Key Words: Evaluate, Naturalized, Tropical Shrub, Forage Plant, Wind-dispersed

Family: ***Asteraceae***

Taxon: ***Verbesina turbacensis***

Synonym: *Verbesina exalata Steyerm.*
Verbesina nicaraguensis Benth.
Verbesina sublobata Benth.
Verbesina verbascifolia Walp.

Common Name: verbesina

Questionaire : current 20090513 **Assessor:** Chuck Chimera **Designation:** EVALUATE
Status: Assessor Approved **Data Entry Person:** Chuck Chimera **WRA Score** 5

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**	**y**
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**	**n**
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)**	**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**	**n**
405	**Toxic to animals**	**y=1, n=0**	**n**
406	**Host for recognized pests and pathogens**	**y=1, n=0**	
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**	

410	**Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)**	**y=1, n=0**	
411	**Climbing or smothering growth habit**	**y=1, n=0**	**n**
412	**Forms dense thickets**	**y=1, n=0**	
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**	
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**	
702	**Propagules dispersed intentionally by people**	**y=1, n=-1**	
703	**Propagules likely to disperse as a produce contaminant**	**y=1, n=-1**	**n**
704	**Propagules adapted to wind dispersal**	**y=1, n=-1**	**y**
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**	
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: EVALUATE **WRA Score** 5

Supporting Data:

101	1975. Woodson, Jr., R.E./Schery, R.W./D'Arcy, W.G. et al.. Flora of Panama. Part IX. Family 184. Compositae. Annals of the Missouri Botanical Garden. 62(4): 835-1321.	[Is the species highly domesticated? No] No evidence
101	2008. Gargiullo, M.B./Magnuson, B.L/Kimball, L.D.. A field guide to plants of Costa Rica. Oxford University Press US, New York, NY	[Is the species highly domesticated? No] No evidence
102	2012. WRA Specialist. Personal Communication.	NA
103	2012. WRA Specialist. Personal Communication.	NA
201	2012. Tropicos.org. Tropicos [Online Database]. Missouri Botanical Garden, http://www.tropicos.org/	[Species suited to tropical or subtropical climate(s) 2-High] Native to Central and South America [Belize, Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Colombia, Venezuela]
202	2012. Tropicos.org. Tropicos [Online Database]. Missouri Botanical Garden, http://www.tropicos.org/	[Quality of climate match data 2-High]
203	1999. Grantham, M./Tan, B.. Cloud Forest Daisies: Horticultural Treasures of Montane Mexico. Pacific Horticulture. Fall: 50-56.	[Broad climate suitability (environmental versatility)? Yes] "In Southern Mexico plants are found at elevations of about 3,000 to 9,000 feet in montane rain forest growing with firs, liquidambar, pines, podocarps, and oaks (Quercus)." [Elevation range exceeds 1000 m]
203	2008. Gargiullo, M.B./Magnuson, B.L/Kimball, L.D.. A field guide to plants of Costa Rica. Oxford University Press US, New York, NY	[Broad climate suitability (environmental versatility)? Yes] "Open sites, roadsides, second growth, mostly in mountain regions. Altitude 100 - 2000 m, mostly over 1000 m on the Pacific slope." [Elevation range exceeds 1000 m]
204	2008. Gargiullo, M.B./Magnuson, B.L/Kimball, L.D.. A field guide to plants of Costa Rica. Oxford University Press US, New York, NY	[Native or naturalized in regions with tropical or subtropical climates? Yes] "This is the most common species of Verbesina in Costa Rica. It is very similar to Verbesina gigantea which is less common and found at lower elevations."
205	2012. Tropicos.org. Tropicos [Online Database]. Missouri Botanical Garden, http://www.tropicos.org/	[Does the species have a history of repeated introductions outside its natural range? No evidence]
301	2012. Parker, J.. BIISC Early Detection Botanist. Pers. Comm. 14 June 2012.	[Naturalized beyond native range? Yes] "Some new suggestions: Manihot glaziovii, Verbesina turbacensis, Tibouchina longifolia. All have been found naturalized on the island."
302	2008. Gargiullo, M.B./Magnuson, B.L/Kimball, L.D.. A field guide to plants of Costa Rica. Oxford University Press US, New York, NY	[Garden/amenity/disturbance weed? No evidence] "Open sites, roadsides, second growth, mostly in mountain regions. Altitude 100 - 2000 m, mostly over 1000 m on the Pacific slope." [Possible that this species could exploit disturbed sites in an introduced region]
303	2007. Randall, R.P.. Global Compendium of Weeds - Index. http://www.hear.org/gcw/	[Agricultural/forestry/horticultural weed? No evidence]
304	2007. Randall, R.P.. Global Compendium of Weeds - Index. http://www.hear.org/gcw/	[Environmental weed? No evidence]
305	1992. Herbst, D.R./Wagner, W.L.. Alien Plants on the Northwestern Hawaiian Islands. Pp. 189-224 in Stone et al. (eds.) Alien Plant Invasions in Native Ecosystems of Hawai`i: Management & Research. Coop. Nat. Park Res. Studies Unit, U Hawaii, Honolulu, HI	[Congeneric weed? Yes] "Golden crown-beard (Verbesina encelioides) has become a management problem. It was first reported on Kure Atoll by H.F. Clay in October 1959, growing near the radar reflector on Green Island. Bermuda grass (Cynodon dactylon), ironwood, and sourbush (Pluchea symphytifolia) were growing with it. Clay surmised that seeds of these plants were brought on equipment from Midway Atoll in 1955 when the reflector was built (Clay 1961). Golden crown-beard and sweet alyssum (Lobularia maritima) have become widespread on Green Island and are undergoing population explosions (Corn et al. 1981). Golden crown-beard forms a thicket that limits the space for ground-nesting seabirds, and it has become necessary to mow the central plain of Green Island to restore nesting areas for the birds."
401	1975. Woodson, Jr., R.E./Schery, R.W./D'Arcy, W.G. et al.. Flora of Panama. Part IX. Family 184. Compositae. Annals of the Missouri Botanical Garden. 62(4): 835-1321.	[Produces spines, thorns or burrs? No] "Shrub or tree to 4 m tall; stems tomentose, with thin petiolar wings. Leaves alternate, to 25 cm long, the larger ones sinuate-lobed, minutely callose denticulate, the midvein prominent, elevated beneath, the minor venation sometimes appearing reticulate beneath, above scabridulous with short, stout-based hairs, beneath softly tomentose with short, verrucose hairs; petiole cuneiform-winged to near the base, mostly distinct from the blade, concaulescent and forming thin wings on the stem in the region of the inflorescence."

402	2000. Inderjit/Asakawa, C./Dakshini , K.M.M.. Allelopathic potential of Verbesina encelioides root leachate in soil. Canadian Journal of Botany. 77(10): 1419-1424.	[Allelopathic? Unknown for V. turbacensis] "Our research demonstrates the allelopathic potential of V. encelioides roots and the probable involvement of allelopathy in its interference success." [Related species potentially allelopathic]
403	1975. Woodson, Jr., R.E./Schery, R.W./D'Arcy, W.G. et al.. Flora of Panama. Part IX. Family 184. Compositae. Annals of the Missouri Botanical Garden. 62(4): 835-1321.	[Parasitic? No] "Shrub or tree to 4 m tall; stems tomentose, with thin petiolar wings." [Asteraceae]
404	1994. Romero, F./Benavides, J./Kass, M./Pezo, D.. Utilization of trees and bushes in ruminant production systems. Pp 205-218 in Animal Agriculture and Natural Resources in Central America: Strategies for Sustainability. CATIE, Turrialba, Costa Rica	[Unpalatable to grazing animals? No] "Table 7. Chemical composition of the foliage of trees and bushes utilized in feeding goats in Central America] [Includes Verbesina turbacensis]
404	1999. Benavides, J.E.. Research on Forage Trees. Pp 169-206 In: First FAO Electronic Conference on Tropical feeding Systems. FAO, Rome	[Unpalatable to grazing animals? Presumably No] "Table 1. Some species of trees and shrubs with potential for forage identified in Central America." [Includes Verbesina turbacensis]
405	1994. Romero, F./Benavides, J./Kass, M./Pezo, D.. Utilization of trees and bushes in ruminant production systems. Pp 205-218 in Animal Agriculture and Natural Resources in Central America: Strategies for Sustainability. CATIE, Turrialba, Costa Rica	[Toxic to animals? No evidence] "Table 7. Chemical composition of the foliage of trees and bushes utilized in feeding goats in Central America] [Includes Verbesina turbacensis. Apparently non-toxic to goats]
405	2000. Simmonds, H./Holst, P./Bourke, C.. The palatability, and potential toxicity of Australian weeds to goats. Rural Industries Research and Development Corporation, Barton, Australia	[Toxic to animals? No evidence, but related species, Verbesina encelioides, is toxic] "The ability to poison is very variable, generally only causes problems during drought periods, but can cause problems at other times if eaten in any quantity."
406	1999. Grantham, M./Tan, B.. Cloud Forest Daisies: Horticultural Treasures of Montane Mexico. Pacific Horticulture. Fall: 50-56.	[Host for recognized pests and pathogens? Unknown] "It may be damaged by oak root fungus but can usually outgrow this pathogen"
406	2008. Smith, L.J.. Host Range, Phylogenetic, and Pathogenic Diversity of Corynespora cassiicola (Berk. & Curt.) Wei. PhD Dissertation. University of Florida, Gainesville, FL	[Host for recognized pests and pathogens? Importance of V. turbacensis as a host of this pathogen unknown] "Table 1-2. Occurrence and fungal-host interaction of Corynespora cassiicola identified during 2004-2005 Guam and Florida surveys"
407	2008. Wagstaff, D.J.. International poisonous plants checklist: an evidence-based reference. CRC Press, Boca Raton, FL	[Causes allergies or is otherwise toxic to humans? No evidence]
408	2008. Gargiullo, M.B./Magnuson, B.L/Kimball, L.D.. A field guide to plants of Costa Rica. Oxford University Press US, New York, NY	[Creates a fire hazard in natural ecosystems? No evidence]
409	2006. Zahawi, R. A./Augspurger, C.K.. Tropical Forest Restoration: Tree Islands as Recruitment Foci in Degraded Lands of Honduras. Ecological Applications. 16(2): 464-478.	[Is a shade tolerant plant at some stage of its life cycle? Probably No. Described as Early Successional] "Dominant vegetation included Pteridium aquilinum, several grasses including Andropogon sp., Stipa sp., Paspalum plicatulum Michx., and Panicum maximum Jacq., and early-successional shrubs, among them Conostegia xalapensis (Bonpl.) D. Don and Verbesina turbacensis Kunth."
409	2008. Gargiullo, M.B./Magnuson, B.L/Kimball, L.D.. A field guide to plants of Costa Rica. Oxford University Press US, New York, NY	[Is a shade tolerant plant at some stage of its life cycle? Unknown. Possibly No] "Open sites, roadsides, second growth, mostly in mountain regions. Altitude 100 - 2000 m, mostly over 1000 m on the Pacific slope." [Habit suggests this species is not shade tolerant]
410	2008. Gargiullo, M.B./Magnuson, B.L/Kimball, L.D.. A field guide to plants of Costa Rica. Oxford University Press US, New York, NY	[Tolerates a wide range of soil conditions? Unknown, but possible based on widespread distribution] "This is the most common species of Verbesina in Costa Rica. It is very similar to Verbesina gigantea which is less common and found at lower elevations."
411	1975. Woodson, Jr., R.E./Schery, R.W./D'Arcy, W.G. et al.. Flora of Panama. Part IX. Family 184. Compositae. Annals of the Missouri Botanical Garden. 62(4): 835-1321.	[Climbing or smothering growth habit? No] "Shrub or tree to 4 m tall; stems tomentose, with thin petiolar wings."
412	1975. Woodson, Jr., R.E./Schery, R.W./D'Arcy, W.G. et al.. Flora of Panama. Part IX. Family 184. Compositae. Annals of the Missouri Botanical Garden. 62(4): 835-1321.	[Forms dense thickets? No evidence]
412	2008. Gargiullo, M.B./Magnuson, B.L/Kimball, L.D.. A field guide to plants of Costa Rica. Oxford University Press US, New York, NY	[Forms dense thickets? No evidence]

412	2012. IABIN SSTN. Occurrence Details: HULE Plantae 1775016 - Verbesina turbacensis. http://ara.inbio.ac.cr/SSTN-IABIN/occurrences/6042191	[Forms dense thickets? Unknown] "Santo Tomas, Route 7; thickets, dry hill side and low damp spot"
501	1975. Woodson, Jr., R.E./Schery, R.W./D'Arcy, W.G. et al.. Flora of Panama. Part IX. Family 184. Compositae. Annals of the Missouri Botanical Garden. 62(4): 835-1321.	[Aquatic? No] "Shrub or tree to 4 m tall; stems tomentose, with thin petiolar wings."
502	2012. Tropicos.org. Tropicos [Online Database]. Missouri Botanical Garden, http://www.tropicos.org/	[Grass? No[Asteraceae
503	2012. Tropicos.org. Tropicos [Online Database]. Missouri Botanical Garden, http://www.tropicos.org/	[Nitrogen fixing woody plant? No] Asteraceae
504	1975. Woodson, Jr., R.E./Schery, R.W./D'Arcy, W.G. et al.. Flora of Panama. Part IX. Family 184. Compositae. Annals of the Missouri Botanical Garden. 62(4): 835-1321.	[Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)? No] "Shrub or tree to 4 m tall; stems tomentose, with thin petiolar wings."
601	2008. Gargiullo, M.B./Magnuson, B.L/Kimball, L.D.. A field guide to plants of Costa Rica. Oxford University Press US, New York, NY	[Evidence of substantial reproductive failure in native habitat? No] "This is the most common species of Verbesina in Costa Rica. It is very similar to Verbesina gigantea which is less common and found at lower elevations."
602	1975. Woodson, Jr., R.E./Schery, R.W./D'Arcy, W.G. et al.. Flora of Panama. Part IX. Family 184. Compositae. Annals of the Missouri Botanical Garden. 62(4): 835-1321.	[Produces viable seed? Yes] "Achene body black, 2.5 mm long, 4 angled, slightly compressed, those of the margins with large, white, tubercular based trichomes, those of the disc mostly smooth, the wings ca. 1-4 mm wide, white, minutely striate; pappus of two unequal, strigose, short awns."
603	2012. WRA Specialist. Personal Communication.	[Hybridizes naturally? Unknown]
604	1987. Kaul, M.L.H./Mangal, P.D.. Phenology and Germination of Crownbeard (Verbesina encelioides). Weed Science. 35(4): 513-518.	[Self-compatible or apomictic? Unknown. Related species self-compatible] "In addition to high and rapid seed germination, efficient seedling survival, and quick vegetative and reproductive growth found in these experiments, the weed exhibits extensive seed production, efficient self- and cross pollination, and broad ecological amplitude (8)."
605	1975. Woodson, Jr., R.E./Schery, R.W./D'Arcy, W.G. et al.. Flora of Panama. Part IX. Family 184. Compositae. Annals of the Missouri Botanical Garden. 62(4): 835-1321.	[Requires specialist pollinators? No evidence] "Inflorescence a large, open, many headed panicle, somewhat flattened; branches stout, tomentulose with short whitish or yellowish-brown hairs; foliose bracts present, scalelike bracteoles sometimes present on the ultimate peduncles, sometimes subtending the head and appearing as part of the involucre, the basal portion of the leaves sometimes concaulescent and forming pairs of green lines between the nodes. Heads small, ca. 5 mm high, ca. 4 mm across, radiate; involucral bracts in several unequal series, imbricate, appressed, acute, dorsally pubescent; paleas scarious, folded over the florets, the keel ciliate; ray florets about 8, white, the ligule elliptical, entire, 2-3 mm long, the tube pilose, ca. 1.5mm long, the ovary lenticular, laterally compressed, ciliate and pubescent on one side, pappus of two small, strigose awns, the dorsal awn the largest; disc florets several, 4-5 mm long, the corolla tubiform, the lower portion pilose, the lobes ventrally papillose, the anthers dark, apically lightappendaged, basally truncate, the style branches truncate, penicillate with a short appendage, the stigmatic lines well marked, the style base expanded-globose, situated against the stout, cylindrical nectary, the ovary laterally compressedlenticular, sparingly pubescent except apically, the shoulders with 1 or 2 stout, short awns."
605	2004. Ramírez, N.. Ecology of Pollination in a Tropical Venezuelan Savanna. Plant Ecology. 173(2): 171-189.	[Requires specialist pollinators? No evidence] "Table AI. Plant species, Life form, habitat, and pollination modes of 164 plant species of a Venezuelan Central Plain" [Verbesina caracasana - Pollination System = Fly-Butterfly. V. turbacensis presumably insect pollinated]
606	2012. WRA Specialist. Personal Communication.	[Reproduction by vegetative fragmentation? Unknown]
607	2012. WRA Specialist. Personal Communication.	[Minimum generative time (years)? Unknown]
701	1975. Woodson, Jr., R.E./Schery, R.W./D'Arcy, W.G. et al.. Flora of Panama. Part IX. Family 184. Compositae. Annals of the Missouri Botanical Garden. 62(4): 835-1321.	[Propagules likely to be dispersed unintentionally? Unknown. Awns may allow for external attachment] "Achene body black, 2.5 mm long, 4 angled, slightly compressed, those of the margins with large, white, tubercular based trichomes, those of the disc mostly smooth, the wings ca. 1-4 mm wide, white, minutely striate; pappus of two unequal, strigose, short awns."

701	2008. Gargiullo, M.B./Magnuson, B.L/Kimball, L.D.. A field guide to plants of Costa Rica. Oxford University Press US, New York, NY	[Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)? Possibly Yes] "Open sites, roadsides, second growth, mostly in mountain regions." [Roadside distribution probably an adaptation to colonize disturbed sites, but may be inadvertently moved along heavily trafficked areas as well]
702	2012. WRA Specialist. Personal Communication.	[Propagules dispersed intentionally by people? Unknown] In cultivation, but not widespread
703	2012. WRA Specialist. Personal Communication.	[Propagules likely to disperse as a produce contaminant? No evidence] Unlikely to be cultivated with produce
704	1975. Woodson, Jr., R.E./Schery, R.W./D'Arcy, W.G. et al.. Flora of Panama. Part IX. Family 184. Compositae. Annals of the Missouri Botanical Garden. 62(4): 835-1321.	[Propagules adapted to wind dispersal? Yes] "Achene body black, 2.5 mm long, 4 angled, slightly compressed, those of the margins with large, white, tubercular based trichomes, those of the disc mostly smooth, the wings ca. 1-4 mm wide, white, minutely striate; pappus of two unequal, strigose, short awns."
704	1993. Guevara, S./Laborde, J.. Monitoring Seed Dispersal at Isolated Standing Trees in Tropical Pastures: Consequences for Local Species Availability. Vegetatio. 107/108: 319-338.	[Propagules adapted to wind dispersal? Yes] [Propagules adapted to wind dispersal? Yes] "Table 2. Number of seeds of plant species captured in seed traps beneath four ISTs of Ficus spp. at Los Tuxtlas, Veracruz, Mexico, between March 15 and September 14 in 1988." [Verbesina turbacensis: Dispersal Mode - Anemochory]
705	1975. Woodson, Jr., R.E./Schery, R.W./D'Arcy, W.G. et al.. Flora of Panama. Part IX. Family 184. Compositae. Annals of the Missouri Botanical Garden. 62(4): 835-1321.	[Propagules water dispersed? No] "Achene body black, 2.5 mm long, 4 angled, slightly compressed, those of the margins with large, white, tubercular based trichomes, those of the disc mostly smooth, the wings ca. 1-4 mm wide, white, minutely striate; pappus of two unequal, strigose, short awns." [Seeds adapted for wind dispersal]
706	1975. Woodson, Jr., R.E./Schery, R.W./D'Arcy, W.G. et al.. Flora of Panama. Part IX. Family 184. Compositae. Annals of the Missouri Botanical Garden. 62(4): 835-1321.	[Propagules bird dispersed? No] "Achene body black, 2.5 mm long, 4 angled, slightly compressed, those of the margins with large, white, tubercular based trichomes, those of the disc mostly smooth, the wings ca. 1-4 mm wide, white, minutely striate; pappus of two unequal, strigose, short awns." [Not fleshy-fruited]
707	1975. Woodson, Jr., R.E./Schery, R.W./D'Arcy, W.G. et al.. Flora of Panama. Part IX. Family 184. Compositae. Annals of the Missouri Botanical Garden. 62(4): 835-1321.	[Propagules dispersed by other animals (externally)? Possibly. Awns may allow for external attachment] "Achene body black, 2.5 mm long, 4 angled, slightly compressed, those of the margins with large, white, tubercular based trichomes, those of the disc mostly smooth, the wings ca. 1-4 mm wide, white, minutely striate; pappus of two unequal, strigose, short awns."
708	2012. WRA Specialist. Personal Communication.	[Propagules survive passage through the gut? Unknown] Unlikely to be consumed
801	2012. WRA Specialist. Personal Communication.	[Prolific seed production (>1000/m2)? Unknown]
802	2008. Royal Botanic Gardens Kew. Seed Information Database (SID). Version 7.1. http://data.kew.org/sid/	[Evidence that a persistent propagule bank is formed (>1 yr)? Unknown] Most Verbesina have orthodox seeds
803	2012. WRA Specialist. Personal Communication.	[Well controlled by herbicides? Unknown] No information on herbicide efficacy or chemical control of this species
804	1999. Grantham, M./Tan, B.. Cloud Forest Daisies: Horticultural Treasures of Montane Mexico. Pacific Horticulture. Fall: 50-56.	[Tolerates, or benefits from, mutilation, cultivation, or fire? Yes. Resprouted after complete dieback to base] "Although normally escaping cold damage in most Bay Area winters, this plant was killed to the soil line at 16°F in the winter of 1990. Vigorous new growth was produced from the base the following spring and plants were almost fully regenerated by the following winter. It may be damaged by oak root fungus but can usually outgrow this pathogen."
805	2012. WRA Specialist. Personal Communication.	[Effective natural enemies present locally (e.g. introduced biocontrol agents)? Unknown]

Summary of Risk Traits

High Risk / Undesirable Traits

- Naturalized on Hawaii Island
- Thrives in tropical climates
- Broad elevation range exceeding 1000 m
- Congeneric weed, *Verbesina encelioides*, is highly invasive
- May be able to exploit or colonize disturbed sites
- Wind-dispersed seeds

Low Risk / Desirable Traits

- Despite ability to spread, no negative impacts have been documented to date
- Fodder tree
- Unarmed (no spines, thorns or burrs)
- Non-toxic