

<b>Taxon:</b> <i>Desmodium incanum</i> (Sw.) DC.	<b>Family:</b> Fabaceae
<b>Common Name(s):</b> kaimi clover Spanish clover tick clover tick trefoil	<b>Synonym(s):</b> <i>Aeschynomene incana</i> (Sw.) G. Mey. <i>Desmodium canum</i> (J.F. Gmel.) <i>Desmodium frutescens</i> Schindl. <i>Desmodium mauritianum</i> (Willd.) DC. <i>Desmodium supinum</i> DC. <i>Hedysarum canum</i> J. F. Gmel. <i>Hedysarum incanum</i> Sw. <i>Hedysarum mauritianum</i> Willd. <i>Hedysarum supinum</i> Sw. <i>Meibomia cana</i> (J. F. Gmel.) S. F. <i>Meibomia mauritiana</i> (Willd.) Kuntze <i>Meibomia supina</i> Britton

<b>Assessor:</b> Chuck Chimera	<b>Status:</b> Assessor Approved	<b>End Date:</b> 12 Jan 2022
<b>WRA Score:</b> 15.0	<b>Designation:</b> H(HPWRA)	<b>Rating:</b> High Risk

**Keywords:** Perennial Herb/Shrub, Weedy, Palatable, Self-fertile, 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	n
204	Native or naturalized in regions with tropical or subtropical climates	y=1, n=0	y
205	Does the species have a history of repeated introductions outside its natural range?	y=-2, ?=-1, n=0	y
301	Naturalized beyond native range	y = 1*multiplier (see Appendix 2), n= question 205	y
302	Garden/amenity/disturbance weed		
303	Agricultural/forestry/horticultural weed	n=0, y = 2*multiplier (see Appendix 2)	y
304	Environmental weed		
305	Congeneric weed	n=0, y = 1*multiplier (see Appendix 2)	y

Qsn #	Question	Answer Option	Answer
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		
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	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	y
504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	y=1, n=0	n
601	Evidence of substantial reproductive failure in native habitat	y=1, n=0	n
602	Produces viable seed	y=1, n=-1	y
603	Hybridizes naturally		
604	Self-compatible or apomictic	y=1, n=-1	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)		
701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	y=1, n=-1	y
702	Propagules dispersed intentionally by people	y=1, n=-1	y
703	Propagules likely to disperse as a produce contaminant		
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	y
708	Propagules survive passage through the gut	y=1, n=-1	y
801	Prolific seed production (>1000/m2)		
802	Evidence that a persistent propagule bank is formed (>1 yr)	y=1, n=-1	y
803	Well controlled by herbicides	y=-1, n=1	y

Qsn #	Question	Answer Option	Answer
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
	't Mannelje, L. & Jones, R.M. (Eds.). (1992). Plant Resources of South-East Asia. No. 4. Forages. Pudoc Scientific Publishers, Wageningen, Netherlands	"Genetic resources and breeding. No cultivars are available. Collections are maintained at ATFGRC (CSIRO, Australia), EMBRAPA (Brazil), CIAT (Colombia), and USDA (Fort Pierce, Florida, United States)."

102	Has the species become naturalized where grown?	
	Source(s)	Notes
	WRA Specialist. (2022). Personal Communication	NA

103	Does the species have weedy races?	
	Source(s)	Notes
	WRA Specialist. (2022). 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
	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 tropical and subtropical America, now widespread in Asia and Africa"

202	Quality of climate match data	High
	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 tropical and subtropical America, now widespread in Asia and Africa"

Qsn #	Question	Answer
203	<b>Broad climate suitability (environmental versatility)</b>	<b>n</b>
	<b>Source(s)</b>	<b>Notes</b>
	't Mannetje, L. & Jones, R.M. (Eds.). (1992). Plant Resources of South-East Asia. No. 4. Forages. Pudoc Scientific Publishers, Wageningen, Netherlands	"D. incanum grows best in regions with annual rainfall of 1500-3000 mm, but will persist and spread in areas receiving 1000 mm. Optimum temperatures are reported to be 30°/25 °C during the growing season. The species is tolerant of light frosts and temporary flooding. In regions where it is naturalized, it is particularly common along roadsides, wasteland and other disturbed ground."
	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 and common along roadsides and in pastures, open forest, and lawns, 5-460 m"

Qsn #	Question	Answer
204	<b>Native or naturalized in regions with tropical or subtropical climates</b>	<b>y</b>
	<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 tropical and subtropical America, now widespread in Asia and Africa; in Hawai'i naturalized and common along roadsides and in pastures, open forest, and lawns, 5-460 m, on Kaua'i, O'ahu, Maui, and Hawai'i. First collected on Kaua'i in 1916 (Forbes 588.K, BISH)."
	USDA, Agricultural Research Service, National Plant Germplasm System. (2022). 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 10 Jan 2022]	"Native Northern America NORTHERN MEXICO: Mexico [Chihuahua, Nuevo León, San Luis Potosí, Sinaloa, Tamaulipas, Zacatecas] SOUTHERN MEXICO: Mexico [Campeche, Chiapas, Colima, Guerrero, Hidalgo, Jalisco, Nayarit, Oaxaca, Querétaro, Quintana Roo, Tabasco, Veracruz de Ignacio de la Llave, Yucatán] Southern America CARIBBEAN: Hispaniola, Antigua and Barbuda, Bahamas, Barbados, Cuba, Dominica, Guadeloupe, Jamaica, St. Kitts and Nevis, St. Lucia, Montserrat, Martinique, United States [Puerto Rico], St. Vincent and Grenadines CENTRAL AMERICA: Belize, Costa Rica, Guatemala, Honduras, Nicaragua, Panama, El Salvador NORTHERN SOUTH AMERICA: French Guiana, Guyana, Suriname, Venezuela BRAZIL: Brazil WESTERN SOUTH AMERICA: Bolivia, Colombia, Ecuador, Peru SOUTHERN SOUTH AMERICA: Argentina, Paraguay"

Qsn #	Question	Answer
205	Does the species have a history of repeated introductions outside its natural range?	y
	<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 tropical and subtropical America, now widespread in Asia and Africa; in Hawai'i naturalized and common along roadsides and in pastures, open forest, and lawns, 5-460 m, on Kaua'i, O'ahu, Maui, and Hawai'i."
	't Mannetje, L. & Jones, R.M. (Eds.). (1992). Plant Resources of South-East Asia. No. 4. Forages. Pudoc Scientific Publishers, Wageningen, Netherlands	"Originally from southern United States to Uruguay and Argentina, this species is now widely distributed in the wet tropics and some areas of the wet subtropics."

301	Naturalized beyond native range	y
	<b>Source(s)</b>	<b>Notes</b>
	't Mannetje, L. & Jones, R.M. (Eds.). (1992). Plant Resources of South-East Asia. No. 4. Forages. Pudoc Scientific Publishers, Wageningen, Netherlands	"Originally from southern United States to Uruguay and Argentina, this species is now widely distributed in the wet tropics and some areas of the wet subtropics. It is abundant on volcanic soils in Hawaii, Fiji, Vanuatu and other Pacific Islands."
	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.	[Kauai, Oahu, Maui and Hawaii] "Native to tropical and subtropical America, now widespread in Asia and Africa; in Hawai'i naturalized and common along roadsides and in pastures, open forest, and lawns, 5-460 m, on Kaua'i, O'ahu, Maui, and Hawai'i. First collected on Kaua'i in 1916 (Forbes 588.K, BISH)."
	Oppenheimer, H. L. (2003). New plant records from Maui and Hawai'i Counties. Bishop Museum Occasional Papers. 73: 3-30	[Molokai and Lanai] "Desmodium incanum DC New island records These are the first records of Spanish clover from the islands of Moloka'i and Lāna'i. It was previously known from Kaua'i, O'ahu, Maui, and Hawai'i (Wagner et al., 1990: 667). Material examined: MOLOKA'I: Kaunakakai, 6 m, 14 Jul 2001, Oppenheimer H70124. LĀNA'I: Hulopo'e, near sea level, 15 Apr 2001, Oppenheimer H40122."

302	Garden/amenity/disturbance weed	
	<b>Source(s)</b>	<b>Notes</b>
	Ricketts, G. & Marble, C. (2020). Biology and Management of Creeping Beggarweed ( <i>Desmodium incanum</i> ) in Warm-Season Turf. ENH1327. UF/IFAS Extension, Gainesville, FL. <a href="https://edis.ifas.ufl.edu">https://edis.ifas.ufl.edu</a> . [Accessed 11 Jan 2022]	[Primarily an agricultural or lawn weed, but may also negatively affect gardens] "Creeping beggarweed is a common perennial broadleaf weed in Florida landscapes, home gardens, pastures, and other agricultural production systems."

303	Agricultural/forestry/horticultural weed	y
	<b>Source(s)</b>	<b>Notes</b>
	Cook, B.G., et al. (2022). Tropical Forages: an interactive selection tool – Digital ISBN 978958694234-8. <a href="https://www.tropicalforages.info/text/intro/index.html">https://www.tropicalforages.info/text/intro/index.html</a> . [Accessed 11 Jan 2022]	"Considered a weed in coffee plantations in South America but can be controlled with single application of either dalapon (8.0 kg/ha) or diquat (1.0 L/ha)."
	Ricketts, G. & Marble, C. (2020). Biology and Management of Creeping Beggarweed ( <i>Desmodium incanum</i> ) in Warm-Season Turf. ENH1327. UF/IFAS Extension, Gainesville, FL. <a href="https://edis.ifas.ufl.edu">https://edis.ifas.ufl.edu</a> . [Accessed 11 Jan 2022]	"Creeping beggarweed is a common perennial broadleaf weed in Florida landscapes, home gardens, pastures, and other agricultural production systems."

Qsn #	Question	Answer
	CABI. (2022). Invasive Species Compendium. Wallingford, UK: CAB International. www.cabi.org/isc	"Originally from New World tropics and subtropics, <i>D. incanum</i> is a perennial shrub that was promoted as a forage crop around the world, with further accidental spread. Although it has some value as forage, it is no longer highly regarded. Its main value lies in its nitrogen-fixing ability (for intercropping). <i>D. incanum</i> is regarded as weedy both within and outside of its native range. It occupies roadsides, rough places, pastures, unplanted grasslands, volcanic soils and in dry to wet areas with low stature vegetation. It is an occasional problem in coffee, banana and rice crops. <i>D. incanum</i> is able to withstand and thrive with frequent herbicidal treatments, grazing, cultivation and fire. Its dispersal is mediated by sticky seeds, which can adhere to people, animals and machinery, making it a nuisance. It is able to compete and persist well with other dominant grasses, including invasive ones. Its spreading (scrambly) low stature habit helps it to both dominate other low vegetation and to persist within it. It could also carry pests and diseases of legume crops such as peanut. "
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	"Weed of: Bananas, Cereals, Orchards & Plantations, Pastures"

304	Environmental weed	
	Source(s)	Notes
	CABI. (2022). Invasive Species Compendium. Wallingford, UK: CAB International. www.cabi.org/isc	[Potentially] " <i>D. incanum</i> is known to occur in disturbed places on both inhabited and uninhabited islands of the Pacific, and while it is often widespread, it is rarely more than locally abundant (Whistler, 1998; Starr and Starr, 2006; Starr et al., 2006; US Forest Service, 2014). The offshore islands and islets of Hawaii are mainly protected areas and provide a habitat for seabirds. It occurs in protected areas in Hawaii on Molokai at Kalaupapa National Historic Park (Medeiros et al., 1996) and on Maui in Haleakala National Park (Welton and Haus, 2008), but is simply listed with a suite of other invasive species and no negative impacts are attributed to it alone. This weed is occasionally controlled in Hawaii in conservation areas, where it is never a major component. It tends to grow alongside trails and fence lines, but does not do well under the forest canopy (J. Beachy and S. Kaye, Big Island Invasive Species Committee, Hawaii USA, personal communication, 2013). Its control is usually for its nuisance value and because conservation workers do not want to see it even as a trailside weed in more pristine areas. A congener <i>Desmodium tortuosum</i> is viewed as a more significant (and already widespread) problem in Hawaii (J. Beachy and S. Kaye, Big Island Invasive Species Committee, Hawaii USA, personal communication, 2013)." ... "In Hawaii, there is one instance where <i>D. incanum</i> threatens conservation values, where it (along with other non-native species) has invaded the West Maui population of <i>Tetramolopium sylvae</i> (Hank Oppenheimer, Maui Nui Plant Extinction Prevention Program, Hawaii USA, personal communication, 2013)."

305	Congeneric weed	y
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Qsn #	Question	Answer
	<b>Source(s)</b>	<b>Notes</b>
	CABI. (2022). Invasive Species Compendium. Wallingford, UK: CAB International. www.cabi.org/isc	"A congener <i>Desmodium tortuosum</i> is viewed as a more significant (and already widespread) problem in Hawaii (J. Beachy and S. Kaye, Big Island Invasive Species Committee, Hawaii USA, personal communication, 2013)."
	Queensland Government. (2022). Weeds of Australia. <i>Desmodium uncinatum</i> . <a href="https://keyserver.lucidcentral.org/weeds">https://keyserver.lucidcentral.org/weeds</a> . [Accessed 11 Jan 2022]	"Silverleaf desmodium ( <i>Desmodium uncinatum</i> ) was introduced as a fodder crop and has now become a weed of creekbanks (i.e. riparian areas), roadsides, fencelines, forest margins, disturbed sites, waste areas and plantation crops (e.g. sugarcane). It is regarded as an environmental weed in south-eastern Queensland, where it is listed among the top 100 most invasive plants species, and on the New South Wales North Coast. Silverleaf desmodium ( <i>Desmodium uncinatum</i> ) spreads into forest margins and along creeks where it trails over shrubs and groundcovers, but it does not climb into trees. It has also been reported to ensnare and kill native wildlife (e.g. frogs, birds, lizards and microbats) that easily become stuck to its stems and fruit."

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] "Prostrate, ascending, or erect subshrubs or shrubs up to 10 dm tall; stems pubescent with spreading hooked and longer straight hairs, glabrate. Leaves trifoliolate, leaflets subcoriaceous, usually elliptic or narrowly elliptic, terminal one 4-9 cm long, 1.5-4.5 cm wide, lateral nerves conspicuous, upper surface with minute hooked and straight hairs, lower surface densely appressed pubescent, apex obtuse or often acute, petioles 1-4 cm long. Flowers numerous in racemose inflorescences 5-12 cm long, rachis densely pubescent with minute hooked hairs, pedicels 3-10 mm long, persistent after articles fall, pubescent with minute hooked hairs; corolla pink to purplish, 5-6 mm long. Pods stipitate, (3) 4-5 (-8)-jointed, (2-) 2.5-3 (-4) cm long, densely pubescent with hooked hairs, articles nearly semicircular, 4-5 mm long, ca. 3 mm wide"

402	Allelopathic	
	<b>Source(s)</b>	<b>Notes</b>
	't Mannetje, L. & Jones, R.M. (Eds.). (1992). Plant Resources of South-East Asia. No. 4. Forages. Pudoc Scientific Publishers, Wageningen, Netherlands	"It grows with a range of pasture grasses, but is usually associated with stoloniferous or rhizomatous species."



Qsn #	Question	Answer
	Hao, B., Caulfield, J. C., Hamilton, M. L., Pickett, J. A., Midega, C. A., Khan, Z. R., ... & Hooper, A. M. (2015). The biosynthesis of allelopathic di-C-glycosylflavones from the roots of <i>Desmodium incanum</i> (G. Mey.) DC. <i>Organic &amp; Biomolecular Chemistry</i> , 13(48), 11663-11673	[Effects on other plants not addressed] "The allelopathic root exudate of the drought-tolerant subsistence cereal intercrop <i>D. incanum</i> , protecting against the parasitic weed <i>Striga hermonthica</i> , comprises a number of di-C-glycosylflavones specifically containing C-glucosyl, C-galactosyl and C-arabinosyl moieties. Here we demonstrate that the biosynthesis of all compounds containing a C-glucose involves C-glucosylation of 2-hydroxynaringenin with subsequent C-galactosylation, C-glucosylation or C-arabinosylation. In addition, the crude soluble enzyme extract converts two fluorinated 2-hydroxyflavanone analogues to corresponding mono- and di-C-glycosylflavones demonstrating that some differences in C-ring substitution can be tolerated by the plant enzymes. Elucidating the biosynthesis of these C-glycosylflavones (CGFs) has the potential to open up opportunities for transferring the enzymic and genetic basis for the <i>S. hermonthica</i> inhibiting allelopathic trait to food crop plants."

403	Parasitic	n
	Source(s)	Notes
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. (1999). <i>Manual of the flowering plants of Hawaii</i> . Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"Prostrate, ascending, or erect subshrubs or shrubs up to 10 dm tall" [Fabaceae. No evidence]

404	Unpalatable to grazing animals	n
	Source(s)	Notes
	't Mannetje, L. & Jones, R.M. (Eds.). (1992). <i>Plant Resources of South-East Asia. No. 4. Forages</i> . Pudoc Scientific Publishers, Wageningen, Netherlands	"The stoloniferous habit of this species enables it to withstand heavy grazing. A 30-40 day rest period between grazings has been recommended, but the species can persist under close continuous grazing. It is amongst the more persistent legume species under heavy grazing."

405	Toxic to animals	n
	Source(s)	Notes
	't Mannetje, L. & Jones, R.M. (Eds.). (1992). <i>Plant Resources of South-East Asia. No. 4. Forages</i> . Pudoc Scientific Publishers, Wageningen, Netherlands	"Kaimi is not toxic to livestock, but palatability is reduced by tannins. Nitrogen concentrations of 2.0-2.5 % have been reported."
	Cook, B.G., et al. (2022). <i>Tropical Forages: an interactive selection tool</i> – Digital ISBN 978958694234-8. <a href="https://www.tropicalforages.info/text/intro/index.html">https://www.tropicalforages.info/text/intro/index.html</a> . [Accessed 11 Jan 2022]	"No toxicity reported."

406	Host for recognized pests and pathogens	
	Source(s)	Notes

Qsn #	Question	Answer
	't Mannetje, L. & Jones, R.M. (Eds.). (1992). Plant Resources of South-East Asia. No. 4. Forages. Pudoc Scientific Publishers, Wageningen, Netherlands	"D. incanum is reported to be sensitive to Peanut Mottle Virus and may act as a source for this virus for cultivated groundnuts in the United States. Several fungal diseases have been recorded on D. incanum, as well as little leaf and desmodium mosaic virus, but they rarely cause serious problems. Seedlings may be damaged by cutworms, and in Hawaii the rose beetle and the cyst nematode <i>Heterodera trifolii</i> may cause damage."
	Cook, B.G., et al. (2022). Tropical Forages: an interactive selection tool – Digital ISBN 978958694234-8. <a href="https://www.tropicalforages.info/text/intro/index.html">https://www.tropicalforages.info/text/intro/index.html</a> . [Accessed 11 Jan 2022]	"Reported to be sensitive to Peanut (Groundnut) Mottle Virus and may be a source of this to cultivated peanuts and soybeans in southern USA. Several fungal diseases reported, as are little leaf and Desmodium mosaic virus. Seedlings may be damaged by cutworms; rose beetles and cyst nematodes, <i>Heterodera trifolii</i> , have been reported in Hawaii. Light infestations by <i>Meloidogyne</i> spp. nematodes under coffee in Cuba."

407	Causes allergies or is otherwise toxic to humans	n
	Source(s)	Notes
	Cook, B.G., et al. (2022). Tropical Forages: an interactive selection tool – Digital ISBN 978958694234-8. <a href="https://www.tropicalforages.info/text/intro/index.html">https://www.tropicalforages.info/text/intro/index.html</a> . [Accessed 11 Jan 2022]	"No toxicity reported."
	't Mannetje, L. & Jones, R.M. (Eds.). (1992). Plant Resources of South-East Asia. No. 4. Forages. Pudoc Scientific Publishers, Wageningen, Netherlands	[No evidence of toxicity to animals] "Kaimi is not toxic to livestock, but palatability is reduced by tannins. Nitrogen concentrations of 2.0 -2.5 % have been reported."
	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, but any medicinal or other internal consumption should be used with caution] "Antimicrobial, diuretic, stomachic, febrifuge, laxative, tonic. Leaves crushed and applied as a poultice to the wound. Infusion to treat excessive or painful menstruation, heat, oliguria, fever, cystitis."

408	Creates a fire hazard in natural ecosystems	n
	Source(s)	Notes
	't Mannetje, L. & Jones, R.M. (Eds.). (1992). Plant Resources of South-East Asia. No. 4. Forages. Pudoc Scientific Publishers, Wageningen, Netherlands	"D. incanum grows best in regions with annual rainfall of 1500-3000 mm, but will persist and spread in areas receiving 1000 mm." [Does not generally occur in arid, fire prone areas]
	Cook, B.G., et al. (2022). Tropical Forages: an interactive selection tool – Digital ISBN 978958694234-8. <a href="https://www.tropicalforages.info/text/intro/index.html">https://www.tropicalforages.info/text/intro/index.html</a> . [Accessed 11 Jan 2022]	"Not usually burned because it occurs in locations which are heavily grazed. However, if burnt, it regrows from buds at the base of its woody stems, as well as regenerating from soil seed reserves."

409	Is a shade tolerant plant at some stage of its life cycle	n
	Source(s)	Notes
	Cook, B.G., et al. (2022). Tropical Forages: an interactive selection tool – Digital ISBN 978958694234-8. <a href="https://www.tropicalforages.info/text/intro/index.html">https://www.tropicalforages.info/text/intro/index.html</a> . [Accessed 11 Jan 2022]	"Has moderate shade tolerance; considered a weed in coffee plantations in South America."

Qsn #	Question	Answer
	Ricketts, G. & Marble, C. (2020). Biology and Management of Creeping Beggarweed ( <i>Desmodium incanum</i> ) in Warm-Season Turf. ENH1327. UF/IFAS Extension, Gainesville, FL. <a href="https://edis.ifas.ufl.edu">https://edis.ifas.ufl.edu</a> . [Accessed 11 Jan 2022]	"It is most common in full-sun, dry areas because it does not grow well in areas that are wet or poorly drained for an extended period."
	Macdonald, I., Thébaud, C., Strahm, W., & Strasberg, D. (1991). Effects of Alien Plant Invasions on Native Vegetation Remnants on La Réunion (Mascarene Islands, Indian Ocean). <i>Environmental Conservation</i> , 18(1), 51-61	[Light-demanding] "Of the 14 species that were recorded in both primary forest and disturbed sites, 11 showed higher mean IVs in the disturbed areas. Species of this group are generally light-demanding species of disturbed soils - e.g. <i>Ageratum conyzoides</i> , <i>Desmodium incanum</i> , <i>Duschesnea indica</i> , <i>Elephantopus scaber</i> , and <i>Rumex</i> spp."

410	<b>Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)</b>	y
	<b>Source(s)</b>	<b>Notes</b>
	't Mannetje, L. & Jones, R.M. (Eds.). (1992). <i>Plant Resources of South-East Asia. No. 4. Forages</i> . Pudoc Scientific Publishers, Wageningen, Netherlands	" <i>D. incanum</i> is apparently best adapted to fertile, neutral to slightly alkaline soils, but may be grown on a wide range of soil types from sands to light clays, pH 4.0-8.0."

411	<b>Climbing or smothering growth habit</b>	n
	<b>Source(s)</b>	<b>Notes</b>
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. (1999). <i>Manual of the flowering plants of Hawaii</i> . Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"Prostrate, ascending, or erect subshrubs or shrubs up to 10 dm tall; stems pubescent with spreading hooked and longer straight hairs, glabrate."

412	<b>Forms dense thickets</b>	n
	<b>Source(s)</b>	<b>Notes</b>
	CABI. (2022). <i>Invasive Species Compendium</i> . Wallingford, UK: CAB International. <a href="http://www.cabi.org/isc">www.cabi.org/isc</a>	"It is able to compete and persist well with other dominant grasses, including invasive ones. Its spreading (scrambly) low stature habit helps it to both dominate other low vegetation and to persist within it."

501	<b>Aquatic</b>	n
	<b>Source(s)</b>	<b>Notes</b>
	't Mannetje, L. & Jones, R.M. (Eds.). (1992). <i>Plant Resources of South-East Asia. No. 4. Forages</i> . Pudoc Scientific Publishers, Wageningen, Netherlands	[Terrestrial]
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. (1999). <i>Manual of the flowering plants of Hawaii</i> . Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[Terrestrial] "in Hawai'i naturalized and common along roadsides and in pastures, open forest, and lawns, 5-460 m"

502	<b>Grass</b>	n
	<b>Source(s)</b>	<b>Notes</b>

Qsn #	Question	Answer
	USDA, Agricultural Research Service, National Plant Germplasm System. (2022). 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 10 Jan 2022]	Family: Fabaceae (alt. Leguminosae) Subfamily: Faboideae Tribe: Desmodieae Subtribe: Desmodiinae

503	Nitrogen fixing woody plant	Y
	Source(s)	Notes
	Toniutti, M. A. et al. (2017). Nitrogen-fixing rhizobial strains isolated from <i>Desmodium incanum</i> DC in Argentina: Phylogeny, biodiversity and symbiotic ability. <i>Systematic and Applied Microbiology</i> , 40(5), 297-307	" <i>Desmodium</i> spp. are leguminous plants belonging to the tribe Desmodieae of the subfamily Papilionoideae. They are widely distributed in temperated and subtropical regions and are used as forageplants, for biological control, and in traditional folk medicine. The genus includes pioneer species that resist the xerothermic environment and grow in arid, barren sites. <i>Desmodium</i> species that form nitrogen-fixing symbiosis with rhizobia play an important role in sustainable agriculture. In Argentina, 23 nativespecies of this genus have been found, including <i>Desmodium incanum</i> . In this study, a total of 64 <i>D.incanum</i> -nodulating rhizobia were obtained from root nodules of four Argentinean plant populations. Rhizobia showed different abiotic-stress tolerances and a remarkable genetic diversity using PCR fingerprinting, with more than 30 different amplification profiles. None of the isolates were found at more than one site, thus indicating a high level of rhizobial diversity associated with <i>D. incanum</i> in Argentinean soils. In selected isolates, 16S rDNA sequencing and whole-cell extract MALDI TOF analysis revealed the presence of isolates related to <i>Bradyrhizobium elkanii</i> , <i>Bradyrhizobium japonicum</i> , <i>Bradyrhizobium yuanmingense</i> , <i>Bradyrhizobium liaoningense</i> , <i>Bradyrhizobium denitrificans</i> and <i>Rhizobium tropici</i> species. In addition, the <i>nodC</i> gene studied in the selected isolates showed different allelic variants. Isolates were phenotypically characterized by assaying their growth under different abiotic stresses. Some of the local isolates were remarkably tolerant to high temperatures, extreme pH and salinity, which are all stressors commonly found in Argentinean soils. One of the isolates showed high tolerance to temperature and extreme pH, and produced higher aerial plant dry weights compared to other inoculated treatments. These results indicated that local isolates could be efficiently used for <i>D. incanum</i> inoculation."
	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.	"Prostrate, ascending, or erect subshrubs or shrubs up to 10 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>
	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.	"Prostrate, ascending, or erect subshrubs or shrubs up to 10 dm tall"

601	<b>Evidence of substantial reproductive failure in native habitat</b>	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] "Native to tropical and subtropical America, now widespread in Asia and Africa; in Hawai'i naturalized and common along roadsides and in pastures, open forest, and lawns, 5-460 m, on Kaua'i, O'ahu, Maui, and Hawai'i."

602	<b>Produces viable seed</b>	y
	<b>Source(s)</b>	<b>Notes</b>
	't Mannetje, L. & Jones, R.M. (Eds.). (1992). Plant Resources of South-East Asia. No. 4. Forages. Pudoc Scientific Publishers, Wageningen, Netherlands	"D. incanum is propagated by seed. Seed is often hard and may require treatment with concentrated sulphuric acid for 10 minutes before sowing. It is recommended that the seed be inoculated with the special <i>Desmodium</i> strain of <i>Bradyrhizobium</i> ."

603	<b>Hybridizes naturally</b>	
	<b>Source(s)</b>	<b>Notes</b>
	't Mannetje, L. & Jones, R.M. (Eds.). (1992). Plant Resources of South-East Asia. No. 4. Forages. Pudoc Scientific Publishers, Wageningen, Netherlands	"It has been hybridized with <i>D. uncinatum</i> (Jacq.) DC., but the hybrid is sterile." [Unknown if natural hybridization occurs]

604	<b>Self-compatible or apomictic</b>	y
	<b>Source(s)</b>	<b>Notes</b>
	't Mannetje, L. & Jones, R.M. (Eds.). (1992). Plant Resources of South-East Asia. No. 4. Forages. Pudoc Scientific Publishers, Wageningen, Netherlands	"D. incanum is self-fertile, but some outcrossing is believed to occur."

605	<b>Requires specialist pollinators</b>	n
	<b>Source(s)</b>	<b>Notes</b>
	Fleming, T. F., & Etcheverry, Á. V. (2017). Comparing the efficiency of pollination mechanisms in Papilionoideae. <i>Arthropod-Plant Interactions</i> , 11(3), 273-283	"Although <i>Desmodium</i> species depend on pollinators because the mechanism cannot self-activate, they are self-compatible, and there is evidence that <i>D. incanum</i> and <i>D. subsericeum</i> produce fruits and seeds also through autonomous self-pollination (Alemán et al. 2014). Native solitary bees such as <i>Megachile</i> , <i>Epanthidium</i> , <i>Melissodes</i> , <i>Psaenythia</i> , the eusocial <i>Bombus</i> and <i>Apis mellifera</i> honey bees form the list of pollinators (Figuerola Fleming 2014)."

Qsn #	Question	Answer
	Ricketts, G. & Marble, C. (2020). Biology and Management of Creeping Beggarweed ( <i>Desmodium incanum</i> ) in Warm-Season Turf. ENH1327. UF/IFAS Extension, Gainesville, FL. <a href="https://edis.ifas.ufl.edu">https://edis.ifas.ufl.edu</a> . [Accessed 11 Jan 2022]	"The plant is commonly pollinated by bees and other pollinators but is also self-fertilized (does not require a pollinator) (Etcheverry et al. 2010)."

606	Reproduction by vegetative fragmentation	y
	Source(s)	Notes
	Ricketts, G. & Marble, C. (2020). Biology and Management of Creeping Beggarweed ( <i>Desmodium incanum</i> ) in Warm-Season Turf. ENH1327. UF/IFAS Extension, Gainesville, FL. <a href="https://edis.ifas.ufl.edu">https://edis.ifas.ufl.edu</a> . [Accessed 11 Jan 2022]	"Creeping beggarweed is a broadleaf perennial weed that reproduces by seeds and stolons; it may also spread by fragments of stems or broken pieces of its taproot."
	't Mannetje, L. & Jones, R.M. (Eds.). (1992). Plant Resources of South-East Asia. No. 4. Forages. Pudoc Scientific Publishers, Wageningen, Netherlands	"Stem trailing, fibrous to woody, sometimes beneath the soil surface, rooting readily at the nodes; root system deep, well-branched."

607	Minimum generative time (years)	
	Source(s)	Notes
	't Mannetje, L. & Jones, R.M. (Eds.). (1992). Plant Resources of South-East Asia. No. 4. Forages. Pudoc Scientific Publishers, Wageningen, Netherlands	[Possibly 1-2 years. Spreads vegetatively within 6 months] "Initial growth is slow, but later growth rates improve, provided moisture is adequate. Trailing stems begin to develop some 6 months after sowing. In regions with a pronounced seasonal climate, growth during the dry season is slow. At higher latitudes, flowering occurs when day lengths shorten."

701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	y
	Source(s)	Notes
	't Mannetje, L. & Jones, R.M. (Eds.). (1992). Plant Resources of South-East Asia. No. 4. Forages. Pudoc Scientific Publishers, Wageningen, Netherlands	"It is naturally spread by animals and humans, the hooked hairs on the pod adhering to fur or clothing." ... "In regions where it is naturalized, it is particularly common along roadsides, wasteland and other disturbed ground."

702	Propagules dispersed intentionally by people	y
	Source(s)	Notes
	Cook, B.G., et al. (2022). Tropical Forages: an interactive selection tool – Digital ISBN 978958694234-8. <a href="https://www.tropicalforages.info/text/intro/index.html">https://www.tropicalforages.info/text/intro/index.html</a> . [Accessed 11 Jan 2022]	"A potentially useful legume in heavily grazed pastures and on low to moderate fertility soils, as in rundown <i>Urochloa</i> pastures in the Amazon Basin. However, no widespread use. "
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	"Major Pathway/s: Herbal, Ornamental, Pasture Dispersed by: Humans"

703	Propagules likely to disperse as a produce contaminant	
	Source(s)	Notes
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	"Major Pathway/s: Herbal, Ornamental, Pasture Dispersed by: Humans"

Qsn #	Question	Answer
	CABI. (2022). Invasive Species Compendium. Wallingford, UK: CAB International. www.cabi.org/isc	[Possibly] "If promoted for forage and erosion control, it could be a weedy contaminant of other plants and soil"

704	Propagules adapted to wind dispersal	n
	Source(s)	Notes
	Castillo-Flores, A. A., & Calvo-Irabién, L. M. (2003). Animal dispersal of two secondary-vegetation herbs into the evergreen rain forest of south-eastern Mexico. <i>Journal of Tropical Ecology</i> , 19(3), 271-278	" <i>Desmodium incanum</i> DC. (Fabaceae) is a 1-m-tall herb producing septate pods with 3–8 articulated segments, densely pubescent with short, uncinata adhesive hairs. Seed pods are 3.5–4.0 mm long each with up to eight seeds."
	't Mannetje, L. & Jones, R.M. (Eds.). (1992). <i>Plant Resources of South-East Asia. No. 4. Forages</i> . Pudoc Scientific Publishers, Wageningen, Netherlands	"It is naturally spread by animals and humans, the hooked hairs on the pod adhering to fur or clothing."

705	Propagules water dispersed	n
	Source(s)	Notes
	't Mannetje, L. & Jones, R.M. (Eds.). (1992). <i>Plant Resources of South-East Asia. No. 4. Forages</i> . Pudoc Scientific Publishers, Wageningen, Netherlands	"It is naturally spread by animals and humans, the hooked hairs on the pod adhering to fur or clothing."

706	Propagules bird dispersed	n
	Source(s)	Notes
	't Mannetje, L. & Jones, R.M. (Eds.). (1992). <i>Plant Resources of South-East Asia. No. 4. Forages</i> . Pudoc Scientific Publishers, Wageningen, Netherlands	"It is naturally spread by animals and humans, the hooked hairs on the pod adhering to fur or clothing."

707	Propagules dispersed by other animals (externally)	y
	Source(s)	Notes
	't Mannetje, L. & Jones, R.M. (Eds.). (1992). <i>Plant Resources of South-East Asia. No. 4. Forages</i> . Pudoc Scientific Publishers, Wageningen, Netherlands	"It is naturally spread by animals and humans, the hooked hairs on the pod adhering to fur or clothing."

708	Propagules survive passage through the gut	y
	Source(s)	Notes
	Cook, B.G., et al. (2022). <i>Tropical Forages: an interactive selection tool</i> – Digital ISBN 978958694234-8. <a href="https://www.tropicalforages.info/text/intro/index.html">https://www.tropicalforages.info/text/intro/index.html</a> . [Accessed 11 Jan 2022]	"Spreads locally from creeping stems especially when pushed into moist soil. Main spreading via pod segments that stick to animal hair and human clothing (hence the name, 'beggar weed'), while seed can also be spread through cattle faeces."
	Blake, S., Wikelski, M., Cabrera, F., Guezou, A., Silva, M., Sadeghayobi, E., Yackulic, C. & Jaramillo, P. (2012). Seed dispersal by Galápagos tortoises. <i>Journal of Biogeography</i> , 39(11): 1961-1972	"Table 1 Summary data indicating the frequency of occurrence of intact seeds in dung piles of tortoises ( <i>Chelonoidis nigra</i> ) found in farmland and in the Galapagos National Park on the island of Santa Cruz." [3 intact seeds of <i>Desmodium incanum</i> found in 1 tortoise dung pile. Presumably viable]



Qsn #	Question	Answer
801	<b>Prolific seed production (&gt;1000/m2)</b>	
	<b>Source(s)</b>	<b>Notes</b>
	't Mannelje, L. & Jones, R.M. (Eds.). (1992). Plant Resources of South-East Asia. No. 4. Forages. Pudoc Scientific Publishers, Wageningen, Netherlands	"Seed yields may exceed 200 kg/ha, but lower yields are more usual."

802	<b>Evidence that a persistent propagule bank is formed (&gt;1 yr)</b>	<b>y</b>
	<b>Source(s)</b>	<b>Notes</b>
	Medeiros, R. B. D., Favreto, R., Ferreira, O. C. L., & Siewerdt, L. (2006). Persistence of <i>Desmodium incanum</i> DC. in croplands established on natural grassland. <i>Pesquisa Agropecuária Gaúcha</i> , 12(1/2): 37-44	"In spite of the gradual reduction in persistence, <i>D. incanum</i> showed ability to persist for until four years, in soil tillage systems under low disturbance such as direct drill."

803	<b>Well controlled by herbicides</b>	<b>y</b>
	<b>Source(s)</b>	<b>Notes</b>
	Cook, B.G., et al. (2022). Tropical Forages: an interactive selection tool – Digital ISBN 978958694234-8. <a href="https://www.tropicalforages.info/text/intro/index.html">https://www.tropicalforages.info/text/intro/index.html</a> . [Accessed 11 Jan 2022]	"Considered a weed in coffee plantations in South America but can be controlled with single application of either dalapon (8.0 kg/ha) or diquat (1.0 L/ha). Susceptible to trifluralin, fluchloralin, fluroxypyr-meptyl + triclopyr, 2,4 D + aminopyralid and 2,4 D + picloram."
	Ricketts, G. & Marble, C. (2020). Biology and Management of Creeping Beggarweed ( <i>Desmodium incanum</i> ) in Warm-Season Turf. ENH1327. UF/IFAS Extension, Gainesville, FL. <a href="https://edis.ifas.ufl.edu">https://edis.ifas.ufl.edu</a> . [Accessed 11 Jan 2022]	"In turfgrass, repeated applications of Group 4 herbicides are needed to control beggarweed (Patrick McCullough, University of Georgia). 2,4-D combination herbicides such as those that contain 2,4-D, dicamba, mecoprop-p acid (MCPP), or other general broadleaf herbicides (such as Trimec) have been reported to provide control of immature creeping beggarweed. Specific products would include SpeedZone® herbicide (2,4-D + dicamba+ mecoprop-p acid [MCPP] + carfentrazone) and Avenue South (penoxsulam + sulfentrazone + 2,4-D + dicamba), among many others. Confront, which contains a mixture of triclopyr and clopyralid, provides good control for creeping beggarweed. Other herbicides such as those containing metsulfuronmethyl (Manson) or metsulfuron-methyl + sulfentrazone (Blindside) have proven to be effective. Depending upon weed size, a repeat application may be required to give good control on more mature plants. Note that herbicides containing 2,4-D may injure St. Augustine grass lawns under certain environmental conditions."
	CABI. (2022). Invasive Species Compendium. Wallingford, UK: CAB International. <a href="http://www.cabi.org/isc">www.cabi.org/isc</a>	"Often <i>D. incanum</i> is a lawn weed and is considered hard to control because the tap root can persist after herbicide treatments (University of Florida Nassau County Extension, 2013). A pre-emergent herbicide can be used in spring to help control <i>D. incanum</i> in lawns (University of Florida Extension Office, 2013). One control method requires that you locate the main stem, cut it close to the ground and immediately "paint" the cut stem with a glyphosate-type product (University of Florida Extension Office, 2013). Control with triclopyr can be as high as 90% and does not kill associated grasses such as <i>Paspalum notatum</i> (Freitas et al., 2003). Use of herbicides generally to control it, or other weeds will not necessarily cause its decline, and can promote its dominance (Reinert et al., 2004)."



Qsn #	Question	Answer
804	Tolerates, or benefits from, mutilation, cultivation, or fire	y
	Source(s)	Notes
	Ricketts, G. & Marble, C. (2020). Biology and Management of Creeping Beggarweed ( <i>Desmodium incanum</i> ) in Warm-Season Turf. ENH1327. UF/IFAS Extension, Gainesville, FL. <a href="https://edis.ifas.ufl.edu">https://edis.ifas.ufl.edu</a> . [Accessed 11 Jan 2022]	"Creeping beggarweed can propagate vegetatively; therefore, a mower can spread parts of the stolons that can eventually become a new plant. Mow and bag clippings with weed seeds. For small areas that are not heavily infested, hand-weeding can be effective, but complete removal of the roots is required for effective control (Dalle and de Blois 2006). Tillage can be effective in agricultural production but is usually not feasible in the landscape."
	CABI. (2022). Invasive Species Compendium. Wallingford, UK: CAB International. <a href="http://www.cabi.org/isc">www.cabi.org/isc</a>	" <i>D. incanum</i> reproduces by seed, stolons and broken taproots. Complete removal of the roots is required for effective control. It withstands or benefits from fire, intense grazing and tillage (Dalle and de Blois, 2006; Guglieri-Caporal et al., 2010; Randriamalala et al., 2012)."
	Cook, B.G., et al. (2022). Tropical Forages: an interactive selection tool – Digital ISBN 978958694234-8. <a href="https://www.tropicalforages.info/text/intro/index.html">https://www.tropicalforages.info/text/intro/index.html</a> . [Accessed 11 Jan 2022]	"Not usually burned because it occurs in locations which are heavily grazed. However, if burnt, it regrows from buds at the base of its woody stems, as well as regenerating from soil seed reserves."

805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	
	Source(s)	Notes
	't Mannetje, L. & Jones, R.M. (Eds.). (1992). Plant Resources of South-East Asia. No. 4. Forages. Pudoc Scientific Publishers, Wageningen, Netherlands	[May act as limiting factors] "Seedlings may be damaged by cutworms, and in Hawaii the rose beetle and the cyst nematode <i>Heterodera trifolii</i> may cause damage."

**Summary of Risk Traits:**

## High Risk / Undesirable Traits

- Thrives and spreads in regions with tropical climates
- Naturalized on Kauai, Oahu, Molokai, Lanai, Maui and Hawaii (Hawaiian Islands) and widely naturalized in the wet tropics
- A common weed in landscapes, home gardens, pastures, and other agricultural production systems
- May compete with or impact certain endangered plants in the Hawaiian Islands, although not conclusively implicated in specific, detrimental effects
- Other *Desmodium* species are invasive weeds
- Tolerates many soil types
- Reproduces by seeds and vegetatively by stolons, by fragments of stems or broken pieces of its taproot.
- Self-fertile
- Seeds dispersed by animals and humans, the hooked hairs on the pod adhering to fur or clothing; seeds also spread internally by grazing animals
- Seeds may form a persistent seed bank (up to 4 years)
- Tolerates heavy grazing, mowing and fire

## Low Risk Traits

- Valued as a palatable pasture species in the Hawaiian Islands, with negative impacts, if any, largely restricted to disturbed habitats
- Unarmed (no spines, thorns, or burrs)
- Highly palatable
- Non-toxic
- Grows best in high light environments (dense shade may inhibit spread)
- Herbicides may provide effective control