

Family: *Acanthaceae*

Taxon: *Thunbergia fragrans*

Synonym: *Flemingia grandiflora* Roxb. Ex Rottler
Thunbergia volubilis Pers.

Common Name white thunbergia
white lady

Questionnaire :	current 20090513	Assessor:	Patti Clifford	Designation: H(HPWRA)
Status:	Assessor Approved	Data Entry Person:	Patti Clifford	WRA Score 9
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)	y
304	Environmental weed		n=0, y = 2*multiplier (see Appendix 2)	
305	Congeneric weed		n=0, y = 1*multiplier (see Appendix 2)	y
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	
405	Toxic to animals		y=1, n=0	n
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	n
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	y

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	n
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	1
701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	y=1, n=-1	n
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	n
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/m ²)	y=1, n=-1	n
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 **9**

Supporting Data:

101	2010. WRA Specialist. Personal Communication.	No evidence.
201	2010. USDA, ARS, National Genetic Resources Program. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Bethesda, Maryland	Native to: Asia Temperate - China ; Asia Tropical - Bhutan, India, Nepal, Sri Lanka, Indochina, Myanmar.
202	2010. USDA, ARS, National Genetic Resources Program. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Bethesda, Maryland	Native to: Asia Temperate - China ; Asia Tropical - Bhutan, India, Nepal, Sri Lanka, Indochina, Myanmar.
203	1983. Haselwood, E.L./Motter, G.G./Hirano, R.T. (eds.). Handbook of Hawaiian weeds. University of Hawaii Press, Honolulu	Found from sea-level to 4,000 feet in Hawaii.
203	1999. Gilman, E.F.. Thunbergia fragrans. Fact Sheet FPS -579: .Environmental Horticulture Department, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida, http://hort.ifas.ufl.edu/database/documents/	USDA Zones 10 - 11.
203	2009. Dave's Garden. PlantFiles: White Lady, Sweet Clock-Vine Thunbergia fragrans. Dave's Garden, http://davesgarden.com/guides/pf/go/2756/	USDA hardiness zones 10b (to 1.7 °C (35 °F), 11: above 4.5 ° (40°F).
204	1991. Smith, A.C.. Flora Vitiensis nova: a new flora of Fiji Volume 5. National Tropical Botanical Garden, Lawai	Naturalized in Fiji along roadsides, thickets and coconut plantations.
204	2002. Tseng, Y.-H./Ou, C.-H.. Thunbergia fragrans Roxb. (Acanthaceae): a newly naturalized plant in Taiwan. Endemic Species Research. 4: 59-62. http://wwwdb.tesri.gov.tw/protect/UploadPic/027017472/02701747259/02701747259_pdf.pdf	Naturalized in areas of Taiwan.
204	2010. USDA, ARS, National Genetic Resources Program. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Bethesda, Maryland	Native to: Asia Temperate - China ; Asia Tropical - Bhutan, India, Nepal, Sri Lanka, Indochina, Myanmar.
205	2000. Whistler, W.A.. Tropical Ornamentals: A Guide. Timber Press, Portland, OR	Widely cultivated in the tropics and subtropics.
301	1991. Smith, A.C.. Flora Vitiensis nova: a new flora of Fiji Volume 5. National Tropical Botanical Garden, Lawai	Naturalized in Fiji along roadsides, thickets and coconut plantations.
301	2002. Tseng, Y.-H./Ou, C.-H.. Thunbergia fragrans Roxb. (Acanthaceae): a newly naturalized plant in Taiwan. Endemic Species Research. 4: 59-62. http://wwwdb.tesri.gov.tw/protect/UploadPic/027017472/02701747259/02701747259_pdf.pdf	Naturalized in areas of Taiwan.
302	2007. Randall, R.P.. Global Compendium of Weeds. http://www.hear.org/gcw/	Listed as a cultivation escape on The Global Compendium of Weeds, but no evidence of control.
303	1997. Nishimoto, R.K.. Herbicide options for weed control in papaya. Integrated Pest Management Reviews. 2: 109-111.	Glyphosate has provided control of Thunbergia fragrans in agricultural fields of papaya.
305	2003. Weber, E.. Invasive Plant Species of the World. A Reference Guide to Environmental Weeds.. CABI Publishing, Wallingford, UK	Thunbergia grandiflora invades forests and forest edges, riparian habitats and coastal areas. A vigorous climber, spreads mainly by stolons, developing an extensive tuberous root system. Dense infestations can kill host trees. Imazapyr is an effective herbicide.

305	2009. Department of Employment, Economic Development and Innovation Queensland Government. <i>Thunbergia grandiflora</i> . Department of Employment, Economic Development and Innovation Queensland Government,	<i>Thunbergia grandiflora</i> is highly invasive to native vegetation and rainforests in Queensland. It degrades creek and river banks.
401	2000. Whistler, W.A.. <i>Tropical Ornamentals: A Guide</i> . Timber Press, Portland, OR	"Vine, herbaceous, twining. Leaves simple, opposite, blade ovate to arrowhead-shaped, usually 5-12 cm long (2-5 in). Flowers continuously throughout the year; flowers solitary or paired, axillary on a long stalk with a pair of leafy bracts below, not fragrant. Corolla of fused petals, salverform, tube 2-3 cm long (3/4 - 1 1/4 in), with a spreading five-lobed limb 4-6 cm across (1 5/8 - 2 1/2 in), white. Fruit a subglobose capsule with an extended terminal beak to 2 cm long (3/4 in)"
402	2010. WRA Specialist. Personal Communication.	Unknown.
403	2000. Whistler, W.A.. <i>Tropical Ornamentals: A Guide</i> . Timber Press, Portland, OR	"Vine, herbaceous, twining. Leaves simple, opposite, blade ovate to arrowhead-shaped, usually 5-12 cm long (2-5 in). Flowers continuously throughout the year; flowers solitary or paired, axillary on a long stalk with a pair of leafy bracts below, not fragrant. Corolla of fused petals, salverform, tube 2-3 cm long (3/4 - 1 1/4 in), with a spreading five-lobed limb 4-6 cm across (1 5/8 - 2 1/2 in), white. Fruit a subglobose capsule with an extended terminal beak to 2 cm long (3/4 in)"
404	2004. Daniel, T.F.. <i>Acanthaceae of Sonora: taxonomy and phytogeography</i> . <i>Proceedings of the California Academy of Sciences</i> . 55: 690-805.	Nearly all Acanthaceae are palatable to animals. In Sonora, Mexico, Acanthaceae serve as browse for both native animals and livestock.
404	2010. WRA Specialist. Personal Communication.	Unknown
405	2010. National Center for Biotechnology Information. PubMed. U.S. National Library of Medicine, Bethesda, Maryland http://www.ncbi.nlm.nih.gov/sites/entrez	No allergies or toxicity found in PubMed.
405	2010. Specialized Information Services, U.S. National Library of Medicine. TOXNET Toxicology Data Network [Online Database]. National Institutes of Health, http://toxnet.nlm.nih.gov/	No evidence of toxicity in ToxNet.
406	1999. Gilman, E.F.. <i>Thunbergia fragrans</i> . Fact Sheet FPS -579: .Environmental Horticulture Department, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida, http://hort.ifas.ufl.edu/database/documents/	Not usually affected by pests.
407	2009. Pollenlibrary. Allergens and plant research by location. SDI Health LLC, www.pollenlibrary.com	No allergies to pollen in literature.
407	2010. National Center for Biotechnology Information. PubMed. U.S. National Library of Medicine, Bethesda, Maryland http://www.ncbi.nlm.nih.gov/sites/entrez	No allergies or toxicity found in PubMed.
407	2010. Specialized Information Services, U.S. National Library of Medicine. TOXNET Toxicology Data Network [Online Database]. National Institutes of Health, http://toxnet.nlm.nih.gov/	No evidence of toxicity in ToxNet.
408	2000. Whistler, W.A.. <i>Tropical Ornamentals: A Guide</i> . Timber Press, Portland, OR	"Vine, herbaceous, twining. Leaves simple, opposite, blade ovate to arrowhead-shaped, usually 5-12 cm long (2-5 in). Flowers continuously throughout the year; flowers solitary or paired, axillary on a long stalk with a pair of leafy bracts below, not fragrant. Corolla of fused petals, salverform, tube 2-3 cm long (3/4 - 1 1/4 in), with a spreading five-lobed limb 4-6 cm across (1 5/8 - 2 1/2 in), white. Fruit a subglobose capsule with an extended terminal beak to 2 cm long (3/4 in)"
409	2009. Dave's Garden. PlantFiles: White Lady, Sweet Clock-Vine <i>Thunbergia fragrans</i> . Dave's Garden, http://davesgarden.com/guides/pf/go/2756/	Full sun.

410	1999. Gilman, E.F.. <i>Thunbergia fragrans</i> . Fact Sheet FPS -579: Environmental Horticulture Department, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida, http://hort.ifas.ufl.edu/database/documents/	Soil tolerances: acidic; alkaline; sand; loam; clay
410	2009. Dave's Garden. PlantFiles: White Lady, Sweet Clock-Vine <i>Thunbergia fragrans</i> . Dave's Garden, http://davesgarden.com/guides/pf/go/2756/	Soil pH requirements: 6.1 to 6.5 (mildly acidic), 6.6 to 7.5 (neutral), 7.6 to 7.8 (mildly alkaline).
411	2009. Dave's Garden. PlantFiles: White Lady, Sweet Clock-Vine <i>Thunbergia fragrans</i> . Dave's Garden, http://davesgarden.com/guides/pf/go/2756/	Vine.
412	2009. Dave's Garden. PlantFiles: White Lady, Sweet Clock-Vine <i>Thunbergia fragrans</i> . Dave's Garden, http://davesgarden.com/guides/pf/go/2756/	Vine.
501	2000. Whistler, W.A.. Tropical Ornamentals: A Guide. Timber Press, Portland, OR	Terrestrial. "Vine, herbaceous, twining. Leaves simple, opposite, blade ovate to arrowhead-shaped, usually 5-12 cm long (2-5 in). Flowers continuously throughout the year; flowers solitary or paired, axillary on a long stalk with a pair of leafy bracts below, not fragrant. Corolla of fused petals, salverform, tube 2-3 cm long (3/4 - 1 1/4 in), with a spreading five-lobed limb 4-6 cm across (1 5/8 - 2 1/2 in), white. Fruit a subglobose capsule with an extended terminal beak to 2 cm long (3/4 in)"
502	2010. USDA, ARS, National Genetic Resources Program. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Bethesda, Maryland	Acanthaceae.
503	2010. www.nationmaster.com. Encyclopedia Nitrogen fixation. Nationmaster.com, http://www.nationmaster.com/encyclopedia/Nitrogen-fixation	Acanthaceae.
504	2000. Whistler, W.A.. Tropical Ornamentals: A Guide. Timber Press, Portland, OR	Terrestrial. "Vine, herbaceous, twining. Leaves simple, opposite, blade ovate to arrowhead-shaped, usually 5-12 cm long (2-5 in). Flowers continuously throughout the year; flowers solitary or paired, axillary on a long stalk with a pair of leafy bracts below, not fragrant. Corolla of fused petals, salverform, tube 2-3 cm long (3/4 - 1 1/4 in), with a spreading five-lobed limb 4-6 cm across (1 5/8 - 2 1/2 in), white. Fruit a subglobose capsule with an extended terminal beak to 2 cm long (3/4 in)"
601	2010. WRA Specialist. Personal Communication.	No evidence.
602	2008. Liu, K./Eastwood, R. J./Flynn, S./Turner, R. M./Stuppy, W. H.. Seed Information Database (release 7.1, May 2008). http://www.kew.org/data/sid	Orthodox seeds. Viable after 2 -3 years in commercial storage facility.
602	2009. Dave's Garden. PlantFiles: White Lady, Sweet Clock-Vine <i>Thunbergia fragrans</i> . Dave's Garden, http://davesgarden.com/guides/pf/go/2756/	Propagation from seed, softwood cuttings and layering.
603	2010. WRA Specialist. Personal Communication.	Unknown.
604	2010. WRA Specialist. Personal Communication.	Unknown.
605	1974. Percival, M.. Floral ecology of coastal scrub in Southeast Jamaica. <i>Biotropica</i> . 6: 104-129.	Flowers of <i>Thunbergia fragrans</i> were visited throughout the daylight hours by two species of native insects and by non-natives species of Thysanoptera. There was a good percentage of seedset of the flowers following visitation.

605	2007. Schmidt-Lebuhn, A.N./Schwerdtfeger, M./Kessler, M./Lohaus, G. Phylogenetic constraints vs. ecology in the nectar composition of Acanthaceae. <i>Flora-Morphology, Distribution, Functional Ecology of Plants</i> . 202: 62-69.	"Nectar composition and concentration were analyzed for 75 samples of 70 species of Acanthaceae representing all major intrafamilial groups. Analyses of variance were conducted to test for significant differences between pollination syndromes and between taxonomical or phylogenetic groups (genera). The available data indicate that the characteristics of nectar in Acanthaceae are predominantly determined by adaptation to needs of the pollinators rather than by phylogenetic constraints." <i>Thunbergia fragrans</i> was categorized as having a sphingophilous (moth) pollination syndrome.
606	2003. Starr, F./Starr, K./Loope, L.. <i>Thunbergia fragrans</i> sweet clock vine Acanthaceae. USGS - Biological Resources Haleakala Field Station Maui,	Propagated by seeds, cuttings and fragments of stems and roots.
606	2009. Dave's Garden. PlantFiles: White Lady, Sweet Clock-Vine <i>Thunbergia fragrans</i> . Dave's Garden, http://davesgarden.com/guides/pf/go/2756/	Propagation from seed, softwood cuttings and layering.
607	1999. Gilman, E.F.. <i>Thunbergia fragrans</i> . Fact Sheet FPS -579: .Environmental Horticulture Department, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida, http://hort.ifas.ufl.edu/database/documents/	Growth rate: fast.
701	2000. Whistler, W.A.. <i>Tropical Ornamentals: A Guide</i> . Timber Press, Portland, OR	Not likely. Fruit a subglobose capsule with an extended terminal beak to 2 cm long (3/4 in)"
702	2000. Whistler, W.A.. <i>Tropical Ornamentals: A Guide</i> . Timber Press, Portland, OR	Widely cultivated in the tropics and subtropics.
702	2003. Starr, F./Starr, K./Loope, L.. <i>Thunbergia fragrans</i> sweet clock vine Acanthaceae. USGS - Biological Resources Haleakala Field Station Maui,	" <i>T. fragrans</i> is spread long distances by people who use the plant as an ornamental. <i>T. fragrans</i> readily spreads by seeds and cuttings to moist lowland disturbed areas in Hawai'i."
703	2010. WRA Specialist. Personal Communication.	Not grown with produce or hay.
704	2010. WRA Specialist. Personal Communication.	No adaptation for wind dispersal. (1) Fruit a subglobose capsule with an extended terminal beak to 2 cm long (3/4 in)"
705	2010. WRA Specialist. Personal Communication.	No adaptation for water dispersal. (1) Fruit a subglobose capsule with an extended terminal beak to 2 cm long (3/4 in)"
706	2000. Whistler, W.A.. <i>Tropical Ornamentals: A Guide</i> . Timber Press, Portland, OR	No adaptation for bird dispersal (such as fleshy berry). (1) Fruit a subglobose capsule with an extended terminal beak to 2 cm long (3/4 in)"
707	2000. Whistler, W.A.. <i>Tropical Ornamentals: A Guide</i> . Timber Press, Portland, OR	No means of external attachment. (1) Fruit a subglobose capsule with an extended terminal beak to 2 cm long (3/4 in)"
708	2010. WRA Specialist. Personal Communication.	Unknown.
801	1998. Wasshausen, D.C.. <i>Acanthaceae of the Southeastern United States</i> . <i>Castanea</i> . 63: 99-116.	Fruit a 2-valved loculicidal capsule. Seeds 2 in each valve (genera description). Flowers year round.
802	2010. WRA Specialist. Personal Communication.	Unknown.
803	2010. WRA Specialist. Personal Communication.	Unknown.
804	1999. Gilman, E.F.. <i>Thunbergia fragrans</i> . Fact Sheet FPS -579: .Environmental Horticulture Department, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida, http://hort.ifas.ufl.edu/database/documents/	<i>Thunbergia fragrans</i> will run wild if not pruned back.
805	2010. WRA Specialist. Personal Communication.	Unknown.