

Family: *Euphorbiaceae*

Taxon: *Pedilanthus tithymaloides*

Synonym: *Euphorbia tithymaloides* L.

Common Name zigzag plant  
slipper flower  
devil's-backbone  
Japanese-poinsettia  
milkbush  
redbird flower  
slipperplant

Questionnaire :	current 20090513	Assessor:	Chuck Chimera	Designation:	H(HPWRA)
Status:	Assessor Approved	Data Entry Person:	Chuck Chimera	WRA Score	7
101	Is the species highly domesticated?		y=-3, n=0		n
102	Has the species become naturalized where grown?		y=1, n=-1		
103	Does the species have weedy races?		y=1, n=-1		
201	Species suited to tropical or subtropical climate(s) - If island is primarily wet habitat, then substitute "wet tropical" for "tropical or subtropical"		(0-low; 1-intermediate; 2-high) (See Appendix 2)		High
202	Quality of climate match data		(0-low; 1-intermediate; 2-high) (See Appendix 2)		High
203	Broad climate suitability (environmental versatility)		y=1, n=0		n
204	Native or naturalized in regions with tropical or subtropical climates		y=1, n=0		y
205	Does the species have a history of repeated introductions outside its natural range?		y=-2, ?=-1, n=0		y
301	Naturalized beyond native range		y = 1*multiplier (see Appendix 2), n= question 205		y
302	Garden/amenity/disturbance weed		n=0, y = 1*multiplier (see Appendix 2)		
303	Agricultural/forestry/horticultural weed		n=0, y = 2*multiplier (see Appendix 2)		n
304	Environmental weed		n=0, y = 2*multiplier (see Appendix 2)		n
305	Congeneric weed		n=0, y = 1*multiplier (see Appendix 2)		n
401	Produces spines, thorns or burrs		y=1, n=0		n
402	Allelopathic		y=1, n=0		
403	Parasitic		y=1, n=0		n
404	Unpalatable to grazing animals		y=1, n=-1		y
405	Toxic to animals		y=1, n=0		y
406	Host for recognized pests and pathogens		y=1, n=0		n
407	Causes allergies or is otherwise toxic to humans		y=1, n=0		y
408	Creates a fire hazard in natural ecosystems		y=1, n=0		n

409	Is a shade tolerant plant at some stage of its life cycle	y=1, n=0	n
410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y=1, n=0	y
411	Climbing or smothering growth habit	y=1, n=0	n
412	Forms dense thickets	y=1, n=0	n
501	Aquatic	y=5, n=0	n
502	Grass	y=1, n=0	n
503	Nitrogen fixing woody plant	y=1, n=0	n
504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	y=1, n=0	n
601	Evidence of substantial reproductive failure in native habitat	y=1, n=0	n
602	Produces viable seed	y=1, n=-1	y
603	Hybridizes naturally	y=1, n=-1	
604	Self-compatible or apomictic	y=1, n=-1	
605	Requires specialist pollinators	y=-1, n=0	y
606	Reproduction by vegetative fragmentation	y=1, n=-1	y
607	Minimum generative time (years)	1 year = 1, 2 or 3 years = 0, 4+ years = -1	
701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	y=1, n=-1	y
702	Propagules dispersed intentionally by people	y=1, n=-1	y
703	Propagules likely to disperse as a produce contaminant	y=1, n=-1	n
704	Propagules adapted to wind dispersal	y=1, n=-1	
705	Propagules water dispersed	y=1, n=-1	n
706	Propagules bird dispersed	y=1, n=-1	n
707	Propagules dispersed by other animals (externally)	y=1, n=-1	n
708	Propagules survive passage through the gut	y=1, n=-1	
801	Prolific seed production (>1000/m2)	y=1, n=-1	
802	Evidence that a persistent propagule bank is formed (>1 yr)	y=1, n=-1	
803	Well controlled by herbicides	y=-1, n=1	
804	Tolerates, or benefits from, mutilation, cultivation, or fire	y=1, n=-1	y
805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	y=-1, n=1	

Designation: H(HPWRA)

WRA Score 7

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**Supporting Data:**

101	2005. Staples, G. W./Herbst, D. R.. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI.	No evidence
102	2010. WRA Specialist. Personal Communication.	NA
103	2010. WRA Specialist. Personal Communication.	NA
201	2005. Staples, G. W./Herbst, D. R.. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI.	"...found from southern Florida through the West Indies and Central America to South America."
202	2005. Staples, G. W./Herbst, D. R.. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI.	"...found from southern Florida through the West Indies and Central America to South America."
203	2010. Dave's Garden. PlantFiles: Devil's Backbone, Japanese Poinsettia, Slipper Spurge, Redbird Cactus, Christmas Candle - Euphorbia tithymaloides. Dave's Garden, <a href="http://davesgarden.com/guides/pf/go/162556/">http://davesgarden.com/guides/pf/go/162556/</a>	"Hardiness: USDA Zone 9b: to -3.8 °C (25 °F) USDA Zone 10a: to -1.1 °C (30 °F) USDA Zone 10b: to 1.7 °C (35 °F) USDA Zone 11: above 4.5 °C (40 °F)"
204	2005. Staples, G. W./Herbst, D. R.. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI.	"...found from southern Florida through the West Indies and Central America to South America."
205	2002. Eggli, U.. Illustrated handbook of succulent plants: Dicotyledons. Springer-Verlage, Berlin - Heidelberg - New York	"cultivated widely as an ornamental in the tropics worldwide, and in greenhouses in temperate regions."
301	1976. Morton, J.F.. Pestiferous spread of many ornamental and fruit species in South Florida. Proceedings of the Florida State Horticultural Society. 89: 348-353.	"Pedilanthus tithymaloides Poit. Slipperflower. Tropical America and West Indies. Found as an escape in hammocks and pinelands; Everglade Keys and Florida Keys."
301	2000. Liogier, A. H./ Martorell, L. F.. Flora of Puerto Rico and adjacent islands: a systematic synopsis. La Editorial, UPR, San Juan, Puerto Rico	"persistent or spontaneous after cultivation" [Puerto Rico, describing Pedilanthus tithymaloides ssp. Tithymaloides]
301	2001. Pope, G.V. (ed.). Flora Zambesiaca Vol 9 (5). Euphorbiaceae (Euphorbioideae tribe Euphorbieae). Kew Publishing and Flora Zambesiaca Managing Committee, Richmond, Surrey, UK	"Plants have occasionally become naturalised in India, but apparently not, so far as is known, in tropical Africa."
301	2002. Eggli, U.. Illustrated handbook of succulent plants: Dicotyledons. Springer-Verlage, Berlin - Heidelberg - New York	"Most forms are cultivated locally as hedge plants and are often naturalized"
301	2007. Guezou, A./Poza, P./Buddenhagen, C.. Preventing Establishment: An Inventory of Introduced Plants in Puerto Villamil, Isabela Island, Galapagos. PLoS ONE. 2(10): e1042. doi:10.1371/journal.pone.0001042.	"Table 1...Pedilanthus tithymaloides...Data for naturalisation assessment in Puerto Villamil...asex2) asexual regeneration from a cultivated plant; fl) presence of flowers;" [not listed a fully naturalized in Galapagos]
301	2008. Foxcroft, L.C./Richardson, D.M./Wilson, J.R.U.. Ornamental Plants as Invasive Aliens: Problems and Solutions in Kruger National Park, South Africa. Environmental Management. 41: 32-51.	"Table 2...Pedilanthus tithymaloides... Evidence of naturalization? Yes" [South Africa]
301	2009. Morkill, A.. Lower Florida Keys National Wildlife Refuges Comprehensive Conservation Plan. U.S. Department of the Interior Fish and Wildlife Service Southeast Region, Atlanta, GA	"Appendix. Pedilanthus tithymaloides subsp. Smallii...Native Status = NN = Not Native, NA = Naturalized"
301	2010. Frohlich, D. Oahu Early Detection Botanist. Pers. Comm. 16 Nov. 2010.	"spreading on a dry, rocky hillside downslope from a house. It's hard to say whether it was spread by vegetative cuttings or seed, but there were many individuals in the area" [Oahu, Hawaiian Islands]

302	2007. Randall, R.P.. Global Compendium of Weeds - <i>Pedilanthus tithymaloides</i> [Online Database]. <a href="http://www.hear.org/gcw/species/pedilanthus_tithymaloides/">http://www.hear.org/gcw/species/pedilanthus_tithymaloides/</a>	"casual alien, cultivation escape, environmental weed, naturalised, weed " [Listed as a weed, but beyond naturalization, no evidence of impacts or control found]
303	2007. Randall, R.P.. Global Compendium of Weeds - <i>Pedilanthus tithymaloides</i> [Online Database]. <a href="http://www.hear.org/gcw/species/pedilanthus_tithymaloides/">http://www.hear.org/gcw/species/pedilanthus_tithymaloides/</a>	No evidence
304	2007. Randall, R.P.. Global Compendium of Weeds - <i>Pedilanthus tithymaloides</i> [Online Database]. <a href="http://www.hear.org/gcw/species/pedilanthus_tithymaloides/">http://www.hear.org/gcw/species/pedilanthus_tithymaloides/</a>	Insufficient evidence [see 3.02]
305	2007. Randall, R.P.. Global Compendium of Weeds [Online Database]. <a href="http://www.hear.org/gcw/">http://www.hear.org/gcw/</a>	No evidence & no other species of <i>Pedilanthus</i> listed as invasive or as weeds
401	1913. Millspaugh, C.F.. The genera <i>Pedilanthus</i> and <i>Cubanthus</i> , and other American Euphorbiaceae. <i>Fieldiana</i> . 2(9): 353-377.	"Shrubby 1.20-1.80 m.; leaves glabrous, subsessile, cuneate at the base, ovate or oblong, 3.5-7.5 cm. long, apex acute often recurved, margin subundulate, the mid-vein often prominently undulate-crenate beneath." [no spines, thorns, or burrs]
402	2008. Flores-Carmona, M.D.C./Cruz-Ortega R./Anaya A.L.. Allelopathic potential of some tropical trees of Ecological Reserve El Eden, Quintana Roo, Mexico. <i>Allelopathy Journal</i> . 21(1): 57-72.	"We investigated the allelopathic potential of leaves of six tropical trees ( <i>Jatropha gaudereri</i> , <i>Pedilanthus tithymaloides</i> , <i>Sebastiania adenophora</i> , <i>Zuelania guidonia</i> , <i>Zanthoxylum caribaeum</i> and <i>Heliocarpus</i> sp.) from the Ecological Reserve El Eden, Quintana Roo, Mexico. Aqueous leachates from dry leaves (1%) were tested in vitro on the root growth of 7 test plants [ <i>Echinochloa crus-galli</i> , <i>Lolium multiflorum</i> , <i>Zea mays</i> , <i>Amaranthus hypochondriacus</i> , <i>Lycopersicon esculentum</i> , <i>Phaseolus vulgaris</i> and <i>Cucurbita pepo</i> (ungerminated and pre-germinated)] and the diameter growth of 3 phytopathogenic fungi [ <i>Alternaria</i> sp., <i>Fusarium oxysporum</i> and <i>Helminthosporium</i> sp]. Aqueous leachates of <i>P. tithymaloides</i> , <i>S. adenophora</i> , <i>Z. caribaeum</i> , <i>J. gaudereri</i> and <i>Heliocarpus</i> sp. were most phytotoxic. <i>S. adenophora</i> and <i>Heliocarpus</i> sp. aqueous leachates inhibited the growth diameter of all phytopathogenic fungi." [unknown from field evidence]
403	2005. Staples, G. W./Herbst, D. R.. <i>A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places</i> . Bishop Museum Press, Honolulu, HI.	"Evergreen or deciduous shrub" [Not parasitic]
404	1997. Nellis, D.W.. <i>Poisonous plants and animals of Florida and the Caribbean</i> . Pineapple Press Inc., Sarasota, FL	"Due to the irritation and unpleasant taste of the sap, livestock seldom consume enough to require veterinary care." [highly unpalatable]
405	1997. Nellis, D.W.. <i>Poisonous plants and animals of Florida and the Caribbean</i> . Pineapple Press Inc., Sarasota, FL	"Toxic properties: The very caustic, milky juice of the roots, stems and leaves contains euphorbol and other diterpene esters which are irritants and cocarcinogens...Symptoms: If ingested, a few drops of the juice produce irritation of the mouth and throat, vomiting and diarrhea. Externally, the juice produces irritation, inflammation and blistering of the skin. The lesions on the skin of livestock are prone to secondary infections. The sap produces an intensely painful irritation of the eye, often followed by keratoconjunctivitis and temporarily reduced visual acuity. The seeds cause violent, persistent vomiting and drastic diarrhea."
406	2005. Staples, G. W./Herbst, D. R.. <i>A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places</i> . Bishop Museum Press, Honolulu, HI.	"Pests are not a problem for slipper flowers."
406	2008. PATSP. Twenty-something ( <i>Pedilanthus tithymaloides</i> ). <a href="http://plantsarethe strangest people.blogspot.com/2008/03/twenty-something-pedilanthus.html">http://plantsarethe strangest people.blogspot.com/2008/03/twenty-something-pedilanthus.html</a>	"Pests: I have never seen, or even heard of, <i>Pedilanthus tithymaloides</i> having a pest problem. That doesn't mean it doesn't happen, but it does mean that this is not a plant where you're forever going to be fighting bugs..."

407	1997. Nellis, D.W.. Poisonous plants and animals of Florida and the Caribbean. Pineapple Press Inc., Sarasota, FL	"Toxic properties: The very caustic, milky juice of the roots, stems and leaves contains euphorbol and other diterpene esters which are irritants and cocarcinogens...Symptoms: If ingested, a few drops of the juice produce irritation of the mouth and throat, vomiting and diarrhea. Externally, the juice produces irritation, inflammation and blistering of the skin. The lesions on the skin of livestock are prone to secondary infections. The sap produces an intensely painful irritation of the eye, often followed by keratoconjunctivitis and temporarily reduced visual acuity. The seeds cause violent, persistent vomiting and drastic diarrhea."
408	2005. Staples, G. W./Herbst, D. R.. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI.	"branches succulent" [although sap may contain flammable oils, there is no evidence that this species creates a fire hazard in natural ecosystems]
409	1992. Holttum, R.E./Enoch, I.. Gardening in the tropics. Timber Press, Portland, OR	"For best development, the plants need full sun, a well drained soil, limited watering and very little fertilizer."
409	2010. Dave's Garden. PlantFiles: Devil's Backbone, Japanese Poinsettia, Slipper Spurge, Redbird Cactus, Christmas Candle - Euphorbia tithymaloides. Dave's Garden, <a href="http://davesgarden.com/guides/pf/go/162556/">http://davesgarden.com/guides/pf/go/162556/</a>	"Sun Exposure: Full Sun, Sun to Partial Shade"
409	2010. Desert Tropicals. Devil's Backbone - Pedilanthus tithymaloides. <a href="http://www.desert-tropicals.com/Plants/Euphorbiaceae/Pedilanthus_tithymaloides.html">http://www.desert-tropicals.com/Plants/Euphorbiaceae/Pedilanthus_tithymaloides.html</a>	"Sun Exposure: Light shade"
410	2005. Staples, G. W./Herbst, D. R.. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI.	"garden plants thrive in any porous, well-drained soil of average fertility.
410	2010. Dave's Garden. PlantFiles: Devil's Backbone, Japanese Poinsettia, Slipper Spurge, Redbird Cactus, Christmas Candle - Euphorbia tithymaloides. Dave's Garden, <a href="http://davesgarden.com/guides/pf/go/162556/">http://davesgarden.com/guides/pf/go/162556/</a>	"Soil pH requirements: 6.1 to 6.5 (mildly acidic) 6.6 to 7.5 (neutral) 7.6 to 7.8 (mildly alkaline)"
410	2010. Learn 2 Grow. Plant Search - Pedilanthus tithymaloides. <a href="http://www.learn2grow.com/plants/pedilanthus-tithymaloides/">http://www.learn2grow.com/plants/pedilanthus-tithymaloides/</a>	"Soil type: Loam, Sand"
411	1967. Woodson, Jr., R.E./Schery, R.W./Webster, G.L./Burch, D.. Flora of Panama. Part VI. Family 97. Euphorbiaceae. Annals of the Missouri Botanical Garden. 54(3): 211-350.	"Shrub to 1.5 m" [not climbing or smothering]
412	2010. WRA Specialist. Personal Communication.	No evidence of forming dense thickets in native or naturalized environments.
501	1967. Woodson, Jr., R.E./Schery, R.W./Webster, G.L./Burch, D.. Flora of Panama. Part VI. Family 97. Euphorbiaceae. Annals of the Missouri Botanical Garden. 54(3): 211-350.	"Shrub to 1.5 m" [terrestrial plant]
502	1967. Woodson, Jr., R.E./Schery, R.W./Webster, G.L./Burch, D.. Flora of Panama. Part VI. Family 97. Euphorbiaceae. Annals of the Missouri Botanical Garden. 54(3): 211-350.	Euphorbiaceae
503	1967. Woodson, Jr., R.E./Schery, R.W./Webster, G.L./Burch, D.. Flora of Panama. Part VI. Family 97. Euphorbiaceae. Annals of the Missouri Botanical Garden. 54(3): 211-350.	Euphorbiaceae [not a nitrogen fixing woody plant]
504	1967. Woodson, Jr., R.E./Schery, R.W./Webster, G.L./Burch, D.. Flora of Panama. Part VI. Family 97. Euphorbiaceae. Annals of the Missouri Botanical Garden. 54(3): 211-350.	"Shrub to 1.5 m" [not a geophyte]
601	1913. Millspaugh, C.F.. The genera Pedilanthus and Cubanthus, and other American Euphorbiaceae. Fieldiana. 2(9): 353-377.	No evidence of substantial reproductive failure in native habitat.

601	1967. Woodson, Jr., R.E./Schery, R.W./Webster, G.L./Burch, D.. Flora of Panama. Part VI. Family 97. Euphorbiaceae. Annals of the Missouri Botanical Garden. 54(3): 211-350.	No evidence
601	2003. Steinmann, V.W.. The submersion of <i>Pedilanthus</i> into <i>Euphorbia</i> (Euphorbiaceae). <i>Acta Botánica Mexicana</i> . 65: 45-50.	No evidence
602	1913. Millspaugh, C.F.. The genera <i>Pedilanthus</i> and <i>Cubanthus</i> , and other American Euphorbiaceae. <i>Fieldiana</i> . 2(9): 353-377.	"Capsule 7.5 mm. long, 9 mm. broad, truncate at base and apex, coccae keeled; seeds ovate, 5 mm. long."
602	2005. Staples, G. W./Herbst, D. R.. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI.	"Selected cultivars must be propagated by cuttings to retain their desired characters; seed can be used, though the plants do not come true."
602	2010. Welzen, P.C. van/Chayamarit, K.. Flora of Thailand Euphorbiaceae. Nationaal Herbarium Nederland, Leiden; Forest Herbarium, National Park, Wildlife & Plant Conservation Department, Bangkok <a href="http://www.nationaalherbarium.nl/thaieuph">www.nationaalherbarium.nl/thaieuph</a>	Fruits 5-6 mm in diam., sulcate. Seeds subglobose, 3-4.5 by 2.5-3 mm, grey-brown (not known from Thailand). [suggests seeds are not always produced in introduced range]
603	2010. WRA Specialist. Personal Communication.	Unknown
604	1973. Webster, G.L./Rupert, E.A.. Phylogenetic Significance of Pollen Nuclear Number in the Euphorbiaceae. <i>Evolution</i> . 27(3): 524-531.	"Only in the genus <i>Euphorbia</i> has self incompatibility been demonstrated, and so far this has been documented for only two species: <i>E. cyparissias</i> (Muenscher, 1936) and <i>E. milii</i> (East, 1940)." [self-compatibility in <i>Pedilanthus</i> unknown]
605	2003. Steinmann, V.W.. The submersion of <i>Pedilanthus</i> into <i>Euphorbia</i> (Euphorbiaceae). <i>Acta Botánica Mexicana</i> . 65: 45-50.	"...it has long been suspected that the genus <i>Pedilanthus</i> arose from ancestral <i>Euphorbia</i> under the selection of hummingbird pollination (Dressler, 1957; Webster, 1967), and both these authors suggested an origin from within <i>Euphorbia</i> subg. <i>Agaloma</i> ."
605	2010. Cacho, N.I./Berry, P.E./Olson, M.E./Steinmann, V.W./Baum, D.A.. Are spurred cyathia a key innovation? Molecular systematics & trait evolution in the slipper spurge ( <i>Pedilanthus</i> clade: <i>Euphorbia</i> , Euphorbiaceae). <i>American Journal of Botany</i> . 97(3): 49	"This contrasts with <i>E. tithymaloides</i> cyathia of nearby populations, which seem to receive almost exclusively hummingbird visits." [apparently requires specialist pollinators]
606	1992. Holtum, R.E./Enoch, I.. Gardening in the tropics. Timber Press, Portland, OR	"Propagation is very easy by means of cuttings, and almost any short piece of stem will root if it is pushed into the soil."
701	1999. Kruer, C.R./Taylor, J.E.. North Key Largo Invasive Exotic Vegetation Mapping & Assessment. Pp 67-80. Florida's Garden of Good and Evil: Proceedings of a Joint Conference of the Exotic Pest Plant Council & the Florida Native Plant Society.	"Persists near damp sites along SR-905 and residences" [dispersed unintentionally as garden waste]
702	2005. Staples, G. W./Herbst, D. R.. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI.	"Plants are cultivated as ornamentals, as hedges or 'living fences,' and for medicinal purposes..."
703	2010. WRA Specialist. Personal Communication.	No evidence, and unlikely to be grown with produce.
704	1967. Woodson, Jr., R.E./Schery, R.W./Webster, G.L./Burch, D.. Flora of Panama. Part VI. Family 97. Euphorbiaceae. Annals of the Missouri Botanical Garden. 54(3): 211-350.	"Capsule ovoid, to 6 mm long, 7 mm diam, glabrous; seed ovoid, obscurely angled, to 5 mm long, the surface smooth, gray." [no special adaptations for wind dispersal, but small seed size may make short distance wind dispersal possible]
705	2010. WRA Specialist. Personal Communication.	No evidence of or apparent adaptations for water dispersal.
706	1967. Woodson, Jr., R.E./Schery, R.W./Webster, G.L./Burch, D.. Flora of Panama. Part VI. Family 97. Euphorbiaceae. Annals of the Missouri Botanical Garden. 54(3): 211-350.	"Capsule ovoid, to 6 mm long, 7 mm diam, glabrous; seed ovoid, obscurely angled, to 5 mm long, the surface smooth, gray." [not fleshy-fruited]
707	1967. Woodson, Jr., R.E./Schery, R.W./Webster, G.L./Burch, D.. Flora of Panama. Part VI. Family 97. Euphorbiaceae. Annals of the Missouri Botanical Garden. 54(3): 211-350.	"Capsule ovoid, to 6 mm long, 7 mm diam, glabrous; seed ovoid, obscurely angled, to 5 mm long, the surface smooth, gray." [no evidence, and no means of external attachment to animals]
708	2010. WRA Specialist. Personal Communication.	Unknown if seeds will survive passage through gut, but unlikely to be consumed.

801	2010. WRA Specialist. Personal Communication.	Unknown
802	2010. WRA Specialist. Personal Communication.	Soil seed longevity unknown
803	2010. WRA Specialist. Personal Communication.	Effectiveness of herbicides unknown
804	1992. Holttum, R.E./Enoch, I.. Gardening in the tropics. Timber Press, Portland, OR	"Pruning several times while the plants are young will encourage many branches to develop, which will give a very dense, bushy appearance eventually." [tolerates repeated pruning and cutting back]
804	2000. Whistler, W.A.. Tropical Ornamentals: A Guide. Timber Press, Portland, OR	"Relatively unattractive individuals can be made bushier and more attractive by pruning."
805	2010. WRA Specialist. Personal Communication.	Unknown