Taxon: Acacia aneura F. Muell. ex Benth. **Family:** Fabaceae

Common Name(s): mulga **Synonym(s):** Racosperma aneurum (F. Muell. ex Benth.) Pedley

Assessor: Chuck Chimera **Status:** Approved **End Date:** 1 Nov 2023

WRA Score: 10.0 **Designation:** H(HPWRA) **Rating:** High Risk

Keywords: Slow-Growing Tree, Naturalized, Fodder, Dense Stands, Fire-Sensitive

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	y = 2*multiplier (see Appendix 2), n = 0	n
304	Environmental weed		
305	Congeneric weed	y = 1*multiplier (see Appendix 2), n = 0	y
401	Produces spines, thorns or burrs	y = 1, n = 0	n
402	Allelopathic		
403	Parasitic	y = 1, n = 0	n
404	Unpalatable to grazing animals	y = 1, n = -1	n
405	Toxic to animals		
406	Host for recognized pests and pathogens		
407	Causes allergies or is otherwise toxic to humans	y = 1, n = 0	n
408	Creates a fire hazard in natural ecosystems		
409	Is a shade tolerant plant at some stage of its life cycle	y = 1, n = 0	n
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

Qsn #	Question	Answer Option	Answer
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	y = 1, n = -1	y
604	Self-compatible or apomictic	y = 1, n = -1	y
605	Requires specialist pollinators	y = -1, n = 0	n
606	Reproduction by vegetative fragmentation	y = 1, n = -1	n
607	Minimum generative time (years)	1 year = 1, 2 or 3 years = 0, 4+ years = -1	>3
701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	y = 1, n = -1	n
702	Propagules dispersed intentionally by people	y = 1, n = -1	y
703	Propagules likely to disperse as a produce contaminant	y = 1, n = -1	n
704	Propagules adapted to wind dispersal	y = 1, n = -1	n
705	Propagules water dispersed		
706	Propagules bird dispersed	y = 1, n = -1	y
707	Propagules dispersed by other animals (externally)	y = 1, n = -1	y
708	Propagules survive passage through the gut		
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		
804	Tolerates, or benefits from, mutilation, cultivation, or fire	y = 1, n = -1	n
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**
	Orchard, A.E. & Wilson, A. J. G. (eds.). 2001. Flora of Australia: Mimosaceae, Acacia. v. 11A, 11B, Part 2. Collingwood, Australia	[No evidence] "A species with a bewildering degree of variability that requires detailed investigation, both in the field and in the herbarium. A single stand may contain several distinct variants, but intermediates between these variants can often be found in other, more distant, stands. The situation is possibly similar to that of Senna artemisioides and S. glutinosa treated as 'form taxa' and discussed at some length by B.R.Randell & B.A.Barlow in Fl. Australia 12: 90-92, 104, 105 (1998). A. aneura also intergrades over wide areas, particularly in the western half of its range, with other species of the complex, notably A. ayersiana and A. minyura, and hybrids with other species occur, particularly with A. ramulosa and A. craspedocarpa. In view of the variability within the species and the common occurrence of intergrades with other species, it could be argued that the circumscription of A. aneura should be widened to include not only A. ayersiana and A. minyura but also A. paraneura. Over most of their geographic ranges these species are, however, distinctive and easily distinguished from A. aneura, and recognising one hugely polymorphic species would have no practical or scientific value."

102	**Has the species become naturalized where grown?**	
	Source(s)	**Notes**
	WRA Specialist. (2023). Personal Communication	NA

103	**Does the species have weedy races?**	
	Source(s)	**Notes**
	WRA Specialist. (2023). 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**
	Boland, D.J. , Brooker, M.I.H., Chippendale, G.M., Hall, N., Hyland, B.P.M., Johnston, R.D., Kleinig, D.A., McDonald, M.W. & Turner, J.D. (2006). Forest Trees of Australia. CSIRO Publishing, Collingwood, Australia	"Mulga communities are widespread and occupy a significant proportion of the continent. They occur in all mainland States except Victoria, mainly south of latitude 20°S and west from near Shark Bay in Western Australia, east to the western plains of New South Wales and the Great Dividing Range in Queensland; it is sparsely represented in the Simpson Desert and the channel country of south-western Queensland." ... "Climate: Altitudinal range: mainly 100–750 m; Hottest/coldest months: 36–40°C/5–8°C; Frost incidence: low to moderate (mean of 1–12 heavy frosts per year); Rainfall: 100– 500 mm per year, summer max. or uniform."
	Orchard, A.E. & Wilson, A. J. G. (eds.). 2001. Flora of Australia: Mimosaceae, Acacia. v. 11A, 11B, Part 2. Collingwood, Australia	"Widely spread in all mainland States except Vic., mainly S of lat. 20°S from the Indian Ocean almost to the Great Dividing Ra. in central Qld and in N.S.W.;"

Qsn #	Question	Answer
202	**Quality of climate match data**	**High**
	Source(s)	**Notes**
	Orchard, A.E. & Wilson, A. J. G. (eds.). 2001. Flora of Australia: Mimosaceae, Acacia. v. 11A, 11B, Part 2. Collingwood, Australia	"Widely spread in all mainland States except Vic., mainly S of lat. 20°S from the Indian Ocean almost to the Great Dividing Ra. in central Qld and in N.S.W.;"

203	**Broad climate suitability (environmental versatility)**	**y**
	Source(s)	**Notes**
	Boland, D.J. , Brooker, M.I.H., Chippendale, G.M., Hall, N., Hyland, B.P.M., Johnston, R.D., Kleinig, D.A., McDonald, M.W. & Turner, J.D. (2006). Forest Trees of Australia. CSIRO Publishing, Collingwood, Australia	"Climate: Altitudinal range: mainly 100–750 m; Hottest/ coldest months: 36–40°C/5–8°C; Frost incidence: low to moderate (mean of 1–12 heavy frosts per year); Rainfall: 100–500 mm per year, summer max. or uniform."
	Jøker, D. (2003). Acacia aneura Benth. Seed Leaflet No. 86. Danida Forest Seed Centre, Denmark	"Indigenous to central and southern Australia where it is a dominant species in open woodland or shrubland in arid and semi-arid zones. It occurs from sea level to about 1000 m altitude in areas with annual rainfall of 100-500 mm, hot summers and cool winters with light frost. It is drought tolerant, but very sensitive to fire."

204	**Native or naturalized in regions with tropical or subtropical climates**	**y**
	Source(s)	**Notes**
	Wagner, W.L. & Herbst, D.R. (1995). Contributions to the flora of Hawaii. IV. New records and name changes. Bishop Museum Occasional Paper 42: 13-27	"Acacia aneura F. Muell. ex Benth. The following collection is a new naturalized record of Acacia aneura, known as mulga in Australia, in the Hawaiian Islands. It is known in cultivation from Oahu, Molokai, Lanai, and Kahoolawe. It has been cultivated in the archipelago since 1931 and was introduced from Australia by C.S. Judd for forestry plantings (from Judd s. n., BISH). It is easily recognized by its narrow, dull phyllodes 0.9–8 (12) mm wide with inconspicuous veins, flat winged pods, and flowers in slender dense bright yellow spikes 1–3 cm long. Material examined. Lanai: Lanai District, W of Lanai City and N of Kaumalapau, Kiei Gulch, lowland dry flat grassland, with Leucaena, Sida, Casuarina, and Panicum, 320 m, abundant and starting to naturalize, 14 May 1990, Wood et al. 336 (BISH, PTBG)."
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	"Preferred Climate/s: Dryland, Subtropical, Tropical"
	Orchard, A.E. & Wilson, A. J. G. (eds.). 2001. Flora of Australia: Mimosaceae, Acacia. v. 11A, 11B, Part 2. Collingwood, Australia	"Widely spread in all mainland States except Vic., mainly S of lat. 20°S from the Indian Ocean almost to the Great Dividing Ra. in central Qld and in N.S.W.;"

205	**Does the species have a history of repeated introductions outside its natural range?**	**y**
	Source(s)	**Notes**
	Jøker, D. (2003). Acacia aneura Benth. Seed Leaflet No. 86. Danida Forest Seed Centre, Denmark	"It has been introduced to a number of tropical countries in Asia, Africa and Latin America."
	Wagner, W.L. & Herbst, D.R. (1995). Contributions to the flora of Hawaii. IV. New records and name changes. Bishop Museum Occasional Paper 42: 13-27	"It is known in cultivation from Oahu, Molokai, Lanai, and Kahoolawe."
	Ebinger, J. E., & Seigler, D. S. (2014). A Genus Treatment for Acacia from Legumes of Arizona: An Illustrated Flora and Reference. Desert Plants. Desert Plants 30(1): 19-28	"Mulga is increasingly being planted in Arizona landscapes."

Qsn #	Question	Answer
	Hassan, R. A., & Hamdy, R. S. (2021). Synoptic overview of exotic Acacia, Senegalia and Vachellia (Caesalpinioideae, mimosoid clade, Fabaceae) in Egypt. Plants, 10(7), 1344	"Native to Australia (New South Wales, Northern Territory, Queensland, South Australia, Western Australia). It was introduced to Egypt in the early 1920s from Australia [44]. It was growing very well in the Egyptian environment and listed among the seeds available for exchange [58]."
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	[Reported from the following locations] "References: United States of America-N-101, United States of America-N-301, United States of America-N-839, United States of America-N-1292, Australia-N-1902, Chile-I-1872, United States of America-N-2092, Australia-W-1977, Chile-W-1977."

301	Naturalized beyond native range	y
	Source(s)	**Notes**
	Wagner, W.L. & Herbst, D.R. (1995). Contributions to the flora of Hawaii. IV. New records and name changes. Bishop Museum Occasional Paper 42: 13-27	[Lanai] "Acacia aneura F. Muell. ex Benth. The following collection is a new naturalized record of Acacia aneura, known as mulga in Australia, in the Hawaiian Islands. It is known in cultivation from Oahu, Molokai, Lanai, and Kahoolawe. It has been cultivated in the archipelago since 1931 and was introduced from Australia by C.S. Judd for forestry plantings (from Judd s. n., BISH). It is easily recognized by its narrow, dull phyllodes 0.9-8 (12) mm wide with inconspicuous veins, flat winged pods, and flowers in slender dense bright yellow spikes 1-3 cm long. Material examined. Lanai: Lanai District, W of Lanai City and N of Kaumalapau, Kiei Gulch, lowland dry flat grassland, with Leucaena, Sida, Casuarina, and Panicum, 320 m, abundant and starting to naturalize, 14 May 1990, Wood et al. 336 (BISH, PTBG)."

302	Garden/amenity/disturbance weed	
	Source(s)	**Notes**
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	[Identified as invasive and/or a weed of unspecified impacts] "References: United States of America-N-101, United States of America-N-301, United States of America-N-839, United States of America-N-1292, Australia-N-1902, Chile-I-1872, United States of America-N-2092, Australia-W-1977, Chile-W-1977."
	Bogner, K. (2023). Pūlama Lanaʻi. Pers. Comm.	[Potential environmental weed and management target. Impacts not as bad as other invasive Acacia species] "Acacia aneura is a species with a sizable population in the Kpau area/CGMA. Unfortunately, there are quite a few trees if you go down the 4WD Keone road. As Hank said, not as bad as Acacia confusa on Lānaʻi (thank goodness), but it would take a lot of work to wipe out that population."

303	Agricultural/forestry/horticultural weed	n
	Source(s)	**Notes**
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	No evidence

Qsn #	Question	Answer
304	Environmental weed	
	Source(s)	Notes
	Bogner, K. (2023). Pūlama Lanaʻi. Pers. Comm.	[Potential environmental weed. Impacts not as bad as other invasive Acacia species] "Acacia aneura is a species with a sizable population in the Kpau area/CGMA. Unfortunately, there are quite a few trees if you go down the 4WD Keone road. As Hank said, not as bad as Acacia confusa on Lānaʻi (thank goodness), but it would take a lot of work to wipe out that population."

305	Congeneric weed	y
	Source(s)	Notes
	Smith, C.W. (1985). Impact of Alien Plants on Hawaii's Native Biota. Pp. 180-250 in Stone & Scott (eds.). Hawaii's terrestrial ecosystems: preservation & management. CPSU, Honolulu, HI	"Acacia mearnsii ... This noxious, evergreen tree often reaches 20 m in height. Apart from producing copious numbers of seeds, it generates numerous suckers resulting in monotypic thickets. The small seeds are not actively dispersed and, although rodents or granivorous birds cannot be totally discounted, man appears to be the principal disseminator. The species resprouts by basal shoots following fire, thereby generally intensifying the infestation. No evaluation of its potential for biological control has been made." ... "Acacia confusa ... This evergreen tree is prized by many for its brilliant display of bright yellow, mimosoid flowers and its ability to grow in poor, dry soils. It reaches heights of 15 m and shades out most other plants. The small seeds are passively dispersed. Man has been the principal disseminator through aerial broadcasting. The leaves are apparently allelopathic since the ground underneath these trees is barren except for a few alien weeds"
	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	"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."
	Weber, E. (2017). Invasive Plant Species of the World, 2nd Edition: A Reference Guide to Environmental Weeds. CABI Publishing, Wallingford, UK	[Acacia baileyana] "Where invasive, the tree forms dense thickets competing for space, water and nutrients, thereby replacing native vegetation (Invasive Species South Africa, 2012). The fast-growing pioneer tree is nitrogen-fixing due to symbiontic rhizobia in root nodules and thus increases soil fertility. Reproduction is by seed, seeds are dispersed by birds and ants. They are long-lived, accumulate in the soil and germinate readily after fire or other disturbances (Blood, 2001; Muyt, 2001; Weeds of Australia, 2014). The tree grows fast and sets seeds by 2 years of age (Morgan et al., 2002). A study reported that 2-year-old trees produce more than 300,000 flowers, resulting in more than 8000 seeds (Morgan et al., 2002)."

401	Produces spines, thorns or burrs	n
	Source(s)	Notes

Qsn #	Question	Answer
	Orchard, A.E. & Wilson, A. J. G. (eds.). 2001. Flora of Australia: Mimosaceae, Acacia. v. 11A, 11B, Part 2. Collingwood, Australia	[No evidence] "Shrub or tree to 18 m tall. Branchlets with white-appressed and red-glandular hairs between resinous ribs that sometimes become beaded with age; new growth dark (red-) brown, sometimes dirty brown-black, resinous. Phyllodes straight or ±curved, terete to flat, 2.5-9 (-12.5) cm long, 0.8-9 mm diam./wide, striate with longitudinal nerves, appressed-pubescent between them, often glabrescent, occasionally resinous. Inflorescences single in axils; peduncles 3-10 mm long; spikes 7-30 mm long. Flowers 5-merous; sepals spathulate or oblong, 0.5-1.1 mm long, free or united in basal ring or rarely with extremely short tube usually with a few hyaline hairs at top; corolla 0.9-1.8 mm long, glabrous or rarely with sparse short appressed hairs towards lobe tips; stamens 2-3.5 mm long; ovary with dense scale-like appressed hairs, occasionally resinous and apparently glabrous. Pods stipitate, oblong, flat, straight, to 10 cm long, 7-17 mm wide, chartaceous or somewhat crustaceous, often brown and resinous when mature, reticulately nerved, sometimes only faintly so, with resinous marginal nerves or a wing to 2 mm wide, glabrous or subglabrous. Seeds oblique to transverse, oblong or oval, 3-6 mm long, 2.2-4.5 mm wide; aril distinct, small, obliquely terminal, pileate, creamy white. Mulga."

402	Allelopathic	
	Source(s)	**Notes**
	Boland, D.J. , Brooker, M.I.H., Chippendale, G.M., Hall, N., Hyland, B.P.M., Johnston, R.D., Kleinig, D.A., McDonald, M.W. & Turner, J.D. (2006). Forest Trees of Australia. CSIRO Publishing, Collingwood, Australia	[Allelopathic potential, if any, unknown] "While it often occurs in large, almost pure stands, it may also be found in close association with numerous other arid zone acacias and species from many genera with include Eremophlia, Senna, Atriplex, Maireana, Triodia, Aristida, Halosarcia and Eragrostis."

403	Parasitic	n
	Source(s)	**Notes**
	Orchard, A.E. & Wilson, A. J. G. (eds.). 2001. Flora of Australia: Mimosaceae, Acacia. v. 11A, 11B, Part 2. Collingwood, Australia	"Shrub or tree to 18 m tall." [Fabaceae. No evidence]

404	Unpalatable to grazing animals	n
	Source(s)	**Notes**
	Ebinger, J. E., & Seigler, D. S. (2014). A Genus Treatment for Acacia from Legumes of Arizona: An Illustrated Flora and Reference. Desert Plants. Desert Plants 30(1): 19-28	"Acacia aneura is a long-lived, drought-tolerant tree. Due to its abundance and extensive distribution, it has been heavily utilized. It is a desirable fodder tree, especially during drought, though quality varies and plants have been overexploited in some areas (NAS 1979; Cunningham et al 1992). Miller (1994) discusses the role of Acacia aneura as a maintenance forage during drought including the presence of tannins in the leaves that can exacerbate mineral deficiencies in livestock."
	Boland, D.J. , Brooker, M.I.H., Chippendale, G.M., Hall, N., Hyland, B.P.M., Johnston, R.D., Kleinig, D.A., McDonald, M.W. & Turner, J.D. (2006). Forest Trees of Australia. CSIRO Publishing, Collingwood, Australia	"Considered the most important fodder tree in Australia (Everist 1969)."
	Orchard, A.E. & Wilson, A. J. G. (eds.). 2001. Flora of Australia: Mimosaceae, Acacia. v. 11A, 11B, Part 2. Collingwood, Australia	"Of great economic importance, particularly to the pastoral industry, most variants being palatable to grazing animals, native and exotic."

405	Toxic to animals	

Qsn #	Question	Answer
	Source(s)	Notes
	Orchard, A.E. & Wilson, A. J. G. (eds.). 2001. Flora of Australia: Mimosaceae, Acacia. v. 11A, 11B, Part 2. Collingwood, Australia	"Of great economic importance, particularly to the pastoral industry, most variants being palatable to grazing animals, native and exotic."
	Tropical Plants Database, Ken Fern. (2023). Acacia aneura. https://tropical.theferns.info/viewtropical.php?id=Acacia+aneura. [Accessed 27 Oct 2023]	[Generic description of toxicity] "Known Hazards - The seed of many Acacia species, including this one, is edible and highly nutritious, and can be eaten safely as a fairly major part of the diet. Not all species are edible, however, and some can contain moderate levels of toxins [1295]. Especially when harvesting from the wild, especial care should be taken to ensure correct identification of any plants harvested for food [K] Especially in times of drought, many Acacia species can concentrate high levels of the toxin Hydrogen cyanide in their foliage, making them dangerous for herbivores to eat."
	McKenzie, R. (2020). Australia's Poisonous Plants, Fungi and Cyanobacteria: A Guide to Species of Medical and Veterinary Importance. CSIRO Publishing, Clayton South, VIC	[Palatable, but potentially toxic to sheep] "Scientific names - Acacia aneura F.Muell. ex Benth [syn. Racosperma aneurum (Benth.) Pedley] Common names - Mulga, yarran Toxin - Tannins, suspected – 'leaves' (phyllodes) contain 5.0–7.5% tannic acid equivalent Animals at risk - Sheep Syndrome - Acquired visceral melanosis ('black livers') of sheep Weight of evidence for toxicity - Consistent for several incidents or a well-documented single case Degree of danger - low danger"

406	Host for recognized pests and pathogens	
	Source(s)	Notes
	Orwa C,et al. (2009). Agroforestree Database: a tree reference and selection guide version 4.0. http://www.worldagroforestry.org. [Accessed 30 Oct 2023]	"Pests and Diseases: In its natural habitat A. aneura is subject to partial defoliation by a range of insects and root damage by termites. Termite damage was light (4% mortality) to moderate (30% mortality) to two provenances aged 18 months in a trial in Zimbabwe."

407	Causes allergies or is otherwise toxic to humans	n
	Source(s)	Notes
	Jøker, D. (2003). Acacia aneura Benth. Seed Leaflet No. 86. Danida Forest Seed Centre, Denmark	[No evidence] "The seeds are rich in protein and can be ground and used as flour. In arid areas the species is used to provide shelter and shade and the attractive foliage makes it a popular ornamental. It is an excellent pollen producing species that is important to beekeepers."

408	Creates a fire hazard in natural ecosystems	
	Source(s)	Notes

Qsn #	Question	Answer
	Bowman, D. M. J. S., Boggs, G. S., & Prior, L. D. (2008). Fire maintains an Acacia aneura shrubland–Triodia grassland mosaic in central Australia. Journal of Arid Environments, 72(1), 34-47	[Trees are flammable, and may burn during intense fires, but in Australia, they can prevent the spread of fires relative to highly flammable grasses] "While it has long been recognised that fire plays an important role in the regeneration and spatial distribution of both A. aneura and Triodia communities the responses to fire of these communities are different (Allan and Southgate, 2002; Hodgkinson, 2002). A. aneura is able to regenerate prolifically after fire from seed bank, and fire is only likely to eliminate A. aneura from a site should the fires occur more frequently than every 10–15 years (Griffin and Friedel, 1984; Williams, 2002) In most years, A. aneura communities do not have sufficient fuel to enable the deep penetration of fire from surrounding Triodia grasslands, or to enable the spread of ignitions from within an A. aneura patch (Griffin and Friedel, 1984). In contrast, Triodia is an extraordinarily flammable grass owing to its architecture of dense hummocks that contain both living and dead phytomass, and the presence of waxy resins that occur on the leaf bases (Allan and Southgate, 2002). Triodia may recover from fire by resprouting, but is sometimes killed, in which case 4-7 years are required for seedlings to establish and produce seed (Allan and Southgate, 2002; Rice and Westoby, 1999)."

409	Is a shade tolerant plant at some stage of its life cycle	n
	Source(s)	**Notes**
	Australian National Botanic Gardens, 2012. Wattles - genus Acacia. Commonly Grown Acacia, Australian Government, Canberra. http://www.anbg.gov.au/acacia/species.html. [Accessed 27 Oct 2023]	"Full sun and good drainage essential."
	The University of Arizona. (2023). Campus Arboretum. Acacia aneura. https://apps.cals.arizona.edu/arboretum/taxon.aspx?id=709. [Accessed 30 Oct 2023]	"This tree grows best in full sun and cannot tolerate complete shade. "

410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y
	Source(s)	**Notes**
	Midgley, S. J., & Gunn, B. V. (1985). Acacia aneura seed collections for international provenance trials. Forest Genetic Resources Information, FAO, (13), 21-29	"It grows on many soil types with the densest stands usually found on red earths and sands or red clayey sands, rarely on alkaline soils and almost never on black cracking clays."
	Boland, D.J. , Brooker, M.I.H., Chippendale, G.M., Hall, N., Hyland, B.P.M., Johnston, R.D., Kleinig, D.A., McDonald, M.W. & Turner, J.D. (2006). Forest Trees of Australia. CSIRO Publishing, Collingwood, Australia	"Soil types vary but the denser stands are usually found on calcareous red loams and sands or red clayey sands and, sometimes, on sandy gravels. It is less common on lateritic and calcareous crusts or those of a markedly skeletal nature."
	Orchard, A.E. & Wilson, A. J. G. (eds.). 2001. Flora of Australia: Mimosaceae, Acacia. v. 11A, 11B, Part 2. Collingwood, Australia	"usually on loamy or sandy soils in areas of low relief or on shallow rocky soils on hills."

411	Climbing or smothering growth habit	n
	Source(s)	**Notes**
	Orchard, A.E. & Wilson, A. J. G. (eds.). 2001. Flora of Australia: Mimosaceae, Acacia. v. 11A, 11B, Part 2. Collingwood, Australia	"Shrub or tree to 18 m tall."

412	Forms dense thickets	y

Qsn #	Question	Answer
	Source(s)	**Notes**
	Fox, J. E. D. (1987). Potential of Australian Acacias from arid and semi-arid zones. Australian Acacias in Developing Countries, 17-28. Australian Centre for International Agricultural Research, Canberra, A.C.T.	"Acacia aneura often occurs in dense stands, has a wide distribution across Australia (165 map sheets) and is probably the most numerous woody species on the continent as a whole."
	Orchard, A.E. & Wilson, A. J. G. (eds.). 2001. Flora of Australia: Mimosaceae, Acacia. v. 11A, 11B, Part 2. Collingwood, Australia	"Often in pure stands forming open forests, woodlands and shrublands or predominant in vegetation with eucalypts, often with shrubby understorey."
	Boland, D.J. , Brooker, M.I.H., Chippendale, G.M., Hall, N., Hyland, B.P.M., Johnston, R.D., Kleinig, D.A., McDonald, M.W. & Turner, J.D. (2006). Forest Trees of Australia. CSIRO Publishing, Collingwood, Australia	"While it often occurs in large, almost pure stands, it may also be found in close association with numerous other arid zone acacias and species from many genera with include Eremophlia, Senna, Atriplex, Maireana, Triodia, Aristida, Halosarcia and Eragrostis."

501	Aquatic	n
	Source(s)	**Notes**
	Orchard, A.E. & Wilson, A. J. G. (eds.). 2001. Flora of Australia: Mimosaceae, Acacia. v. 11A, 11B, Part 2. Collingwood, Australia	[Terrestrial] "Widely spread in all mainland States except Vic., mainly S of lat. 20°S from the Indian Ocean almost to the Great Dividing Ra. in central Qld and in N.S.W.; usually on loamy or sandy soils in areas of low relief or on shallow rocky soils on hills. Often in pure stands forming open forests, woodlands and shrublands or predominant in vegetation with eucalypts, often with shrubby understorey. A prominent and conspicuous element of the landscape that has given rise to such terms as ‘mulga country’, ‘mulga lands’ or simply ‘the mulga’."

502	Grass	n
	Source(s)	**Notes**
	USDA, Agricultural Research Service, National Plant Germplasm System. (2023). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/. [Accessed 27 Oct 2023]	"Genus: Acacia Family: Fabaceae (alt. Leguminosae) Subfamily: Caesalpinioideae Tribe: Acacieae"

503	Nitrogen fixing woody plant	y
	Source(s)	**Notes**
	Ebinger, J. E., & Seigler, D. S. (2014). A Genus Treatment for Acacia from Legumes of Arizona: An Illustrated Flora and Reference. Desert Plants. Desert Plants 30(1): 19-28	"Acacia aneura is reported to nodulate (Allen & Allen 1981)."

504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	n
	Source(s)	**Notes**
	Orchard, A.E. & Wilson, A. J. G. (eds.). 2001. Flora of Australia: Mimosaceae, Acacia. v. 11A, 11B, Part 2. Collingwood, Australia	"Shrub or tree to 18 m tall."

601	Evidence of substantial reproductive failure in native habitat	n
	Source(s)	**Notes**

Qsn #	Question	Answer
	Boland, D.J. , Brooker, M.I.H., Chippendale, G.M., Hall, N., Hyland, B.P.M., Johnston, R.D., Kleinig, D.A., McDonald, M.W. & Turner, J.D. (2006). Forest Trees of Australia. CSIRO Publishing, Collingwood, Australia	"Mulga communities are widespread and occupy a significant proportion of the continent. They occur in all mainland States except Victoria, mainly south of latitude 20°S and west from near Shark Bay in Western Australia, east to the western plains of New South Wales and the Great Dividing Range in Queensland; it is sparsely represented in the Simpson Desert and the channel country of south-western Queensland."

602	Produces viable seed	y
	Source(s)	**Notes**
	Ghassali, F., Salkini, A. K., Petersen, S. L., Niane, A. A., & Louhaichi, M. (2012). Germination dynamics of Acacia species under different seed treatments. Range management and Agroforestry, 33(1), 37-42	"Establishment of Acacia is typically inhibited by hard seed coat. This study was conducted to evaluate effective seed stratification methods for fourteen Acacia species, using water (control), boiling water, sulphuric acid and mechanical scarification techniques. Highest germination was observed with sulphuric acid treatment. Average non-germinated seeds were 95% in the control. The highest germination percentage was recorded in A. victoriae, A. deanii ssp deanii, A. deanii ssp paucijuga, A. farnesiana, A. karroo, A. pruinocarpa, A. saligna under sulphuric acid treatment, A. ligulata, A. aneura, A. blakei, A. estrophiolata when using hot water, A. kempeana, A. pendula, A. sparsiflora using mechanical scarification. These results indicate the importance of proper seed stratification in Acacia species."
	Tropical Plants Database, Ken Fern. (2023). Acacia aneura. https://tropical.theferns.info/viewtropical.php?id=Acacia+aneura. [Accessed 27 Oct 2023]	"Propagation Seed - best sown as soon as it is ripe in a sunny position in a nursery seedbed[1]. Like many species within the family Fabaceae, once they have been dried for storage the seeds of this species benefits from scarification before sowing in order to speed up and improve germination. This can usually be done by pouring a small amount of nearly boiling water on the seeds (being careful not to cook them!) and then soaking them for 12 - 24 hours in warm water. By this time they should have imbibed moisture and swollen - if they have not, then carefully make a nick in the seedcoat (being careful not to damage the embryo) and soak for a further 12 hours before sowing [K]. Treated seed germinates in 3 - 4 weeks at 25°c[133]. As soon as the seedlings are large enough to handle, prick them out into individual pots and grow them on in a sunny position. Nursery growth is slow with seedlings often taking 6 - 8 months to reach 20cm tall [303]. Dormancy is evident in fresh seed but disappears after 1 year. Viability is maintained for 13 years with air-dried seeds stored at room temperature and increases with seed age up to 3 years. Even when 20 years old, a germination rate of 13% has been achieved[303]. Cuttings of half-ripe wood with a heel, planted in individual pots[78]. Fair percentage[78]."
	Australian National Botanic Gardens, 2012. Wattles - genus Acacia. Commonly Grown Acacia, Australian Government, Canberra. http://www.anbg.gov.au/acacia/species.html. [Accessed 27 Oct 2023]	"Propagation: From scarified seed or boiling water treatment."

603	Hybridizes naturally	y
	Source(s)	**Notes**
	Orchard, A.E. & Wilson, A. J. G. (eds.). 2001. Flora of Australia: Mimosaceae, Acacia. v. 11A, 11B, Part 2. Collingwood, Australia	"Hybrids with A. aneura occur, particularly in W.A., and are well represented in herbarium collections. Most of these have been identified as A. brachystachya (or more recently, A. cibaria) which does not occur in the west of W.A." ... "Specimens usually referred to A. brachystachya in the west of W.A. are for the most part, hybrids between A. aneura and A. ramulosa." ... "Hybrids with A. aneura and A. ramulosa occur frequently."

Qsn #	Question	Answer
	Andrew, R. L., Miller, J. T., Peakall, R., Crisp, M. D., & Bayer, R. J. (2003). Genetic, cytogenetic and morphological patterns in a mixed mulga population: evidence for apomixis. Australian Systematic Botany, 16 (1), 69-80	"Putative hybrid forms, reported in many parts of the group's range (Pedley 2001), could also result from recent or ancient hybridisation events and subsequent persistence of the hybrid as a clone."

604	Self-compatible or apomictic	y
	Source(s)	**Notes**
	Andrew, R. L., Miller, J. T., Peakall, R., Crisp, M. D., & Bayer, R. J. (2003). Genetic, cytogenetic and morphological patterns in a mixed mulga population: evidence for apomixis. Australian Systematic Botany, 16 (1), 69-80	"The mating system of mulga is largely unknown, although clonality is not expected because recruitment occurs mostly through seed, which has a hard coat and germinates mainly following fire or flooding (Preece 1971). Australian arid-zone acacias are thought to be largely outbreeding (Keighery 1982) and Australian acacias are largely self-incompatible (Kenrick and Knox 1989). However, self-fertilisation or apomixis may occur in A. cowleana and A. holosericea (Moran et al. 1992)."
	Miller, J. T., Andrew, R. A., & Maslin, B. R. (2002). Towards an understanding of variation in the Mulga complex (Acacia aneura and relatives). Conservation Science Western Australia, 4(3): 19-35	[Facultative apomixis.] "Acacia aneura and its close relatives form a highly variable species complex commonly known as Mulga. They are small trees that dominate the vegetation of arid regions, in all occupying around 20% of Australia. This paper discusses and illustrates some of the more important types of variation found in Mulga, especially growth form and phyllode and pod morphology. This variation occurs both between and within populations and often results in a very complex mosaic of mixed Mulga populations. The underlying genetic and biological factors responsible for this variation are explored. While hybridisation is probably one cause of the variation, our use of microsatellite markers has not been able to provide direct evidence of this; however, the sampling done to date has been very small. Genetic developmental mechanisms such as polyploidy, apomixis and neoteny are maintaining this diversity. The Mulga complex contains multiple ploidy levels, including triploids, tetraploids and pentaploids, and polyembryony is a common feature in all these polyploids. Microsatellite data have identified fixed heterozygozity in populations with some genetic differences among morphotypes. Progeny arrays of 24 morphotypes indicated that over 95% of the plants have the same genotype as the mother plant. This accumulating evidence indicates that the Mulga complex is reproducing through facultative apomixis. Additionally the retention of juvenile characteristics (neoteny) is seen in many populations and also increases the variability. Given the importance of Mulga to the ecology, management and sustainable utilisation of arid zone ecosystems, it is important that the classification of the group adequately reflect the biological reality that exists in nature, if indeed this is achievable. The work reported here, and in related molecular and population studies, provides a basis for testing new classifications of Mulga. It also provides new information that can contribute to an improved classification of the group."

605	Requires specialist pollinators	n
	Source(s)	**Notes**
	Jøker, D. (2003). Acacia aneura Benth. Seed Leaflet No. 86. Danida Forest Seed Centre, Denmark	"It is an excellent pollen producing species that is important to beekeepers." ... "The flowers are pollinated by insects and the seeds are dispersed mainly by ants, termites and birds."

Qsn #	Question	Answer
606	Reproduction by vegetative fragmentation	n
	Source(s)	Notes
	Jøker, D. (2003). Acacia aneura Benth. Seed Leaflet No. 86. Danida Forest Seed Centre, Denmark	Mulga is propagated by seeds and it does not resprout after cutting. Germination is normally good, about 80%."

607	Minimum generative time (years)	>3
	Source(s)	Notes
	Orwa C,et al. (2009). Agroforestree Database: a tree reference and selection guide version 4.0. http://www.worldagroforestry.org. [Accessed 30 Oct 2023]	"Growth rate is generally slow but is related to moisture conditions. In central Australia planted specimens receiving an average of 370 mm of rainfall a year grew in ten years into multi-stemmed shrubs 3 m tall and 2-4 cm dbh with a crown diameter of 2 m. Cultivated specimens receiving regular irrigation have reached 10 m tall and 10 cm dbh in 10 years. In trials where rainfall is relatively high, the Charleville, Queensland provenance, a broad phyllode form, has grown more rapidly than provenances from central Australia."
	Midgley, S. J., & Gunn, B. V. (1985). Acacia aneura seed collections for international provenance trials. Forest Genetic Resources Information, FAO, (13), 21-29	"Results have shown growth rates to be generally slow (2 m in height after 3 years) but little attention has been given to improvement of growth or other attributes through the use of better provenances."
	Allan, G., Allan, C., Materne, C., & Wilson, D. (2009). 12. Post-fire recruitment dynamics of mulga communities in central Australia. Pp. 38-44 in Edwards GP and McConnell K. 2009. Proceedings of the Desert Fire Symposium. DKCRC Working Paper 35. Desert Knowledge CRC, Alice Springs	[10+ years] "Mulgas are also known to have a relatively long juvenile period, typically considered to be seven to 10 years, before individuals are capable of flowering and setting seed to replace the seed source. Therefore, mulga communities are considered vulnerable to short fire intervals."
	Kube, P. (1987). Growth rates, establishment techniques, and propagation of some Central Australian acacias. Australian Acacias in Developing Countries, 77-80. Australian Centre for International Agricultural Research, Canberra, A.C.T.	Planted specimens receiving little supplementary water runoff and above-average rainfall (370 mm yr- I) have, in 10 years, grown into a healthy multi-stemmed tree 3 m tall with a diameter at breast height (dbh) of 2-4 cm and a crown radius of 1 m. These trees were grown on a loam soil. With a good water supply, A. aneura can grow 1 m in height per year. Cultivated specimens receiving regular irrigation have grown into multi-stemmed trees 10 m tall and with dbh of 10 cm in 10 years. The wood density of IO-year-old A. aneura (a tree 6 m tall) was measured as 850 kg m-3 and the heartwood was well developed. Although slow-growing without a good water supply, A. aneura has proven to be drought-tolerant and will remain healthy under cultivation long after other species (such as some eucalypts) decline."

701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	n
	Source(s)	Notes
	Orchard, A.E. & Wilson, A. J. G. (eds.). 2001. Flora of Australia: Mimosaceae, Acacia. v. 11A, 11B, Part 2. Collingwood, Australia	"Pods not stipitate, oblong, flat, straight, to 6 cm long, 8-15 mm wide, with wings 1-2 mm wide, rather crustaceous, brown, with scattered appressed hairs at maturity. Seeds oblique to transverse, oblong, c. 5 mm long, 2.5-3 mm wide; aril conspicuous, terminal, cupular, greyish." [No evidence. Pods and seeds lack means of external attachment. Arils are adaptations for ant and possibly bird dispersal]

702	Propagules dispersed intentionally by people	y
	Source(s)	Notes
	Hassan, R. A., & Hamdy, R. S. (2021). Synoptic overview of exotic Acacia, Senegalia and Vachellia (Caesalpinioideae, mimosoid clade, Fabaceae) in Egypt. Plants, 10(7), 1344	"It was introduced to Egypt in the early 1920s from Australia [44]. It was growing very well in the Egyptian environment and listed among the seeds available for exchange [58]."

Qsn #	Question	Answer
	Ebinger, J. E., & Seigler, D. S. (2014). A Genus Treatment for Acacia from Legumes of Arizona: An Illustrated Flora and Reference. Desert Plants. Desert Plants 30(1): 19-28	"Mulga is increasingly being planted in Arizona landscapes. Its size and growth habit make it ideal for planting in street medians and patios. It can also be planted as a screen and as an accent plant (Jones & Sacamano 2000)."
	Wagner, W.L. & Herbst, D.R. (1995). Contributions to the flora of Hawaii. IV. New records and name changes. Bishop Museum Occasional Paper 42: 13-27	"The following collection is a new naturalized record of Acacia aneura, known as mulga in Australia, in the Hawaiian Islands. It is known in cultivation from Oahu, Molokai, Lanai, and Kahoolawe. It has been cultivated in the archipelago since 1931 and was introduced from Australia by C.S. Judd for forestry plantings (from Judd s. n., BISH)."

703	Propagules likely to disperse as a produce contaminant	n
	Source(s)	**Notes**
	Orchard, A.E. & Wilson, A. J. G. (eds.). 2001. Flora of Australia: Mimosaceae, Acacia. v. 11A, 11B, Part 2. Collingwood, Australia	"Pods not stipitate, oblong, flat, straight, to 6 cm long, 8–15 mm wide, with wings 1–2 mm wide, rather crustaceous, brown, with scattered appressed hairs at maturity. Seeds oblique to transverse, oblong, c. 5 mm long, 2.5–3 mm wide; aril conspicuous, terminal, cupular, greyish." [Unlikely. Not cultivated with other crops, and pods and seeds relatively large]
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	No evidence

704	Propagules adapted to wind dispersal	n
	Source(s)	**Notes**
	Wright, B. R., & Zuur, A. F. (2014). Seedbank dynamics after masting in mulga (Acacia aptaneura): implications for post-fire regeneration. Journal of Arid Environments, 107, 10-17	"Consequently, as mulga seeds are not adapted for wind dispersal, it was assumed that plants were spaced at sufficient distances to ensure that seeds recorded from beneath shrub canopies were seeds that had originated from those particular shrubs."

705	Propagules water dispersed	
	Source(s)	**Notes**
	Boland, D.J. , Brooker, M.I.H., Chippendale, G.M., Hall, N., Hyland, B.P.M., Johnston, R.D., Kleinig, D.A., McDonald, M.W. & Turner, J.D. (2006). Forest Trees of Australia. CSIRO Publishing, Collingwood, Australia	[Distribution on flood and erosional plains indicates water may facilitate dispersal] "Mulga grows most plentifully on flood and erosional plains and in broad valley heads, but occurrences also include hill slopes and ridges. In sand ridge deserts it may occur in the dune swales."
	Wright, B. R., & Zuur, A. F. (2014). Seedbank dynamics after masting in mulga (Acacia aptaneura): implications for post-fire regeneration. Journal of Arid Environments, 107, 10-17	[Possibly moved by overland water flow] "Mulga seedbanks were found to be more concentrated beneath areas with litter compared to bare areas. This may indicate that mulga litter beds act as seed safe sites, providing mechanical protection against granivore removal following seed shed. Alternatively (or additionally), heavy litter may act as a physical barrier during rain events or windy weather, catching seeds that become entrained by overland water flows or wind during gusty conditions."

Qsn #	Question	Answer
706	**Propagules bird dispersed**	y
	Source(s)	**Notes**
	Jøker, D. (2003). Acacia aneura Benth. Seed Leaflet No. 86. Danida Forest Seed Centre, Denmark	[Aril attracts ants, but may also facilitate some dispersal by birds] "Seed: seeds are oval and fl at, 3-5 x 2-4 mm, shiny dark brown and with a hard seedcoat. At the base of the seeds is attached a small pale aril." ... "The flowers are pollinated by insects and the seeds are dispersed mainly by ants, termites and birds."
	WRA Specialist. (2023). Personal Communication	In the Hawaiian Islands, game birds may consumed and potentially disperse seeds.

707	**Propagules dispersed by other animals (externally)**	y
	Source(s)	**Notes**
	Davidson, D. W., & Morton, S. R. (1984). Dispersal adaptations of some Acacia species in the Australian arid zone. Ecology, 65(4), 1038-1051	"Arils of A. aneura offer a relatively low energy reward (Table 3 and Fig. 3), and we have observed only small-bodied ants in the genera Melophorus and Pheidole foraging for this species' diaspores. Because nest mounds of these ants are moved frequently (in sharp contrast to the long-lived Rhytidoponera mound microhabitats), we were unable to detect associations between any Acacia species and the mounds of these ants, though we did find seeds discarded in refuse heaps"

708	**Propagules survive passage through the gut**	
	Source(s)	**Notes**
	Jøker, D. (2003). Acacia aneura Benth. Seed Leaflet No. 86. Danida Forest Seed Centre, Denmark	"The flowers are pollinated by insects and the seeds are dispersed mainly by ants, termites and birds." [Possibly dispersed by birds, but unconfirmed by other references. The seed aril may attract birds, but appears to be an adaptation to ant dispersal]

801	**Prolific seed production (>1000/m2)**	y
	Source(s)	**Notes**
	Wright, B. R., & Zuur, A. F. (2014). Seedbank dynamics after masting in mulga (Acacia aptaneura): implications for post-fire regeneration. Journal of Arid Environments, 107, 10-17	[Prolific seed production after exceptionally high rainfall years] "The mean density of viable seeds at each shrub was low prior to masting, at 1 seed per 0.16m2 sampling unit in the canopy zone (6.3 seeds/m2), and 0.1 seeds per sampling unit in the extended zone (0.5 seeds/m2). Mean seed densities increased sharply following seed fall, with the November 2010 sampling round indicating 206.8 seeds per sampling unit in the canopy zone (1292 seeds/m2) and 36.4 seeds per sampling unit in the extended zone (227.6 seeds/ m2)." ... "The current study indicated that mulga populations have sparse seedbanks in the absence of recent seed fall, but experience transient post-mast seedbank pulses that last approximately 18 months from the time of initial seed fall."

802	**Evidence that a persistent propagule bank is formed (>1 yr)**	y
	Source(s)	**Notes**
	Orwa C,et al. (2009). Agroforestree Database: a tree reference and selection guide version 4.0. http://www.worldagroforestry.org. [Accessed 30 Oct 2023]	"Seed storage behaviour is orthodox with 13% germination following 20 years of open storage at room temperature. Viability is maintained for 13 years with air-dried seeds stored at room temperature and increases with seed age up to 3 years. Dormancy is evident in fresh seed but disappears after 1 year. On average, there are 50 000-110 000 seeds/kg."

Qsn #	Question	Answer
	Jøker, D. (2003). Acacia aneura Benth. Seed Leaflet No. 86. Danida Forest Seed Centre, Denmark	"Storage and viability The seed is orthodox and if dried to a moisture content below 10% and stored in air-tight containers it will remain viable for several years even at ambient temperature. At low temperatures the seed can be stored for more than 10 years. Seed that has been stored for some months often germinates better than fresh seed. Dormancy and pretreatment The seeds are hardcoated and must be scarifi ed in order to allow water to enter. The recommended method is to dip the seeds in boiling water for 5-30 seconds or pour boiling water on the seeds and let them remain in the water until it has cooled down."

803	Well controlled by herbicides	
	Source(s)	**Notes**
	Jøker, D. (2003). Acacia aneura Benth. Seed Leaflet No. 86. Danida Forest Seed Centre, Denmark	"Mulga is propagated by seeds and it does not resprout after cutting." [Herbicides may not be required for control.]
	WRA Specialist. (2023). Personal Communication	Unknown. Herbicides used to control other Acacia species may be effective.

804	Tolerates, or benefits from, mutilation, cultivation, or fire	n
	Source(s)	**Notes**
	Kube, P. (1987). Growth rates, establishment techniques, and propagation of some Central Australian acacias. Australian Acacias in Developing Countries, 77-80. Australian Centre for International Agricultural Research, Canberra, A.C.T.	"Acacia aneura can live for greater than 50 years but is very fire-sensitive. Although normally drought-tolerant, it will die in a severe drought."
	Fox, J. E. D. (1987). Potential of Australian Acacias from arid and semi-arid zones. Australian Acacias in Developing Countries, 17-28. Australian Centre for International Agricultural Research, Canberra, A.C.T.	"Initial height growth of fire-induced sprouts may be much more rapid than new seedling growth from the same species. For example, A. aneura sprouts in the Pilbara grew to 1.26 m in 5 years, three limes faster than seedling growth at the same site (Fox 1985a). This species is generally killed by fire however, and the ultimate form of resprouts is not clear."
	Jøker, D. (2003). Acacia aneura Benth. Seed Leaflet No. 86. Danida Forest Seed Centre, Denmark	"Mulga is propagated by seeds and it does not resprout after cutting."

805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	
	Source(s)	**Notes**
	Wagner, W.L. & Herbst, D.R. (1995). Contributions to the flora of Hawaii. IV. New records and name changes. Bishop Museum Occasional Paper 42: 13-27	[Unknown, but able to naturalize on at least one island] "The following collection is a new naturalized record of Acacia aneura, known as mulga in Australia, in the Hawaiian Islands. It is known in cultivation from Oahu, Molokai, Lanai, and Kahoolawe. It has been cultivated in the archipelago since 1931 and was introduced from Australia by C.S. Judd for forestry plantings (from Judd s. n., BISH). It is easily recognized by its narrow, dull phyllodes 0.9–8 (12) mm wide with inconspicuous veins, flat winged pods, and flowers in slender dense bright yellow spikes 1–3 cm long. Material examined. Lanai: Lanai District, W of Lanai City and N of Kaumalapau, Kiei Gulch, lowland dry flat grassland, with Leucaena, Sida, Casuarina, and Panicum, 320 m, abundant and starting to naturalize, 14 May 1990, Wood et al. 336 (BISH, PTBG)."

Summary of Risk Traits:

Acacia aneura (mulga) is a shrub or small tree that is native to arid and semi-arid regions of Australia. It is used as a source of fodder and timber and has been introduced to a number of locations worldwide, including the Hawaiian Islands. It is now reported to be naturalized on the island of Lanai. In its native range, it forms dense stands, is able to reproduce through facultative apomixis, and periodically produces large numbers of seeds after exceptionally high rainfall years.

High Risk / Undesirable Traits
• Able to grow and spread in arid to semi-arid tropical regions.
• Naturalized on Lanai (Hawaiian Islands)
• Identified as a potential environmental weed by botanists in the Hawaiian Islands.
• Other Acacia species are invasive weeds.
• May be toxic to sheep if eaten (limited evidence).
• Might increase fire risk in fire prone ecosystems (but lower risk than flammable grasslands).
• Tolerates many soil types.
• Forms dense stands in native range.
• N-Fixing species (modifies soil nutrient levels and may facilitate establishment of other weeds).
• Reproduces by seeds.
• Hybridizes with other Acacia species.
• Can reproduced through facultative apomixis.
• Seeds dispersed by ants, gravity, potentially birds and water, and through intentional cultivation.
• Prolific seed production following heavy rainfall years.
• Seeds may form a persistent seedbank (>1 year).

Low Risk Traits
• Palatable to grazing animals
• Unarmed (no spines, thorns, or burrs)
• Grows best in full sun and high light environments (dense shade may inhibit spread)
• Not documented to spread vegetatively.
• Slow growing and reaches reproductive maturity in 10+ years.
• Limited seed production in years with low precipitation.
• Killed by cutting and fire.