

<b>Taxon:</b> <i>Lantana montevidensis</i> (Spreng.) Briq.	<b>Family:</b> Verbenaceae
<b>Common Name(s):</b> creeping lantana purple lantana trailing lantana	<b>Synonym(s):</b> <i>Lantana sellowiana</i> Link & Otto <i>Lippia montevidensis</i> Spreng.

<b>Assessor:</b> Chuck Chimera	<b>Status:</b> Assessor Approved	<b>End Date:</b> 15 Mar 2018
<b>WRA Score:</b> 25.0	<b>Designation:</b> H(HPWRA)	<b>Rating:</b> High Risk

**Keywords:** Malodorous, Low Shrub, Environmental Weed, Rarely Seeds, Spreads Vegetatively

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)	n
303	Agricultural/forestry/horticultural weed	n=0, y = 2*multiplier (see Appendix 2)	y
304	Environmental weed	n=0, y = 2*multiplier (see Appendix 2)	y
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	y
405	Toxic to animals		
406	Host for recognized pests and pathogens	y=1, n=0	y
407	Causes allergies or is otherwise toxic to humans	y=1, n=0	y
408	Creates a fire hazard in natural ecosystems		
409	Is a shade tolerant plant at some stage of its life cycle	y=1, n=0	n

Qsn #	Question	Answer Option	Answer
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	y
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		
605	Requires specialist pollinators	y=-1, n=0	n
606	Reproduction by vegetative fragmentation	y=1, n=-1	y
607	Minimum generative time (years)	1 year = 1, 2 or 3 years = 0, 4+ years = -1	1
701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	y=1, n=-1	y
702	Propagules dispersed intentionally by people	y=1, n=-1	y
703	Propagules likely to disperse as a produce contaminant	y=1, n=-1	n
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	y
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)	y=1, n=-1	n
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
	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.	[Not domesticated, but sterile form exists] "[2n = 36 (sterile) or 48 (wild form).] Native to southern Brazil, Uruguay, Paraguay, and Argentina,"

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
	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 13 Mar 2018]	"Native Southern America Brazil: Brazil Minas Gerais, Parana, Rio Grande do Sul, Santa Catarina, Sao Paulo Southern South America: Argentina Buenos Aires, Catamarca, Corrientes, Entre Rios, Formosa, Misiones; Paraguay ; Uruguay Western South America: Bolivia"

202	Quality of climate match data	High
	Source(s)	Notes
	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 13 Mar 2018]	

Qsn #	Question	Answer
203	<b>Broad climate suitability (environmental versatility)</b>	<b>y</b>
	<b>Source(s)</b>	<b>Notes</b>
	Learn 2 Grow. 2018. <i>Lantana montevidensis</i> . <a href="http://www.learn2grow.com/plants/lantana-montevidensis/">http://www.learn2grow.com/plants/lantana-montevidensis/</a> . [Accessed 13 Mar 2018]	"USDA Hardiness Zone - 8 - 15"
	Peel, M. C., Finlayson, B. L., & McMahon, T. A. (2007). Updated world map of the Köppen-Geiger climate classification. <i>Hydrology and Earth System Sciences</i> , 4(2), 439-473	Distribution in the native range and naturalized range (specifically New South Wales, Queensland, Australia & the Hawaiian Islands) is widespread and occurs in more than 3 climatic groups

204	<b>Native or naturalized in regions with tropical or subtropical climates</b>	<b>y</b>
	<b>Source(s)</b>	<b>Notes</b>
	Parsons, W.T. & Cuthbertson, E.G. 2001. <i>Noxious Weeds of Australia</i> . Second Edition. CSIRO Publishing, Collingwood, Australia	"It is considered a weed only in Australia, where it occurs in coastal and subcoastal Queensland especially in the Burnett and Wide Bay Pastoral Districts, in northern New South Wales and parts of the Sydney region and, as an ornamental, in some Northern Territory towns."
	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.	"Native to southern Brazil, Uruguay, Paraguay, and Argentina, now cultivated nearly worldwide and naturalized in many tropical and subtropical areas; in Hawai'i commonly cultivated and apparently naturalized (Nagata, 1988) at least around Lana'i City and nearby pineapple fields. Cultivated in Hawai'i as early as 1930 (St. John 10514, BISH), but first naturalized collection made in 1986 (K. Nagata 3497, BISH, HLA)."

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>
	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.	"Native to southern Brazil, Uruguay, Paraguay, and Argentina, now cultivated nearly worldwide and naturalized in many tropical and subtropical areas"
	Parsons, W.T. & Cuthbertson, E.G. 2001. <i>Noxious Weeds of Australia</i> . Second Edition. CSIRO Publishing, Collingwood, Australia	"This native of Uruguay and southern Brazil has been introduced to most other tropical and subtropical regions as a ground-covering ornamental."

301	<b>Naturalized beyond native range</b>	<b>y</b>
	<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.	"in Hawai'i commonly cultivated and apparently naturalized (Nagata, 1988) at least around Lana'i City and nearby pineapple fields. Cultivated in Hawai'i as early as 1930 (St. John 10514, BISH), but first naturalized collection made in 1986 (K. Nagata 3497, BISH, HLA)."
	Parsons, W.T. & Cuthbertson, E.G. 2001. <i>Noxious Weeds of Australia</i> . Second Edition. CSIRO Publishing, Collingwood, Australia	"It is considered a weed only in Australia, where it occurs in coastal and subcoastal Queensland especially in the Burnett and Wide Bay Pastoral Districts, in northern New South Wales and parts of the Sydney region and, as an ornamental, in some Northern Territory towns."

Qsn #	Question	Answer
	Lorence, D.H., Flynn, T.W. & Wagner, W.L. 1995. Contributions to the flora of Hawai'i. III. New additions, range extensions, and rediscoveries of flowering plants. Bishop Museum Occasional Papers 41: 19-58	"This species is commonly cultivated in the Hawaiian Islands and has become naturalized around Lanai City, Lanai (Wagner et al. 1990: 1230). On Kauai it is adventive locally, probably spreading from seeds dispersed by birds or from yard clippings dumped into the pasture from adjacent housing areas. This is a new naturalized record of this species on Kauai. Material examined. KAUAI: Koloa District, Poipu, in pasture N of Lawai Road, secondary vegetation dominated by <i>Leucaena</i> and <i>Digitaria</i> , 6 m, 12 Nov 1988, T. Flynn & D. Lorence 3132 (PTBG)."
	Johnson, S. B., & Lisle, S. D. (2006). The problem with <i>Lantana montevidensis</i> (creeping lantana). In 15th Australian Weeds Conference, Adelaide, South Australia, 24-28 September 2006: Managing weeds in a changing climate (pp. 727-730). Weed Management Society of South Australia, Torrens Park, South Australia	"Varieties of <i>L. montevidensis</i> are widely planted as ornamentals throughout Australia. Naturalised populations of the species are generally found in eastern coastal and subcoastal areas of Australia, from Nowra 34°53'S in southern NSW to Cairns 16°55'S in northern Qld (Munir 1996, Neal 1999). <i>Lantana montevidensis</i> is common in south-east Qld, mainly from Rockhampton to the NSW/Qld border, particularly in the Moreton, Wide Bay, Burnett and Port Curtis pastoral districts (Everist 1981, O'Donnell et al. 1999, O'Donnell 2002). Naturalisation has also occurred in the coastal districts of South Kennedy, North Kennedy (around Townsville) and Cook (around Cairns), and the inland district of Leichhardt (Munir 1996)."

303	Agricultural/forestry/horticultural weed	y
	Source(s)	Notes
	O'Donnell, C. (2002). The creeping lantana handbook. A guide to ecology, control and management. Queensland Department of Primary Industries, Natural Resources and Mines, Brisbane	"Creeping lantana ( <i>Lantana montevidensis</i> ) has invaded native and improved pasture in open forest and scrub country in National parks and grazing land. This has resulted in a change in the ecosystem and a reduction in biodiversity, with negative impacts on native animals and trees. The abundance of native and improved pasture has also been reduced, with a consequent reduction in the carrying capacity. This has reduced land values and production potential."
	Parsons, W.T. & Cuthbertson, E.G. 2001. Noxious Weeds of Australia. Second Edition. CSIRO Publishing, Collingwood, Australia	"The presence of creeping lantana thickets reduces the available grazing area and, hence, pasture productivity."
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	"Weed of: Pastures"

304	Environmental weed	y
	Source(s)	Notes

Qsn #	Question	Answer
	Johnson, S. B., & Lisle, S. D. (2006). The problem with <i>Lantana montevidensis</i> (creeping lantana). In 15th Australian Weeds Conference, Adelaide, South Australia, 24-28 September 2006: Managing weeds in a changing climate (pp. 727-730). Weed Management Society of South Australia, Torrens Park, South Australia	"Although <i>L. montevidensis</i> has spread extensively in eastern Australia, further spread is likely. Flowering and fruit set may occur all year, with fruit dispersal by a range of birds and animals, and vegetative spread also possible. <i>Lantana montevidensis</i> forms dense low growing thickets, invading pastures and many natural ecosystems. Management is difficult and integrated control is needed including preventative, chemical and mechanical measures. Fire, hand removal and vegetation management are also useful tools. The declaration of <i>L. camara</i> as a WoNS species has resulted in its removal from trade and distribution. However, the legislative response to <i>L. montevidensis</i> has been limited. This is despite the apparent potential for the species to spread further and to cross with other varieties and hybrids to form new <i>Lantana</i> species aggregates that may hamper future control measures. The NSW government has declared all <i>Lantana</i> species under the Noxious Weeds Act 1993 to help prevent species contributing further genetic material to the existing pool."
	O'Donnell, C. (2002). The creeping lantana handbook. A guide to ecology, control and management. Queensland Department of Primary Industries, Natural Resources and Mines, Brisbane	"Creeping lantana ( <i>Lantana montevidensis</i> ) has invaded native and improved pasture in open forest and scrub country in National parks and grazing land. This has resulted in a change in the ecosystem and a reduction in biodiversity, with negative impacts on native animals and trees. The abundance of native and improved pasture has also been reduced, with a consequent reduction in the carrying capacity. This has reduced land values and production potential."
	Staples, G.W. & Herbst, D.R. 2005. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI	"Trailing lantana has not proved invasive in Hawai'i, probably because fruit is rarely formed here."

305	Congeneric weed	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.	" <i>Lantana camara</i> ... in Hawai'i an extremely serious weed of mesic forest, diverse mesic forest, dry shrubland, and other low elevation, dry, disturbed habitats, 2-1,070 m, on Midway Atoll and all of the main islands. Bird-dispersed, often forming dense, impenetrable thickets, well naturalized prior to 1871 and apparently introduced in 1858 (Hillebrand, 1888)."
	Smith, C.W. 1985. Impact of Alien Plants on Hawaii's Native Biota. Pp. 180-250 in Stone & Scott (eds.). Hawaii's terrestrial ecosystems: preservation & management. CPSU, Honolulu, HI	" <i>Lantana camara</i> ... This thorny shrub is a noxious weed. It can form impenetrable thickets which crowd out other plants. The fruit are dispersed by alien frugivorous birds. It generating from basal shoots. Allelopathic substances are produced by shoots and roots (Achhereddy and Singh, in press). The plant has been subjected to biological control which has been quite effective in some areas (Gardner and Davis 1982). Further control agents are being sought."
	Weber, E. 2017. Invasive Plant Species of the World, 2nd Edition: A Reference Guide to Environmental Weeds. CABI Publishing, Wallingford, UK	" <i>Lantana camara</i> belongs to the worst invaders of subtropical and tropical areas, forming dense thickets. Native plant species richness is strongly reduced and the shrub forms an understorey in open forests (Gooden et al., 2009; Prasad, 2012; Sundaram and Hiremath, 2012)."

401	Produces spines, thorns or burrs	n
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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.	[Without prickles] "Malodorous, low subshrubs; stems lax and sprawling or decumbent, rooting at nodes that touch the ground, up to 4 m long, mat-forming and usually manybranched, without prickles. Leaves ovate to lanceolate or oblong-rhombic, 1.2-3.5 cm long, 0.8-1.6 cm wide, upper surface reticulate- rugose and scabrous or hirsute, lower surface strigose on veins or densely tomentulose and densely resinous-glandular, margins crenate-serrate, petioles 0.3-0.6 cm long."

402	Allelopathic	
	<b>Source(s)</b>	<b>Notes</b>
	Mishra, A. (2014). Allelopathic properties of <i>Lantana camara</i> : A review article. International Journal of Innovative Research and Review, 2(4), 32-52	Unknown. Allelopathy documented in genus

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.	"Malodorous, low subshrubs; stems lax and sprawling or decumbent, rooting at nodes that touch the ground, up to 4 m long, mat-forming and usually many-branched, without prickles." [Verbenaceae]

404	Unpalatable to grazing animals	y
	<b>Source(s)</b>	<b>Notes</b>
	Wade, G.L. & Mengak, M.T. 2010. Deer-Tolerant Ornamental Plants. Circular 985. University of Georgia Cooperative Extension, Athens, Georgia	"Vines and Groundcovers Deer Rarely Browse ... <i>Lantana montevidensis</i> "
	Fuller, T.C. & McClintock, E.M. 1986. Poisonous plants of California: Issue 53 of California natural history guides. University of California Press, Berkeley and Los Angeles, CA	[Possibly palatable to sheep "Other species, such as <i>Lantana montevidensis</i> , Creeping Lantana, with small purple flowers in heads, have been suspected of causing poisonings. In one Australian experiment, however, <i>Lantana montevidensis</i> proved nontoxic to sheep."

405	Toxic to animals	
	<b>Source(s)</b>	<b>Notes</b>
	Harrison, M. 2009. Flowering Shrubs and Small Trees for the South. Pineapple Press Inc, Sarasota, FL	"All species of <i>lantana</i> are poisonous and should be kept out of pastures. Livestock, pets, and children have been poisoned by ingesting berries or foliage of this toxic plant."
	Staples, G.W. & Herbst, D.R. 2005. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI	"No cases of poisoning due to ingestion have been reported, but it should be regarded with suspicion."
	Fuller, T.C. & McClintock, E.M. 1986. Poisonous plants of California: Issue 53 of California natural history guides. University of California Press, Berkeley and Los Angeles, CA	"Other species, such as <i>Lantana montevidensis</i> , Creeping Lantana, with small purple flowers in heads, have been suspected of causing poisonings. In one Australian experiment, however, <i>Lantana montevidensis</i> proved nontoxic to sheep."

Qsn #	Question	Answer
	O'Donnell, C. (2002). The creeping lantana handbook. A guide to ecology, control and management. Queensland Department of Primary Industries, Natural Resources and Mines, Brisbane	"Reports as to possible toxicity effects after ingestion by cattle are conflicting. Everist (1974) reported that the plant was suspected of producing effects similar to toxic forms of bush or common lantana whilst Dowling and McKenzie (1993) reported that the plant was not toxic. An explanation could be that if cattle have grazed pastures infested with creeping lantana since birth they develop resistance or immunity but introduced cattle may have an adverse reaction when grazing infested pasture."
	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
	Parsons, W.T. & Cuthbertson, E.G. 2001. Noxious Weeds of Australia. Second Edition. CSIRO Publishing, Collingwood, Australia	toxic to cattle

406	Host for recognized pests and pathogens	y
	Source(s)	Notes
	Nishikawa, J., Nakashima, C., & Kobayashi, T. (2001). Brown leaf spot on <i>Lantana</i> spp. caused by <i>Pseudocercospora guianensis</i> . <i>Journal of General Plant Pathology</i> , 67(4), 281-284	"Brown leaf spot of <i>Lantana camara</i> L. and <i>L. montevidensis</i> Briq. caused by <i>Pseudocercospora guianensis</i> (Stevens et Solheim) Deighton was found in Shizuoka, Chiba, Kagoshima and Okinawa Prefectures. Pathogenicity of isolates from the leaf spots was examined, and a taxonomic study as well as identification of the causal fungus was carried out. Similar leaf spots appeared on 7 to 25 days after inoculation with the isolates on <i>Lantana</i> spp., and the same fungus was re-isolated from the inoculated leaves. Two hitherto known <i>Pseudocercospora</i> species on <i>Lantana</i> , <i>P. guianensis</i> and <i>P. formosana</i> , were considered to be variations within one species, and we identified the causal fungus as <i>P. guianensis</i> due to priority."
	Habeck, D. H., Mead, F. W. & Fasulo, T. R. 2014. <i>Lantana</i> Lace Bug, <i>Teleonemia scrupulosa</i> Stål (Insecta: Hemiptera: Tingidae). EENY-246. Revised. Institute of Food and Agricultural Sciences, University of Florida, Gainesville, FL	"In East Africa after defoliating lantana, lantana lace bugs moved to sesame ( <i>Sesamum indicum</i> L.) causing economic losses to the crop (Greathead 1968). On <i>Lantana</i> , the lace bug feeds on the undersurface of the leaves and attacks newly opened buds and flowers. On purple sage, it feeds on the upper and lower surfaces of the leaves. When on the upper surface, the black excrement spots deposited by the lace bug are readily visible (Johnson and Lyon 1991)."

407	Causes allergies or is otherwise toxic to humans	y
	Source(s)	Notes
	Harrison, M. 2009. Flowering Shrubs and Small Trees for the South. Pineapple Press Inc, Sarasota, FL	"All species of lantana are poisonous and should be kept out of pastures. Livestock, pets, and children have been poisoned by ingesting berries or foliage of this toxic plant."
	Staples, G.W. & Herbst, D.R. 2005. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI	"No cases of poisoning due to ingestion have been reported, but it should be regarded with suspicion."



Qsn #	Question	Answer
	Floridata. 2018. <i>Lantana montevidensis</i> . <a href="https://floridata.com/Plants/Verbenaceae/Lantana%20montevidensis/60">https://floridata.com/Plants/Verbenaceae/Lantana %20montevidensis/60</a> . [Accessed 14 Mar 2018]	"The unripe berries of <i>Lantana</i> species are toxic. Livestock and pets have become ill after eating the foliage."
	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

408	Creates a fire hazard in natural ecosystems	
	Source(s)	Notes
	Haddad, C. R., & Valio, I. F. M. (1993). Effect of fire on flowering of <i>Lantana montevidensis</i> Briq. <i>Journal of Plant Physiology</i> , 141(6), 704-707	[Flammability unknown] " <i>Lantana montevidensis</i> Briq. is an endemic species of the Brazilian «cerrado» (savannah) that usually flowers abundantly after burning of the vegetation. Several possible effects of fire on the induction of flowering in this species were tested with no significant result. It seems that the removal of the aerial part of the plant caused by the fire is the necessary stimulus for flowering induction. Pruning the plants caused similar results."
	Monterey County Resource Management Agency. 2002. Fire Resistant Landscaping. <a href="http://www.co.monterey.ca.us">http://www.co.monterey.ca.us</a> . [Accessed 14 Mar 2018]	<i>Lantana montevidensis</i> included in a list of fire resistant plants for landscaping

409	Is a shade tolerant plant at some stage of its life cycle	n
	Source(s)	Notes
	O'Donnell, C. (2002). <i>The creeping lantana handbook. A guide to ecology, control and management</i> . Queensland Department of Primary Industries, Natural Resources and Mines, Brisbane	"Creeping lantana's abundance is also favoured by its ability to persist during periods of extended drought and an ability to grow and reproduce under conditions of both shade and full sunlight."
	Parsons, W.T. & Cuthbertson, E.G. 2001. <i>Noxious Weeds of Australia. Second Edition</i> . CSIRO Publishing, Collingwood, Australia	"It is an extremely efficient pioneer species." [High light environments]
	Missouri Botanical Garden. 2018. <i>Lantana montevidensis</i> . <a href="http://www.missouribotanicalgarden.org">http://www.missouribotanicalgarden.org</a> . [Accessed 14 Mar 2018]	"Sun: Full sun"

Qsn #	Question	Answer
410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y
	<b>Source(s)</b>	<b>Notes</b>
	Rauch, F.D. & Weissich, P.R. 2000. Plants for Tropical Landscapes: A Gardener's Guide. University of Hawaii Press, Honolulu, HI	"Growing best in full sun in almost any soil, it is drought and heat tolerant and moderately salt tolerant."
	Learn 2 Grow. 2018. <i>Lantana montevidensis</i> . <a href="http://www.learn2grow.com/plants/lantana-montevidensis/">http://www.learn2grow.com/plants/lantana-montevidensis/</a> . [Accessed 13 Mar 2018]	"Soil pH - Acidic, Neutral, Alkaline Soil Drainage - Well Drained Soil type - Clay, Loam, Sand"
	Parsons, W.T. & Cuthbertson, E.G. 2001. Noxious Weeds of Australia. Second Edition. CSIRO Publishing, Collingwood, Australia	"Subhumid to semi-arid regions of the tropics and subtropics, especially on stony soils readily replacing pasture species affected by prolonged droughts."

411	Climbing or smothering growth habit	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.	"Malodorous, low subshrubs; stems lax and sprawling or decumbent"

412	Forms dense thickets	y
	<b>Source(s)</b>	<b>Notes</b>
	Johnson, S. B., & Lisle, S. D. (2006). The problem with <i>Lantana montevidensis</i> (creeping lantana). In 15th Australian Weeds Conference, Adelaide, South Australia, 24-28 September 2006: Managing weeds in a changing climate (pp. 727-730). Weed Management Society of South Australia, Torrens Park, South Australia	" <i>Lantana montevidensis</i> forms dense low growing thickets, invading pastures and many natural ecosystems." ... " <i>Lantana montevidensis</i> is a creeping perennial species that roots at the stem nodes and produces low growing but dense thickets." ... "The size and density of existing colonies increases as stems root at the nodes and as seedlings develop within and near existing thickets."
	Parsons, W.T. & Cuthbertson, E.G. 2001. Noxious Weeds of Australia. Second Edition. CSIRO Publishing, Collingwood, Australia	The presence of creeping lantana thickets reduces the available grating area and, hence. pasture productivity."

501	Aquatic	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.	[Terrestrial] "Malodorous, low subshrubs" ... "in Hawai'i commonly cultivated and apparently naturalized (Nagata, 1988) at least around Lana'i City and nearby pineapple fields."

502	Grass	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.	Family: Verbenaceae

503	Nitrogen fixing woody plant	n
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Qsn #	Question	Answer
	<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 13 Mar 2018]	Family: Verbenaceae

<b>504</b>	<b>Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)</b>	<b>n</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.	"Malodorous, low subshrubs; stems lax and sprawling or decumbent, rooting at nodes that touch the ground, up to 4 m long, mat-forming and usually many-branched, without prickles."

<b>601</b>	<b>Evidence of substantial reproductive failure in native habitat</b>	<b>n</b>
	<b>Source(s)</b>	<b>Notes</b>
	Haddad, C. R., & Valio, I. F. M. (1993). Effect of fire on flowering of <i>Lantana montevidensis</i> Briq. <i>Journal of Plant Physiology</i> , 141(6), 704-707	" <i>Lantana montevidensis</i> is an endemic species of the Brazilian cerrado (savannah) that usually flowers abundantly after burning of the vegetation."

<b>602</b>	<b>Produces viable seed</b>	<b>y</b>
	<b>Source(s)</b>	<b>Notes</b>
	Johnson, S. B., & Lisle, S. D. (2006). The problem with <i>Lantana montevidensis</i> (creeping lantana). In 15th Australian Weeds Conference, Adelaide, South Australia, 24-28 September 2006: Managing weeds in a changing climate (pp. 727-730). Weed Management Society of South Australia, Torrens Park, South Australia	"Plants of <i>L. montevidensis</i> are able to set fruit throughout the year, generally from early summer through to mid-winter in Qld (O'Donnell 2002). Seed production in <i>L. montevidensis</i> generally occurs five weeks after flowering (O'Donnell 2002). Various authors including Henderson (1969) stated that weedy varieties of <i>L. montevidensis</i> produce a large amount of fertile seed. For example, O'Donnell (2002) found yearly seed production varied between 4965–5175 seeds m <sup>-2</sup> and while each drupe had two seeds, generally only 30% of drupes produced two seedlings."
	Parsons, W.T. & Cuthbertson, E.G. 2001. <i>Noxious Weeds of Australia</i> . Second Edition. CSIRO Publishing, Collingwood, Australia	"Seeds may germinate at any time of the year provided moisture is available but most seem to germinate after the first summer storms."
	Staples, G.W. & Herbst, D.R. 2005. <i>A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places</i> . Bishop Museum Press, Honolulu, HI	"stems self-layer where they touch the ground, and cuttings are easily rooted; seed is rarely produced in Hawaii."

<b>603</b>	<b>Hybridizes naturally</b>	
	<b>Source(s)</b>	<b>Notes</b>

Qsn #	Question	Answer
	Johnson, S. B., & Lisle, S. D. (2006). The problem with <i>Lantana montevidensis</i> (creeping lantana). In 15th Australian Weeds Conference, Adelaide, South Australia, 24-28 September 2006: Managing weeds in a changing climate (pp. 727-730). Weed Management Society of South Australia, Torrens Park, South Australia	[Unknown if natural hybrids occur] " <i>Lantana camara</i> × <i>L. montevidensis</i> hybrids have been developed for use in horticulture (Howard 1969). In particular, <i>L. montevidensis</i> is commonly used to achieve new horticultural varieties with low, mounding and trailing growth habits. A number of authors have noted the hybridisation of both previously geographically separated species and varieties when grown in the same location (e.g. Day et al. 2003)." ... "Neal (1999) found up to 1% seed production in such varieties and that pollen from weedy varieties of <i>L. montevidensis</i> , also often planted for ornamental purposes, resulted in up to 6% seed production in adjacent plantings of <i>L. camara</i> hybrids." ... "The continued sale of <i>L. montevidensis</i> varieties and hybrids therefore poses a quantified risk of gene flow in the environment. It is important to restrict this to prevent future hybrid varieties spreading to new environments and to make control using herbicides and biological agents less difficult (van Oosterhout 2004)."

604	Self-compatible or apomictic	
	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.	[Unknown] "Flowers in capitata, hemispherical heads arising in the leaf axils, inflorescences becoming oblong in fruit, much longer than subtending leaves, peduncles filiform, 2-6 cm long, outer bracts broadly ovate to oblong-ovate, 5-8 mm long, inner ones conspicuously smaller; calyx ca. 2 mm long; corolla magenta or lilac to rose or purple, the tube 8-10 mm long, the lobes 3.5-8 mm long."

605	Requires specialist pollinators	n
	Source(s)	Notes
	Missouri Botanical Garden. 2018. <i>Lantana montevidensis</i> . <a href="http://www.missouribotanicalgarden.org">http://www.missouribotanicalgarden.org</a> . [Accessed 14 Mar 2018]	"Attracts: Butterflies."
	Staples, G.W. & Herbst, D.R. 2005. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI	"Trailing lantana has not proved invasive in Hawai'i, probably because fruit is rarely formed here."
	James, R., & Pitts-Singer, T. L. 2008. Bee Pollination in Agricultural Ecosystems. Oxford University Press, New York, NY	[Related species pollinated by honey bees] "The honey bee, <i>Apis mellifera</i> , has been implicated in assisting the invasion of non-native plant species in areas in which honey bees are also non-native. Honey bees' high abundances and broad diets combined with their broad geographic distribution in areas outside their native range likely contribute to the frequency of their interactions with exotic plant species. For example, the Australian invasive plant <i>Lantana camara</i> relies on honey bees for pollination because its corolla tube is too long for the primarily short-tongued native species (Gouson & Detwent, 2004)."

606	Reproduction by vegetative fragmentation	y
	Source(s)	Notes

Qsn #	Question	Answer
	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.	"Malodorous, low subshrubs; stems lax and sprawling or decumbent, rooting at nodes that touch the ground,"
	Parsons, W.T. & Cuthbertson, E.G. 2001. Noxious Weeds of Australia. Second Edition. CSIRO Publishing, Collingwood, Australia	"The size and density of existing colonies increase as stems take root at the nodes and when seedlings develop within and on the margins of thickets"

607	Minimum generative time (years)	1
	Source(s)	Notes
	Johnson, S. B., & Lisle, S. D. (2006). The problem with <i>Lantana montevidensis</i> (creeping lantana). In 15th Australian Weeds Conference, Adelaide, South Australia, 24-28 September 2006: Managing weeds in a changing climate (pp. 727-730). Weed Management Society of South Australia, Torrens Park, South Australia	"Although glasshouse plants of <i>L. montevidensis</i> have been shown to produce seeds within a year (Neal 1999, O'Donnell 2002), seedling development is much slower in the field with growth rates of 1 cm per month (Parsons and Cuthbertson 2001, O'Donnell 2002). Seedlings become winter dormant, reshoot and flower in spring of the following year."

701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	y
	Source(s)	Notes
	Johnson, S. B., & Lisle, S. D. (2006). The problem with <i>Lantana montevidensis</i> (creeping lantana). In 15th Australian Weeds Conference, Adelaide, South Australia, 24-28 September 2006: Managing weeds in a changing climate (pp. 727-730). Weed Management Society of South Australia, Torrens Park, South Australia	"Both O'Donnell and Panetta (2000) and Parsons and Cuthbertson (2001) noted that seeds are widely spread by fruit-eating animals and birds, by water flowing across the soil, especially after heavy rain and in mud attached to hooves, boots and machinery." ... "New plants arise from garden waste containing material of <i>L. montevidensis</i> stem cuttings and leaves when this is not disposed of properly (Neal 1999)."

702	Propagules dispersed intentionally by people	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.	"now cultivated nearly worldwide and naturalized in many tropical and subtropical areas;"
	Johnson, S. B., & Lisle, S. D. (2006). The problem with <i>Lantana montevidensis</i> (creeping lantana). In 15th Australian Weeds Conference, Adelaide, South Australia, 24-28 September 2006: Managing weeds in a changing climate (pp. 727-730). Weed Management Society of South Australia, Torrens Park, South Australia	"The trade of nursery plants has, and continues to be responsible for the dispersal of this species."

703	Propagules likely to disperse as a produce contaminant	n
	Source(s)	Notes
	Staples, G.W. & Herbst, D.R. 2005. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI	"stems self-layer where they touch the ground, and cuttings are easily rooted; seed is rarely produced in Hawaii." [No evidence. Unlikely given limited seed production]

704	Propagules adapted to wind dispersal	n
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Qsn #	Question	Answer
	<b>Source(s)</b>	<b>Notes</b>
	Parsons, W.T. & Cuthbertson, E.G. 2001. Noxious Weeds of Australia. Second Edition. CSIRO Publishing, Collingwood, Australia	"FRUIT Green at first, ripening to a single-seeded reddish brown berry, 8 mm diameter. SEED Pole straw-coloured, stony, about 4 mm long. ROOT Brown woody taproot with strong laterals and fine white rootlets." ... "Creeping lantana seeds are spread widely by fruit-eating animals and birds, water flowing across the soil surface during heavy rain, and in mud sticking to hooves and footwear."

705	Propagules water dispersed	y
	<b>Source(s)</b>	<b>Notes</b>
	Parsons, W.T. & Cuthbertson, E.G. 2001. Noxious Weeds of Australia. Second Edition. CSIRO Publishing, Collingwood, Australia	"FRUIT Green at first, ripening to a single-seeded reddish brown berry, 8 mm diameter. SEED Pole straw-coloured, stony, about 4 mm long. ROOT Brown woody taproot with strong laterals and fine white rootlets." ... "Creeping lantana seeds are spread widely by fruit-eating animals and birds, water flowing across the soil surface during heavy rain, and in mud sticking to hooves and footwear."

706	Propagules bird dispersed	y
	<b>Source(s)</b>	<b>Notes</b>
	Parsons, W.T. & Cuthbertson, E.G. 2001. Noxious Weeds of Australia. Second Edition. CSIRO Publishing, Collingwood, Australia	"FRUIT Green at first, ripening to a single-seeded reddish brown berry, 8 mm diameter. SEED Pole straw-coloured, stony, about 4 mm long. ROOT Brown woody taproot with strong laterals and fine white rootlets." ... "Creeping lantana seeds are spread widely by fruit-eating animals and birds, water flowing across the soil surface during heavy rain, and in mud sticking to hooves and footwear."

707	Propagules dispersed by other animals (externally)	y
	<b>Source(s)</b>	<b>Notes</b>
	O'Donnell, C. (2002). The creeping lantana handbook. A guide to ecology, control and management. Queensland Department of Primary Industries, Natural Resources and Mines, Brisbane	"Ants transport creeping lantana seed and bury it when building their nests. If this buried seed becomes exposed within about two years, it could still be viable and germinable."
	Parsons, W.T. & Cuthbertson, E.G. 2001. Noxious Weeds of Australia. Second Edition. CSIRO Publishing, Collingwood, Australia	"FRUIT Green at first, ripening to a single-seeded reddish brown berry, 8 mm diameter. SEED Pole straw-coloured, stony, about 4 mm long. ROOT Brown woody taproot with strong laterals and fine white rootlets." ... "Creeping lantana seeds are spread widely by fruit-eating animals and birds, water flowing across the soil surface during heavy rain, and in mud sticking to hooves and footwear."

708	Propagules survive passage through the gut	y
	<b>Source(s)</b>	<b>Notes</b>
	Parsons, W.T. & Cuthbertson, E.G. 2001. Noxious Weeds of Australia. Second Edition. CSIRO Publishing, Collingwood, Australia	"FRUIT Green at first, ripening to a single-seeded reddish brown berry, 8 mm diameter. SEED Pole straw-coloured, stony, about 4 mm long. ROOT Brown woody taproot with strong laterals and fine white rootlets." ... "Creeping lantana seeds are spread widely by fruit-eating animals and birds, water flowing across the soil surface during heavy rain, and in mud sticking to hooves and footwear."

Qsn #	Question	Answer
	O'Donnell, C. (2002). The creeping lantana handbook. A guide to ecology, control and management. Queensland Department of Primary Industries, Natural Resources and Mines, Brisbane	"Seed will pass through cattle without loss of viability, so quarantining animals that have been grazing creeping lantana infested pastures (when creeping lantana is bearing ripe fruits) in holding yards or in a holding paddock for 5 or 6 days will help prevent seed being dispersed into clean pastures."

801	Prolific seed production (>1000/m2)	n
	Source(s)	Notes
	Whistler, W.A. 2000. Tropical Ornamentals: A Guide. Timber Press, Portland, OR	"Fruit a fleshy, dark purple, subglobose drupe 3.5-5 mm in diameter, infrequently formed in cultivation."
	Staples, G.W. & Herbst, D.R. 2005. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI	"stems self-layer where they touch the ground, and cuttings are easily rooted; seed is rarely produced in Hawaii."

802	Evidence that a persistent propagule bank is formed (>1 yr)	
	Source(s)	Notes
	O'Donnell, C. (2002). The creeping lantana handbook. A guide to ecology, control and management. Queensland Department of Primary Industries, Natural Resources and Mines, Brisbane	"A 'longevity' experiment found that all surface-sown seed was dead after two years. However, about 20 per cent of the buried seed was still viable although viability was declining. Creeping lantana seed is therefore relatively short-lived. Depending on seasonal conditions, plants are capable of flowering and setting fruit more than once a year. Plants have been observed to remain in fruit from early summer through to mid-winter."

Qsn #	Question	Answer
803	Well controlled by herbicides	y
	Source(s)	Notes
	O'Donnell, C. (2002). The creeping lantana handbook. A guide to ecology, control and management. Queensland Department of Primary Industries, Natural Resources and Mines, Brisbane	"Herbicides — Summary <ul style="list-style-type: none"> <li>• Starane® gave best overall control.</li> <li>• Timing of glyphosate appears critical (apply at the end, not beginning, of growing season).</li> <li>• Lantana DP-600® appeared to work well for up to two years. Significant regrowth occurred after this time in plants that had previously appeared to be dead.</li> <li>• No chemical gave 100 per cent control. Regrowth (of adult plants) occurred for all chemicals with time."</li> </ul>
	Johnson, S. B., & Lisle, S. D. (2006). The problem with <i>Lantana montevidensis</i> (creeping lantana). In 15th Australian Weeds Conference, Adelaide, South Australia, 24-28 September 2006: Managing weeds in a changing climate (pp. 727-730). Weed Management Society of South Australia, Torrens Park, South Australia	"Herbicides Fluroxypyr gave the best overall control of <i>L. montevidensis</i> while glyphosate gave good results in autumn, but not spring. Wetting agents did not improve the efficacy of either herbicide. Dichlorprop, 2,4-D and picloram/2,4-D mixtures were less effective. No herbicide achieves 100% control, with regrowth from apparently dead plants after periods of two years and more. Repeated herbicide applications on actively growing plants in late summer and autumn should be used where cultivation is not practical."
	Parsons, W.T. & Cuthbertson, E.G. 2001. Noxious Weeds of Australia. Second Edition. CSIRO Publishing, Collingwood, Australia	"Spray with dichlorprop, repeating the spraying as required to cope with seedling growth to actively growing plants in late summer or autumn. Fosamine, glufosinate, imazapyr, and triclopyr have also given useful control in experiments."

804	Tolerates, or benefits from, mutilation, cultivation, or fire	y
	Source(s)	Notes
	Johnson, S. B., & Lisle, S. D. (2006). The problem with <i>Lantana montevidensis</i> (creeping lantana). In 15th Australian Weeds Conference, Adelaide, South Australia, 24-28 September 2006: Managing weeds in a changing climate (pp. 727-730). Weed Management Society of South Australia, Torrens Park, South Australia	"Adult plants are not killed by fire because regrowth occurs soon after, and while seed set may be delayed, observations suggest higher flower and seed numbers on previously burnt plants. Regrowth from a burning event did not improve the performance of herbicides over unburnt areas."
	O'Donnell, C. (2002). The creeping lantana handbook. A guide to ecology, control and management. Queensland Department of Primary Industries, Natural Resources and Mines, Brisbane	"Controlling adult plants is difficult. They are very resilient with respect to fire, drought, mechanical disturbance and some herbicides. However, pruning of woody stems at ground level proved effective in controlling mature plants. Although they regrew after the first two prunings, plants died after the third."

805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	
	Source(s)	Notes



Qsn #	Question	Answer
	<p>Harley, K. L. S., &amp; Kassulke, R. C. (1973). The suitability of <i>Teleonemia harleyi</i> for biological control of <i>Lantana camara</i> in Australia. <i>Entomophaga</i>, 18(4), 343-347</p>	<p>"AB: Further studies on <i>Teleonemia harleyi</i> Froeschner [cf. RAE/A61, 4427], which was described from <i>Lantana camara</i> in Trinidad [61, 425], showed that the Tingid can be reared with facility on flowering plants of this weed, though not on plants not bearing flowers. The eggs are inserted singly into the flower stalks, petioles or leaves. Both the nymphs and the adults feed on the flowers, or, if these are not available, on the leaf-buds. However, reproduction is minimal unless flowers are available. In the insectary (where the temperature ranged between 15.5 and 36.6 deg C), the preoviposition period lasted 7-9 days, the egg stage 9-10 days and the nymphal stage 16 days; 50% of the adults lived for about 58 days and some adults lived for more than 110 days. All the taxa of <i>Lantana</i> naturalised in Australia were attacked equally effectively; all flowers were destroyed and no seed was set. In tests to determine food-plant specificity, <i>T. harleyi</i> neither fed nor oviposited on any of the plants offered except <i>L. camara</i> and <i>L. montevidensis</i>. Feeding on <i>L. montevidensis</i> was much lighter than on <i>L. camara</i> and no eggs were laid on this species. <i>T. harleyi</i> was approved in September 1972 for release in Australia for the control of <i>L. camara</i>."</p>
	<p>Harley, K. L. S., &amp; Kassulke, R. C. (1974). The suitability of <i>Phytobia lantanae</i> Frick for biological control of <i>Lantana camara</i> in Australia. <i>Austral Entomology</i>, 13(3), 229-233</p>	<p>"AB: In further investigations on the importation of insects for the biological control of <i>Lantana camara</i> in Australia [cf. RAE/A 61, 4427, etc.], the leaf-mining Agromyzid <i>Phytobia lantanae</i> Frick was brought from Trinidad in 1973 and reared in large numbers in the laboratory by a method that is described. When plants of 57 species were tested for suitability for feeding and breeding by the Agromyzid, breeding took place only on <i>L. camara</i> and <i>L. montevidensis</i>. In experimental liberations near Brisbane, Queensland, large mines were evident after 10 days. The prospects for control are considered to be good."</p>
	<p>Day, M. D., Wilson, B. W., &amp; Nahrung, H. F. (1999). The life history and host range of <i>Charidotis pygmaea</i> (Col.: Chrysomelidae), a biological control agent for <i>Lantana montevidensis</i> (Verbenaceae). <i>Biocontrol Science and Technology</i>, 9(3), 347-354</p>	<p>"AB: The life cycle and host range of <i>Charidotis pygmaea</i> were investigated to assess its suitability for release as a biological control agent for <i>Lantana camara</i> and <i>L. montevidensis</i>. Adults fed and deposited eggs on the underside of leaves of both species. They generally laid fewer eggs in the dry winter months when <i>Lantana</i> yellows or drops its leaves. Larvae fed on the upper leaf surface and pupation occurred on the leaves or stems. Development from egg to adult took approximately 50 days. Survival to the adult stage was greater, and the development time was shorter on <i>L. montevidensis</i> than on all varieties of <i>L. camara</i> tested, suggesting that the agent would be ineffective against <i>L. camara</i>. Forty-two plant species were tested to determine host specificity in choice oviposition and larval feeding trials. These demonstrated that <i>C. pygmaea</i> did not pose a threat to non-target species. Consequently, <i>C. pygmaea</i> was approved for release in Australia and through its ability to survive the dry season, should assist in the control of <i>L. montevidensis</i>."</p>

Qsn #	Question	Answer
	<p>Day, M. D., Willson, B. W., &amp; Latimer, K. J. (1998). The life history and host range of <i>Ectaga garcia</i>, a biological control agent for <i>Lantana camara</i> and <i>L. montevidensis</i> in Australia. <i>BioControl</i>, 43(3), 325-338</p>	<p>"AB: The life cycle and host specificity of <i>Ectaga garcia</i> were investigated in the laboratory. Adults emerged in the morning and were inactive during the day. Eggs were laid and larvae fed on the undersurface of leaves of <i>Lantana camara</i> and <i>L. montevidensis</i>. Larvae spun protective cocoons from which they fed and in which they pupated. Development from egg to adult took approximately 48 days. Forty-five plant species were tested to determine host specificity. Females laid eggs only on <i>L. camara</i> and <i>L. montevidensis</i>. In no-choice trials, neonate larvae fed but failed to complete development on nine test species. <i>E. garcia</i> was subsequently approved for release in Australia."</p>
	<p>Trujillo, E. E., &amp; Norman, D. J. (1995). <i>Septoria</i> leaf spot of lantana from Ecuador: a potential biological control for bush lantana in forests of Hawaii. <i>Plant Disease</i>, 79(8), 819-821</p>	<p>[<i>L. montevidensis</i> was tested to be immune from a biocontrol agent before the agent was suggested to be released] "AB: Pathogenicity tests with a <i>Septoria</i> sp. isolated from <i>Lantana camara</i> from Ecuador showed aggressiveness to 4 <i>L. camara</i> selections from forests in Hawaii, USA. The initial symptoms of the disease on inoculated leaves were chlorotic spots that appear within 2 weeks, becoming distinctly angular necrotic lesions in 4 weeks, inducing leaf chlorosis and defoliation 6 weeks after inoculation. Inoculum applied at 1 x 10<sup>6</sup> conidia/ml in 2% sucrose-0.5% gelatin solution produced an av. of 87 lesions/leaf. Ornamental hybrids of <i>L. camara</i> x <i>L. montevidensis</i> were also susceptible, but these plants had significantly fewer lesions. All selections of <i>L. montevidensis</i> tested were immune. This <i>Septoria</i> sp. from Ecuador is the first pathogen found to be virulent on bush lantana, the most serious ecological threat to Kauai's forest, and its release is presumed to be an effective biocontrol agent for this weed."</p>
	<p>WRA Specialist. 2018. Personal Communication</p>	<p>Many biological control agents have been released to control <i>L. camara</i>, some of them might also attack <i>L. montevidensis</i> as shown several references; however agents that attack <i>L. montevidensis</i> might be avoided in Hawaii as shown in Trujillo &amp; Norman (1995)</p>

**Summary of Risk Traits:**

High Risk / Undesirable Traits

- Broad climate suitability (broad native & introduced distribution across several climate zones)
- Thrives in tropical climates
- Naturalized on Kauai & Lanai (Hawaiian Islands), & across Australia
- Regarded as an agricultural weed (of pastures) & environmental weed in Australia (but currently not the Hawaiian Islands)
- *Lantana camara* is highly invasive
- Possibly toxic to animals & people
- Host of pathogens
- Tolerates many soil types
- Forms dense, low-growing thickets
- Reproduces by seeds (rarely if ever in the Hawaiian Islands)
- May hybridize with *Lantana camara*
- Spreads vegetatively by rooting stems
- Able to reach maturity in 1 growing season
- Cuttings & garden waste can contribute to accidental spread
- Seeds, if produced, dispersed by birds, other fruit eating animals, water & intentionally by people
- Seeds able to be stored for extended periods; May form a persistent seed bank
- Resprouts after cutting & fire

Low Risk Traits

- Unarmed (no spines, thorns, or burrs)
- Ornamental
- Thrives in full sun (may not spread rapidly into densely shaded areas)
- Limited or absent seed production in the Hawaiian Islands greatly minimizes ability to spread long distances from cultivated sites
- Herbicides provide effective control
- Biocontrol agents released to control *Lantana camara* may also reduce vigor of cultivated plants