

**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>Medicago polymorpha (bur clover)</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		
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	y	1
4.02	Allelopathic	n	0
4.03	Parasitic	n	0
4.04	Unpalatable to grazing animals	n	-1
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)	n	0
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	n?	0
6.06	Reproduction by vegetative fragmentation	n	-1
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	n?	-1
7.05	Propagules water dispersed	n	-1
7.06	Propagules bird dispersed	?	
7.07	Propagules dispersed by other animals (externally)	y	1
7.08	Propagules dispersed by other animals (internally)	?	
8.01	Prolific seed production	y?	1
8.02	Evidence that a persistent propagule bank is formed (>1 yr)		
8.03	Well controlled by herbicides		
8.04	Tolerates, or benefits from, mutilation or cultivation	y?	1
8.05	Effective natural enemies present in Florida, or east of the continental divide		
<b>Total Score</b>			<b>11</b>

<b>Outcome</b>	<b>Reject*</b>
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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	5	yes
B	11	yes
C	15	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		
2.05	Wagner, Herbst, and Sohmer (1999) Manual of the flowering plants of Hawai'i. University of Hawai'i Press/Bishop Museum Press, Honolulu.	"Native to Europe and temperate Asia to China and Japan, also in northern India, widely cultivated as a fodder plant"
3.01	1. Wagner, Herbst, and Sohmer (1999) Manual of the flowering plants of Hawai'i. University of Hawai'i Press/Bishop Museum Press, Honolulu. 2. Wilken and Hannah (1998) Medicago polymorpha factsheet, Channel Islands National Park ( <a href="http://www.usgs.nau.edu/swepic/factsheets/MEPO3_APRS.pdf">http://www.usgs.nau.edu/swepic/factsheets/MEPO3_APRS.pdf</a> ).	1. Naturalized in Hawaii. 2. "A native of southern Europe, bur clover has become naturalized throughout warm temperate North America (southern and Pacific U.S.), Chile, Australia, southern Africa, Japan, and Hawaii (Arnold and de Wet 1993, Barneby 1989, Chapman 1991, Gleason and Cronquist 1991, Heyn 1963, Montenegro et al. 1991, Ohwi 1965, Wagner et al. 1990)."
3.02	Lorenzi (2000) Plantas Daninhas do Brasil. Instituto Plantarum.	"This nuisance plant...can be found infesting soccer fields, gardens, orchards, roadsides and vacant lots" BUT "Rarely does it form serious infestations"
3.03	1. Holm (1979) A Geographical Atlas of World Weeds. John Wiley and Sons. 2. Lorenzi (2000) Plantas Daninhas do	1. Considered a principal weed of agriculture in

	Brasil. Instituto Plantarum.	Mexico (as <i>M. hispida</i> ), and a common weed of agriculture in many other countries (as <i>M. hispida</i> and <i>M. polymorpha</i> ). 2. "This nuisance plant...can be found infesting...orchards...Rarely does it form serious infestations"
3.04		no evidence
3.05	Holm (1979) A Geographical Atlas of World Weeds. John Wiley and Sons.	several congeners are principal weeds of agriculture
4.01	USDA, NRCS. 2005. The PLANTS Database, Version 3.5 ( <a href="http://plants.usda.gov">http://plants.usda.gov</a> ). Plant fact sheet for burclover ( <i>Medicago polymorpha</i> L.).	The fruit is a hooked burr.
4.02	USDA, NRCS. 2005. The PLANTS Database, Version 3.5 ( <a href="http://plants.usda.gov">http://plants.usda.gov</a> ). Data compiled from various sources by Mark W. Skinner. National Plant Data Center, Baton Rouge, LA 70874-4490 USA.	not allelopathic
4.03	USDA, NRCS. 2005. The PLANTS Database, Version 3.5 ( <a href="http://plants.usda.gov">http://plants.usda.gov</a> ). Plant fact sheet for burclover ( <i>Medicago polymorpha</i> L.).	no description of this
4.04	USDA, NRCS. 2005. The PLANTS Database, Version 3.5 ( <a href="http://plants.usda.gov">http://plants.usda.gov</a> ). Plant fact sheet for burclover ( <i>Medicago polymorpha</i> L.).	"All classes of livestock except horses and mules will eat burclover readily"
4.05	USDA, NRCS. 2005. The PLANTS Database, Version 3.5 ( <a href="http://plants.usda.gov">http://plants.usda.gov</a> ). 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	USDA, NRCS. 2005. The PLANTS Database, Version 3.5 ( <a href="http://plants.usda.gov">http://plants.usda.gov</a> ). Data compiled from various sources by Mark W. Skinner. National Plant Data Center, Baton Rouge, LA 70874-4490 USA.	no toxicity
4.08		no evidence
4.09	1. USDA, NRCS. 2005. The PLANTS Database, Version 3.5 ( <a href="http://plants.usda.gov">http://plants.usda.gov</a> ). Plant fact sheet for burclover ( <i>Medicago polymorpha</i> L.). 2. USDA, NRCS. 2005. The PLANTS Database, Version 3.5 ( <a href="http://plants.usda.gov">http://plants.usda.gov</a> ). Data compiled from various sources by Mark W. Skinner. National Plant Data Center, Baton Rouge, LA 70874-4490 USA.	1. "This species inhabits all exposures and grows well under light conditions varying from full sunlight to heavy shade." BUT 2. shade intolerant
4.1	USDA, NRCS. 2005. The PLANTS Database, Version 3.5 ( <a href="http://plants.usda.gov">http://plants.usda.gov</a> ). Plant fact sheet for burclover ( <i>Medicago polymorpha</i> L.).	"Although burclover will succeed in many soil types, heavy loams are most suitable and valleys and low foothills are generally the preferred sites of natural plant development...Burclover

		does poorly on soils of low fertility."
4.11	USDA, NRCS. 2005. The PLANTS Database, Version 3.5 ( <a href="http://plants.usda.gov">http://plants.usda.gov</a> ). Data compiled from various sources by Mark W. Skinner. National Plant Data Center, Baton Rouge, LA 70874-4490 USA.	growth habit: forb/herb
4.12		no evidence, and is an herb
5.01		terrestrial
5.02	USDA, NRCS. 2005. The PLANTS Database, Version 3.5 ( <a href="http://plants.usda.gov">http://plants.usda.gov</a> ). Data compiled from various sources by Mark W. Skinner. National Plant Data Center, Baton Rouge, LA 70874-4490 USA.	Fabaceae
5.03	1. USDA, NRCS. 2005. The PLANTS Database, Version 3.5 ( <a href="http://plants.usda.gov">http://plants.usda.gov</a> ). Data compiled from various sources by Mark W. Skinner. National Plant Data Center, Baton Rouge, LA 70874-4490 USA. 2. Allen and Allen (1981) The Leguminosae: a Source Book of Characteristics, Uses, and Nodulation. The University of Wisconsin Press, Madison.	1. nitrogen fixation: high 2. <i>M. polymorpha</i> widely reported to fix nitrogen. [but herbaceous]
5.04	1. USDA, NRCS. 2005. The PLANTS Database, Version 3.5 ( <a href="http://plants.usda.gov">http://plants.usda.gov</a> ). Data compiled from various sources by Mark W. Skinner. National Plant Data Center, Baton Rouge, LA 70874-4490 USA. 2. USDA, NRCS. 2005. The PLANTS Database, Version 3.5 ( <a href="http://plants.usda.gov">http://plants.usda.gov</a> ). Plant fact sheet for burclover ( <i>Medicago polymorpha</i> L.).	1. not propagated by bulbs, corms, or tubers 2. shallow-rooted
6.01		
6.02	USDA, NRCS. 2005. The PLANTS Database, Version 3.5 ( <a href="http://plants.usda.gov">http://plants.usda.gov</a> ). Data compiled from various sources by Mark W. Skinner. National Plant Data Center, Baton Rouge, LA 70874-4490 USA.	propagated by seed
6.03		
6.04		
6.05		
6.06	USDA, NRCS. 2005. The PLANTS Database, Version 3.5 ( <a href="http://plants.usda.gov">http://plants.usda.gov</a> ). Data compiled from various sources by Mark W. Skinner. National Plant Data Center, Baton Rouge, LA 70874-4490 USA.	vegetative spread rate: none (and an annual)
6.07	USDA, NRCS. 2005. The PLANTS Database, Version 3.5 ( <a href="http://plants.usda.gov">http://plants.usda.gov</a> ). Data compiled from various sources by Mark W. Skinner. National Plant Data Center, Baton Rouge, LA 70874-4490 USA.	annual
7.01		
7.02	1. Wagner, Herbst, and Sohmer (1999) Manual of the flowering plants of Hawai'i. University of Hawai'i Press/Bishop Museum Press, Honolulu. 2. USDA, NRCS. 2005. The PLANTS Database, Version 3.5 ( <a href="http://plants.usda.gov">http://plants.usda.gov</a> ). Plant fact sheet for burclover ( <i>Medicago polymorpha</i> L.).	1. "widely cultivated as a fodder plant" 2. "Burclover is commonly used as a cover crop in orchards."
7.03		no evidence
7.04	USDA, NRCS. 2005. The PLANTS Database, Version 3.5 ( <a href="http://plants.usda.gov">http://plants.usda.gov</a> ). Plant fact sheet for burclover ( <i>Medicago polymorpha</i> L.).	fruit is a flattened, coiled pod, up to 1/4 in. wide
7.05		no evidence
7.06	USDA, NRCS. 2005. The PLANTS Database, Version 3.5	Pods are eaten by quail

	( <a href="http://plants.usda.gov">http://plants.usda.gov</a> ). Plant fact sheet for burclover ( <i>Medicago polymorpha</i> L.).	
7.07	USDA, NRCS. 2005. The PLANTS Database, Version 3.5 ( <a href="http://plants.usda.gov">http://plants.usda.gov</a> ). Plant fact sheet for burclover ( <i>Medicago polymorpha</i> L.).	"While summer grazing burclover, sheep often accumulate numerous burs in the wool"; fruit is "fringed with a double row of conspicuous, hooked spines"
7.08	USDA, NRCS. 2005. The PLANTS Database, Version 3.5 ( <a href="http://plants.usda.gov">http://plants.usda.gov</a> ). Plant fact sheet for burclover ( <i>Medicago polymorpha</i> L.).	Pods are eaten by livestock and by deer
8.01	1. USDA, NRCS. 2005. The PLANTS Database, Version 3.5 ( <a href="http://plants.usda.gov">http://plants.usda.gov</a> ). Plant fact sheet for burclover ( <i>Medicago polymorpha</i> L.). 2. Wagner, Herbst, and Sohmer (1999) Manual of the flowering plants of Hawai'i. University of Hawai'i Press/Bishop Museum Press, Honolulu.	1. "Well developed plants may produce more than 1,000 pods." [small plant] 2. several seeds per pod
8.02		
8.03		
8.04	USDA, NRCS. 2005. The PLANTS Database, Version 3.5 ( <a href="http://plants.usda.gov">http://plants.usda.gov</a> ). Plant fact sheet for burclover ( <i>Medicago polymorpha</i> L.).	"It can be mowed to control excessive growth, which will not hinder its ability to produce a seed crop for the next year."
8.05		