

<b>Taxon:</b> <i>Vigna luteola</i> (Jacq.) Benth.	<b>Family:</b> Fabaceae
<b>Common Name(s):</b> dalrymple vigna deer pea hairy cowpea	<b>Synonym(s):</b> Dolichos luteolus Jacq. Dolichos niloticus Delile Dolichos repens L. Vigna glabra Savi Vigna marina auct. Austral. Vigna nilotica (Delile) Hook. f. Vigna repens (L.) Kuntze

<b>Assessor:</b> Chuck Chimera	<b>Status:</b> Assessor Approved	<b>End Date:</b> 27 Sep 2018
<b>WRA Score:</b> 12.0	<b>Designation:</b> H(HPWRA)	<b>Rating:</b> High Risk

**Keywords:** Herbaceous Vine, Weedy, Pasture Forage, 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	n=0, y = 1*multiplier (see Appendix 2)	y
303	Agricultural/forestry/horticultural weed		
304	Environmental weed	n=0, y = 2*multiplier (see Appendix 2)	n
305	Congeneric weed	n=0, y = 1*multiplier (see Appendix 2)	y
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

Qsn #	Question	Answer Option	Answer
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	y=1, n=0	n
409	Is a shade tolerant plant at some stage of its life cycle		
410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y=1, n=0	y
411	Climbing or smothering growth habit	y=1, n=0	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	n
702	Propagules dispersed intentionally by people	y=1, n=-1	y
703	Propagules likely to disperse as a produce contaminant		
704	Propagules adapted to wind dispersal	y=1, n=-1	n
705	Propagules water dispersed	y=1, n=-1	y
706	Propagules bird dispersed	y=1, n=-1	n
707	Propagules dispersed by other animals (externally)	y=1, n=-1	n
708	Propagules survive passage through the gut	y=1, n=-1	y
801	Prolific seed production (>1000/m <sup>2</sup> )		
802	Evidence that a persistent propagule bank is formed (>1 yr)		
803	Well controlled by herbicides	y=-1, n=1	y
804	Tolerates, or benefits from, mutilation, cultivation, or fire	y=1, n=-1	y
805	Effective natural enemies present locally (e.g. introduced biocontrol agents)		

**Supporting Data:**

Qsn #	Question	Answer
101	Is the species highly domesticated?	n
	Source(s)	Notes
	Bosch, C.H. 2004. <i>Vigna luteola</i> (Jacq.) Benth. [Internet] Record from PROTA4U. Grubben, G.J.H. & Denton, O.A. (Editors). PROTA (Plant Resources of Tropical Africa / Ressources végétales de l'Afrique tropicale), Wageningen, Netherlands. <a href="http://www.prota4u.org/search.asp">http://www.prota4u.org/search.asp</a> . [Accessed ]	[Used in cowpea breeding, but not domesticated] "An important germplasm collection of <i>Vigna luteola</i> is held at IITA, Ibadan, Nigeria. Accessions are also held at CIAT (Colombia) and ILRI (Ethiopia). <i>Vigna luteola</i> is used as a source of resistance and improved nutritive value in cowpea breeding. A method has been developed for recovery of interspecific hybrids of mung bean ( <i>Vigna radiata</i> (L.) R.Wilczek) and other <i>Vigna</i> species that were previously difficult to hybridize, including <i>Vigna luteola</i> ."

102	Has the species become naturalized where grown?	
	Source(s)	Notes
	WRA Specialist. 2018. Personal Communication	NA

103	Does the species have weedy races?	
	Source(s)	Notes
	WRA Specialist. 2018. 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
	Bosch, C.H. 2004. <i>Vigna luteola</i> (Jacq.) Benth. [Internet] Record from PROTA4U. Grubben, G.J.H. & Denton, O.A. (Editors). PROTA (Plant Resources of Tropical Africa / Ressources végétales de l'Afrique tropicale), Wageningen, Netherlands. <a href="http://www.prota4u.org/search.asp">http://www.prota4u.org/search.asp</a> . [Accessed 25 Sep 2018]	"Origin and geographic distribution <i>Vigna luteola</i> occurs throughout the tropics and is widespread in mainland Africa. It has been grown on research stations in Réunion and Mauritius."

202	Quality of climate match data	High
	Source(s)	Notes
	Bosch, C.H. 2004. <i>Vigna luteola</i> (Jacq.) Benth. [Internet] Record from PROTA4U. Grubben, G.J.H. & Denton, O.A. (Editors). PROTA (Plant Resources of Tropical Africa / Ressources végétales de l'Afrique tropicale), Wageningen, Netherlands. <a href="http://www.prota4u.org/search.asp">http://www.prota4u.org/search.asp</a> . [Accessed 25 Sep 2018]	

203	Broad climate suitability (environmental versatility)	y
	Source(s)	Notes

Qsn #	Question	Answer
	Cook, B.G. et al. 2005. Tropical Forages: an interactive selection tool., SIRO, DPI&F(Qld), CIAT and ILRI. <a href="http://www.tropicalforages.info/index.htm">http://www.tropicalforages.info/index.htm</a> . [Accessed 25 Sep 2018]	" <i>V. luteola</i> is found over a diverse range of temperature environments. While it mostly occurs at 650–2,150 m asl in tropical Africa, and has been found at 2,050 m asl (9° 50'N) in Costa Rica, it is also recorded from more temperate environments such as Buenos Aires (34°S, Argentina) and New York (40°N, USA), and also from the lowland tropics of Central America. Average annual temperature in these areas spans about 13–26°C. Optimum temperature for growth is in the range 20–30°C. 'Dalrymple' is very susceptible to frost."
	Tomooka, N., Isemura, T., Naito, K., Kaga, A. & Vaughan, D. (2014). <i>Vigna</i> Species. Pp. 175-208 in Singh, M. et al. (eds.). Springer, New Delhi	" <i>V. luteola</i> is native to Africa, Asia, and Australasia but has been used as a short-season and highly palatable pasture or green manure in Europe and the New World. It is particularly useful in wet or waterlogged conditions. It has a wide range of adaptation to soil types, light conditions, and temperatures."
	Gargiullo, M.B., Magnuson, B.L & Kimball, L.D. 2008. A Field Guide to Plants of Costa Rica. Oxford University Press US, New York, NY	" <i>Vigna luteola</i> (cowpea) ... Habitat: Open sites, sometimes along beaches. Altitude: Sea level to 1200 m." [Elevation range in Costa Rica >1000 m, demonstrating environmental versatility]
	Bosch, C.H. 2004. <i>Vigna luteola</i> (Jacq.) Benth. [Internet] Record from PROTA4U. Grubben, G.J.H. & Denton, O.A. (Editors). PROTA (Plant Resources of Tropical Africa / Ressources végétales de l'Afrique tropicale), Wageningen, Netherlands. <a href="http://www.prota4u.org/search.asp">http://www.prota4u.org/search.asp</a> . [Accessed 25 Sep 2018]	" <i>Vigna luteola</i> grows in swampy grasslands, among reeds on sandy lake shores, in papyrus swamps, on stream sides and in swamp forest, from sea-level up to 2200 m altitude. It prefers an annual rainfall of 1250 mm or more." [Elevation range >2000 m, demonstrating environmental versatility]

204	<b>Native or naturalized in regions with tropical or subtropical climates</b>	<b>y</b>
	<b>Source(s)</b>	<b>Notes</b>
	Bosch, C.H. 2004. <i>Vigna luteola</i> (Jacq.) Benth. [Internet] Record from PROTA4U. Grubben, G.J.H. & Denton, O.A. (Editors). PROTA (Plant Resources of Tropical Africa / Ressources végétales de l'Afrique tropicale), Wageningen, Netherlands. <a href="http://www.prota4u.org/search.asp">http://www.prota4u.org/search.asp</a> . [Accessed 25 Sep 2018]	" <i>Vigna luteola</i> occurs throughout the tropics and is widespread in mainland Africa. It has been grown on research stations in Réunion and Mauritius."
	Frohlich, D. & Lau, A. 2012. New plant records for the Hawaiian islands. Bishop Museum Occasional Papers 113: 27–54	" <i>Vigna luteola</i> , a forage species naturalized throughout the tropics and subtropics and previously collected as naturalized on o'ahu, was found on Kaua'i growing in a coastal species restoration site. it is unclear how this species came to be growing in that location. Material examined. KAUA'I: Kōloa District, lāwai Bay, 21°53'22"N, 159°30'12"W, 3 m. Vine twining in and around <i>Scaevola</i> ; stems pale green, leaves dark glossy green above w/ obvious reticulate venation, below glossy, paler w/ obvious venation; peduncle erect, pale green; calyx pale green; standard greenish yellow w/in, yellow green w/out. Coastal, growing in "Native coastal restoration" site fronting Allerton estate. <i>Scaevola</i> , <i>Wedelia</i> , <i>Vigna</i> spp., <i>Stenotaphrum</i> , <i>Ipomoea</i> , 6 oct 2008, T. Flynn 7401."

205	<b>Does the species have a history of repeated introductions outside its natural range?</b>	<b>y</b>
	<b>Source(s)</b>	<b>Notes</b>

Qsn #	Question	Answer
	Cook, B.G. et al. 2005. Tropical Forages: an interactive selection tool., SIRO, DPI&F(Qld), CIAT and ILRI. <a href="http://www.tropicalforages.info/index.htm">http://www.tropicalforages.info/index.htm</a> . [Accessed 25 Sep 2018]	"Naturalised in: Argentina, Brazil, Costa Rica, Colombia, Dominican Republic, French Guiana, Galapagos, Guatemala, Mexico, Nicaragua, Paraguay, Peru, Puerto Rico, USA, and Venezuela."
	USDA, ARS, Germplasm Resources Information Network. 2018. National Plant Germplasm System [Online Database]. <a href="http://www.ars-grin.gov/npgs/index.html">http://www.ars-grin.gov/npgs/index.html</a> . [Accessed 25 Sep 2018]	"Naturalized (natzd. throughout tropics & subtropics, & in e. Mediterranean region)"

301	Naturalized beyond native range	y
	Source(s)	Notes
	Cook, B.G. et al. 2005. Tropical Forages: an interactive selection tool., SIRO, DPI&F(Qld), CIAT and ILRI. <a href="http://www.tropicalforages.info/index.htm">http://www.tropicalforages.info/index.htm</a> . [Accessed 25 Sep 2018]	"Naturalised in: Argentina, Brazil, Costa Rica, Colombia, Dominican Republic, French Guiana, Galapagos, Guatemala, Mexico, Nicaragua, Paraguay, Peru, Puerto Rico, USA, and Venezuela."
	USDA, ARS, Germplasm Resources Information Network. 2018. National Plant Germplasm System [Online Database]. <a href="http://www.ars-grin.gov/npgs/index.html">http://www.ars-grin.gov/npgs/index.html</a> . [Accessed 25 Sep 2018]	"Naturalized (natzd. throughout tropics & subtropics, & in e. Mediterranean region)"
	Gargiullo, M.B., Magnuson, B.L & Kimball, L.D. 2008. A Field Guide to Plants of Costa Rica. Oxford University Press US, New York, NY	" <i>Vigna luteola</i> ... Range: Native to much of the Old World tropics and S US, introduced in tropical Amer. Notes: Seen on beach at Puerto Viejo, Limón. There are 17 species of <i>Vigna</i> in Costa Rica."
	Frohlich, D. & Lau, A. 2012. New plant records for the Hawaiian islands. Bishop Museum Occasional Papers 113: 27–54	[Kauai] " <i>Vigna luteola</i> , a forage species naturalized throughout the tropics and subtropics and previously collected as naturalized on O'ahu, was found on Kaua'i growing in a coastal species restoration site. it is unclear how this species came to be growing in that location. Material examined. KAUA'I: Kōloa District, Lāwai Bay, 21°53'22"N, 159°30'12"W, 3 m. Vine twining in and around <i>Scaevola</i> ; stems pale green, leaves dark glossy green above w/ obvious reticulate venation, below glossy, paler w/ obvious venation; peduncle erect, pale green; calyx pale green; standard greenish yellow w/in, yellow green w/out. Coastal, growing in "Native coastal restoration" site fronting Allerton estate. <i>Scaevola</i> , <i>Wedelia</i> , <i>Vigna</i> spp., <i>Stenotaphrum</i> , <i>Ipomoea</i> , 6 oct 2008, T. Flynn 7401."

302	Garden/amenity/disturbance weed	y
	Source(s)	Notes
	Cook, B.G. et al. 2005. Tropical Forages: an interactive selection tool., SIRO, DPI&F(Qld), CIAT and ILRI. <a href="http://www.tropicalforages.info/index.htm">http://www.tropicalforages.info/index.htm</a> . [Accessed 26 Sep 2018]	"It forms a good ground cover in shaded situations, but its twining habit may present problems with young trees." ... "While it is recorded as causing some problems in rice crops, there are no records of this species becoming a major weed." [May cause problems for young trees in orchards or plantations. Impacts in agricultural settings unquantified. Further evidence may result in answering "yes" to 3.03]

Qsn #	Question	Answer
	Bosch, C.H. 2004. <i>Vigna luteola</i> (Jacq.) Benth. [Internet] Record from PROTA4U. Grubben, G.J.H. & Denton, O.A. (Editors). PROTA (Plant Resources of Tropical Africa / Ressources végétales de l'Afrique tropicale), Wageningen, Netherlands. <a href="http://www.prota4u.org/search.asp">http://www.prota4u.org/search.asp</a> . [Accessed 26 Sep 2018]	"It is considered a weed of rice in South America, and in South Africa it figures on the national weed list." [Possible agricultural weed]
	Lloyd-Reilley, J., Kadin, E., & Maher, S. D. (2003). Plant Fact Sheet - Wild Cowpea - <i>Vigna luteola</i> . USDA NRCS Kika de la Garza Plant Materials Center, Kingsville, Texas. <a href="https://plants.usda.gov">https://plants.usda.gov</a> . [Accessed 27 Sep 2018]	"This plant may become weedy or invasive in some regions or habitats and may displace desirable vegetation if not properly managed."
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	"Weed of: Orchards & Plantations, Pastures"

303	Agricultural/forestry/horticultural weed	
	Source(s)	Notes
	Cook, B.G. et al. 2005. Tropical Forages: an interactive selection tool., SIRO, DPI&F(Qld), CIAT and ILRI. <a href="http://www.tropicalforages.info/index.htm">http://www.tropicalforages.info/index.htm</a> . [Accessed 25 Sep 2018]	"It forms a good ground cover in shaded situations, but its twining habit may present problems with young trees." ... "While it is recorded as causing some problems in rice crops, there are no records of this species becoming a major weed." [May cause problems for young trees in orchards or plantations]
	Bosch, C.H. 2004. <i>Vigna luteola</i> (Jacq.) Benth. [Internet] Record from PROTA4U. Grubben, G.J.H. & Denton, O.A. (Editors). PROTA (Plant Resources of Tropical Africa / Ressources végétales de l'Afrique tropicale), Wageningen, Netherlands. <a href="http://www.prota4u.org/search.asp">http://www.prota4u.org/search.asp</a> . [Accessed 26 Sep 2018]	"It is considered a weed of rice in South America, and in South Africa it figures on the national weed list."
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	"Weed of: Orchards & Plantations, Pastures"

304	Environmental weed	n
	Source(s)	Notes
	Cook, B.G. et al. 2005. Tropical Forages: an interactive selection tool., SIRO, DPI&F(Qld), CIAT and ILRI. <a href="http://www.tropicalforages.info/index.htm">http://www.tropicalforages.info/index.htm</a> . [Accessed 25 Sep 2018]	"While it is recorded as causing some problems in rice crops, there are no records of this species becoming a major weed."
	Frohlich, D. & Lau, A. 2012. New plant records for the Hawaiian islands. Bishop Museum Occasional Papers 113: 27-54	[Not regarded as an environmental weed in Hawaiian Islands to date] " <i>Vigna luteola</i> , a forage species naturalized throughout the tropics and subtropics and previously collected as naturalized on O'ahu, was found on Kaua'i growing in a coastal species restoration site. it is unclear how this species came to be growing in that location."
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	No evidence

305	Congeneric weed	y
	Source(s)	Notes

Qsn #	Question	Answer
	Rawal, K. M. (1975). Natural hybridization among wild, weedy and cultivated <i>Vigna unguiculata</i> (L.) Walp. <i>Euphytica</i> , 24(3), 699-707	"As is the case with many cultivated species, <i>Vigna unguiculata</i> (L.) Walp. has a wild form growing in secondary forests and derived savannahs and a companion weed form adapted to disturbed habitats such as roadside ditches and fields. Evidence of introgressive hybridization between weedy and cultivated forms has been presented. The zone of extensive natural hybridization corresponds to the cultivation area in northern Nigeria and Niger and may well extend to Upper Volta and Senegal. The pattern of distribution of wild and weedy forms, the extent of introgression and ethnobotanical evidence strongly suggest West Africa as the center of domestication for <i>V. unguiculata</i> ."
	Murphy, T. R., & Gossett, B. J. (1984). Control of cowpea ( <i>Vigna unguiculata</i> ) in soybean ( <i>Glycine max</i> ) with acifluorfen. <i>Weed Science</i> , 32(4), 427-431	"Due to similarities in size, their seed are often a contaminant in soybean seed, which has assisted in their spread. In a recent South Carolina survey, cowpea ranked as the ninth most troublesome weed in soybean production"

401	Produces spines, thorns or burrs	n
	Source(s)	Notes
	Acevedo-Rodríguez, P. 2005. Vines and Climbing Plants of Puerto Rico and the Virgin Islands. Contributions from the United States National Herbarium Volume 51: 1-483. Smithsonian Institution, Washington, D.C.	[No evidence] "Herbaceous vine, creeping or climbing, twining, attaining 10 m in length. Stems branched from the base, slender, cylindrical, ferruginous-pilose. Leaves alternate, trifoliolate; leaflets chartaceous, ovate or lanceolate, 2.5-7.5 × 1-5 cm; upper surface glabrous, with slightly prominent venation; lower surface sparsely appressed-pubescent, especially on the prominent veins, the apex acute, obtuse, or less frequently acuminate, the base cuneate to rounded, slightly asymmetrical on the lateral leaflets, the margins entire, ciliate; petiolules 2-3 mm long, pubescent; rachis 9-13 mm long, marginate or narrowly winged; petioles 2-9 cm long, marginate or narrowly winged; stipels oblong, 2-2.5 mm long; stipules lanceolate, ca. 3 mm long, auriculate at the base."

402	Allelopathic	n
	Source(s)	Notes
	Cook, B.G. et al. 2005. Tropical Forages: an interactive selection tool., SIRO, DPI&F(Qld), CIAT and ILRI. <a href="http://www.tropicalforages.info/index.htm">http://www.tropicalforages.info/index.htm</a> . [Accessed 25 Sep 2018]	"Compatible with most tussocky tropical grasses. Because of its twining growth habit, it may not be appropriate as a ground cover in plantation crops. Its most likely use is in short term pasture and green manure situations where compatibility is not critical." [Physical competition, rather than allelopathy, may inhibit or interfere with plantation crops]

403	Parasitic	n
	Source(s)	Notes
	Gargiullo, M.B., Magnuson, B.L & Kimball, L.D. 2008. A Field Guide to Plants of Costa Rica. Oxford University Press US, New York, NY	" <i>Vigna luteola</i> ... Prostrate vine, rooting at nodes and along internodes, or climbing on other vegetation." [Fabaceae (alt.Leguminosae). No evidence]

404	Unpalatable to grazing animals	n
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Qsn #	Question	Answer
	Source(s)	Notes
	Bosch, C.H. 2004. <i>Vigna luteola</i> (Jacq.) Benth. [Internet] Record from PROTA4U. Grubben, G.J.H. & Denton, O.A. (Editors). PROTA (Plant Resources of Tropical Africa / Ressources végétales de l'Afrique tropicale), Wageningen, Netherlands. <a href="http://www.prota4u.org/search.asp">http://www.prota4u.org/search.asp</a> . [Accessed 25 Sep 2018]	"Because it is palatable for livestock and grows and nodulates well in wet and slightly saline soils, <i>Vigna luteola</i> has been tested as a pasture plant and cover crop in a number of countries including Ghana, Zambia, Argentina, Cuba and Australia. However, disadvantages as a pasture crop are its rather short life cycle, susceptibility to frost and to insect pests, and troublesome seed production."
	Cook, B.G. et al. 2005. Tropical Forages: an interactive selection tool., SIRO, DPI&F(Qld), CIAT and ILRI. <a href="http://www.tropicalforages.info/index.htm">http://www.tropicalforages.info/index.htm</a> . [Accessed 25 Sep 2018]	" <i>V. luteola</i> is extremely palatable and is preferentially grazed. Although established plants tolerate short periods of heavy grazing, recovery or spelling periods are an essential part of grazing management. Under more lenient grazing, it may persist for 3 years or longer."

405	Toxic to animals	n
	Source(s)	Notes
	Cook, B.G. et al. 2005. Tropical Forages: an interactive selection tool., SIRO, DPI&F(Qld), CIAT and ILRI. <a href="http://www.tropicalforages.info/index.htm">http://www.tropicalforages.info/index.htm</a> . [Accessed 25 Sep 2018]	" <i>V. luteola</i> is extremely palatable and is preferentially grazed. Although established plants tolerate short periods of heavy grazing, recovery or spelling periods are an essential part of grazing management. Under more lenient grazing, it may persist for 3 years or longer."
	Quattrocchi, U. 2012. CRC World Dictionary of Medicinal and Poisonous Plants: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	[No evidence of toxicity to animals] " <i>Vigna luteola</i> ... a good source of browse for white-tailed deer, palatable for livestock"

406	Host for recognized pests and pathogens	
	Source(s)	Notes
	Addison, H. J. (2003). Shade tolerance of tropical forage legumes for use in agroforestry systems. PhD Dissertation. James Cook University	"One of the species' major problems is its susceptibility to insect attack, which includes leaf eating caterpillars and the bean fly ( <i>Melanagromyza phaseloi</i> ) that attacks seedlings (Skerman et al. 1988)."
	Cook, B.G. et al. 2005. Tropical Forages: an interactive selection tool., SIRO, DPI&F(Qld), CIAT and ILRI. <a href="http://www.tropicalforages.info/index.htm">http://www.tropicalforages.info/index.htm</a> . [Accessed 2 Oct 2018]	[Unclear if <i>V. luteola</i> is an important alternate host of any of these pests or pathogens] "Pests and diseases - Like many <i>Vigna</i> species, <i>V. luteola</i> is susceptible to insect damage, particularly from caterpillars (eg. <i>Prodenia</i> spp.) and jassids (Cicadellidae: Homoptera). There do not appear to be any major disease problems, although it is recorded as being susceptible to "witches' broom" phytoplasma disease and is listed as a host of bean golden mosaic bigeminivirus and cowpea severe mosaic Comovirus in Brazil, and peanut mottle virus in Australia."

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

Qsn #	Question	Answer
	Quattrocchi, U. 2012. CRC World Dictionary of Medicinal and Poisonous Plants: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	[No evidence. Edible & medicinal uses] "tender seeds cooked, a good source of browse for white-tailed deer, palatable for livestock, flowers boiled and eaten, roots chewed to extract the sweet juice," ... "Antimicrobial, antineoplastic, antiinflammatory, used for coughs and colds; whole plant and other plants pounded, squeezed and the liquid applied to boils and cuts; plant used to control lipid adsorption and cholesterol levels. Leaves and flowers mixed with <i>Hagenia abyssinica</i> (Bruce) J.F. Gmel. flowers to treat syphilis and ulcers; flowers and buds chewed by the mother and given to infants as a tonic."

408	Creates a fire hazard in natural ecosystems	n
	Source(s)	Notes
	Cook, B.G. et al. 2005. Tropical Forages: an interactive selection tool., SIRO, DPI&F(Qld), CIAT and ILRI. <a href="http://www.tropicalforages.info/index.htm">http://www.tropicalforages.info/index.htm</a> . [Accessed 26 Sep 2018]	[No evidence. Grows in wet habitats] "Prefers good soil moisture conditions, and is tolerant of waterlogging and short-term flooding. While it can make a useful contribution in areas with average rainfalls as low as 800 mm/yr, ideally rainfall should be >1,200 mm, and up to at least 4,000 mm. In lower rainfall environments, soils should have good moisture storage characteristics. It has little drought tolerance and does not perform well under dry conditions."
	Addison, H. J. (2003). Shade tolerance of tropical forage legumes for use in agroforestry systems. PhD Dissertation. James Cook University	[No evidence. Unlikely given wet habitat] " <i>Vigna luteola</i> is widely distributed in the tropics, preferring a rainfall of greater than 1250 mm and especially wet or swampy soils, as it is one of the best legumes for wet conditions (Bogdan 1977; Skerman et al. 1988). It will not tolerate dry conditions or drought."

409	Is a shade tolerant plant at some stage of its life cycle	
	Source(s)	Notes
	Cook, B.G. et al. 2005. Tropical Forages: an interactive selection tool., SIRO, DPI&F(Qld), CIAT and ILRI. <a href="http://www.tropicalforages.info/index.htm">http://www.tropicalforages.info/index.htm</a> . [Accessed 25 Sep 2018]	"It forms a good ground cover in shaded situations, but its twining habit may present problems with young trees." ... "Although <i>V. luteola</i> has been shown to be relatively high yielding compared with a wide range of other legumes under moderate and dense shade environments (50% and 20% light transmission), other legumes such as <i>Arachis pintoi</i> , <i>A. repens</i> and <i>Desmodium heterocarpon</i> subsp. <i>ovalifolium</i> offer greater persistence. At 65% light transmission, even the more light-demanding species, <i>Stylosanthes guianensis</i> and <i>S. scabra</i> can give higher yields."
	Shelton, H. M., Humphreys, L. R., & Betello, C. (1987). Pastures in the plantations of Asia and the Pacific. <i>Tropical Grasslands</i> , 21(4), 159-168	"TABLE 1 Shade tolerance of some grass and legume species" [Shade tolerance - Medium - <i>Vigna luteola</i> ] [In contrast, Addison (2003) reports that <i>V. luteola</i> is shade intolerant]
	Addison, H. J. (2003). Shade tolerance of tropical forage legumes for use in agroforestry systems. PhD Dissertation. James Cook University	[Results contradict other references] "Plants of <i>V. luteola</i> under the more heavily shaded treatments, 84% shade in particular, had few leaves, with most of those displaying patches of necrosis. Plants appeared sickly and weak, and composed mainly of stem material suggesting that nutritive value to stock and persistence, in particular, may be serious problems under shaded conditions." ... "Table 6.1 Summary of assessment for each species tested across all trials" [ <i>V. luteola</i> - Shade-adapted or shade-tolerant = No]

Qsn #	Question	Answer
410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y
	Source(s)	Notes
	Cook, B.G. et al. 2005. Tropical Forages: an interactive selection tool., SIRO, DPI&F(Qld), CIAT and ILRI. <a href="http://www.tropicalforages.info/index.htm">http://www.tropicalforages.info/index.htm</a> . [Accessed 25 Sep 2018]	"Adapted to a wide range of soil types from light loams to heavy textured clays, and from very acid to strongly alkaline soils. <i>V. luteola</i> is adapted to poorly drained and moderately saline soils."

411	Climbing or smothering growth habit	y
	Source(s)	Notes
	Acevedo-Rodríguez, P. 2005. Vines and Climbing Plants of Puerto Rico and the Virgin Islands. Contributions from the United States National Herbarium Volume 51: 1-483. Smithsonian Institution, Washington, D.C.	"Herbaceous vine, creeping or climbing, twining, attaining 10 m in length."
	Cook, B.G. et al. 2005. Tropical Forages: an interactive selection tool., SIRO, DPI&F(Qld), CIAT and ILRI. <a href="http://www.tropicalforages.info/index.htm">http://www.tropicalforages.info/index.htm</a> . [Accessed 25 Sep 2018]	"It forms a good ground cover in shaded situations, but its twining habit may present problems with young trees."
	Gargiullo, M.B., Magnuson, B.L & Kimball, L.D. 2008. A Field Guide to Plants of Costa Rica. Oxford University Press US, New York, NY	"Prostrate vine, rooting at nodes and along internodes, or climbing on other vegetation."
	Bosch, C.H. 2004. <i>Vigna luteola</i> (Jacq.) Benth. [Internet] Record from PROTA4U. Grubben, G.J.H. & Denton, O.A. (Editors). PROTA (Plant Resources of Tropical Africa / Ressources végétales de l'Afrique tropicale), Wageningen, Netherlands. <a href="http://www.prota4u.org/search.asp">http://www.prota4u.org/search.asp</a> . [Accessed 25 Sep 2018]	"Twining or trailing perennial herb; stem up to 6 m long, hairy but glabrescent."

412	Forms dense thickets	n
	Source(s)	Notes
	Cook, B.G. et al. 2005. Tropical Forages: an interactive selection tool., SIRO, DPI&F(Qld), CIAT and ILRI. <a href="http://www.tropicalforages.info/index.htm">http://www.tropicalforages.info/index.htm</a> . [Accessed 26 Sep 2018]	"It forms a good ground cover in shaded situations, but its twining habit may present problems with young trees."
	Lloyd-Reilley, J., Kadin, E., & Maher, S. D. (2003). Plant Fact Sheet - Wild Cowpea - <i>Vigna luteola</i> . USDA NRCS Kika de la Garza Plant Materials Center, Kingsville, Texas. <a href="https://plants.usda.gov">https://plants.usda.gov</a> . [Accessed 27 Sep 2018]	"Its vines often form dense tangles."

Qsn #	Question	Answer
501	<b>Aquatic</b>	<b>n</b>
	<b>Source(s)</b>	<b>Notes</b>
	Bosch, C.H. 2004. <i>Vigna luteola</i> (Jacq.) Benth. [Internet] Record from PROTA4U. Grubben, G.J.H. & Denton, O.A. (Editors). PROTA (Plant Resources of Tropical Africa / Ressources végétales de l'Afrique tropicale), Wageningen, Netherlands. <a href="http://www.prota4u.org/search.asp">http://www.prota4u.org/search.asp</a> . [Accessed ]	[Terrestrial, but grows in close proximity to riparian habitats] " <i>Vigna luteola</i> grows in swampy grasslands, among reeds on sandy lake shores, in papyrus swamps, on stream sides and in swamp forest, from sea-level up to 2200 m altitude."
502	<b>Grass</b>	<b>n</b>
	<b>Source(s)</b>	<b>Notes</b>
	USDA, ARS, Germplasm Resources Information Network. 2018. National Plant Germplasm System [Online Database]. <a href="http://www.ars-grin.gov/npgs/index.html">http://www.ars-grin.gov/npgs/index.html</a> . [Accessed 25 Sep 2018]	Family: Fabaceae (alt. Leguminosae) Subfamily: Faboideae Tribe: Phaseoleae Subtribe: Phaseolinae
503	<b>Nitrogen fixing woody plant</b>	<b>n</b>
	<b>Source(s)</b>	<b>Notes</b>
	Bosch, C.H. 2004. <i>Vigna luteola</i> (Jacq.) Benth. [Internet] Record from PROTA4U. Grubben, G.J.H. & Denton, O.A. (Editors). PROTA (Plant Resources of Tropical Africa / Ressources végétales de l'Afrique tropicale), Wageningen, Netherlands. <a href="http://www.prota4u.org/search.asp">http://www.prota4u.org/search.asp</a> . [Accessed 25 Sep 2018]	[Herbaceous, N-fixing plant] "Twining or trailing perennial herb; stem up to 6 m long, hairy but glabrescent." ... " <i>Vigna luteola</i> is nonspecific in its <i>Rhizobium</i> requirement. It is day-neutral and flowers throughout the year."
504	<b>Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)</b>	<b>n</b>
	<b>Source(s)</b>	<b>Notes</b>
	Cook, B.G. et al. 2005. Tropical Forages: an interactive selection tool., SIRO, DPI&F(Qld), CIAT and ILRI. <a href="http://www.tropicalforages.info/index.htm">http://www.tropicalforages.info/index.htm</a> . [Accessed 26 Sep 2018]	[No evidence] "Annual or perennial, trailing or climbing herb with glabrous to densely hairy stems, rooting readily when in contact with moist soil."
601	<b>Evidence of substantial reproductive failure in native habitat</b>	<b>n</b>
	<b>Source(s)</b>	<b>Notes</b>
	Bosch, C.H. 2004. <i>Vigna luteola</i> (Jacq.) Benth. [Internet] Record from PROTA4U. Grubben, G.J.H. & Denton, O.A. (Editors). PROTA (Plant Resources of Tropical Africa / Ressources végétales de l'Afrique tropicale), Wageningen, Netherlands. <a href="http://www.prota4u.org/search.asp">http://www.prota4u.org/search.asp</a> . [Accessed 26 Sep 2018]	" <i>Vigna luteola</i> occurs throughout the tropics and is widespread in mainland Africa." [No evidence. Broad native & introduced range]
602	<b>Produces viable seed</b>	<b>y</b>

Qsn #	Question	Answer
	<b>Source(s)</b>	<b>Notes</b>
	Cook, B.G. et al. 2005. Tropical Forages: an interactive selection tool., SIRO, DPI&F(Qld), CIAT and ILRI. <a href="http://www.tropicalforages.info/index.htm">http://www.tropicalforages.info/index.htm</a> . [Accessed 26 Sep 2018]	"V. luteola often has a high percentage of hard seed, and germination should be tested prior to use. If hard seed levels are greater than 50%, then seed should be scarified before sowing. It is not specific in its rhizobium requirements, but can be inoculated with cowpea strain (e.g. CB 756 in Australia) if there is any doubt. Seed is normally sown 2–3 cm deep, at 2 kg/ha when sown in mixtures and 5 kg/ha when sown alone. Sowing rates of 10–20 kg/ha are preferable when it is used as a green manure . It has a large seed and vigorous seedlings, and is easily established in well-prepared seed beds, competing well with weeds."
	Lloyd-Reilley, J., Kadin, E., & Maher, S. D. (2003). Plant Fact Sheet - Wild Cowpea - <i>Vigna luteola</i> . USDA NRCS Kika de la Garza Plant Materials Center, Kingsville, Texas. <a href="https://plants.usda.gov">https://plants.usda.gov</a> . [Accessed 26 Sep 2018]	"Wild cowpea can be easily propagated from seed or cuttings. Propagation from seed has ranged from 8-96 percent. Greenhouse germination tests conducted at the Kika de la Garza Plant Materials Center in 1998 and 1999 found that the variability may be due in part to accession differences. One wild cowpea accession consistently had better than 93% germination, while a second accession had less than 10%."

603	Hybridizes naturally	
	<b>Source(s)</b>	<b>Notes</b>
	Souza, J. M. T., Snak, C., & Varassin, I. G. (2017). Floral divergence and temporal pollinator partitioning in two synchronopatric species of <i>Vigna</i> (Leguminosae-Papilionoideae). <i>Arthropod-Plant Interactions</i> , 11(3), 285-297	"No fruit was set as a result of hybridization treatments." ... "Since the heterospecific pollination tests resulted in fruit abortion, this indicates that hybridization between <i>V. longifolia</i> and <i>V. luteola</i> is being prevented by genetic barriers."
	Tomooka, N., Isemura, T., Naito, K., Kaga, A. & Vaughan, D. (2014). <i>Vigna</i> Species. Pp. 175-208 in Singh, M. et al. (eds.). Springer, New Delhi	[Possibly. Hybridization common in genus. No direct evidence found for <i>V. luteola</i> ] "Cross compatibility studies have been reviewed by Tomooka et al. ( 2002a ). Generally, there is no barrier to gene flow between domesticated forms and their closest relatives. Species in the same section of the subgenus <i>Ceratotropis</i> can usually cross with little difficulty. Natural interspecific hybrids have been found between <i>V. hirtella</i> and <i>V. minima</i> in northern Thailand (author's unpublished observations). Recently, Pandiyan et al. ( 2010 ) reported a number of cross-sectional and cross subgenus hybrids. Among these hybrids, the cross between <i>V. radiata</i> and <i>V. umbellata</i> is particularly significant as <i>V. umbellata</i> possesses a high level of resistance to bruchid beetles, one of the most serious pests of <i>Vigna</i> ."

604	Self-compatible or apomictic	y
	<b>Source(s)</b>	<b>Notes</b>
	Souza, J. M. T., Snak, C., & Varassin, I. G. (2017). Floral divergence and temporal pollinator partitioning in two synchronopatric species of <i>Vigna</i> (Leguminosae-Papilionoideae). <i>Arthropod-Plant Interactions</i> , 11(3), 285-297	" <i>Vigna longifolia</i> and <i>V. luteola</i> were self-compatible, but depended on pollinators to set seeds." ... "The reproductive biology of <i>V. luteola</i> and <i>V. longifolia</i> was very similar. Both species are self-compatible but depended on pollinators to set seeds, a common feature of tropical herbaceous legumes (Arroyo 1981)."

605	Requires specialist pollinators	n
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Qsn #	Question	Answer
	<b>Source(s)</b>	<b>Notes</b>
	Souza, J. M. T., Snak, C., & Varassin, I. G. (2017). Floral divergence and temporal pollinator partitioning in two synchronopatric species of <i>Vigna</i> (Leguminosae-Papilionoideae). <i>Arthropod-Plant Interactions</i> , 11(3), 285-297	"As with <i>V. longifolia</i> , <i>Bombus morio</i> was the most effective pollinator of <i>V. luteola</i> . Other pollinators were <i>M. susurrans</i> / <i>M. tenuitarsis</i> and <i>A. mellifera</i> "

606	Reproduction by vegetative fragmentation	y
	<b>Source(s)</b>	<b>Notes</b>
	Cook, B.G. et al. 2005. <i>Tropical Forages: an interactive selection tool.</i> , SIRO, DPI&F(Qld), CIAT and ILRI. <a href="http://www.tropicalforages.info/index.htm">http://www.tropicalforages.info/index.htm</a> . [Accessed 25 Sep 2018]	"Annual or perennial, trailing or climbing herb with glabrous to densely hairy stems, rooting readily when in contact with moist soil."
	Gargiullo, M.B., Magnuson, B.L & Kimball, L.D. 2008. <i>A Field Guide to Plants of Costa Rica</i> . Oxford University Press US, New York, NY	"Prostrate vine, rooting at nodes and along internodes, or climbing on other vegetation."

607	Minimum generative time (years)	1
	<b>Source(s)</b>	<b>Notes</b>
	Cook, B.G. et al. 2005. <i>Tropical Forages: an interactive selection tool.</i> , SIRO, DPI&F(Qld), CIAT and ILRI. <a href="http://www.tropicalforages.info/index.htm">http://www.tropicalforages.info/index.htm</a> . [Accessed 25 Sep 2018]	[Flowers as early as 90 days from planting] "Annual or perennial, trailing or climbing herb with glabrous to densely hairy stems, rooting readily when in contact with moist soil." ... "Flowering time appears to vary with provenance. There appears to be a photo-periodic requirement, which could well be confounded with moisture availability and/or a need for low temperatures. Most of a range of accessions tested in subtropical (28°S) Australia, flowered in early April, some 90 days after sowing, while natural stands at 26°N in the USA flower through much of the growing season. At lower latitudes, 'Dalrymple' flowered about 90 days after sowing at 15°S in northern Australia, and another accession, CPI 46383 at 17°S, commenced flowering only 50 days after planting (mid January), but produced peaks of flowering in late April and again in mid-July."

701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	n
	<b>Source(s)</b>	<b>Notes</b>
	Cook, B.G. et al. 2005. <i>Tropical Forages: an interactive selection tool.</i> , SIRO, DPI&F(Qld), CIAT and ILRI. <a href="http://www.tropicalforages.info/index.htm">http://www.tropicalforages.info/index.htm</a> . [Accessed 26 Sep 2018]	"It has a large seed and vigorous seedlings, and is easily established in well-prepared seed beds, competing well with weeds." ... "Although there is the potential for spread through pod dehiscence and high seed yields, spread is usually restricted under grazing because of its high palatability. Further, it tends to grow over pods, burying them in foliage if not grazed, thus reducing dehiscence. It can be spread by seed in dung under favourable conditions of warmth and moisture, but not readily." [No means of external attachment]

702	Propagules dispersed intentionally by people	y
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Qsn #	Question	Answer
	<b>Source(s)</b>	<b>Notes</b>
	Tomooka, N., Isemura, T., Naito, K., Kaga, A. & Vaughan, D. (2014). <i>Vigna Species</i> . Pp. 175-208 in Singh, M. et al. (eds.). Springer, New Delhi	" <i>V. luteola</i> is native to Africa, Asia, and Australasia but has been used as a short-season and highly palatable pasture or green manure in Europe and the New World. It is particularly useful in wet or waterlogged conditions. It has a wide range of adaptation to soil types, light conditions, and temperatures."

703	Propagules likely to disperse as a produce contaminant	
	<b>Source(s)</b>	<b>Notes</b>
	Cook, B.G. et al. 2005. <i>Tropical Forages: an interactive selection tool.</i> , SIRO, DPI&F(Qld), CIAT and ILRI. <a href="http://www.tropicalforages.info/index.htm">http://www.tropicalforages.info/index.htm</a> . [Accessed 27 Sep 2018]	"Although there is the potential for spread through pod dehiscence and high seed yields, spread is usually restricted under grazing because of its high palatability. Further, it tends to grow over pods, burying them in foliage if not grazed, thus reducing dehiscence. It can be spread by seed in dung under favourable conditions of warmth and moisture, but not readily." [Could potentially be moved inadvertently as a pasture contaminant]

704	Propagules adapted to wind dispersal	n
	<b>Source(s)</b>	<b>Notes</b>
	Cook, B.G. et al. 2005. <i>Tropical Forages: an interactive selection tool.</i> , SIRO, DPI&F(Qld), CIAT and ILRI. <a href="http://www.tropicalforages.info/index.htm">http://www.tropicalforages.info/index.htm</a> . [Accessed 25 Sep 2018]	[Seeds may be released by dehiscence, but are not adapted for further dispersal by wind] "Pods pendant, linear, 4–8 cm long, 5–6.5 mm wide with slight constrictions between the 4–9 (–12) seeds; sparsely to rather densely adpressed pubescent. Seeds dark red-brown or grey brown with black speckling to black, 3–4 mm long and 2–3 mm wide." ... "Although there is the potential for spread through pod dehiscence and high seed yields, spread is usually restricted under grazing because of its high palatability. Further, it tends to grow over pods, burying them in foliage if not grazed, thus reducing dehiscence. It can be spread by seed in dung under favourable conditions of warmth and moisture, but not readily."

705	Propagules water dispersed	y
	<b>Source(s)</b>	<b>Notes</b>
	Quattrocchi, U. 2012. <i>CRC World Dictionary of Medicinal and Poisonous Plants: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology</i> . CRC Press, Boca Raton, FL	"aggressive species, along coastal regions from tropical areas, on sandy lake shores, in swampy grasslands, in wet pastures" [Common near aquatic habitats, suggesting water dispersal of seeds or vegetative parts]
	Miryeganeh, M., Takayama, K., Tateishi, Y., & Kajita, T. (2014). Long-distance dispersal by sea-drifted seeds has maintained the global distribution of <i>Ipomoea pes-caprae</i> subsp. <i>brasiliensis</i> (Convolvulaceae). <i>PLoS One</i> , 9(4), e91836	"Pantropical plants with sea-drifted seeds [6], [7], [8] have an extraordinarily wide range of distribution in littoral areas of the tropics and subtropics worldwide. Members of this plant group are littoral plants and can disperse their seeds over very long distances using ocean currents as a vector. A few species from divergent families are known in this plant group, including <i>Ipomoea pes-caprae</i> (L.) R. Br. (Convolvulaceae), <i>Canavalia rosea</i> Sweet. (Fabaceae), <i>Vigna marina</i> (Burm.) Merr. - <i>Vigna luteola</i> (Jacq.) Benth. (Fabaceae), and <i>Hibiscus tiliaceus</i> L. - <i>Hibiscus pernambucensis</i> Arruda (Malvaceae). All species in this group are believed to have developed mechanisms for long-distance seed dispersal by ocean currents."

Qsn #	Question	Answer
	Bosch, C.H. 2004. <i>Vigna luteola</i> (Jacq.) Benth. [Internet] Record from PROTA4U. Grubben, G.J.H. & Denton, O.A. (Editors). PROTA (Plant Resources of Tropical Africa / Ressources végétales de l'Afrique tropicale), Wageningen, Netherlands. <a href="http://www.prota4u.org/search.asp">http://www.prota4u.org/search.asp</a> . [Accessed ]	" <i>Vigna luteola</i> grows in swampy grasslands, among reeds on sandy lake shores, in papyrus swamps, on stream sides and in swamp forest, from sea-level up to 2200 m altitude." [Proximity to aquatic habitats indicates water is a dispersal vector for this species]
	Kalliola, R., Salo, J., Puhakka, M., & Rajasilta, M. (1991). New site formation and colonizing vegetation in primary succession on the western Amazon floodplains. <i>The Journal of Ecology</i> , 79(4): 877-901	[Found on bars along river] "The bars of the Ucayali River commonly feature thirty to forty unevenly distributed plant species. Plant cover on sand is scarce, and includes <i>Gynerium sagittatum</i> , <i>Ludwigia erecta</i> , <i>Tessaria integrifolia</i> , <i>Torulium odoratum</i> and <i>Vigna luteola</i> "

706	Propagules bird dispersed	n
	Source(s)	Notes
	Bosch, C.H. 2004. <i>Vigna luteola</i> (Jacq.) Benth. [Internet] Record from PROTA4U. Grubben, G.J.H. & Denton, O.A. (Editors). PROTA (Plant Resources of Tropical Africa / Ressources végétales de l'Afrique tropicale), Wageningen, Netherlands. <a href="http://www.prota4u.org/search.asp">http://www.prota4u.org/search.asp</a> . [Accessed 25 Sep 2018]	"Fruit a linear, curved pod, slightly constricted between the seeds, 5.5–8 cm long, with short curved beak. Seeds up to 4.5 mm × 3.5 mm." [Not fleshy-fruited, & no apparent adaptations for bird dispersal]
	Lloyd-Reilley, J., Kadin, E., & Maher, S. D. (2003). Plant Fact Sheet - Wild Cowpea - <i>Vigna luteola</i> . USDA NRCS Kika de la Garza Plant Materials Center, Kingsville, Texas. <a href="https://plants.usda.gov">https://plants.usda.gov</a> . [Accessed 27 Sep 2018]	"Ground feeding birds also enjoy the seeds." [Birds are seed predators, but may possibly disperse some seeds in the process. Not likely to be an important dispersal vector]

707	Propagules dispersed by other animals (externally)	n
	Source(s)	Notes
	Cook, B.G. et al. 2005. Tropical Forages: an interactive selection tool., SIRO, DPI&F(Qld), CIAT and ILRI. <a href="http://www.tropicalforages.info/index.htm">http://www.tropicalforages.info/index.htm</a> . [Accessed 26 Sep 2018]	"Although there is the potential for spread through pod dehiscence and high seed yields, spread is usually restricted under grazing because of its high palatability. Further, it tends to grow over pods, burying them in foliage if not grazed, thus reducing dehiscence. It can be spread by seed in dung under favourable conditions of warmth and moisture, but not readily." [Dispersed internally by grazing animals]

708	Propagules survive passage through the gut	y
	Source(s)	Notes
	Cook, B.G. et al. 2005. Tropical Forages: an interactive selection tool., SIRO, DPI&F(Qld), CIAT and ILRI. <a href="http://www.tropicalforages.info/index.htm">http://www.tropicalforages.info/index.htm</a> . [Accessed 25 Sep 2018]	"It can be spread by seed in dung under favourable conditions of warmth and moisture, but not readily."
	Platt, S. G., Eley, R. M., Liu, H., Rainwater, T. R., Nifong, J. C., Rosenblatt, A. E., Heithaus, M. R. and Mazzotti, F. J. 2013. Frugivory and seed dispersal by crocodilians: an overlooked form of saurochory?. <i>Journal of Zoology</i> , 291: 87–99	"Table 1 Fruits and seeds reported in stomach contents and feces of crocodilians" [Alligator mississippiensis - Fruit or seeds - includes <i>Vigna luteola</i> . No information on viability]

801	Prolific seed production (>1000/m2)	

Qsn #	Question	Answer
	<b>Source(s)</b>	<b>Notes</b>
	Cook, B.G. et al. 2005. Tropical Forages: an interactive selection tool., SIRO, DPI&F(Qld), CIAT and ILRI. <a href="http://www.tropicalforages.info/index.htm">http://www.tropicalforages.info/index.htm</a> . [Accessed 26 Sep 2018]	"Seeds dark red-brown or grey brown with black speckling to black, 3–4 mm long and 2–3 mm wide. 40,000 seeds/kg." [Soil seed densities under natural conditions unspecified]

802	Evidence that a persistent propagule bank is formed (>1 yr)	
	<b>Source(s)</b>	<b>Notes</b>
	Royal Botanic Gardens Kew. (2018) Seed Information Database (SID). Version 7.1. Available from: <a href="http://data.kew.org/sid/">http://data.kew.org/sid/</a> . [Accessed 27 Sep 2018]	"Storage Behaviour: Orthodox Storage Conditions: 33% germination following 48 years storage at room temperature (Harrington, 1972)"
	WRA Specialist. 2018. Personal Communication	Based on storage information, seeds may form a persistent seed bank, but longevity under natural conditions has not been specified.

803	Well controlled by herbicides	y
	<b>Source(s)</b>	<b>Notes</b>
	Lloyd-Reilley, J., Kadin, E., & Maher, S. D. (2003). Plant Fact Sheet - Wild Cowpea - <i>Vigna luteola</i> . USDA NRCS Kika de la Garza Plant Materials Center, Kingsville, Texas. <a href="https://plants.usda.gov">https://plants.usda.gov</a> . [Accessed 27 Sep 2018]	"To control wild cowpea, use a broadleaf herbicide. Remember to make sure that the product chosen is licensed for aquatic use if the planting is near a waterway or wetland area."

804	Tolerates, or benefits from, mutilation, cultivation, or fire	y
	<b>Source(s)</b>	<b>Notes</b>
	Addison, H. J. (2003). Shade tolerance of tropical forage legumes for use in agroforestry systems. PhD Dissertation. James Cook University	"It has been reported to make good growth with <i>Paspalum</i> and <i>Setaria</i> species, but does not tolerate heavy grazing or cutting."
	Cook, B.G. et al. 2005. Tropical Forages: an interactive selection tool., SIRO, DPI&F(Qld), CIAT and ILRI. <a href="http://www.tropicalforages.info/index.htm">http://www.tropicalforages.info/index.htm</a> . [Accessed 27 Sep 2018]	"Not tolerant of grazing. Susceptible to insect and virus damage. Less drought tolerance than many other legumes. Rather short lived. Susceptible to frost."
	Lloyd-Reilley, J., Kadin, E., & Maher, S. D. (2003). Plant Fact Sheet - Wild Cowpea - <i>Vigna luteola</i> . USDA NRCS Kika de la Garza Plant Materials Center, Kingsville, Texas. <a href="https://plants.usda.gov">https://plants.usda.gov</a> . [Accessed 27 Sep 2018]	"Stutzenbaker (1999) notes that wild cow pea can endure livestock grazing, periodic burning, and occasional floods" [In contrast to Addison (2003)]

805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	
	<b>Source(s)</b>	<b>Notes</b>
	Frohlich, D. & Lau, A. 2012. New plant records for the Hawaiian islands. Bishop Museum Occasional Papers 113: 27–54	[Unknown] " <i>Vigna luteola</i> , a forage species naturalized throughout the tropics and subtropics and previously collected as naturalized on O'ahu, was found on Kaua'i growing in a coastal species restoration site. it is unclear how this species came to be growing in that location."

**Summary of Risk Traits:**

High Risk / Undesirable Traits

- Elevation range exceeds 1000 m, demonstrating environmental versatility
- Thrives in tropical climates
- Naturalized on Kauai & Oahu (Hawaiian Islands); widely introduced & naturalized elsewhere
- An aggressive weedy vine that may impact rice, other agricultural crops & young trees
- Other *Vigna* species have become weeds
- Tolerates many soil types (not substrate limited)
- Climbing vine; can potentially smother young trees
- Reproduces by seeds & vegetatively by rooting at nodes & internodes
- Self-compatible, but dependent on bees & other pollinators for seed set
- Rapidly reaches maturity (as quickly as 90 days from planting)
- Seeds dispersed by water, in cattle dung & intentionally planted by people
- Prolific seed production & potentially long-lived seed bank
- May tolerate burning, grazing & flooding (conflicting accounts)

Low Risk Traits

- Despite reports of weediness, valued as a palatable pasture livestock forage (& unlikely to become weedy or problematic in regularly grazed pastures)
- Unarmed (no spines, thorns, or burrs)
- Herbicides may provide effective control