

Australia/New Zealand Weed Risk Assessment adapted for Florida.

Data used for analysis published in: Gordon, D.R., D.A. Onderdonk, A.M. Fox, R.K. Stocker, and C. Gantz. 2008. Predicting Invasive Plants in Florida using the Australian Weed Risk Assessment. Invasive Plant Science and Management 1: 178-195.

<i>Ruellia tweediana (Mexican petunia)</i>			
Question number	Question	Answer	Score
1.01	Is the species highly domesticated?	n	0
1.02	Has the species become naturalised where grown?		
1.03	Does the species have weedy races?		
2.01	Species suited to Florida's USDA climate zones (0-low; 1-intermediate; 2-high)	2	
2.02	Quality of climate match data (0-low; 1-intermediate; 2-high)	2	
2.03	Broad climate suitability (environmental versatility)		
2.04	Native or naturalized in habitats with periodic inundation	y	1
2.05	Does the species have a history of repeated introductions outside its natural range?	y	
3.01	Naturalized beyond native range	y	0
3.02	Garden/amenity/disturbance weed	?	
3.03	Weed of agriculture	y	0
3.04	Environmental weed	n	0
3.05	Congeneric weed	y	0
4.01	Produces spines, thorns or burrs	n	0
4.02	Allelopathic	n	0
4.03	Parasitic	n	0
4.04	Unpalatable to grazing animals		
4.05	Toxic to animals	n	0
4.06	Host for recognised pests and pathogens		
4.07	Causes allergies or is otherwise toxic to humans	n	0
4.08	Creates a fire hazard in natural ecosystems	n	0
4.09	Is a shade tolerant plant at some stage of its life cycle	y	1
4.1	Grows on infertile soils (oligotrophic, limerock, or excessively draining soils)	y	1
4.11	Climbing or smothering growth habit	n	0
4.12	Forms dense thickets	n	0

5.01	Aquatic	n	0
5.02	Grass	n	0
5.03	Nitrogen fixing woody plant	n	0
5.04	Geophyte	n	0
6.01	Evidence of substantial reproductive failure in native habitat		
6.02	Produces viable seed	y	1
6.03	Hybridizes naturally		
6.04	Self-compatible or apomictic		
6.05	Requires specialist pollinators		
6.06	Reproduction by vegetative fragmentation		
6.07	Minimum generative time (years)	1	1
7.01	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)		
7.02	Propagules dispersed intentionally by people	y	1
7.03	Propagules likely to disperse as a produce contaminant	n	-1
7.04	Propagules adapted to wind dispersal	y	1
7.05	Propagules water dispersed	n	-1
7.06	Propagules bird dispersed	n	-1
7.07	Propagules dispersed by other animals (externally)	n	-1
7.08	Propagules dispersed by other animals (internally)	n	-1
8.01	Prolific seed production		
8.02	Evidence that a persistent propagule bank is formed (>1 yr)	y?	1
8.03	Well controlled by herbicides	?	
8.04	Tolerates, or benefits from, mutilation or cultivation		
8.05	Effective natural enemies present in Florida, or east of the continental divide		
Total Score			11

Outcome	Reject*
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*Used secondary screen from: Daehler, C. C., J.L. Denslow, S. Ansari, and H. Kuo. 2004. A risk assessment system for screening out harmful invasive pest plants from Hawaii's and other Pacific islands. *Conserv. Biol.* 18: 360-368.

section	# questions answered	satisfy minimum?
A	6	yes
B	10	yes
C	14	yes
total	30	yes

Data collected 2006-2007

Question number	Reference	Source data
1.01	S. Wilson, pers. comm.	some cultivars are likely as weedy as the wildtype form
1.02		
1.03		
2.01		
2.02		
2.03		
2.04	Horticopia 4.0	"These plants also do very well in swamps and areas that stay too wet for even grass to grow."
2.05	1. Wagner, Herbst, and Sohmer (1999) Manual of the flowering plants of Hawai'i. University of Hawai'i Press/Bishop Museum Press, Honolulu. 2. Wilson and Mecca (2003) Seed production and germination of eight cultivars and the wild type of <i>Ruellia tweediana</i> : a potentially invasive ornamental. Journal of Environmental Horticulture 21: 137-143.	Native to Mexico; also present in Hawaii (1) and the Virgin Islands and Puerto Rico (2). Used horticulturally (2).
3.01	Wagner, Herbst, and Sohmer (1999) Manual of the flowering plants of Hawai'i. University of Hawai'i Press/Bishop Museum Press, Honolulu.	"Native to Mexico; in Hawaii cultivated as an ornamental but easily escaping, now naturalized and often found in dry habitats such as cracks in sidewalks and disturbed, shaded gulch bottoms"
3.02	Liogier (1997) Descriptive Flora of Puerto Rico and Adjacent Islands. Vol. 5. Editorial de la Universidad de Puerto Rico.	"Common as a weed in P.R." [but counted as an agricultural weed in Puerto Rico (see 3.03) - not counting here as well, since it's not clear what type of weed is meant]
3.03	Holm (1979) A Geographical Atlas of World Weeds. John Wiley and Sons.	Considered a common weed of agriculture in Puerto Rico.
3.04		no evidence
3.05	1. Waterhouse (1997) The major invertebrate pests and weeds of agriculture and plantation forestry in the southern and western Pacific. ACIAR Monograph No. 44, 99p. 2. Holm (1979) A Geographical Atlas of World Weeds. John Wiley and Sons.	1. <i>R. prostrata</i> is a weed of roadsides and tree crops in the Pacific. 2. <i>R. tuberosa</i> considered a serious weed of

		agriculture in Thailand.
4.01	Wagner, Herbst, and Sohmer (1999) Manual of the flowering plants of Hawai'i. University of Hawai'i Press/Bishop Museum Press, Honolulu.	no description of these traits
4.02		no evidence
4.03	Wagner, Herbst, and Sohmer (1999) Manual of the flowering plants of Hawai'i. University of Hawai'i Press/Bishop Museum Press, Honolulu.	no description of this
4.04		
4.05		no evidence
4.06		
4.07		no evidence
4.08		no evidence
4.09	Horticoptia 4.0	exposure: full shade to partial sun
4.1	Horticoptia 4.0	"Suitable soil is well-drained/loamy, sandy or clay."
4.11	USDA, NRCS. 2005. The PLANTS Database, Version 3.5 (http://plants.usda.gov). Data compiled from various sources by Mark W. Skinner. National Plant Data Center, Baton Rouge, LA 70874-4490 USA.	growth habit: subshrub, shrub, forb/herb
4.12		no evidence
5.01		terrestrial
5.02	USDA, NRCS. 2005. The PLANTS Database, Version 3.5 (http://plants.usda.gov). Data compiled from various sources by Mark W. Skinner. National Plant Data Center, Baton Rouge, LA 70874-4490 USA.	Acanthaceae
5.03	USDA, NRCS. 2005. The PLANTS Database, Version 3.5 (http://plants.usda.gov). Data compiled from various sources by Mark W. Skinner. National Plant Data Center, Baton Rouge, LA 70874-4490 USA.	Acanthaceae
5.04	Horticoptia 4.0	"This plant's roots are...fibrous."
6.01		
6.02	1. Horticoptia 4.0 2. Wilson and Mecca (2003) Seed production and germination of eight cultivars and the wild type of <i>Ruellia tweediana</i> : a potentially invasive ornamental. Journal of Environmental Horticulture 21: 137-143.	1. propagation from seeds; "Plants seeds themselves into the garden and can form clumps many feet across. Seedlings can also be found many feet away from original plants." 2. Seven of eight cultivars, and wild type, all produced viable seed.
6.03		
6.04		
6.05		
6.06		
6.07	Wilson and Mecca (2003) Seed production and germination of eight cultivars and the wild type of <i>Ruellia tweediana</i> : a potentially invasive ornamental. Journal of Environmental Horticulture 21: 137-143.	Several cultivars and wild type of <i>R. tweediana</i> flowered approx. 3 months after germination.
7.01		
7.02	Wilson and Mecca (2003) Seed production and	<i>R. tweediana</i> is extensively

	germination of eight cultivars and the wild type of <i>Ruellia tweediana</i> : a potentially invasive ornamental. <i>Journal of Environmental Horticulture</i> 21: 137-143.	cultivated for its ornamental value.
7.03		no evidence
7.04	Witztum and Schulgasser (1995) The mechanics of seed expulsion in Acanthaceae. <i>Journal of Theoretical Biology</i> 176: 531-542.	<i>Ruellia brittoniana</i> [synonym] has explosive dispersal of its seeds. "The 16-20 disk shaped, slightly oblong seeds...are thrown out to distances of up to 2.5-3 m."
7.05		no evidence
7.06		wind dispersed
7.07	Wagner, Herbst, and Sohmer (1999) <i>Manual of the flowering plants of Hawai'i</i> . University of Hawai'i Press/Bishop Museum Press, Honolulu.	fruit is an ellipsoid capsule, 2-2.5 cm long, smooth externally
7.08		wind dispersed
8.01	Witztum and Schulgasser (1995) The mechanics of seed expulsion in Acanthaceae. <i>Journal of Theoretical Biology</i> 176: 531-542.	16-20 seeds per fruit
8.02	1. Hammer (2002) Mexican bluebell (<i>Ruellia tweediana</i> Griseb.): a pretty invasive weed. <i>Wildland Weeds</i> 5: 6-8. 2. Wilson and Mecca (2003) Seed production and germination of eight cultivars and the wild type of <i>Ruellia tweediana</i> : a potentially invasive ornamental. <i>Journal of Environmental Horticulture</i> 21: 137-143.	1. "Attempts to eradicate the species by hand removal is [sic] nearly futile because a persistent seed bank in the soil allows it to reappear long after eradication efforts are thought to be successful." 2. Germination of seeds stored for 12 months varied between 23 and 100%, depending on type and temperature. [stored in laboratory, not in soil]
8.03		
8.04		
8.05		