

**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.**

<b><i>Abutilon hirtum</i> (Florida Keys Indian mallow)</b>			
<b>Question number</b>	<b>Question</b>	<b>Answer</b>	<b>Score</b>
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	2
3.02	Garden/amenity/disturbance weed	n	0
3.03	Weed of agriculture	y	4
3.04	Environmental weed	n	0
3.05	Congeneric weed	y	2
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	y	1
4.05	Toxic to animals	n	0
4.06	Host for recognised pests and pathogens	y	1
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	n	0
4.10	Grows on infertile soils (oligotrophic, limerock, or excessively draining soils)		
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		
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	n	-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	n	-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		
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		
8.05	Effective natural enemies present in Florida, or east of the continental divide		
<b>Total score</b>			<b>5</b>

**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	11	yes
C	10	yes
total	28	yes

Data collected 2006-2007

Question number	Reference	Source data
1.01		no evidence of cultivation
1.02		
1.03		
2.01		
2.02		
2.03		
2.04	van Valkenburg and Bunyapraphatsara, eds. (2001) Plant Resources of South-East Asia. No. 12(2). Medicinal and poisonous plants. Backhuys Publishers, Leiden.	" <i>A. hirtum</i> occurs in the drier tropical regions of the Old World"
2.05	1. van Valkenburg and Bunyapraphatsara, eds. (2001) Plant Resources of South-East Asia. No. 12(2). Medicinal and poisonous plants. Backhuys Publishers, Leiden. 2. Fryxell (1988) Malvaceae of Mexico. Systematic Botany Monographs vol. 25.	1. " <i>A. hirtum</i> occurs in the drier tropical regions of the Old World, and is introduced into the Americas." 2. " <i>Abutilon hirtum</i> is an Old World species that occurs in tropical parts of Africa, Asia, and Australia. It is adventive in the West Indies, southern Florida, Mexico, and Central America, and parts of South America (Peru, Venezuela)."
3.01	USDA, ARS, National Genetic Resources Program. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland ( <a href="http://www.ars-grin.gov/cgi-bin/npgs/html/taxon.pl?744">http://www.ars-grin.gov/cgi-bin/npgs/html/taxon.pl?744</a> ).	naturalized in neotropics
3.02		no evidence
3.03	1. Atiri (1984) The occurrence and importance of okra mosaic virus in Nigerian weeds. <i>Annals of Applied Biology</i> 104: 261-265. 2. Holm (1979) <i>A Geographical Atlas of World Weeds</i> . John Wiley and Sons.	1. <i>Abutilon hirtum</i> is a weed of okra in Nigeria. 2. Present as a weed of agriculture in Thailand and Sudan.
3.04		no evidence
3.05	Holm (1979) <i>A Geographical Atlas of World Weeds</i> . John Wiley and Sons.	<i>A. indicum</i> considered a serious weed of agriculture in Ghana, and a common weed in India.
4.01	Fryxell (1988) Malvaceae of Mexico. Systematic Botany Monographs vol. 25.	no description of these traits
4.02		no evidence
4.03	Fryxell (1988) Malvaceae of Mexico. Systematic Botany Monographs vol. 25.	no description of this
4.04	Lusigi, Nkurunziza, and Masheti (1984) Forage preferences of livestock in the arid lands of northern Kenya. <i>Journal of Range Management</i> 37: 542-548.	<i>A. hirtum</i> rated as undesirable as a forage for camels, sheep, goats, and cattle in Kenya.
4.05		no evidence

4.06	van Valkenburg and Bunyaphrathatsara, eds. (2001) Plant Resources of South-East Asia. No. 12(2). Medicinal and poisonous plants. Backhuys Publishers, Leiden.	" <i>Abutilon</i> species are often effective hosts for diseases and pests that attack malvaceous crops... <i>Abutilon</i> is a serious host for several insect pests of cotton...Root-knot nematodes such as <i>Meloidogyne javanica</i> and <i>M. incognita</i> also frequently attack <i>Abutilon</i> . In Nigeria, <i>A. hirtum</i> is a host for okra mosaic virus."
4.07		no evidence
4.08		no evidence
4.09	van Valkenburg and Bunyaphrathatsara, eds. (2001) Plant Resources of South-East Asia. No. 12(2). Medicinal and poisonous plants. Backhuys Publishers, Leiden.	"The Malesian species of <i>Abutilon</i> [including <i>A. hirtum</i> ] are sun-loving, always occurring in open locations in lowland areas."
4.10		
4.11	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. van Valkenburg and Bunyaphrathatsara, eds. (2001) Plant Resources of South-East Asia. No. 12(2). Medicinal and poisonous plants. Backhuys Publishers, Leiden.	1. growth habit: subshrub, forb/herb 2. "an undershrub up to about 2.5 m tall"
4.12		no evidence
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.	Malvaceae
5.03	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.	Malvaceae
5.04		
6.01		
6.02	van Valkenburg and Bunyaphrathatsara, eds. (2001) Plant Resources of South-East Asia. No. 12(2). Medicinal and poisonous plants. Backhuys Publishers, Leiden.	" <i>Abutilon</i> is propagated by seed."
6.03		
6.04		
6.05	van Valkenburg and Bunyaphrathatsara, eds. (2001) Plant Resources of South-East Asia. No. 12(2). Medicinal and poisonous plants. Backhuys Publishers, Leiden.	" <i>Abutilon</i> species are feed plants for humming-birds."

6.06	van Valkenburg and Bunyaphratsara, eds. (2001) Plant Resources of South-East Asia. No. 12(2). Medicinal and poisonous plants. Backhuys Publishers, Leiden.	" <i>Abutilon</i> is propagated by seed."
6.07		
7.01		
7.02		no evidence
7.03		no evidence
7.04	Fryxell (1988) Malvaceae of Mexico. Systematic Botany Monographs vol. 25.	fruit a schizocarp 12-14 mm long, about 2 cm in diameter [no evidence of adaptation for wind dispersal]
7.05		no evidence
7.06		
7.07	Fryxell (1988) Malvaceae of Mexico. Systematic Botany Monographs vol. 25.	fruit a schizocarp with 20-25 mericarps [no evidence of any means of attachment]
7.08		
8.01	Fryxell (1988) Malvaceae of Mexico. Systematic Botany Monographs vol. 25.	20-25 3-seeded mericarps per fruit
8.02		
8.03		
8.04		
8.05		