

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>Agave americana</i> (century plant)			
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	n?	0
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	n	0
3.03	Weed of agriculture	y	0
3.04	Environmental weed	y	0
3.05	Congeneric weed	y	0
4.01	Produces spines, thorns or burrs	y	1
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	y	1
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	n	0
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	y	1
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	y	1
6.04	Self-compatible or apomictic		
6.05	Requires specialist pollinators	?	
6.06	Reproduction by vegetative fragmentation	y	1
6.07	Minimum generative time (years)		
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	n	-1
7.05	Propagules water dispersed	n	-1
7.06	Propagules bird dispersed		
7.07	Propagules dispersed by other animals (externally)	n	-1
7.08	Propagules dispersed by other animals (internally)		
8.01	Prolific seed production	n	-1
8.02	Evidence that a persistent propagule bank is formed (>1 yr)		
8.03	Well controlled by herbicides	y	-1
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			14

Outcome	Reject*
----------------	----------------

*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	7	yes
B	10	yes
C	14	yes
total	31	yes

Data collected 2006-2007

Question number	Reference	Source data
1.01		cultivated, but no evidence of selection for reduced weediness
1.02		
1.03		
2.01		
2.02		
2.03		
2.04	Dehgan (1998) Landscape Plants for Subtropical Climates. University Press of Florida.	native to arid regions of Mexico
2.05	Whistler (2000) Tropical Ornamentals: a Guide. Timber Press, Portland.	"widely cultivated for its attractive foliage and as a novelty"
3.01	1. Harden (1993) Flora of New South Wales. New South Wales University Press. 2. Badano and Pugnaire (2004) Invasion of <i>Agave</i> species (Agavaceae) in south-east Spain: invader demographic parameters and impacts on native species. Diversity and Distributions 10: 493-500. 3. Richardson, Macdonald, Hoffman, and Henderson (1997) Alien plant invasions. Pp. 535-570 in Cowling, Richardson, and Pierce (eds) Vegetation of Southern Africa, Cambridge University Press. 4. Waterhouse (1997) The major invertebrate pests and weeds of agriculture and plantation forestry in the southern and western Pacific. ACIAR Monograph No. 44, 99p.	Naturalized in Australia (1), Spain (2), southern Africa (3), and the Pacific (4)
3.02		no evidence
3.03	Waterhouse (1997) The major invertebrate pests and weeds of agriculture and plantation forestry in the southern and western Pacific. ACIAR Monograph No. 44, 99p.	considered a major weed of agriculture in the southern and western Pacific (table 11)
3.04	1. Badano and Pugnaire (2004) Invasion of <i>Agave</i> species (Agavaceae) in south-east Spain: invader demographic parameters and impacts on native species. Diversity and Distributions 10: 493-500. 2. Richardson, Macdonald, Hoffman, and Henderson (1997) Alien plant invasions. Pp. 535-570 in Cowling, Richardson, and Pierce (eds) Vegetation of Southern Africa, Cambridge University Press.	1. <i>Agave americana</i> is spreading in coastal dunes in Spain, "interfering with the dominant native species". 2. <i>Agave americana</i> considered one of 84 important environmental weeds in southern African biomes (Appendix 22.1).
3.05	Richardson, Macdonald, Hoffman, and Henderson (1997) Alien plant invasions. Pp. 535-570 in Cowling, Richardson, and Pierce (eds) Vegetation of Southern Africa, Cambridge University Press.	<i>A. sisalana</i> also considered one of 84 important environmental weeds in southern African biomes.
4.01	Dehgan (1998) Landscape Plants for Subtropical Climates. University Press of Florida.	"leaves are...fibrous with a sharp terminal black spine; often have sharp marginal teeth"
4.02	USDA, NRCS. 2005. <i>The PLANTS Database</i> , 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.	not allelopathic

4.03	Dehgan (1998) Landscape Plants for Subtropical Climates. University Press of Florida.	no description of this
4.04	Nobel (1988) Environmental biology of agaves and cacti. Cambridge University Press, Cambridge.	"Agaves...are consumed by both wild and domesticated animals in arid and semiarid regions." [unclear whether eaten readily]
4.05	USDA, NRCS. 2005. <i>The PLANTS Database</i> , 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.	no toxicity
4.06		
4.07		causes dermatitis in humans
4.08		no evidence
4.09	1. USDA, NRCS. 2005. <i>The PLANTS Database</i> , 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. 2. Dehgan (1998) Landscape Plants for Subtropical Climates. University Press of Florida.	1. shade intolerant 2. plant in full sun
4.1	1. Badano and Pugnaire (2004) Invasion of Agave species (Agavaceae) in south-east Spain: invader demographic parameters and impacts on native species. <i>Diversity and Distributions</i> 10: 493-500. 2. Dehgan (1998) Landscape Plants for Subtropical Climates. University Press of Florida.	1. "This suggests that sandy soils are an opportunity which releases the clonal reproduction of <i>Agave</i> [including <i>A. americana</i>]." 2. "tolerates poor sandy soil"
4.11	Dehgan (1998) Landscape Plants for Subtropical Climates. University Press of Florida.	"rosulate shrub"
4.12	Weber (2003) Invasive Plant Species of the World. CABI Publishing.	"A single individual can form dense impenetrable stands that eliminate native vegetation."
5.01		terrestrial
5.02	USDA, NRCS. 2005. <i>The PLANTS Database</i> , 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.	Agavaceae
5.03	USDA, NRCS. 2005. <i>The PLANTS Database</i> , 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.	not nitrogen fixing (and Agavaceae)
5.04	1. USDA, NRCS. 2005. <i>The PLANTS Database</i> , 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. 2. Hortocopia 4.0	1. not propagated by bulbs, corms, or tubers 2. "This plant's roots are fibrous."
6.01		
6.02	Gentry (1982) Agaves of Continental North America. The University of Arizona Press.	"...freely suckering and sometimes seeding"
6.03	Gentry (1982) Agaves of Continental North America. The University of Arizona Press.	Morphological intermediates between <i>A. americana</i> and <i>A. scabra</i> have been observed along the eastern edges of the Chihuahuan or Coahuilan Desert, "seeming to express interspecific hybrids".
6.04		

6.05	Gentry (1982) Agaves of Continental North America. The University of Arizona Press.	Bats are important pollinators of agaves, and agave flowers are also visited by hummingbirds, other birds, and insects. [primary pollinators are specialists]
6.06	1. Gentry (1982) Agaves of Continental North America. The University of Arizona Press. 2. Badano and Pugnaire (2004) Invasion of Agave species (Agavaceae) in south-east Spain: invader demographic parameters and impacts on native species. Diversity and Distributions 10: 493-500.	1. "...freely suckering and sometimes seeding" 2. "...showing that rhizomes are the main propagation mechanisms of <i>A. americana</i> in this site"
6.07	Whistler (2000) Tropical Ornamentals: a Guide. Timber Press, Portland.	"flowers infrequently, after 15 to 30 years of growth" [but time to vegetative reproduction is not known]
7.01		
7.02	1. Gentry (1982) Agaves of Continental North America. The University of Arizona Press. 2. Nobel (1988) Environmental biology of agaves and cacti. Cambridge University Press, Cambridge.	1. In Mesoamerica and elsewhere, agaves are widely cultivated for food, drink, and fiber. 2. <i>Agave americana</i> is used throughout the world as an ornamental.
7.03		no evidence
7.04	Dehgan (1998) Landscape Plants for Subtropical Climates. University Press of Florida.	seeds germinate on plant and then fall to the ground and root
7.05		no evidence
7.06		
7.07		no evidence that fruit has any means of attachment
7.08		
8.01	1. 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. 2. Whistler (2000) Tropical Ornamentals: a Guide. Timber Press, Portland.	1. fruit/seed abundance: low 2. "flowers infrequently, after 15 to 30 years of growth...it dies after flowering"
8.02		
8.03	Tunison and Zimmer (1992) Success in controlling localized alien plants in Hawaii Volcanoes National Park. Pp. 506-524 in Stone, Smith, and Tunison (eds.) Alien Plant Invasions in Native Ecosystems of Hawaii: Management and Research. University of Hawaii Press, Honolulu.	Application of 5% Garlon 4 to <i>A. americana</i> plants in Hawaii Volcanoes National Park resulted in a reduction from 25 to 5 plants after 2 years.
8.04		
8.05		