, size and venation of the leaflets and size of flowers and heads."

601	Evidence of substantial reproductive failure in native habitat	n

Qsn #	Question	Answer
	Source(s)	**Notes**
	Orwa C,, Mutua, A., Kindt R., Jamnadass, R, & Anthony, S. 2009 Agroforestree Database: a tree reference and selection guide version 4.0. http://www.worldagroforestry.org. [Accessed 27 Jan 2016]	"The species flowers throughout the year in its natural range, and at the end of the dry season in trials in Zimbabwe. A. angustissima is a prolific seed producer." [No evidence. Widespread native & introduced range]

602	Produces viable seed	y
	Source(s)	**Notes**
	Cook, B.G., Pengelly, B.C., Brown, S.D., Donnelly, J.L., Eagles, D.A., Franco, M.A., Hanson, J., Mullen, B.F., Partridge, I.J., Peters, M, & Schultze-Kraft, R. 2005. Tropical Forages: an interactive selection tool., [CD-ROM], SIRO, DPI&F(Qld), CIAT and ILRI. http://www.tropicalforages.info/index.htm. [Accessed 27 Jan 2016]	"Seed production: A. angustissima is generally a prolific seed producer. At lowland sites (20 m asl) in Papua New Guinea, A. angustissima flowered but did not seed, while at higher elevation (1,650 m) it seeded prolifically."
	Orwa C,, Mutua, A., Kindt R., Jamnadass, R, & Anthony, S. 2009 Agroforestree Database: a tree reference and selection guide version 4.0. http://www.worldagroforestry.org. [Accessed 27 Jan 2016]	"The species flowers throughout the year in its natural range, and at the end of the dry season in trials in Zimbabwe. A. angustissima is a prolific seed producer."

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

604	Self-compatible or apomictic	n
	Source(s)	**Notes**
	Raine, N. E., Pierson, A. S., & Stone, G. N. (2007). Plant–pollinator interactions in a Mexican Acacia community. Arthropod-Plant Interactions, 1(2): 101-117	[Reported to be self-incompatible] "Bees dominated (68–93%) visitation to the mass-flowering species A. macracantha, A. hindsii and A. angustissima (Table 2), and all three shared many pollinator taxa" ... "In any protandrous species (including A. angustissima, A. hindsii and A. macracantha), the delay between anther dehiscence and stigma receptivity must balance the conflicting demands of avoiding self pollination, whilst maximising the chances of receiving sufficient crosspollen. In self-incompatible species, such as the three mass-flowering Chamela Acacia species, we expect stigma receptivity to occur long enough after dehiscence for stigmatic clogging by self-pollen to be rare."

605	Requires specialist pollinators	n
	Source(s)	**Notes**

Qsn #	Question	Answer
	Raine, N. E., Pierson, A. S., & Stone, G. N. (2007). Plant–pollinator interactions in a Mexican Acacia community. Arthropod-Plant Interactions, 1(2): 101-117	"Bees dominated (68–93%) visitation to the mass-flowering species A. macracantha, A. hindsii and A. angustissima (Table 2), and all three shared many pollinator taxa (see Table 3 and Supplementary material—Appendices B–F for visitors recorded across sites and Acacia species). The major bee taxa were honeybees (Apis mellifera L.), native social bees (Scaptotrigona hellwegeri (Roubik) and Trigona spp.; Apidae), and solitary bees in the genera Hylaeus (Colletidae), Augochloropsis and Lasioglossum (Halictidae), Ceratina and Xylocopa (Anthophoridae) and Megachile (Megachilidae). Other solitary bee genera, including Eulonchopria (Colletidae), Pseudoaugochloropsis and Halictus (Halictidae), Exomalopsis (Anthophoridae), and Anthodioctes (Megachilidae) frequently visited at least two Acacia species."
	USDA NRCS. 2008. Plant Fact Sheet - Prairie Acacia - Acacia angustissima. USDA NRCS Plant Materials Center. http://plants.usda.gov/factsheet/pdf/fs_acan.pdf. [Accessed 28 Jan 2016]	"For an aesthetic landscape use, these plants with their round white flowers that appear in the summer into fall, are attractive to bees, butterflies, and birds."

606	Reproduction by vegetative fragmentation	y
	Source(s)	**Notes**
	Lance, R. 2004. Woody Plants of the Southeastern United States: A Winter Guide. University of Georgia Press, Athens, GA	"Height rarely over 1 m and colonizing by woody rhizomes."
	USDA NRCS. 2012. Release Brochure for Prairie Acacia (Acacia angustissima). USDA-Natural Resources Conservation Service, James E. “Bud” Smith Plant Materials Center, Knox City, TX	"It is a smooth and small rounded shrub, forming colonies by means of woody rhizomes with aerial stems that are rarely over three feet tall."
	Richardson, A. 2011. Plants of Deep South Texas: A Field Guide to the Woody and Flowering Species. Texas A&M University Press, College Station, TX	"Small spineless shrubs up to 3' or taller, sometimes forming new plants from rhizomes."

607	Minimum generative time (years)	
	Source(s)	**Notes**
	Orwa C,, Mutua, A., Kindt R., Jamnadass, R, & Anthony, S. 2009 Agroforestree Database: a tree reference and selection guide version 4.0. http://www.worldagroforestry.org. [Accessed 27 Jan 2016]	"A. angustissima is a relatively fast growing tree, sometimes achieving a 5 m height and about 6 cm diameter after 2 .5 years." [Unknown, but likely less than 4 years]

701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	
	Source(s)	**Notes**
	Orwa C,, Mutua, A., Kindt R., Jamnadass, R, & Anthony, S. 2009 Agroforestree Database: a tree reference and selection guide version 4.0. http://www.worldagroforestry.org. [Accessed 28 Jan 2016]	[Possibly, Seeds lack means of external attachment, but distribution along roads may result in accidental movement of seeds] "This ability to grow quickly has resulted in A. angustissima becoming weedy and forming thickets, especially along roadsides and in sandy soil in pastures in its native range."

Qsn #	Question	Answer
702	**Propagules dispersed intentionally by people**	**y**
	Source(s)	**Notes**
	USDA NRCS. 2008. Plant Fact Sheet - Prairie Acacia - Acacia angustissima. USDA NRCS Plant Materials Center. http://plants.usda.gov/factsheet/pdf/fs_acan.pdf. [Accessed 28 Jan 2016]	"For an aesthetic landscape use, these plants with their round white flowers that appear in the summer into fall, are attractive to bees, butterflies, and birds."

703	**Propagules likely to disperse as a produce contaminant**	**n**
	Source(s)	**Notes**
	Queensland Government. 2011. Weeds of Australia - Bolivian wattle Acaciella angustissima. http://keyserver.lucidcentral.org/weeds/data/03030800-0b07-490a-8d04-0605030c0f01/media/Html/Acaciella_angustissima.htm. [Accessed 28 Jan 2016]	[No evidence to date] "seeds may be dispersed by animals that consume them (e.g. cattle or birds) or by water movement."

704	**Propagules adapted to wind dispersal**	
	Source(s)	**Notes**
	Román-Dañobeytia, F. J., Levy-Tacher, S. I., Aronson, J., Rodrigues, R. R., & Castellanos-Albores, J. (2012). Testing the performance of fourteen native tropical tree species in two abandoned pastures of the Lacandon rainforest region of Chiapas, Mexico. Restoration Ecology, 20(3), 378-386	"Table 1. Ecological and utilitarian characteristics of the 14 Lacandon rainforest tree species studied." [Acaciella angustissima - Seed dispersal vector = Wind. Seeds are not morphologically adapted to wind dispersal, but pods might be carried by wind]
	Quesada, E. M., & Pérez, R. M. (2011). Acaciella angustissima (Fabaceae, Mimosoideae), new for Cuba. Willdenowia, 43(1), 139-141	[Possibly hurricane dispersed] "The occurrence of single plants in anthropogenic habitats suggests a rather recent unintentional introduction, possibly as a result of fruits and/or seeds having been dispersed from the southern USA by hurricane “Ike” in 2008."

705	**Propagules water dispersed**	
	Source(s)	**Notes**
	Queensland Government. 2011. Weeds of Australia - Bolivian wattle Acaciella angustissima. http://keyserver.lucidcentral.org/weeds/data/03030800-0b07-490a-8d04-0605030c0f01/media/Html/Acaciella_angustissima.htm. [Accessed 27 Jan 2016]	[Distribution along waterways may facilitate dispersal]:Habitat: The only naturalised population was found growing along a waterway in south-eastern Queensland. However, this species is thought to be suited to coastal habitats in the tropical and sub-tropical regions of Australia." ... "These seeds may be dispersed by animals that consume them (e.g. cattle or birds) or by water movement."

Qsn #	Question	Answer
706	**Propagules bird dispersed**	
	Source(s)	**Notes**
	Queensland Government. 2011. Weeds of Australia - Bolivian wattle Acaciella angustissima. http://keyserver.lucidcentral.org/weeds/data/03030800-0b07-490a-8d04-0605030c0f01/media/Html/Acaciella_angustissima.htm. [Accessed 27 Jan 2016]	"Bolivian wattle (Acaciella angustissima) produces numerous hard seeds, that are probably long lived like those of other wattles. These seeds may be dispersed by animals that consume them (e.g. cattle or birds) or by water movement."

Qsn #	Question	Answer
707	**Propagules dispersed by other animals (externally)**	**n**
	Source(s)	**Notes**
	Queensland Government. 2011. Weeds of Australia - Bolivian wattle Acaciella angustissima. http://keyserver.lucidcentral.org/weeds/data/03030800-0b07-490a-8d04-0605030c0f01/media/Html/Acaciella_angustissima.htm. [Accessed 28 Jan 2016]	[No evidence of external dispersal. Pods & seeds lack means of external attachment] "Bolivian wattle (Acaciella angustissima) produces numerous hard seeds, that are probably long-lived like those of other wattles. These seeds may be dispersed by animals that consume them (e.g. cattle or birds) or by water movement."

Qsn #	Question	Answer
708	**Propagules survive passage through the gut**	**y**
	Source(s)	**Notes**
	Queensland Government. 2011. Weeds of Australia - Bolivian wattle Acaciella angustissima. http://keyserver.lucidcentral.org/weeds/data/03030800-0b07-490a-8d04-0605030c0f01/media/Html/Acaciella_angustissima.htm. [Accessed 27 Jan 2016]	"Bolivian wattle (Acaciella angustissima) produces numerous hard seeds, that are probably long lived like those of other wattles. These seeds may be dispersed by animals that consume them (e.g. cattle or birds) or by water movement."
	Gardiner, C., Cox, K., Wright, C., & Keating, M. (2010). Passage and survival of Acaciella angustissima (Mill.) Britton & Rose and Aeschynomene paniculata Willd. ex Vogel seed through the sheep gut. Proceedings of the 17th Australasian Weeds Conference, pp. 418-420. New Zealand Plant Protection Society, Christchurch, New Zealand	"The results show that seeds of both species pass through sheep with most seeds being passed after 48 h with a percentage of these seeds being viable. Of the number of seeds fed, 4.25% were recovered for A. angustissima and 1.4% for A. paniculata. Seed recovered from the faeces had 0% and 13% germination for A. angustissima and A. paniculata respectively, but with additional post-digestion hot water scarification germination increased to 75% and 33% for A. angustissima and A. paniculata respectively. This paper discusses these results and the implications for the possible spread of these species across the northern Australian landscape."

Qsn #	Question	Answer
801	**Prolific seed production (>1000/m2)**	**y**
	Source(s)	**Notes**
	Cook, B.G., Pengelly, B.C., Brown, S.D., Donnelly, J.L., Eagles, D.A., Franco, M.A., Hanson, J., Mullen, B.F., Partridge, I.J., Peters, M, & Schultze-Kraft, R. 2005. Tropical Forages: an interactive selection tool., [CD-ROM], SIRO, DPI&F(Qld), CIAT and ILRI. http://www.tropicalforages.info/index.htm. [Accessed 27 Jan 2016]	"Seed production is prolific. Seed weight is 90,000–100,000 seeds/kg."

Qsn #	Question	Answer
	Gardiner, C., Chlanclud, N., Clouten, B. & Cox, K. (2008). Acaciella angustissima: a soil seed bank study. Proceedings of the 16th Australian Weeds Conference, eds R.D. van Klinken, V.A. Osten, F.D. Panetta and J.C. Scanlan, pp. 187-8. Queensland Weeds Society, Brisbane	"Table 1. Seed density in the soil seed bank." [Seed densities as high as 2322 seeds m-2 have been documented]
	Csurhes, S. & Navie, S. 2009. Weed Risk Assessment. White ball acacia. Acaciella angustissima (syn. Acacia angustissima, Acacia boliviana). The State of Queensland, Department of Employment, Economic Development and Innovation	[Potentially] "Acaciella angustissima usually produces large numbers of seeds. However, at lowland sites (20 m above sea level) in Papua New Guinea, it has been observed to flower but does not produce any seeds, whereas at higher elevation (1650 m) it seeded prolifically. Like most species of Acacia, recruitment tends to occur most readily when competition from other plants is low (Cook et al. 2005)."

802	Evidence that a persistent propagule bank is formed (>1 yr)	y
	Source(s)	**Notes**
	Dyer, R. (2008). Investing in weed research in northern Australia: a livestock industry perspective. In Proceedings of the 16th Australian Weeds Conference, Cairns Convention Centre, North Queensland, Australia, 18-22 May, 2008. (pp. 17-22). Queensland Weed Society	"All have low palatability, can form dense stands and can persist in soil through dormant seed for over 10 years."
	Queensland Government. 2011. Weeds of Australia - Bolivian wattle Acaciella angustissima. http://keyserver.lucidcentral.org/weeds/data/03030800-0b07-490a-8d04-0605030c0f01/media/Html/Acaciella_angustissima.htm. [Accessed 27 Jan 2016]	"Bolivian wattle (Acaciella angustissima) produces numerous hard seeds, that are probably long lived like those of other wattles."
	Gardiner, C., Chlanclud, N., Clouten, B. & Cox, K. (2008). Acaciella angustissima: a soil seed bank study. Proceedings of the 16th Australian Weeds Conference, eds R.D. van Klinken, V.A. Osten, F.D. Panetta and J.C. Scanlan, pp. 187-8. Queensland Weeds Society, Brisbane	[5+ years] "Germination The control treatment had 1% germination while the scarified treatment had 86% germination. This confirms that A. angustissima seeds have hardseededness, and therefore have the ability to form long-lived seed banks. Soil seed bank Soil seed bank was greatest under living adult trees, but was still significant where there had been no seed input for approximately five years (Table 1). This confirms that A. angustissima has a persistent soil seed bank." ... "The soil seed bank at Douglas shows that A. angustissima has a soil seed bank for at least five years. The relatively low seed density at this site may reflect the time since the shrub was removed, and rate of dormancy-release."

803	Well controlled by herbicides	y
	Source(s)	**Notes**
	Cook, B.G., Pengelly, B.C., Brown, S.D., Donnelly, J.L., Eagles, D.A., Franco, M.A., Hanson, J., Mullen, B.F., Partridge, I.J., Peters, M, & Schultze-Kraft, R. 2005. Tropical Forages: an interactive selection tool., [CD-ROM], SIRO, DPI&F(Qld), CIAT and ILRI. http://www.tropicalforages.info/index.htm. [Accessed 27 Jan 2016]	"Herbicide effects: Can be controlled using basal bark or cut-stump applications of tree -killing herbicides such as fluroxypyr, triclopyr or trichlopyr + picloram. Seedlings can be controlled using complete foliarsprays of fluroxypyr."

Qsn #	Question	Answer
804	**Tolerates, or benefits from, mutilation, cultivation, or fire**	**y**
	Source(s)	**Notes**
	CAB International, 2005. Forestry Compendium. CAB International, Wallingford, UK	"- Ability to fix nitrogen; regenerate rapidly; coppice; pollard"
	Cook, B.G., Pengelly, B.C., Brown, S.D., Donnelly, J.L., Eagles, D.A., Franco, M.A., Hanson, J., Mullen, B.F., Partridge, I.J., Peters, M, & Schultze-Kraft, R. 2005. Tropical Forages: an interactive selection tool., [CD-ROM], SIRO, DPI&F(Qld), CIAT and ILRI. http://www.tropicalforages.info/index.htm. [Accessed 27 Jan 2016]	"Fire: Tolerant of annual burning of rangelands once mature."
	Orwa C,, Mutua, A., Kindt R., Jamnadass, R, & Anthony, S. 2009 Agroforestree Database: a tree reference and selection guide version 4.0. http://www.worldagroforestry.org. [Accessed 26 Jan 2016]	"The crown architecture enables the tree to withstand frequent cuttings or defoliation with a high recovery and growth rate. A. angustissima has also been shown to respond well to coppicing."

805	**Effective natural enemies present locally (e.g. introduced biocontrol agents)**	
	Source(s)	**Notes**
	Orwa C,, Mutua, A., Kindt R., Jamnadass, R, & Anthony, S. 2009 Agroforestree Database: a tree reference and selection guide version 4.0. http://www.worldagroforestry.org. [Accessed 27 Jan 2016]	"In trials in Hawaii the tree has been shown to be naturally resistant to attack from the Chinese rose beetle (Adoretus sinicus Burmeister)."

Summary of Risk Traits: