

<b>Taxon:</b> Chamaecrista nictitans	<b>Family:</b> Fabaceae
<b>Common Name(s):</b> partridge pea	<b>Synonym(s):</b> Cassia aeschynomene DC. ex Collad. Cassia lechenaultiana DC. Cassia nictitans L. Cassia patellaria DC. ex Collad. Cassia patellaria var. glabrata Vogel Chamaecrista lechenaultiana (DC.) O. ~

<b>Assessor:</b> Chuck Chimera	<b>Status:</b> Assessor Approved	<b>End Date:</b> 1 Dec 2019
<b>WRA Score:</b> 8.0	<b>Designation:</b> H(HPWRA)	<b>Rating:</b> High Risk

**Keywords:** Annual Herb, Naturalized, Disturbance Weed, Palatable, Self-Compatible

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		
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		
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		

Qsn #	Question	Answer Option	Answer
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	y=1, n=0	n
410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y=1, n=0	y
411	Climbing or smothering growth habit	y=1, n=0	n
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	n
607	Minimum generative time (years)	1 year = 1, 2 or 3 years = 0, 4+ years = -1	1
701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)		
702	Propagules dispersed intentionally by people		
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	y=1, n=-1	n
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		
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
	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] "Native to the Neotropics, now widely naturalized; in Hawai'i naturalized in dry to mesic, disturbed sites, 3-1,130 m, documented from all of the main islands except Moloka'i. First recorded as in cultivation prior to 1871 (Hillebrand, 1888), but first naturalized collection made on O'ahu in 1895 (Heller 1969, BISH)"

102	Has the species become naturalized where grown?	
	Source(s)	Notes
	WRA Specialist. (2019). Personal Communication	NA

103	Does the species have weedy races?	
	Source(s)	Notes
	WRA Specialist. (2019). Personal Communication	NA

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

Qsn #	Question	Answer
	<p>USDA, Agricultural Research Service, National Plant Germplasm System. (2019). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. <a href="https://npgsweb.ars-grin.gov/">https://npgsweb.ars-grin.gov/</a>. [Accessed 26 Nov 2019]</p>	<p>"Native                      Northern America                      NORTHEASTERN U.S.A.: United States [Indiana, Massachusetts, Michigan, New Hampshire (s.w.), New York, Ohio, Pennsylvania, Rhode Island, Vermont (s.e.), West Virginia, Connecticut]                      NORTH-CENTRAL U.S.A.: United States [Illinois, Kansas (e.), Missouri, Oklahoma (e.), Wisconsin]                      SOUTHEASTERN U.S.A.: United States [Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Maryland, North Carolina, South Carolina, Virginia, Mississippi, Tennessee]                      SOUTH-CENTRAL U.S.A.: United States [New Mexico, Texas (e.)]                      SOUTHWESTERN U.S.A.: United States [Arizona]                      NORTHERN MEXICO: Mexico [Chihuahua, Durango, San Luis Potosí, Sinaloa, Sonora, Tamaulipas, Zacatecas, Baja California (Norte), Baja California Sur]                      SOUTHERN MEXICO: Mexico [Campeche, Chiapas, Guerrero, Jalisco, Michoacán de Ocampo, Nayarit, Oaxaca, Querétaro, Quintana Roo, Tabasco, Veracruz de Ignacio de la Llave, Yucatán]                      Southern America                      CARIBBEAN: Aruba, Bahamas, Cuba, Grenada, Guadeloupe, Hispaniola, Jamaica, Martinique, Netherlands Antilles, St. Kitts and Nevis, St. Vincent and Grenadines, Trinidad and Tobago, [Trinidad] United States, [Puerto Rico, Virgin Islands, U.S.] Virgin Islands (British)                      CENTRAL AMERICA: Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, Panama                      NORTHERN SOUTH AMERICA: French Guiana, Guyana, Suriname, Venezuela                      BRAZIL: Brazil [Amapá, Amazonas, Bahia, Ceará, Espírito Santo, Maranhão, Mato Grosso, Mato Grosso do Sul, Minas Gerais, Pará (s.e.), Paraná, Pernambuco, Rio de Janeiro, Rio Grande do Sul, Rondônia, Santa Catarina, São Paulo]                      WESTERN SOUTH AMERICA: Bolivia, Colombia, Ecuador, [Cotopaxi, Guayas, Loja] Peru                      SOUTHERN SOUTH AMERICA: Argentina, [Chaco, Corrientes, Formosa, Jujuy, Misiones, Salta] Paraguay"</p>

202	Quality of climate match data	High
	Source(s)	Notes
	<p>USDA, Agricultural Research Service, National Plant Germplasm System. (2019). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. <a href="https://npgsweb.ars-grin.gov/">https://npgsweb.ars-grin.gov/</a>. [Accessed 26 Nov 2019]</p>	

203	Broad climate suitability (environmental versatility)	y
	Source(s)	Notes
	<p>Wagner, W.L., Herbst, D.R. &amp; Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.</p>	<p>"in Hawai'i naturalized in dry to mesic, disturbed sites, 3-1,130 m"                      [Elevation range exceeds 1000 m]</p>

Qsn #	Question	Answer
	Tropicos.org. 2019. Missouri Botanical Garden. <a href="http://www.tropicos.org/">http://www.tropicos.org/</a> . [Accessed 26 Nov 2019]	Occurs over a broad range of elevations and latitudes. Collected from sea level to 2600 m elevation, and from latitudes of 00°44'00"N to 45°10'01"N and 00°35'00"S to 38°43'00"S

204	Native or naturalized in regions with tropical or subtropical climates	y
	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.	"Native to the Neotropics, now widely naturalized; in Hawai'i naturalized in dry to mesic, disturbed sites, 3-1,130 m, documented from all of the main islands except Moloka'i. First recorded as in cultivation prior to 1871 (Hillebrand, 1888), but first naturalized collection made on O'ahu in 1895 (Heller 1969, BISH)"
	USDA, Agricultural Research Service, National Plant Germplasm System. (2019). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. <a href="https://npgsweb.ars-grin.gov/">https://npgsweb.ars-grin.gov/</a> . [Accessed 26 Nov 2019]	"Native Northern America NORTHEASTERN U.S.A.: United States [Indiana, Massachusetts, Michigan, New Hampshire (s.w.), New York, Ohio, Pennsylvania, Rhode Island, Vermont (s.e.), West Virginia, Connecticut] NORTH-CENTRAL U.S.A.: United States [Illinois, Kansas (e.), Missouri, Oklahoma (e.), Wisconsin] SOUTHEASTERN U.S.A.: United States [Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Maryland, North Carolina, South Carolina, Virginia, Mississippi, Tennessee] SOUTH-CENTRAL U.S.A.: United States [New Mexico, Texas (e.)] SOUTHWESTERN U.S.A.: United States [Arizona] NORTHERN MEXICO: Mexico [Chihuahua, Durango, San Luis Potosí, Sinaloa, Sonora, Tamaulipas, Zacatecas, Baja California (Norte), Baja California Sur] SOUTHERN MEXICO: Mexico [Campeche, Chiapas, Guerrero, Jalisco, Michoacán de Ocampo, Nayarit, Oaxaca, Querétaro, Quintana Roo, Tabasco, Veracruz de Ignacio de la Llave, Yucatán] Southern America CARIBBEAN: Aruba, Bahamas, Cuba, Grenada, Guadeloupe, Hispaniola, Jamaica, Martinique, Netherlands Antilles, St. Kitts and Nevis, St. Vincent and Grenadines, Trinidad and Tobago, [Trinidad] United States, [Puerto Rico, Virgin Islands, U.S.] Virgin Islands (British) CENTRAL AMERICA: Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, Panama NORTHERN SOUTH AMERICA: French Guiana, Guyana, Suriname, Venezuela BRAZIL: Brazil [Amapá, Amazonas, Bahia, Ceará, Espírito Santo, Maranhão, Mato Grosso, Mato Grosso do Sul, Minas Gerais, Pará (s.e.), Paraná, Pernambuco, Rio de Janeiro, Rio Grande do Sul, Rondônia, Santa Catarina, São Paulo] WESTERN SOUTH AMERICA: Bolivia, Colombia, Ecuador, [Cotopaxi, Guayas, Loja] Peru SOUTHERN SOUTH AMERICA: Argentina, [Chaco, Corrientes, Formosa, Jujuy, Misiones, Salta] Paraguay"

205	Does the species have a history of repeated introductions outside its natural range?	y
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Qsn #	Question	Answer
	<b>Source(s)</b>	<b>Notes</b>
	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.	"Native to the Neotropics, now widely naturalized"

301	Naturalized beyond native range	y
	<b>Source(s)</b>	<b>Notes</b>
	Hughes, G. D. 1995. New Hawaiian plant records II. Bishop Museum Occasional Papers. 42: 1-10	"Chamaecrista nictitans (L.) Moench var. glabrata (Vogel) H. Irwin & Barneby Previous knowledge: In cultivation prior to 1871 (Hillebrand 1888). First naturalized collection in 1895 (Heller 1969, BISH). Hawaiian Archipelago distribution all the main islands except Molokai. Native to the Neotropics and now widely naturalized (Wagner et al. 1990: 656). Significance: New island record for Molokai in Kalamaula Game Management Area, 125 m, in 1990 (Hughes s.n., BISH). This naturalized species is common and widespread in all lowland areas. Identification confirmed by D.R. Herbst."
	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.	"Native to the Neotropics, now widely naturalized; in Hawai'i naturalized in dry to mesic, disturbed sites, 3-1,130 m, documented from all of the main islands except Moloka'i. First recorded as in cultivation prior to 1871 (Hillebrand, 1888), but first naturalized collection made on O'ahu in 1895 (Heller 1969, BISH)."

302	Garden/amenity/disturbance weed	y
	<b>Source(s)</b>	<b>Notes</b>
	Smith, A.C. 1985. Flora Vitiensis Nova: A New Flora of Fiji (Spermatophytes Only). Volume 3. National Tropical Botanical Garden, Lawai, HI	"abundant locally as a weed along roadsides and in cultivated areas, sometimes in coconut plantations."
	Haselwood, E.L., Motter, G.G., & Hirano, R.T. (eds.). 1983. Handbook of Hawaiian Weeds. University of Hawaii Press, Honolulu, HI	"Found below 3,000 feet. A weed in cultivated areas, pastures, rangelands, and waste places."
	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.	"Native to the Neotropics, now widely naturalized; in Hawai'i naturalized in dry to mesic, disturbed sites, 3-1,130 m, documented from all of the main islands except Moloka'i."
	USDA NRCS (2015). Plant Guide. Sensitive partridge pea. <i>Chamaecrista nictitans</i> (L.) Moench. <a href="https://plants.usda.gov">https://plants.usda.gov</a> . [Accessed 26 Nov 2019]	"Weedy or Invasive: Because partridge pea is a reseeding annual it may spread to nearby fields, especially where competition is removed."

303	Agricultural/forestry/horticultural weed	
	<b>Source(s)</b>	<b>Notes</b>
	Haselwood, E.L., Motter, G.G., & Hirano, R.T. (eds.). 1983. Handbook of Hawaiian Weeds. University of Hawaii Press, Honolulu, HI	[Possibly impacts agriculture, but primarily a weed of disturbed places] "Found below 3,000 feet. A weed in cultivated areas, pastures, rangelands, and waste places."

304	Environmental weed	
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Qsn #	Question	Answer
	<b>Source(s)</b>	<b>Notes</b>
	Haselwood, E.L., Motter, G.G., & Hirano, R.T. (eds.). 1983. Handbook of Hawaiian Weeds. University of Hawaii Press, Honolulu, HI	"Found below 3,000 feet. A weed in cultivated areas, pastures, rangelands, and waste places."
	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.	[Potentially. Impacts to natural ecosystems unquantified] "in Hawai'i naturalized in dry to mesic, disturbed sites, 3-1,130 m"

305	Congeneric weed	y
	<b>Source(s)</b>	<b>Notes</b>
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	"Chamaecrista mimosoides ... Weed of: Orchards & Plantations"
	Moody, K. 1989. Weeds Reported in Rice in South and Southeast Asia. International Rice Research Institute, Manila, Philippines	Chamaecrista mimosoides reported as a rice weed in India, the Philippines and Thailand

401	Produces spines, thorns or burrs	n
	<b>Source(s)</b>	<b>Notes</b>
	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] "Annual or weakly perennial herbs 5-20 dm tall. Leaves 2-10(-14) cm long, leaflets 10-26(-31) pairs, usually folding within a few minutes of collection if not already folded, linear to linear-oblongate, 4-24 mm long, ca. 1.4 mm wide, glabrous or lower surface sometimes puberulent, 1-2 petiolar nectaries present, saucer-shaped or cup-shaped, 0.4-1.2 mm in diameter, stipules lanceolate, 5-15 mm long, 5-13- nerved."

402	Allelopathic	
	<b>Source(s)</b>	<b>Notes</b>
	WRA Specialist. (2019). Personal Communication	Unknown. No evidence found

403	Parasitic	n
	<b>Source(s)</b>	<b>Notes</b>
	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.	"Annual or weakly perennial herbs 5-20 dm tall." [Fabaceae. No evidence]

404	Unpalatable to grazing animals	n
	<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 1 Dec 2019]	"Based on a single, short-term, cafeteria-style palatability trial, <i>C. nictitans</i> was more palatable to goats than <i>C. rotundifolia</i> cv. Wynn."

Qsn #	Question	Answer
	Miller, J. H. & Miller, K. V. 2005. Forest Plants of the Southeast and Their Wildlife Uses. University of Georgia Press, Athens, GA	"Partridge peas are a moderately preferred White-tailed Deer browse."
	Missouriplants.com. (2019). <i>Chamaecrista nictitans</i> . <a href="http://www.missouriplants.com">http://www.missouriplants.com</a> . [Accessed 26 Nov 2019]	"The fruits can be glabrous or hairy and are eaten by wildlife."
	Glow, M. P., Ditchkoff, S. S., & Smith, M. D. (2019). Annual Fire Return Interval Influences Nutritional Carrying Capacity of White-Tailed Deer in Pine-Hardwood Forests. <i>Forest Science</i> 65(4): 483-491	[ <i>Chamaecrista nictitans</i> listed among forage plants] "Table 1. List of 25 forages sampled and their associated crude protein content (%) within pin-hardwood stands after a 1- (n = 8) or 2-year (n = 8) fire return interval during 3 periods in 2014 and 2015 at Three Notch Wildlife Research Foundation in east-central Alabama, United States."

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 1 Dec 2019]	"Toxicity - None reported."
	Burrows, G. E., & Tyrl, R. J. (2013). Toxic Plants of North America. Second Edition. Wiley-Blackwell, Hoboken, NJ	"Typical of cassias and sennas, fruits and seeds of <i>C. fasciculata</i> and <i>C. nictitans</i> contain anthraquinones that may cause irritation of the digestive tract. It is very unlikely that problems will occur, because large quantities of the legumes must be consumed; problems are generally self-limiting and of short duration. Otherwise the foliage is nutritious and readily eaten by cattle and sheep (Phillips Petroleum Co. 1963). Interestingly, seeds of <i>C. fascicularis</i> are especially useful as feed for quail (Ball et al. 1991)."

406	Host for recognized pests and pathogens	
	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 ]	"Pests and diseases - No information available."
	Cook, B.G., Schultze-Kraft, R., Pengelly, B.C., Taylor, M., Jones, C., Burkart, S. and Peters, M. (2019). Tropical Forages: an interactive selection tool. CIAT and ILRI. <a href="https://apps.lucidcentral.org/tropical_forages">https://apps.lucidcentral.org/tropical_forages</a> . [Accessed 1 Dec 2019]	"Pests and diseases - Seed eaten by birds. Leaves eaten by the larvae of the cloudless sulphur butterfly ( <i>Phoebis sennae</i> ) and the ceraunus blue butterfly ( <i>Hemiargus ceraunus</i> ) in Texas. Plants killed by an anthracnose disease when in flower."



Qsn #	Question	Answer
407	Causes allergies or is otherwise toxic to humans	n
	Source(s)	Notes
	Quattrocchi, U. 2012. CRC World Dictionary of Medicinal and Poisonous Plants: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	"Stimulant, tonic, febrifuge, antiviral activity against Herpes simplex virus, a remedy for stomachache and fever."
	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 1 Dec 2019]	"Toxicity - None reported."

408	Creates a fire hazard in natural ecosystems	n
	Source(s)	Notes
	Cook, B.G., Schultze-Kraft, R., Pengelly, B.C., Taylor, M., Jones, C., Burkart, S. and Peters, M. (2019). Tropical Forages: an interactive selection tool. CIAT and ILRI. <a href="https://apps.lucidcentral.org/tropical_forages">https://apps.lucidcentral.org/tropical_forages</a> . [Accessed 1 Dec 2019]	"Fire - No information available, but providing seed is set before the advent of fire, like most annuals, it may well thrive due to heat breakdown of dormancy."
	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.	"in Hawai'i naturalized in dry to mesic, disturbed sites, 3-1,130 m" [Found in dry habitats but no evidence that it become abundant enough to be a fire hazard]
	Smith, C.W. & Tunison, J.T. 1992. Fire and alien plants in Hawaii: research and management implications for native ecosystems Pp. 394-408 In Stone, C.P., Smith, C.W. & Tunison, J.T. (eds.). Alien Plant Invasions in Native Ecosystems of Hawaii: Management and Research. Cooperative National Park Resources Studies Unit, University of Hawaii, Honolulu	[Invades burned areas, but no evidence that it increases fire risk] "Woody alien plants usually invade burned areas only to a limited degree and are typically early successional species. Alien shrubs such as partridge pea ( <i>Chamaecrista nictitans</i> ), indigo ( <i>Indigofera suffruticosa</i> ), sourbush ( <i>Pluchea symphytifolia</i> ), and yellow Himalayan raspberry ( <i>Rubus ellipticus</i> ) invade burned sites immediately after fire but appear to be early successional species."

409	Is a shade tolerant plant at some stage of its life cycle	n
	Source(s)	Notes
	Cook, B.G., Schultze-Kraft, R., Pengelly, B.C., Taylor, M., Jones, C., Burkart, S. and Peters, M. (2019). Tropical Forages: an interactive selection tool. CIAT and ILRI. <a href="https://apps.lucidcentral.org/tropical_forages">https://apps.lucidcentral.org/tropical_forages</a> . [Accessed 1 Dec 2019]	" <i>C. nictitans</i> can be found growing in open situations and in light shade in savanna and forest, but not in dense shade."

410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y
	Source(s)	Notes
	Cook, B.G., Schultze-Kraft, R., Pengelly, B.C., Taylor, M., Jones, C., Burkart, S. and Peters, M. (2019). Tropical Forages: an interactive selection tool. CIAT and ILRI. <a href="https://apps.lucidcentral.org/tropical_forages">https://apps.lucidcentral.org/tropical_forages</a> . [Accessed 1 Dec 2019]	"Native to a wide range of soil types but most prevalent on free-draining sands of acid to neutral reaction. While recorded pH at collection sites varies from 5.5 to 7, the values represent a small sample and do not necessarily represent the soil reaction limitations for this particularly diverse species."

Qsn #	Question	Answer
411	Climbing or smothering growth habit	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.	"Annual or weakly perennial herbs 5-20 dm tall."

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.	"in Hawai'i naturalized in dry to mesic, disturbed sites, 3-1,130 m"
	Smith, C.W. & Tunison, J.T. 1992. Fire and alien plants in Hawaii: research and management implications for native ecosystems Pp. 394-408 In Stone, C.P., Smith, C.W. & Tunison, J.T. (eds.). Alien Plant Invasions in Native Ecosystems of Hawaii: Management and Research. Cooperative National Park Resources Studies Unit, University of Hawaii, Honolulu	[May temporarily reach higher densities following fire, but is eventually replaced by later successional species] "Woody alien plants usually invade burned areas only to a limited degree and are typically early successional species. Alien shrubs such as partridge pea ( <i>Chamaecrista nictitans</i> ), indigo ( <i>Indigofera suffruticosa</i> ), soubush ( <i>Pluchea symphytifolia</i> ), and yellow Himalayan raspberry ( <i>Rubus ellipticus</i> ) invade burned sites immediately after fire but appear to be early successional species."

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] "naturalized in dry to mesic, disturbed sites"

502	Grass	n
	Source(s)	Notes
	USDA, Agricultural Research Service, National Plant Germplasm System. (2019). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. <a href="https://npgsweb.ars-grin.gov/">https://npgsweb.ars-grin.gov/</a> . [Accessed 26 Nov 2019]	Family: Fabaceae (alt.Leguminosae) Subfamily: Caesalpinioideae Tribe: Cassieae Subtribe: Cassiinae

503	Nitrogen fixing woody plant	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.	[N-fixing herb] "Annual or weakly perennial herbs 5-20 dm tall."

Qsn #	Question	Answer
504	<b>Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)</b>	n
	<b>Source(s)</b>	<b>Notes</b>
	USDA NRCS (2015). Plant Guide. Sensitive partridge pea. <i>Chamaecrista nictitans</i> (L.) Moench. <a href="https://plants.usda.gov">https://plants.usda.gov</a> . [Accessed 26 Nov 2019]	"Sensitive partridge pea is an annual, herbaceous, leguminous plant. It grows 4–20 in (10–50 cm) tall on multiple stems and has a well-developed taproot."

601	<b>Evidence of substantial reproductive failure in native habitat</b>	n
	<b>Source(s)</b>	<b>Notes</b>
	Contu, S. (2012). <i>Chamaecrista nictitans</i> . The IUCN Red List of Threatened Species 2012: e.T19893070A20040380. <a href="http://dx.doi.org/10.2305/IUCN.UK.2012.RLTS.T19893070A20040380.en">http://dx.doi.org/10.2305/IUCN.UK.2012.RLTS.T19893070A20040380.en</a> . [Accessed 26 Nov 2019]	" <i>Chamaecrista nictitans</i> is widespread and common in its natural range, and it is naturalized elsewhere. At present the population is believed to be stable and does not appear to be under any significant threat, hence the species is rated as Least Concern."
	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] "Native to the Neotropics, now widely naturalized; in Hawai'i naturalized in dry to mesic, disturbed sites, 3-1,130 m, documented from all of the main islands except Moloka'i."

602	<b>Produces viable seed</b>	y
	<b>Source(s)</b>	<b>Notes</b>
	Haselwood, E.L., Motter, G.G., & Hirano, R.T. (eds.). 1983. Handbook of Hawaiian Weeds. University of Hawaii Press, Honolulu, HI	"Propagation: By seed."
	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 Nov 2019]	"Recruits readily from seed."
	USDA NRCS (2015). Plant Guide. Sensitive partridge pea. <i>Chamaecrista nictitans</i> (L.) Moench. <a href="https://plants.usda.gov">https://plants.usda.gov</a> . [Accessed 26 Nov 2019]	"Seeds and Plant Production Sensitive partridge pea is a reseeding annual that flowers from July–September (Cook et al., 2005). The seeds require scarification for good germination. Sensitive partridge pea had a maximum germination rate under wet heat (boiling water) at 70–80°C (Bolin, 2009). Seedlings are fast growing and may bloom within 6 weeks (Cook et al., 2005). It is a C3 species that can show strong responses to elevated atmospheric CO2 levels by responding negatively with lower rates of branching, height, and leaf formation (Millhollen et al., 2006; Matiella, 2009). It can produce 5–30 lb/ac/yr biomass in longleaf pine/wiregrass/bluestem plant communities (USDA NRCS, 2015b). There are approximately 455 seeds/g (Cook et al., 2005)"
	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.	"Seeds dark brown, smooth and dull, except with a few small glossy depressions, quadrangular, ca. 2 mm long."

603	<b>Hybridizes naturally</b>	
	<b>Source(s)</b>	<b>Notes</b>
	WRA Specialist. (2019). Personal Communication	Unknown. No evidence found

Qsn #	Question	Answer
604	Self-compatible or apomictic	y
	Source(s)	Notes
	Lee, T. (1989). Patterns of Fruit and Seed Production in a Vermont Population of <i>Cassia nictitans</i> L. (Caesalpinaceae). <i>Bulletin of the Torrey Botanical Club</i> , 116(1), 15-21	" <i>Cassia nictitans</i> is apparently self-compatible and self-pollinating, as suggested by its floral structure (Irwin and Barneby 1982)." ... "self-pollination, half of the unmanipulated ( control) flowers in the greenhouse experiment aborted shortly after anthesis. Such abortion was probably not due to lack of pollen, as hand-selfed and hand-crossed flowers also had high flower abortion rates (Table 2). In contrast to fruit production, seed production per fruit was significantly lower in control flowers than in hand-selfed flowers, suggesting pollen limitation at this level. Such limitation may not occur in nature where wind, which is minimal in the greenhouse, probably shakes abundant pollen onto stigmas."

605	Requires specialist pollinators	n
	Source(s)	Notes
	Lee, T. (1989). Patterns of Fruit and Seed Production in a Vermont Population of <i>Cassia nictitans</i> L. (Caesalpinaceae). <i>Bulletin of the Torrey Botanical Club</i> , 116(1), 15-21	" <i>Cassia nictitans</i> is apparently self-compatible and self-pollinating, as suggested by its floral structure (Irwin and Barneby 1982)."
	USDA NRCS (2015). Plant Guide. Sensitive partridge pea. <i>Chamaecrista nictitans</i> (L.) Moench. <a href="https://plants.usda.gov">https://plants.usda.gov</a> . [Accessed 1 Dec 2019]	"Sensitive partridge pea has extrafloral nectaries that attract ants, spiders, and pollinators."

606	Reproduction by vegetative fragmentation	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.	"Annual or weakly perennial herbs 5-20 dm tall."
	Cook, B.G., Schultze-Kraft, R., Pengelly, B.C., Taylor, M., Jones, C., Burkart, S. and Peters, M. (2019). Tropical Forages: an interactive selection tool. CIAT and ILRI. <a href="https://apps.lucidcentral.org/tropical_forages">https://apps.lucidcentral.org/tropical_forages</a> . [Accessed 1 Dec 2019]	"Recruits readily from seed."

607	Minimum generative time (years)	1
	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.	"Annual or weakly perennial herbs 5-20 dm tall."

701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	
	Source(s)	Notes

Qsn #	Question	Answer
	Smith, A.C. 1985. Flora Vitiensis Nova: A New Flora of Fiji (Spermatophytes Only). Volume 3. National Tropical Botanical Garden, Lawai, HI	"abundant locally as a weed along roadsides and in cultivated areas, sometimes in coconut plantations." [No means of attachment, but occurrence along roadsides suggests some inadvertent dispersal may occur]
	Coastal Plain Plants. (2019). Chamaecrista nictitans. <a href="http://coastalplainplants.org/wiki/index.php/Chamaecrista_nictitans#Seed_dispersal">http://coastalplainplants.org/wiki/index.php/Chamaecrista_nictitans#Seed_dispersal</a> . [Accessed 1 Dec 2019]	"This species is thought to be dispersed by consumption by vertebrates."

702	Propagules dispersed intentionally by people	
	Source(s)	Notes
	Cook, B.G., Schultze-Kraft, R., Pengelly, B.C., Taylor, M., Jones, C., Burkart, S. and Peters, M. (2019). Tropical Forages: an interactive selection tool. CIAT and ILRI. <a href="https://apps.lucidcentral.org/tropical_forages">https://apps.lucidcentral.org/tropical_forages</a> . [Accessed 1 Dec 2019]	[May be cultivated intentionally in some locations. In the Hawaiian Islands, primarily a disturbance weed] "Productive in tropical and sub-tropical environments on acid infertile soils Erect habit enables it to be used as cut-and-carry forage More palatable than <i>C. rotundifolia</i> Recruits from seed where competition is removed"

703	Propagules likely to disperse as a produce contaminant	y
	Source(s)	Notes
	Haselwood, E.L., Motter, G.G., & Hirano, R.T. (eds.). 1983. Handbook of Hawaiian Weeds. University of Hawaii Press, Honolulu, HI	"A weed in cultivated areas, pastures, rangelands, and waste places." [Common in grasslands - a likely contaminant of cut fodder / cut forage [hay]

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.	[No evidence] "Pods linear-oblong, ± falcate, 2.2-5 cm long, usually pilose, occasionally puberulent, or rarely glabrous. Seeds dark brown, smooth and dull, except with a few small glossy depressions, quadrangular, ca. 2 mm long."

705	Propagules water dispersed	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.	"naturalized in dry to mesic, disturbed sites" [Water may secondarily move seeds or pods, but unlikely to be an important dispersal vector in dry habitats]

706	Propagules bird dispersed	n
	Source(s)	Notes
	Cook, B.G., Schultze-Kraft, R., Pengelly, B.C., Taylor, M., Jones, C., Burkart, S. and Peters, M. (2019). Tropical Forages: an interactive selection tool. CIAT and ILRI. <a href="https://apps.lucidcentral.org/tropical_forages">https://apps.lucidcentral.org/tropical_forages</a> . [Accessed 1 Dec 2019]	"Seed eaten by birds." [Birds presumably act as seed predators rather than legitimate dispersers, although it may be possible that some seeds survive ingestion]

Qsn #	Question	Answer
707	Propagules dispersed by other animals (externally)	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.	"Seeds dark brown, smooth and dull, except with a few small glossy depressions, quadrangular, ca. 2 mm long." [No means of external attachment]
708	Propagules survive passage through the gut	y
	Source(s)	Notes
	Coastal Plain Plants. (2019). <i>Chamaecrista nictitans</i> . <a href="http://coastalplainplants.org/wiki/index.php/Chamaecrista_nictitans#Seed_dispersal">http://coastalplainplants.org/wiki/index.php/Chamaecrista_nictitans#Seed_dispersal</a> . [Accessed 1 Dec 2019]	"This species is thought to be dispersed by consumption by vertebrates."
801	Prolific seed production (>1000/m <sup>2</sup> )	
	Source(s)	Notes
	USDA NRCS (2015). Plant Guide. Sensitive partridge pea. <i>Chamaecrista nictitans</i> (L.) Moench. <a href="https://plants.usda.gov">https://plants.usda.gov</a> . [Accessed 1 Dec 2019]	"It can produce 5–30 lb/ac/yr biomass in longleaf pine/wiregrass/bluestem plant communities (USDA-NRCS, 2015b). There are approximately 455 seeds/g (Cook et al., 2005)" [Densities in natural settings unknown]
802	Evidence that a persistent propagule bank is formed (>1 yr)	
	Source(s)	Notes
	Coastal Plain Plants. (2019). <i>Chamaecrista nictitans</i> . <a href="http://coastalplainplants.org/wiki/index.php/Chamaecrista_nictitans#Seed_dispersal">http://coastalplainplants.org/wiki/index.php/Chamaecrista_nictitans#Seed_dispersal</a> . [Accessed 1 Dec 2019]	"For propagation, the seeds need scarification for successful germination. It has best results when boiled between 70 and 80 degrees Celsius, and seedlings can germinate within 6 weeks."
	McLaughlin, S. P., & Bowers, J. E. (2007). Effects of exotic grasses on soil seed banks in southeastern Arizona grasslands. <i>Western North American Naturalist</i> , 67(2), 206-218	"Many summer annuals detected in our samples were present in the June seed bank but were virtually or entirely absent from the August seed bank and can therefore be regarded as transient. They included <i>Chamaecrista nictitans</i> , <i>Chamaesyce hyssopifolia</i> , <i>Diodia teres</i> , <i>Portulaca umbraticola</i> , and <i>Sida spinosa</i> (Tables 3, 4)."
	Royal Botanic Gardens Kew. (2019) Seed Information Database (SID). Version 7.1. Available from: <a href="http://data.kew.org/sid/">http://data.kew.org/sid/</a> . [Accessed 1 Dec 2019]	"Storage Behaviour: Orthodox Storage Conditions: 95 % viability following drying to mc's in equilibrium with 15 % RH and freezing for 7 months at -20°C at RBG Kew, WP."
	WRA Specialist. (2019). Personal Communication	Seeds may form a persistent seed bank, but longevity in natural conditions is unknown
803	Well controlled by herbicides	
	Source(s)	Notes
	Cook, B.G., Schultze-Kraft, R., Pengelly, B.C., Taylor, M., Jones, C., Burkart, S. and Peters, M. (2019). Tropical Forages: an interactive selection tool. CIAT and ILRI. <a href="https://apps.lucidcentral.org/tropical_forages">https://apps.lucidcentral.org/tropical_forages</a> . [Accessed 1 Dec 2019]	"Unknown. Likely to be similar to <i>C. rotundifolia</i> "

Qsn #	Question	Answer
804	Tolerates, or benefits from, mutilation, cultivation, or fire	
	Source(s)	Notes
	Smith, C.W. & Tunison, J.T. 1992. Fire and alien plants in Hawaii: research and management implications for native ecosystems Pp. 394-408 In Stone, C.P., Smith, C.W. & Tunison, J.T. (eds.). Alien Plant Invasions in Native Ecosystems of Hawaii: Management and Research. Cooperative National Park Resources Studies Unit, University of Hawaii, Honolulu	[Invades burned areas, but no evidence that it resprouts after fires] "Woody alien plants usually invade burned areas only to a limited degree and are typically early successional species. Alien shrubs such as partridge pea ( <i>Chamaecrista nictitans</i> ), indigo ( <i>Indigofera suffruticosa</i> ), sourbush ( <i>Pluchea symphytifolia</i> ), and yellow Himalayan raspberry ( <i>Rubus ellipticus</i> ) invade burned sites immediately after fire but appear to be early successional species."
	Cook, B.G., Schultze-Kraft, R., Pengelly, B.C., Taylor, M., Jones, C., Burkart, S. and Peters, M. (2019). Tropical Forages: an interactive selection tool. CIAT and ILRI. <a href="https://apps.lucidcentral.org/tropical_forages">https://apps.lucidcentral.org/tropical_forages</a> . [Accessed 1 Dec 2019]	[Tolerates some cutting] "As with most subshrubs, taller varieties are best cut at 20-30cm to assist regrowth. Recruitment from seed is possible if there is bare ground, but grasses and weeds progressively invade pure swards."

805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	
	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.	[Probably not. Presumably no limiting factors preventing spread] "in Hawai'i naturalized in dry to mesic, disturbed sites, 3-1,130 m, documented from all of the main islands except Moloka'i."

**Summary of Risk Traits:**

## High Risk / Undesirable Traits

- Elevation range exceeds 1000 m, demonstrating environmental versatility
- Thrives in tropical climates
- Naturalized on all main Hawaiian Islands
- A disturbance weed, with potential impacts to agriculture and the natural environment
- Other *Chamaecrista* species are invasive
- Tolerates many soil types
- Reproduces by seeds
- Self-compatible
- Reaches maturity in one growing season
- Seeds dispersed by gravity, internally by grazing animals and possibly accidentally and intentionally by people
- May tolerate cutting and fire

## Low Risk Traits

- Despite naturalization and weediness, *Chamaecrista nictitans* is an early successional plant and generally displaced by later successional species
- Unarmed (no spines, thorns, or burrs)
- Provides fodder for livestock
- Limited shade tolerance (dense shade may limit ability to spread)
- Not reported to spread vegetatively