

**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>Alpinia zerumbet (shellplant)</i></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		
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	y	0
3.03	Weed of agriculture	n	0
3.04	Environmental weed	n	0
3.05	Congeneric weed	n	0
4.01	Produces spines, thorns or burrs	n	0
4.02	Allelopathic	y	1
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	n	0
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		
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	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		
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>

<b>Outcome</b>	<b>Accept*</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	6	yes
B	11	yes
C	11	yes
total	28	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	1. van Valkenburg and Bunyapraphatsara, eds. (2001) Plant Resources of South-East Asia. No. 12(2). Medicinal and poisonous plants. Backhuys Publishers, Leiden. 2. Gilman (1999) <i>Alpinia zerumbet</i> . University of Florida, IFAS Extension, FPS-35 ( <a href="http://hort.ufl.edu/shrubs/ALPZERA.PDF">http://hort.ufl.edu/shrubs/ALPZERA.PDF</a> ). 3. Horticultura 4.0.	1. <i>Alpinia</i> usually prefers temperatures around 27-30°C during daytime and 17-18°C at night. <i>A. zerumbet</i> "considered native to north-eastern India, Burma (Myanmar), Indo-China, China and Japan. Cultivated throughout South-East Asia and in many other tropical and subtropical countries". 2. USDA hardiness zones 9B through 11. 3. Hardiness zones 7B to 10A.
2.02		
2.03		
2.04		
2.05	van Valkenburg and Bunyapraphatsara, eds. (2001) Plant Resources of South-East Asia. No. 12(2). Medicinal and poisonous plants. Backhuys Publishers, Leiden.	"Considered native to north-eastern India, Burma (Myanmar), Indo-China, China and Japan. Cultivated throughout South-East Asia and in many other tropical and subtropical countries."
3.01	1. Henderson (2001) Alien Weeds and Invasive Plants: a Complete Guide to Declared Weeds and Invaders in South Africa. Plant Protection Research Institute Handbook No. 12. 2. Wagner, Herbst, and Sohmer (1999) Manual of the flowering plants of Hawai'i. University of Hawai'i Press/Bishop Museum Press, Honolulu.	1. Naturalized in South Africa - considered a "potential transformer". BUT 2. In Hawaii, only an occasional escape from cultivation.
3.02	Henderson (2001) Alien Weeds and Invasive Plants: a	Considered a "potential

	Complete Guide to Declared Weeds and Invaders in South Africa. Plant Protection Research Institute Handbook No. 12.	transformer" in South Africa - invades watercourses, forest margins, roadsides, and urban open space".
3.03		no evidence
3.04		no evidence
3.05		no evidence
4.01	van Valkenburg and Bunyaphatsara, eds. (2001) Plant Resources of South-East Asia. No. 12(2). Medicinal and poisonous plants. Backhuys Publishers, Leiden.	no description of these traits
4.02	Fujita, Nishimura, Kaburagi, and Mizutani (1994) Plant growth inhibiting $\alpha$ -pyrones from <i>Alpinia speciosa</i> . Phytochemistry 36: 23-27.	A plant growth inhibitor isolated from leaves of <i>Alpinia speciosa</i> [synonym] "caused a 35% reduction in hypocotyl length of lettuce seedling compared to the control at 25 ppm, etiolation at 100 ppm and necrosis at 200 ppm".
4.03	van Valkenburg and Bunyaphatsara, eds. (2001) Plant Resources of South-East Asia. No. 12(2). Medicinal and poisonous plants. Backhuys Publishers, Leiden.	no description of this
4.04		
4.05		no evidence
4.06	Gilman (1999) <i>Alpinia zerumbet</i> . University of Florida, IFAS Extension, FPS-35 ( <a href="http://hort.ufl.edu/shrubs/ALPZERA.PDF">http://hort.ufl.edu/shrubs/ALPZERA.PDF</a> ).	No serious pests or diseases.
4.07	van Valkenburg and Bunyaphatsara, eds. (2001) Plant Resources of South-East Asia. No. 12(2). Medicinal and poisonous plants. Backhuys Publishers, Leiden.	"In Ambon the leaves are used as perfumed wrappers for cooked rice. The pith of the young stem was commonly eaten in parts of Malaysia." [and no evidence of toxicity]
4.08		no evidence
4.09	1. van Valkenburg and Bunyaphatsara, eds. (2001) Plant Resources of South-East Asia. No. 12(2). Medicinal and poisonous plants. Backhuys Publishers, Leiden. 2. Dehgan, B. (1998) Landscape Plants for Subtropical Climates. University Press of Florida.	1. " <i>Alpinia</i> requires cool, shaded conditions...A. <i>zerumbet</i> occurs naturally in open, shaded forest." BUT 2. full sun or partial shade
4.1	1. van Valkenburg and Bunyaphatsara, eds. (2001) Plant Resources of South-East Asia. No. 12(2). Medicinal and poisonous plants. Backhuys Publishers, Leiden. 2. Dehgan, B. (1998) Landscape Plants for Subtropical Climates. University Press of Florida.	1. "They [genus <i>Alpinia</i> ] require rich soils." 2. fertile soil
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

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.	Zingiberaceae
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.	herbaceous Zingiberaceae
5.04		
6.01		
6.02	Whistler (2000) Tropical Ornamentals: a Guide. Timber Press, Portland.	"Propagate by rhizome division or seeds."
6.03		
6.04		
6.05	van Valkenburg and Bunyaphatsara, eds. (2001) Plant Resources of South-East Asia. No. 12(2). Medicinal and poisonous plants. Backhuys Publishers, Leiden.	" <i>Alpinia</i> is pollinated by insects, often bees."
6.06	van Valkenburg and Bunyaphatsara, eds. (2001) Plant Resources of South-East Asia. No. 12(2). Medicinal and poisonous plants. Backhuys Publishers, Leiden.	" <i>Alpinia</i> is propagated by division of rhizomes"
6.07		
7.01		
7.02	van Valkenburg and Bunyaphatsara, eds. (2001) Plant Resources of South-East Asia. No. 12(2). Medicinal and poisonous plants. Backhuys Publishers, Leiden.	"Many species of <i>Alpinia</i> , including... <i>A. zerumbet</i> , are cultivated as garden plants and as potplants for their attractive, often variegated leaves and striking inflorescences."
7.03		no evidence
7.04	Dehgan, B. (1998) Landscape Plants for Subtropical Climates. University Press of Florida.	fruit is a globose capsule, to 0.75 in. in diameter
7.05		no evidence
7.06		
7.07	Dehgan, B. (1998) Landscape Plants for Subtropical Climates. University Press of Florida.	fruit is a globose capsule, to 0.75 in. in diameter [no evidence of any means of attachment]
7.08		
8.01	Whistler (2000) Tropical Ornamentals: a Guide. Timber Press, Portland.	fruit a "many-seeded capsule"
8.02		
8.03		
8.04		
8.05		