Taxon: Neonotonia wightii **Family:** Fabaceae

Common Name(s): glycine
perennial soybean
soja pérenne
soja-perene

Synonym(s): Glycine wightii (Wight & Arn.) Verdc.
Notonia wightii Wight & Arn.

Assessor: Chuck Chimera **Status:** Assessor Approved **End Date:** 4 May 2015

WRA Score: 16.0 **Designation:** H(HPWRA) **Rating:** High Risk

Keywords: Fodder Plant, Smothering Vine, N-Fixing, Self-Compatible, Animal-Dispersed

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

Qsn #	Question	Answer Option	Answer
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	y
412	Forms dense thickets	y=1, n=0	n
501	Aquatic	y=5, n=0	n
502	Grass	y=1, n=0	n
503	Nitrogen fixing woody plant	y=1, n=0	n
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	y
605	Requires specialist pollinators	y=-1, n=0	n
606	Reproduction by vegetative fragmentation	y=1, n=-1	y
607	Minimum generative time (years)	1 year = 1, 2 or 3 years = 0, 4+ years = -1	1
701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	y=1, n=-1	y
702	Propagules dispersed intentionally by people	y=1, n=-1	y
703	Propagules likely to disperse as a produce contaminant	y=1, n=-1	y
704	Propagules adapted to wind dispersal	y=1, n=-1	n
705	Propagules water dispersed		
706	Propagules bird dispersed	y=1, n=-1	n
707	Propagules dispersed by other animals (externally)	y=1, n=-1	n
708	Propagules survive passage through the gut	y=1, n=-1	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		
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**
	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 2 May 2015]	[Assessment of wild type. Possible that certain cultivars may have traits that reduce or increase the weedy potential] "A short-day plant. Cultivars have been selected partly on the basis of flowering time."

102	**Has the species become naturalized where grown?**	
	Source(s)	**Notes**
	WRA Specialist. 2015. Personal Communication	NA

103	**Does the species have weedy races?**	
	Source(s)	**Notes**
	WRA Specialist. 2015. 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**
	USDA, ARS, National Genetic Resources Program. 2015. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland. URL: http://www.ars-grin.gov/. [Accessed 2 May 2015]	"Native: AFRICA Northeast Tropical Africa: Chad; Ethiopia; Sudan East Tropical Africa: Kenya; Tanzania; Uganda West-Central Tropical Africa: Burundi; Cameroon; Gabon; Zaire West Tropical Africa: Ghana; Guinea; Liberia; Nigeria; Sierra Leone; Togo South Tropical Africa: Angola; Malawi; Mozambique; Zambia; Zimbabwe Southern Africa: Botswana ASIA-TEMPERATE Arabian Peninsula: Yemen ASIA-TROPICAL Indian Subcontinent: India; Sri Lanka Malesia: Indonesia - Java; Malaysia [Malaya]"

Qsn #	Question	Answer
202	**Quality of climate match data**	**High**
	Source(s)	**Notes**
	USDA, ARS, National Genetic Resources Program. 2015. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland. URL: http://www.ars-grin.gov/. [Accessed]	

203	**Broad climate suitability (environmental versatility)**	**y**
	Source(s)	**Notes**
	FAO. 2015. Grassland Species Profiles - Neonotonia wightii. http://www.fao.org/ag/agp/AGPC/doc/gbase/data/pf000055.htm. [Accessed 2 May 2015]	"In Kenya it grows from the lowlands up to 2 450 m at the latitude of the equator. In Colombia, it occurs from sea level to 1 800 m. "
	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 2 May 2015]	[Elevation range exceeds 1000 m, demonstrating environmental versatility] "Most evaluated material originates from tropical east Africa, where it occurs mostly >1,000 (and up to 2,450) m asl, and from southern Africa to 33ºS, largely at lower altitudes (but sometimes to 1,750 m asl). Average annual temperatures vary from as low as 15ºC to about 25ºC, sometimes with a lowest average monthly minimum of 5 or 6ºC, and subject to frosts. Foliage and finer stems are killed by frost causing leaf shedding, but plants recover from buds on the older, less affected stems, and from the low crown. Up to 50% of plants may be killed if temperatures fall below -10ºC. Optimum day/night temperature regime for growth 30/25ºC, with growth slowing at 16°C and ceasing at 13°C."

204	**Native or naturalized in regions with tropical or subtropical climates**	**y**
	Source(s)	**Notes**
	USDA, ARS, National Genetic Resources Program. 2015. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland. URL: http://www.ars-grin.gov/. [Accessed 2 May 2015]	"Native: AFRICA Northeast Tropical Africa: Chad; Ethiopia; Sudan East Tropical Africa: Kenya; Tanzania; Uganda West-Central Tropical Africa: Burundi; Cameroon; Gabon; Zaire West Tropical Africa: Ghana; Guinea; Liberia; Nigeria; Sierra Leone; Togo South Tropical Africa: Angola; Malawi; Mozambique; Zambia; Zimbabwe Southern Africa: Botswana ASIA-TEMPERATE Arabian Peninsula: Yemen ASIA-TROPICAL Indian Subcontinent: India; Sri Lanka Malesia: Indonesia - Java; Malaysia [Malaya] Naturalized: naturalized elsewhere "

205	**Does the species have a history of repeated introductions outside its natural range?**	**y**

Qsn #	Question	Answer
	Source(s)	**Notes**
	Csurhes, S. & Edwards, R. 1998. Potential environmental weeds in Australia: Candidate species for preventative control. Biodiversity Group, Environment Australia, Canberra, Australia	"It is native to India, Malaysia, Indonesia and tropical Africa (Hacker 1990) and was probably imported into Australia for use as cattle fodder."
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"now widely naturalized; in Hawai'i cultivated as a fodder plant and naturalized in pastures, along roadsides, and in other low elevation, disturbed areas at least on O'ahu, Maui, Kaho'olawe, and Hawai'i. First collected on Hawai'i in 1975 (Herbst & Ishikawa 5515, BISH)"
	Pacific Island Ecosystems at Risk (PIER). 2010. Neonotonia wightii. http://www.hear.org/pier/species/neonotonia_wightii.htm. [Accessed 3 May 2015]	Fiji, French Polynesia Society Islands, Hawaiian Islands, New Caledonia, Niue, Papua New Guinea, Tonga, Wallis and Futuna, Australia, La Réunion, Mauritius,

301	Naturalized beyond native range	y
	Source(s)	**Notes**
	Smith, A.C. 1985. Flora Vitiensis Nova: A New Flora of Fiji (Spermatophytes Only). Volume 3. National Tropical Botanical Garden, Lawai, HI	"A perennial climbing or trailing herb 0.5-4.5 m. long, often woody at base and with the rootstock sometimes thick and woody, cultivated only (or perhaps sparingly naturalized) near sea level." ... "It is a comparatively recent introduction into Fiji (usually brought in as Glycine javanica and at least once as Desmodium sandwicense). It has probably become naturalized, although the only available vouchers are all from trial plots."
	Ziegler, A. D., Warren, S. D., Perry, J. L., & Giambelluca, T. W. (2000). Reassessment of revegetation strategies for Kaho'olawe Island, Hawai'i. Journal of Range Management, 53: 106-113	"Glycine and siratro, both of which volunteer readily in planting sites, are considered invasive in that they may smother other more desirable species, particularly less competitive natives." ... "Buffelgrass and glycine, and 2 volunteer species, Natal redtop and siratro, demonstrate the greatest ability to persist on the hardpan fo periods of several years."
	Csurhes, S. & Edwards, R. 1998. Potential environmental weeds in Australia: Candidate species for preventative control. Biodiversity Group, Environment Australia, Canberra, Australia	"Naturalised populations are common in coastal and sub-coastal areas of Queensland and New South Wales."
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"now widely naturalized; in Hawai'i cultivated as a fodder plant and naturalized in pastures, along roadsides, and in other low elevation, disturbed areas at least on O'ahu, Maui, Kaho'olawe, and Hawai'i. First collected on Hawai'i in 1975 (Herbst & Ishikawa 5515, BISH).-"
	Oppenheimer, H.. 2007. New plant records from Moloka'i, Lāna'i, Maui, and Hawai'i for 2006. Bishop Museum Occasional Papers 96:17-34	"Occurring on roadsides, in pastures, and other disturbed areas at low elevations on Kaua'i, O'ahu, Moloka'i, Maui, Kaho'olawe, and Hawai'i (Wagner et al. 1999: 674; Hughes 1995: 6; Herbarium Pacificum Staff 1996: 4–5), this aggressive vine is also on Läna'i. It has the potential to spread rapidly and smother dry forest species. Material examined. LÄNA'I: Keömoku Rd, 420 m, near 3-mile marker, local, vines climbing Eucalyptus, Schinus, Panicum, Leucaena, 19 Oct 2006, Oppenheimer H100632."

Qsn #	Question	Answer
	Hughes, G.D. 1995. New Hawaiian plant records II. Bishop Museum Occasional Papers. 42:1-10	"Significance: New island record for Molokai in Kalamaula Game Management Area in 1990 (Hughes s.n., BISH). For a relatively new introduction, this plant has come to dominate large sections of secondary lowland habitat in western and central Molokai including Moomomi, Hoolehua, and Kaunakakai. This vine can produce a very large amount of seed, and forms a blanketlike layer on top of other vegetation that smothers and displaces other species. It has been observed climbing on top of 15 m-high kiawe trees along the Molokai forest road."

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 2 May 2015]	"Has becomes a serious weed of rainforest margins, growing over surrounding weedy shrubs such as Lantana camara and Solanum mauritianum, and into the lower tree canopy ."
	WRA Specialist. 2015. Personal Communication	A weed of disturbed habitats that has negative environmental impacts

303	Agricultural/forestry/horticultural weed	n
	Source(s)	**Notes**
	Motooka, P., Castro, L., Nelson, D., Nagai, G. & Ching,L. 2003. Weeds of Hawaii's Pastures and Natural Areas: An Identification and Management Guide. CTAHR, UH Manoa, Honolulu, HI	"Not a problem in pastures, as tinaroo glycine is relished by cattle and other livestock. Unchecked, it could smother smaller plants and shrubs and enshroud fences. In fact, it has been used to Glycine wightii control lantana. Conceivably, tinaroo glycine could become a problem in exclosures where livestock are kept out."

304	Environmental weed	y
	Source(s)	**Notes**

Qsn #	Question	Answer
	Queensland Government. 2011. Weeds of Australia - Glycine. Neonotonia wightii. http://keyserver.lucidcentral.org/weeds/data/03030800-0b07-490a-8d04-0605030c0f01/media/Html/Neonotonia_wightii.htm. [Accessed 4 May 2015]	"Glycine (Neonotonia wightii) is regarded as an environmental weed in Queensland and northern New South Wales. It is also seen as a potential environmental weed or "sleeper weed" in other parts of northern Australia. This species can infest extensive areas of open land and rainforest margins where it smothers grasses and other understorey vegetation, and sometimes even shrubs and smaller trees. It reduces the amount of light reaching these plants, eventually even killing them, and prevents the regeneration of native species. Its growth is most prolific in tropical and sub-tropical climates where the annual rainfall is between 750-1500 mm. Glycine (Neonotonia wightii) is currently of most concern in south-eastern Queensland, and during a recent study it was ranked among the top 20 most invasive environmental weeds in this region. It appears on numerous local environmental weed lists in south-eastern Queensland (i.e. in Ipswich City, Gold Coast City, Maroochy Shire, Beaudesert Shire, Cooloola Shire and Redland Shire) and is regarded as a threat to ecosystem integrity in conservation areas in Springbrook, on the Gold Coast hinterland. Glycine (Neonotonia wightii) is also listed as an environmental weed in the Townsville City Council region and as an undesirable plant in the Wet Tropics World Heritage Area in northern Queensland. In New South Wales, glycine (Neonotonia wightii) is sporadically naturalised in coastal districts, mainly north from the Bellingen area."
	Medeiros, A. C., Loope, L. L., & Chimera, C. G. 1993. Kanaio Natural Area Reserve biological inventory and management recommendations. Prepared for Natural Area Reserve System, State of Hawaii	[Potential threat to dry forest reserve] "Glycine wightii (Fabaceae) is the most recent invasive threat in the reserve, becoming established within the last five years." ... "In the coming years, it may prove to be a serious management problem for the reserve. especially in areas protected from browsing."

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

401	Produces spines, thorns or burrs	n
	Source(s)	**Notes**
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[No evidence] "Twining or prostrate perennial herbs; stems 0.6-4.5 m long, often forming dense clumps, woody toward base, densely pubescent with long, spreading to appressed, rusty hairs. Leaflets elliptic, ovate, or rhombic-ovate, 1.5-16 cm long, 1.3-12.5 cm wide, glabrous to densely velvety pubescent, stipe Is subulate, ca. 2 mm long."

402	Allelopathic	n
	Source(s)	**Notes**

Qsn #	Question	Answer
	FAO. 2015. Grassland Species Profiles - Neonotonia wightii. http://www.fao.org/ag/agp/AGPC/doc/gbase/data/pf000055.htm. [Accessed 3 May 2015]	[No evidence] "Combines well with Panicum maximum, P. maximum var. trichoglume, Setaria anceps, Chloris gayana, Melinis minutiflora and Pennisetum purpureum. In Digitaria decumbens it lasts two years at Campinas, Brazil, and at least three years in the fertile Cauca Valley of Colombia. At Atherton, north Queensland, it is sown at 11 kg./ha with Rhodes grass at 3.3 kg./ha (Tow, 1967). In Brazil, it is sown at 0.5-m intervals at 3 kg./0.40 ha in three rows between colonial guinea rows sown 2 m apart; with elephant or napier grass, at 0.5-m intervals at 6.5 kg./ha in one row between two rows of grass spaced 0.5 m apart; with pangola grass in alternate rows 1 m apart, the glycine planted at 20 seeds 0.5 m apart; with molasses grass the glycine is planted on the square with 20 seeds at 0.5 m apart and the molasses grass subsequently broadcast over the glycine (Menegario, 1964)."
	Domínguez Monge, S., Domínguez Valenzuela, J. A., Cruz Hipólito, H. E., & Medina Pitalúa, J. L. 2004. Memoria XVI Congreso Latinoamericano de Malezas y XXIV Congreso Nacional de la Asociación Mexicana de la Ciencia de la Maleza, Manzanillo, Colima, México, del 10 al 12 de Noviembre de 2003. ALAM	[No evidence] "The allelopathic activity of extracts of foliage and soil from Mucuna pruriens var. utilis and Neonotonia wigthii on the growth and germination of seedlings of Sorghum halepense and Rottboellia coochinchinensis was evaluated. Soil extracts from M. pruriens affected the growth of aerial parts and roots of S. halepense and aerial parts of R. cochinchinensis. Soil extracts of N. wightii did not affect the growth of either weed species. None of the extracts affected the germination of the weed species. Leaf extracts of M. pruriens affected the root and aerial growth of S. halepense and the aerial parts of R. cochinchinensis."

403	Parasitic	n
	Source(s)	**Notes**
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[Fabaceae. No evidence] "Twining or prostrate perennial herbs..."

404	Unpalatable to grazing animals	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 2 May 2015]	"Pasture for grazing, cut-and-carry, and standover - makes good hay and silage. Suitable for open pasture or agroforestry, although twining habit can be a problem in the latter."

405	Toxic to animals	n
	Source(s)	**Notes**
	FAO. 2015. Grassland Species Profiles - Neonotonia wightii. http://www.fao.org/ag/agp/AGPC/doc/gbase/data/pf000055.htm. [Accessed 2 May 2015]	"Although oestrogenic substances are present in Neonotonia wightii, no breeding troubles have been reported (Colman, Holder and Swain, 1966). "

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 2 May 2015]	"Low levels of oestrogenic substances have not been associated with any problems. Can cause meat taint initially, which diminishes with continued exposure."

406	Host for recognized pests and pathogens	y
	Source(s)	**Notes**
	Carvalho Jr, A. D., & Figueiredo, M. B. (2000). The real identity of the soybean rust in Brazil. Summa Phytopathologica, 26(2): 197-200	"In this paper the taxonomic problem of soyabean rust in Brazil is reviewed. The soybean rust fungus was first reported in Minas Gerais, Brazil, by J. Deslandes in 1979 who identified the pathogen as Phakopsora pachyrhizi. The announcement of the presence of P. pachyrhizi in Brazil caused impact because the high economical importance of soyabean as an export product. The papers produced by mycologists all over the world on Phakopsoraceae were analysed and it was concluded that Phakopsora meibomiae is the soyabean rust fungus occurring in Brazil. This species also occurs on other Leguminosae: Phaseolus lunatus, Glycine wightii, Crotalaria spp., and Centrosema spp. among others."
	Mabagala, R. B., & Saettler, A. W. (1992). The role of weeds in survival of Pseudomonas syringae pv. phaseolicola in Northern Tanzania. Plant Disease, 76(7): 683-687	"Of 16 weed species belonging to 10 families, only Neonotonia wightii served as a perennial reservoir of P. s. pv. phaseolicola, the cause of halo blight of Phaseolus vulgaris. The weed survived dry periods along fences and hedgerows, by roadsides, on ditch banks and in corners of fields."
	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 2 May 2015]	"Pests and diseases: Generally few problems with pests and diseases. Under very wet conditions, leaf blight caused by Rhizoctonia solani can cause severe leaf damage. A leaf spot (Cercospora sp.), sclerotinia rot (Sclerotinia sclerotiorum) and another disease caused by Synchytrium dolici producing small yellow rust spots on the leaves and stems have also been recorded. Rust (Phakopsora pachyrhiza) is sometimes found on mature leaves but is not a problem in grazed stands where there is a regular turnover of leaves. N. wightii is an alternative host for halo blight caused by Pseudomonas syringae pv. phaseolicola, a serious disease of french beans (Phaseolus vulgaris), but is not seriously affected itself. Alfalfa mosaic virus has been isolated. During moist and mild, temperature conditions, webworms (Oncopera spp.: Lepidoptera, Hepialidae) can severely defoliate plants. Amnemus weevil (Amnemus quadrituberculatus) and rough brown weevil (Baryopadus corrugatus) (both Coleoptera, Curculionidae) attack the roots of young plants, causing loss of stand. Seed yields have been reduced due to activity of a bruchid weevil (Bruchus sp.: Coleoptera, Bruchidae)."

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

Qsn #	Question	Answer
	FAO. 2015. Grassland Species Profiles - Neonotonia wightii. http://www.fao.org/ag/agp/AGPC/doc/gbase/data/pf000055.htm. [Accessed 3 May 2015]	[No evidence of toxicity to humans] "Although oestrogenic substances are present in Neonotonia wightii, no breeding troubles have been reported (Colman, Holder and Swain, 1966). "
	Wagstaff, D.J. 2008. International poisonous plants checklist: an evidence-based reference. CRC Press, Boca Raton, FL	No evidence of toxicity to humans

408	Creates a fire hazard in natural ecosystems	n
	Source(s)	**Notes**
	FAO. 2015. Grassland Species Profiles - Neonotonia wightii. http://www.fao.org/ag/agp/AGPC/doc/gbase/data/pf000055.htm. [Accessed 3 May 2015]	[Recovers from fire, but does not appear to significantly increase fire risk] Response to fire: Moderate. Van Rensburg (1967) reports that, even at the height of the dry season, it produces green growth after burning. This would be governed by the store of subsoil moisture and how well the plants were established. "

409	Is a shade tolerant plant at some stage of its life cycle	
	Source(s)	**Notes**
	Bazill, J. A. (1987). Evaluation of tropical forage legumes under Pinus caribaea var hondurensis in Turrialba, Costa Rica. Agroforestry Systems, 5(2): 97-108	"As part of an investigation on the eventual use of shade-tolerant species as components of silvopastoral systems in Central America, 25 species/cultivars were sown in late Dec. 1983 in plots in the open and under an even cover of P. caribaea var. hondurensis (10 yr old, b.a. 30 m2/ha). Mean light intensity under the canopy was 18% full sunlight."; "Glycine wightii and Macroptilium atropurpureum did not perform particularly well."
	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 2 May 2015]	"Moderately shade tolerant, growing successfully under trees in open forest and woodland. Twines towards the light when growing among taller grasses."
	Stur, W.W. 1991. Screening forage species for shade tolerance - a preliminary report. ACIAR Proceedings No. 32: 58-63	[Yield decreases with decreasing light levels] "The yield ranking of legumes changed to a greater extent than that of the grasses as light transmission was reduced from 50 to 20% (Table 2). Legumes which had a much lower yield ranking at 20 than at 50% light transmission included ... Neonofonia wightii cv. Tinaroo ..."

410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y
	Source(s)	**Notes**

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 2 May 2015]	"Occurs on wide range of soils from red sands to heavy black clays, mostly, but not always, well drained, and with pH from 6-8.9. In cultivation, grows best on fertile, deep, freely drained, near neutral clays and clay loams, usually of alluvial origin or derived from basic igneous rocks (basalt, andesite). Performance is less reliable on soils with pH much less than 6 unless heavily limed, or those with a hard-setting A horizon. More demanding than most tropical legumes for molybdenum. Very sensitive to manganese (more so than Trifolium repens) and aluminium toxicity (similar to Trifolium repens), both of which are alleviated by additions of lime. Symptoms of Mn toxicity include interveinal chlorosis and leaf puckering. Moderately tolerant of salinity, some varieties more so than others. Of the twining legumes, N. wightii is best adapted to neutral fertile soils, Centrosema molle (pubescens) to acid fertile soils, and Macrotyloma axillare and Macroptilium atropurpureum to acid, moderately fertile soils."

411	Climbing or smothering growth habit	y
	Source(s)	**Notes**
	Hughes, G.D. 1995. New Hawaiian plant records II. Bishop Museum Occasional Papers. 42:1-10	"For a relatively new introduction, this plant has come to dominate large sections of secondary lowland habitat in western and central Molokai including Moomomi, Hoolehua, and Kaunakakai. This vine can produce a very large amount of seed, and forms a blanketlike layer on top of other vegetation that smothers and displaces other species."
	Ziegler, A. D., Warren, S. D., Perry, J. L., & Giambelluca, T. W. (2000). Reassessment of revegetation strategies for Kaho'olawe Island, Hawai'i. Journal of Range Management, 53: 106-113	"Glycine and siratro, both of which volunteer readily in planting sites, are considered invasive in that they may smother other more desirable species, particularly less competitive natives."
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"Twining or prostrate perennial herbs; stems 0.6-4.5 m long, often forming dense clumps, woody toward base, densely pubescent with long, spreading to appressed, rusty hairs."

412	Forms dense thickets	n
	Source(s)	**Notes**
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[Smothering impacts] "Twining or prostrate perennial herbs; stems 0.6-4.5 m long, often forming dense clumps, woody toward base, densely pubescent with long, spreading to appressed, rusty hairs."

501	Aquatic	n
	Source(s)	**Notes**
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[Terrestrial] "Twining or prostrate perennial herbs..." ... "naturalized in pastures, along roadsides, and in other low elevation, disturbed areas..."

502	Grass	n

Qsn #	Question	Answer
	Source(s)	**Notes**
	USDA, ARS, National Genetic Resources Program. 2015. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland. URL: http://www.ars-grin.gov/. [Accessed 2 May 2015]	"Family: Fabaceae (alt. Leguminosae) subfamily: Faboideae tribe: Phaseoleae subtribe: Glycininae. Also placed in: Papilionaceae "

503	Nitrogen fixing woody plant	n
	Source(s)	**Notes**
	FAO. 2015. Grassland Species Profiles - Neonotonia wightii. http://www.fao.org/ag/agp/AGPC/doc/gbase/data/pf000055.htm. [Accessed 2 May 2015]	[Not woody] "Herbaceous perennial with strong taproot and trailing, climbing and twining stems. Stems slender and well branched, and under grazing may arise from a crown below the soil surface; runners frequently root at the nodes and are moderately hairy." ... "At Palmira, Colombia, glycine pastures fix 160 kg. N/ ha/year (Lotero, personal communication). At Campinas, Brazil, it has been shown to fix 170 to 290 kg./alqueire/year or about 70 to 120 kg./ha (Menegario, 1964). In Kenya, Gethin-Jones (1942) found that if fixed 165 kg. N/ha/year for four years, and on another East African site it fixed 175 kg. N/ha (= 875 kg. sulphate of ammonia) annually for the first five years and then 110 kg. N/ha (= 550 kg. sulphate of ammonia) per year for the following four years as the soil nitrogen percentage rose. Colman, Holder and Swain (1966) recorded that it fixed 156 to 203 kg. N/ha over three seasons, but in a dry season at the same station, Mears (1967) recorded only 16.5 kg. N/ ha. Edye (1967) showed that in fertile black earths, nitrogen fixation by glycine is low."

504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	n
	Source(s)	**Notes**
	FAO. 2015. Grassland Species Profiles - Neonotonia wightii. http://www.fao.org/ag/agp/AGPC/doc/gbase/data/pf000055.htm. [Accessed 2 May 2015]	"Herbaceous perennial with strong taproot and trailing, climbing and twining stems."

601	Evidence of substantial reproductive failure in native habitat	n
	Source(s)	**Notes**
	FAO. 2015. Grassland Species Profiles - Neonotonia wightii. http://www.fao.org/ag/agp/AGPC/doc/gbase/data/pf000055.htm. [Accessed 2 May 2015]	[Widespread. No evidence] "Neonotonia wightii belongs to the subgenus Glycine, which is entirely African in origin. It is found in the East Indies, tropical Asia, Ethiopia, through east and central Africa and down to southern Africa, where it occurs in the warmer parts of the Transvaal, Natal and east Cape Province."

602	Produces viable seed	y
	Source(s)	**Notes**

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 2 May 2015]	"N. wightii is a prolific seeder, and with sufficient space and the appropriate environment, seedlings establish readily. Some varieties can also spread vegetatively, rooting down at the nodes."

603	Hybridizes naturally	
	Source(s)	**Notes**
	WRA Specialist. 2015. Personal Communication	Unknown. No evidence of hybridization found

604	Self-compatible or apomictic	y
	Source(s)	**Notes**
	FAO. 2015. Grassland Species Profiles - Neonotonia wightii. http://www.fao.org/ag/agp/AGPC/doc/gbase/data/pf000055.htm. [Accessed 2 May 2015]	"Breeding system: Self-pollinated and cleistogamous (Hutton, 1960) but some cross-pollination occurs (Bogdan, 1966; Hutton, 1970b). Chromosome number 2n = 22 (diploid) and 2n = 44 (tetraploid). "

605	Requires specialist pollinators	n
	Source(s)	**Notes**
	Roubik, D.W. 1995. Pollination of cultivated plants in the tropics. FAO Services Bulletin 118. FAO, Rome, Italy	"Glycine wightii" ... "Pollinators - bee"
	Nogueira-Couto, R. H., Pereira, J. M. S., & De Jong, D. (1998). Pollination of Glycine wightii, a perennial soyabean, by Africanized honey bees. Journal of Apicultural Research, 37(4): 289-291	"When investigating pollination of G. wightii [Neonotonia wightii], Lepidoptera, Vespidae, Diptera and Hymenoptera of the families Halictidae, Anthophoridae (Exomalopsis sp.), and Apidae (Apis mellifera scutellata) collected nectar. A. m. scutellata comprised over 90% of the visitors observed. Bean pod production of flowers exposed to bees was increased approx equal to 56% and seeds per pod 45%"

606	Reproduction by vegetative fragmentation	y
	Source(s)	**Notes**
	FAO. 2015. Grassland Species Profiles - Neonotonia wightii. http://www.fao.org/ag/agp/AGPC/doc/gbase/data/pf000055.htm. [Accessed 4 May 2015]	"...runners frequently root at the nodes..."
	Queensland Government. 2011. Weeds of Australia - Glycine. Neonotonia wightii. http://keyserver.lucidcentral.org/weeds/data/03030800-0b07-490a-8d04-0605030c0f01/media/Html/Neonotonia_wightii.htm. [Accessed 4 May 2015]	"This species reproduces mainly by seed. It occasionally also reproduces vegetatively, with pieces of its older woody stems capable of taking root when they are detached."

607	Minimum generative time (years)	1

Qsn #	Question	Answer
	Source(s)	**Notes**
	Febles, G., Perez, J., & Padilla, C. (1983) The effect of time of application of phosphoric fertilizer on Neonotonia wightii seed production. Cuban Journal of Agricultural Science.17(2):183-190	"In the 1st yr, yield of seed plus pods was highest in the control (846 kg/ha) followed by (b) with 787 kg/ha. "
	Infonet-Biovision. 2011. Green Manure / Cover Crop Legumes. http://www.infonet-biovision.org/default/ct/777/soilFertilityManagement. [Accessed 4 May 2015]	"Time to maturity: 12 months "

701	**Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)**	**y**
	Source(s)	**Notes**
	Queensland Government. 2011. Weeds of Australia - Glycine. Neonotonia wightii. http://keyserver.lucidcentral.org/weeds/data/03030800-0b07-490a-8d04-0605030c0f01/media/Html/Neonotonia_wightii.htm. [Accessed 4 May 2015]	"The seeds can be spread in contaminated agricultural produce (i.e. fodder) and dumped garden waste. They may also be dispersed by water and animals."
	WRA Specialist. 2015. Personal Communication	Ubiquity of plants along roads & in pastures, & persistence of seeds in the soil suggests that inadvertent dispersal is likely to occur

702	**Propagules dispersed intentionally by people**	**y**
	Source(s)	**Notes**
	Queensland Government. 2011. Weeds of Australia - Glycine. Neonotonia wightii. http://keyserver.lucidcentral.org/weeds/data/03030800-0b07-490a-8d04-0605030c0f01/media/Html/Neonotonia_wightii.htm. [Accessed 4 May 2015]	"Glycine (Neonotonia wightii) has been cultivated as a pasture legume or cover crop. Several cultivars have been released in Australia for use these purposes. The four main ones being 'Tinaroo', 'Clarence', 'Cooper' and 'Malawi', with 'Tinaroo' being the most common."
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai‘i Press and Bishop Museum Press, Honolulu, HI.	[Introduced for forage] "...in Hawai'i cultivated as a fodder plant and naturalized in pastures, along roadsides,"

703	**Propagules likely to disperse as a produce contaminant**	**y**
	Source(s)	**Notes**
	Ziegler, A. D., Warren, S. D., Perry, J. L., & Giambelluca, T. W. (2000). Reassessment of revegetation strategies for Kaho'olawe Island, Hawai'i. Journal of Range Management, 53: 106-113	"Glycine appears to have been a contaminant in the hay mulch used to stabilize terraces that were constructed across the site ." ... "The presence of glycine may result from contamination in the seed mixture. and/or dispersal, from on-island sources, including the Phase I site."

Qsn #	Question	Answer
704	**Propagules adapted to wind dispersal**	**n**
	Source(s)	**Notes**
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"Pods linear-oblong, straight or curved, 15-36 mm long, 2.5-5 mm wide, densely rusty pubescent, transversely grooved between the seeds, ± weakly septate. Seeds 4-7, dark reddish brown, oblong, somewhat compressed, 2.5-4 mm long, 1.5-3 mm wide, aril white."

705	**Propagules water dispersed**	
	Source(s)	**Notes**
	Landmark Ecological Services Pty Ltd. 2006. Wilsons Creek/Huonbrook Weed Management Strategy. Wilsons Creek Huonbrook Landcare Group, Mullumbimby, NSW	[Speculation that water may move seeds] "This vine is likely to have been spread from deliberately planted cover/fodder/soil stabilisation plantings, through soil or possibly water movement, or dispersed by cattle. Seeds are hard-coated and long-lived in the soil, making eradication difficult."

706	**Propagules bird dispersed**	**n**
	Source(s)	**Notes**
	Queensland Government. 2011. Weeds of Australia - Glycine. Neonotonia wightii. http://keyserver.lucidcentral.org/weeds/data/03030800-0b07-490a-8d04-0605030c0f01/media/Html/Neonotonia_wightii.htm. [Accessed 4 May 2015]	"The seeds can be spread in contaminated agricultural produce (i.e. fodder) and dumped garden waste. They may also be dispersed by water and animals."

707	**Propagules dispersed by other animals (externally)**	**n**
	Source(s)	**Notes**
	Queensland Government. 2011. Weeds of Australia - Glycine. Neonotonia wightii. http://keyserver.lucidcentral.org/weeds/data/03030800-0b07-490a-8d04-0605030c0f01/media/Html/Neonotonia_wightii.htm. [Accessed 4 May 2015]	"[Viable seeds are able to pass through the digestive tracts of animals that consume them, but otherwise lack means of external attachment] The seeds can be spread in contaminated agricultural produce (i.e. fodder) and dumped garden waste. They may also be dispersed by water and animals."

708	**Propagules survive passage through the gut**	**y**
	Source(s)	**Notes**
	Gardener, C. J., McIvor, J. G., & Jansen, A. (1993). Passage of legume and grass seeds through the digestive tract of cattle and their survival in faeces. Journal of Applied Ecology, 30(1): 63-74	"Table 5. Fraction of seed excreted, times after feeding for an output of 50% and 90% of excreted seed, and mean retention time of hard seed of 10 legume species placed in the rumens of two steer" [Neonotonia wightii - % seeds excreted in faeces = 50.8%]
	Neto, M. S., Jones, R. M., & Ratcliff, D. (1987). Recovery of pasture seed ingested by ruminants. 1. Seed of six tropical pasture species fed to cattle, sheep and goats. Animal Production Science, 27(2): 239-246	"Table 5. Recovery of viable seeds by washing faeces as a percentage of viable seed ingested, and recovery of legume seedlings as a percentage of viable seed ingested" [Tinaroo glycine recovered from Cattle (70.8%), Sheep (13.7%), Goats (31.0%)]

Qsn #	Question	Answer
	Gardener, C.J., McIvor, J.G. & Jansen, A. 1993. Survival of Seeds of Tropical Grassland Species Subjected to Bovine Digestion. Journal of Applied Ecology 30(1): 75-85	"The survival of seeds in nylon bags placed first in the rumen and then immersed in acid pepsin has proved a good indicator of the actual survival of seeds through the digestive tract of cattle. Gardener, McIvor & Jansen (1993) studied the survival of seeds of seven grasses and 10 legumes placed in the rumens of steers and found close agreement with the nylon bag results(Fig. 6). Many seeds of Pennisetum clandestinum, Leucaena leucocephala, Stylosanthes hamata, Stylosanthes scabra, Lotononis bainesii and Neonotonia wightii survived while seeds of Cajanus cajan, Lablab purpureus, Urochloa mosambicensis, Cenchrus ciliaris and Chloris gayana survived poorly..."

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 2 May 2015]	"50,000-170,000 (-330,000) seeds/kg." ... "While yields of up to 1 t/ha seed have been recorded, commercial producers consider 300 kg/ha satisfactory." [300 x 50,000-170,000 (-330,000)/ha = 1500-5100 (-9900) seeds/square meter]
	Hughes, G.D. 1995. New Hawaiian plant records II. Bishop Museum Occasional Papers. 42:1-10	"This vine can produce a very large amount of seed, and forms a blanketlike layer on top of other vegetation that smothers and displaces other species."
	Cameron, D. G. (1984). Tropical and subtropical pasture legumes. 4. Glycine (Neonotonia wightii): An outstanding but soil specific legume. Queensland Agricultural Journal 110(6): 311-316	Seed yields of up to 300 kg/ha are obtained.

802	Evidence that a persistent propagule bank is formed (>1 yr)	y
	Source(s)	**Notes**
	Landmark Ecological Services Pty Ltd. 2006. Wilsons Creek/Huonbrook Weed Management Strategy. Wilsons Creek Huonbrook Landcare Group, Mullumbimby, NSW	"Seeds are hard-coated and long-lived in the soil, making eradication difficult."
	Royal Botanic Gardens Kew. 2008. Seed Information Database (SID). Version 7.1. http://data.kew.org/sid/. [Accessed 2 May 2015]	"Storage Behaviour: Orthodox. Storage Conditions: Long-term storage under IPGRI preferred conditions at RBG Kew, WP. Oldest collection 23 years"
	Baskin, C.C. & Baskin, J.M. 2014. Seeds Ecology, Biogeography, and Evolution of Dormancy and Germination. Second Edition. Academic Press, San Francisco, CA	"TABLE 9.17 Dormancy class or nondormancy (D/ND) in seeds of herbaceous species growing in tropical semievergreen forests or in areas where forests have been removed." [Glycine wightii - PY= physical dormancy]

Qsn #	Question	Answer
	de Morais, L. F., Almeida, J. C., Deminicis, B. B., de Pádua, F. T., Morenz, M. J., de Abreu, J. B., Araujo, R. P. & de Nepomuceno, D. D. (2014). Methods for Breaking Dormancy of Seeds of Tropical Forage Legumes. American Journal of Plant Sciences 5: 1831-1835	[Seeds possess physical dormancy] "The aim of this study was to evaluate methods for breaking dormancy of seeds Neonotonia wightii (perennial soybean), Macrotiloma axilare (archer), Pueraria phaseoloides (tropical kudzu), Calopogonium mucunoides (calopo), which were subjected to the following treatments for physical breaks and physiological dormancy: 1) control; 2) scarification with sandpaper; 3) immersion in H2SO4 98% for five minutes and subsequent washing in water; 4) preheating at 60˚C for 150 minutes in an air circulating oven; 5) 0.2% KNO3; and 6) gibberellic acid (GA3 0.5%). The results showed that using H2SO4 to break seed dormancy archer and perennial soybean and calopo scarification with sandpaper were the most recommended treatments. Tropical Kudzu presented physiological response to treatments with the use of gibberellic acid and physical treatment using immersion H2SO4. Thus, it is necessary to use techniques to make the breaking dormancy of seeds of legumes, resulting in an increase in the rate of seed germination and rapid deployment of the legume."

803	Well controlled by herbicides	y
	Source(s)	**Notes**
	Motooka, P., Castro, L., Nelson, D., Nagai, G. & Ching,L. 2003. Weeds of Hawaii's Pastures and Natural Areas: An Identification and Management Guide. CTAHR, UH Manoa, Honolulu, HI	"Pat Bily (TNC) reported good control with foliar application of 2% solution of triclopyr amine in water with a surfactant. Tolerant of tebuthiuron in apple-of-Sodom control trials and following large-scale aerial treatment of pastures in South Point, Hawai'i."
	Cameron, D. G. (1984). Tropical and subtropical pasture legumes. 4. Glycine (Neonotonia wightii): An outstanding but soil specific legume. Queensland Agricultural Journal 110(6): 311-316	"Plants in unwanted areas are eradicated with a spray of 1 kg 2,4,5-T/ha. "

804	Tolerates, or benefits from, mutilation, cultivation, or fire	
	Source(s)	**Notes**
	FAO. 2015. Grassland Species Profiles - Neonotonia wightii. http://www.fao.org/ag/agp/AGPC/doc/gbase/data/pf000055.htm. [Accessed 2 May 2015]	"Response to defoliation: Grazing or cutting to 5 cm over a two-year period reduced the stand to 12 to 15 percent (Whiteman, 1969) but it survived better than Macroptilium atropurpureum, Desmodium uncinatum and Lotononis bainesii. Grazing every four weeks at Wollongbar, New South Wales, Australia, reduced plant numbers compared with eight- and ten-week intervals. Savage (1970) recorded highest yields from cutting at 3.75 cm every nine weeks. More frequent cutting at this height reduced yields. Cutting at 5 cm caused a significant depression of yield at Lawes (lat. 28 S, rainfall 680 mm) on heavy black soil (Santhirasegaram, Coaldrake and Salih, 1966). Left ungrazed, the plant's leaves eventually drop and the production of new growth is considerably delayed (van Rensburg, 1967)." ... "Response to fire: Moderate. Van Rensburg (1967) reports that, even at the height of the dry season, it produces green growth after burning. This would be governed by the store of subsoil moisture and how well the plants were established."

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 9 May 2015]	[Intolerant of intensive grazing. Tolerant of fire] "N. wightii is relatively slow to establish, and should not be grazed too early. Under normal conditions, mixed grass/legume pastures can be grazed 7-8 weeks after sowing, but then only with sufficient grazing pressure to reduce the grass competition for the young legume plants. In the following season once the legume is fully established, the pasture can be rotationally grazed, leaving at least a 20 cm stubble after each grazing. It is intolerant of continuous intensive grazing." ... "Overcomes the damaging effects of fire by virtue of low or buried crown, and setting large amounts of hard seed that germinate following fire."

805	**Effective natural enemies present locally (e.g. introduced biocontrol agents)**	
	Source(s)	**Notes**
	Queensland Government Department of Agriculture, Fisheries and Forestry. 2015. Glycine (Neonotonia wightii). https://www.daff.qld.gov.au/plants/weeds-pest-animals-ants/weeds/a-z-listing-of-weeds/photo-guide-to-weeds/glycine. [Accessed 4 May 2015]	"There is no biological control agent available for this plant."

Summary of Risk Traits:

High Risk / Undesirable Traits
• Elevation range exceeds 1000 m, demonstrating environmental versatility
• Thrives in tropical climates
• Widely naturalized outside native range
• Disturbance-adapted weed with negative environmental impacts
• Host for crop pathogens
• Tolerates many soil types
• Smothers other vegetation
• Reproduces by seeds & vegetatively at nodes
• Self-compatible
• Seeds dispersed by animals (internally), intentionally by people, secondarily by water & as a contaminant of soil, garden waste or other fodder
• Able to reach maturity quickly (in 12 months)
• Prolific seed production
• Hard-coated seeds capable of forming a persistent seed bank (longevity unknown)
• Intolerant of heavy grazing, but tolerates fire

Low Risk Traits
• Unarmed (no spines, thorns or burrs)
• Provides fodder for livestock
• Non-toxic
• Shade reduces productivity (thrives in high light environments)
• Herbicides may provide effective control