Taxon: Thevetia thevetioides (Kunth) K. Schum. **Family:** Apocynaceae

Common Name(s): cascabel grande
giant luckynut
giant thevetia

Synonym(s): Cascabela thevetioides (Kunth)

Assessor: No Assessor **Status:** Assessor Approved **End Date:** 26 Jun 2018

WRA Score: **-1.0** **Designation:** L **Rating:** Low Risk

Keywords: Tropical Tree, Toxic, Ornamental, Outcrossing, Zoochorous

Qsn #	Question	Answer Option	Answer
101	Is the species highly domesticated?	y=-3, n=0	n
102	Has the species become naturalized where grown?		
103	Does the species have weedy races?		
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	y
301	Naturalized beyond native range	y = 1*multiplier (see Appendix 2), n= question 205	n
302	Garden/amenity/disturbance weed	n=0, y = 1*multiplier (see Appendix 2)	n
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		
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		
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		

Qsn #	Question	Answer Option	Answer
410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)		
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	n
604	Self-compatible or apomictic	y=1, n=-1	n
605	Requires specialist pollinators	y=-1, n=0	y
606	Reproduction by vegetative fragmentation	y=1, n=-1	n
607	Minimum generative time (years)		
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	y
707	Propagules dispersed by other animals (externally)	y=1, n=-1	n
708	Propagules survive passage through the gut	y=1, n=-1	y
801	Prolific seed production (>1000/m2)	y=1, n=-1	n
802	Evidence that a persistent propagule bank is formed (>1 yr)		
803	Well controlled by herbicides		
804	Tolerates, or benefits from, mutilation, cultivation, or fire		
805	Effective natural enemies present locally (e.g. introduced biocontrol agents)		

Supporting Data:

Qsn #	Question	Answer
101	**Is the species highly domesticated?**	**n**
	Source(s)	**Notes**
	Quattrocchi, U. 2012. CRC World Dictionary of Medicinal and Poisonous Plants: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	[No evidence] "Mexico. Small tree or shrub, erect, milky juice, narrow linear shiny leaves, bright yellow tubular flowers, large rounded green fruits, good for soil conservation"
	Llamas, K.A. 2003. Tropical Flowering Plants. Timber Press, Portland, OR	[No evidence] "This large, xeric shrub thrives in Mediterranean-type climates with hot, dry summers. Excellent for coastal locations. A more prolific bloomer than T. peruviana."
	Woodson, Jr., R.E. 1914. North American Flora, Volume 29, Part 2. (Asclepiadales) Apocynaceae. The New York Botanical Garden, New York, NY	No evidence

102	**Has the species become naturalized where grown?**	
	Source(s)	**Notes**
	WRA Specialist. 2018. Personal Communication	NA

103	**Does the species have weedy races?**	
	Source(s)	**Notes**
	WRA Specialist. 2018. Personal Communication	NA

201	**Species suited to tropical or subtropical climate(s) - If island is primarily wet habitat, then substitute "wet tropical" for "tropical or subtropical"**	**High**
	Source(s)	**Notes**
	USDA, ARS, Germplasm Resources Information Network. 2018. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html. [Accessed 26 Jun 2018]	"Native Northern America SOUTHERN MEXICO: Mexico [Guanajuato, Guerrero, Hidalgo, Mexico, Michoacan, Morelos, Oaxaca, Puebla, Queretaro]"

202	**Quality of climate match data**	**High**
	Source(s)	**Notes**
	USDA, ARS, Germplasm Resources Information Network. 2018. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html. [Accessed 26 Jun 2018]	

Qsn #	Question	Answer
203	**Broad climate suitability (environmental versatility)**	**y**
	Source(s)	**Notes**
	Dharani, N. 2002. Field guide to common trees & shrubs of East Africa. Struik Publishers, Cape Town, South Africa	"cultivated in warmer areas at altitudes from sea level to 2000 m" [elevation range >1000m]
	Llamas, K.A. 2003. Tropical Flowering Plants. Timber Press, Portland, OR	"zones 9-11"
	Tropicos.org. 2018. Missouri Botanical Garden. http://www.tropicos.org/. [Accessed 26 Jun 2018]	Collected from 400 m - 3200 m elevation, demonstrating environmental versatility

Qsn #	Question	Answer
204	**Native or naturalized in regions with tropical or subtropical climates**	**y**
	Source(s)	**Notes**
	USDA, ARS, Germplasm Resources Information Network. 2018. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html. [Accessed 26 Jun 2018]	"Native Northern America SOUTHERN MEXICO: Mexico [Guanajuato, Guerrero, Hidalgo, Mexico, Michoacan, Morelos, Oaxaca, Puebla, Queretaro]"

Qsn #	Question	Answer
205	**Does the species have a history of repeated introductions outside its natural range?**	**y**
	Source(s)	**Notes**
	Knight, A.P. and R. G. Walter (Eds.). 2002. A Guide to Plant Poisoning of Animals in North America. Teton NewMedia, Jackson WY	"Habitat: Native to tropical America, this plant is widely cultivated in the southern United States and Hawaii, and most tropical areas of the world."
	Dave's Garden. 2018. Giant Thevetia, Be-Still Tree - Thevetia thevetioides. https://davesgarden.com/guides/pf/go/57964/. [Accessed 26 Jun 2018]	"Regional This plant has been said to grow in the following regions: Phoenix, Arizona (2 reports) Carlsbad, California El Cajon, California La Mesa, California Palm Springs, California (2 reports) San Diego, California (2 reports) Tustin, California Upland, California Vista, California Boca Raton, Florida Ainaloa, Hawaii"

Qsn #	Question	Answer
301	**Naturalized beyond native range**	**n**
	Source(s)	**Notes**
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	No evidence
	Wagner, W.L., Herbst, D.R.& Lorence, D.H. 2018. Flora of the Hawaiian Islands. Smithsonian Institution, Washington, D.C. http://botany.si.edu/. [Accessed 26 Jun 2018]	No evidence in Hawaiian Islands to date

Qsn #	Question	Answer
302	**Garden/amenity/disturbance weed**	**n**
	Source(s)	**Notes**
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	No evidence

Qsn #	Question	Answer
303	**Agricultural/forestry/horticultural weed**	**n**
	Source(s)	**Notes**
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	No evidence

304	**Environmental weed**	**n**
	Source(s)	**Notes**
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	No evidence

305	**Congeneric weed**	**y**
	Source(s)	**Notes**
	BioNET-EAFRINE. 2011. Thevetia peruviana (Yellow Oleander). https://keys.lucidcentral.org/keys/v3/eafrinet/weeds/key/weeds/Media/Html/Thevetia_peruviana_(Yellow_Oleander).htm. [Accessed 26 Jun 2018]	"Thevetia peruviana can be invasive in open areas and under light shade. All parts of the plants are very poisonous, especially the sap and oily seeds. The common name be-still refers to its poisonous properties."
	Invasive Species South Africa. 2018. Yellow oleander Thevetia peruviana. http://www.invasives.org.za/legislation/item/320-yellow-oleander-thevetia-peruviana. [Accessed 26 Jun 2018]	"Why is it a problem? Competes with and has the potential to replace indigenous species. Extremely poisonous."

401	**Produces spines, thorns or burrs**	**n**
	Source(s)	**Notes**
	Knight, A.P. and R. G. Walter (Eds.). 2002. A Guide to Plant Poisoning of Animals in North America. Teton NewMedia, Jackson WY	"Description: Yellow oleander is a perennial branched shrub or tree growing to 30 feet (12 meters) tall with dark green, glossy, alternate linear leaves up to 6 inches (15 cm) long and 0.5 inch (1 to 2 cm) wide, with milky sap."
	Woodson, Jr., R.E. 1914. North American Flora, Volume 29, Part 2. (Asclepiadales) Apocynaceae. The New York Botanical Garden, New York, NY	[No evidence] "Shrub or small tree, occasionally attaining a height of 10 m.; leaves membranaceous, linear oblanceolate, 6-10 cm. long, 4-12 mm. broad, acutely acuminate, attenuate at the base, glabrous or essentially so above, minutely puberulent or rarely glabrate beneath, the secondary veins conspicuous on both sides, the petioles 3-5 mm. long"

402	**Allelopathic**	
	Source(s)	**Notes**

Qsn #	Question	Answer
	Begum, P., Khan, A. M., Ullah, I., & Ahmad, N. (2017). Phytotoxic effects of Thuja orientalis L. and Thevetia peruviana (Pers.) schum crude extracts on wheat seed germination. Pure and Applied Biology, 6(3), 805-813	[Unknown. Allelopathy documented in congener] "The present studies focus on the phytotoxic effects of four crude extracts viz-viz n-hexane, ethyl acetate, methanol and butanol of two plants Thuja orientalis and Thevetia peruviana at two different concentrations i.e, 10 mg/ml and 1 mg/ml against wheat grains germination. Wheat grains (Triticum aestivum) germination percentage, germination velocity, root inhibition percentage, root shoot length, seedlings fresh dry weights and moisture content was determined. Maximum inhibition of germination was exhibited by n-hexane and butanol concentrations of Thuja orientalis and ethyl acetate of Thevetia peruviana. Germination velocity was reduced at maximum level by n-hexane and butanol extracts of Thuja orientalis and Thevetia peruviana respectively. Butanol and methanol extracts of Thuja orientalis and Thevetia peruviana were highly effective in reducing the shoot length while maximum reduction in root length was exhibited by ethyl acetate and n-hexane extracts of the two plants respectively. Ethyl acetate extract of both the plants was most effective in root inhibition against wheat grains. Maximum reduction in seedling moisture content was recorded in seedlings treated with methanolic extract at the same concentration of Thuja orientalis and Thevetia peruviana. Over all the phytotoxic effects of both the plants for all the parameters were more pronounced at 10 mg/ml concentration."

403	Parasitic	n
	Source(s)	**Notes**
	Woodson, Jr., R.E. 1914. North American Flora, Volume 29, Part 2. (Asclepiadales) Apocynaceae. The New York Botanical Garden, New York, NY	"Shrub or small tree, occasionally attaining a height of 10 m" [Apocynaceae. No evidence]

404	Unpalatable to grazing animals	y
	Source(s)	**Notes**
	Knight, A.P. and R. G. Walter (Eds.). 2002. A Guide to Plant Poisoning of Animals in North America. Teton NewMedia, Jackson WY	"Principal Toxin: Thevitin A and B and thevetoxin are potent cardiac glycosides found in all parts of the plant and are concentrated in the fruits" [Toxicity would likely deter browsing]

405	Toxic to animals	y
	Source(s)	**Notes**
	Knight, A.P. and R. G. Walter (Eds.). 2002. A Guide to Plant Poisoning of Animals in North America. Teton NewMedia, Jackson WY	"Principal Toxin: Thevitin A and B and thevetoxin are potent cardiac glycosides found in all parts of the plant and are concentrated in the fruits"
	Fuller, T.C. & McClintock, E.M. 1986. Poisonous plants of California: Issue 53 of California natural history guides. University of California Press, Berkeley and Los Angeles, CA	"Toxic part: Entire plant, especially the seeds. Toxin: Cardiac glycosides (thevetin, cerebrin, and neriifolin), which produce symptoms similar to digitalis. Symptoms: Nausea, vomiting, and irregular pulse. Can be fatal. One fruit can cause the death of an adult. The milky juice is irritating and may cause dermatitis in those susceptible."

Qsn #	Question	Answer
406	**Host for recognized pests and pathogens**	
	Source(s)	**Notes**
	Missouri Botanical Garden. 2018. Cascabela thevetioides. http://www.missouribotanicalgarden.org/PlantFinder/PlantFinderDetails.aspx?taxonid=274295&isprofile=0&=. [Accessed 26 Jun 2018]	"No serious insect or disease problems. Watch for mealybugs, aphids and scale. Caterpillars may chew on the foliage. Remove and destroy any leaves damaged by leaf spot."

407	**Causes allergies or is otherwise toxic to humans**	**y**
	Source(s)	**Notes**
	Knight, A.P. and R. G. Walter (Eds.). 2002. A Guide to Plant Poisoning of Animals in North America. Teton NewMedia, Jackson WY	"Principal Toxin: Thevitin A and B and thevetoxin are potent cardiac glycosides found in all parts of the plant and are concentrated in the fruits"
	Fuller, T.C. & McClintock, E.M. 1986. Poisonous plants of California: Issue 53 of California natural history guides. University of California Press, Berkeley and Los Angeles, CA	"Toxic part: Entire plant, especially the seeds. Toxin: Cardiac glycosides (thevetin, cerebrin, and neriifolin), which produce symptoms similar to digitalis. Symptoms: Nausea, vomiting, and irregular pulse. Can be fatal. One fruit can cause the death of an adult. The milky juice is irritating and may cause dermatitis in those susceptible."

408	**Creates a fire hazard in natural ecosystems**	**n**
	Source(s)	**Notes**
	Alvarado-Cárdenas, L. O., Villaseñor, J. L., López-Mata, L., Cadena, J., & Ortiz, E. (2017). Systematics, distribution and conservation of Cascabela (Apocynaceae: Rauvolfioideae: Plumerieae) in Mexico. Plant Systematics and Evolution, 303(3), 337-369	"It grows in different vegetation types, but mainly in the tropical dry forests of several natural protected areas, such as the Tehuacan–Cuicatlan Biosphere Reserve." [Occurs in dry areas which may be fire prone]
	Rancho Santa Fe Fire Protection District. 2013. Plant and Landscape Guide. https://www.rsf-fire.org/wp-content/uploads/2016/10/PlantListBrochure.pdf. [Accessed]	[Thevetia thevetioides recommended for fire prone landscaping] "In an effort to protect homes from a future devastating Wildland fire such as the ones experienced in 2003 and 2007, the Rancho Santa Fe Fire Protection District (RSFFPD) does not allow certain types of trees, plants, or shrubs to be planted within certain distances of structures. This booklet contains valuable information pertaining to both desirable and undesirable trees, shrubs, ground covers, vines, roadway clearances, and palm trees. The goal is to educate the public on RSFFPD's ordinances regarding landscaping so they can increase the the chances of their home surviving a wildfire."
	WRA Specialist. 2018. Personal Communication	No evidence found. Related species with similar habit considered fire resistant plants

Qsn #	Question	Answer
409	**Is a shade tolerant plant at some stage of its life cycle**	
	Source(s)	**Notes**
	Llamas, K.A. 2003. Tropical Flowering Plants. Timber Press, Portland, OR	"Full Sun"
	Missouri Botanical Garden. 2018. Cascabela thevetioides. http://www.missouribotanicalgarden.org/PlantFinder/PlantFinderDetails.aspx?taxonid=274295&isprofile=0&=. [Accessed 26 Jun 2018]	"Sun: Full sun to part shade"

410	**Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)**	
	Source(s)	**Notes**
	Missouri Botanical Garden. 2018. Cascabela thevetioides. http://www.missouribotanicalgarden.org/PlantFinder/PlantFinderDetails.aspx?taxonid=274295&isprofile=0&=. [Accessed 26 Jun 2018]	"Grows well in average, medium moisture soils in full sun to part shade. Thrives in rich, sandy soils. Container plants do best in fertile soils with good drainage."
	Llamas, K.A. 2003. Tropical Flowering Plants. Timber Press, Portland, OR	"Sandy, well-drained soil."

411	**Climbing or smothering growth habit**	**n**
	Source(s)	**Notes**
	Knight, A.P. and R. G. Walter (Eds.). 2002. A Guide to Plant Poisoning of Animals in North America. Teton NewMedia, Jackson WY	"Description: Yellow oleander is a perennial branched shrub or tree growing to 30 feet (12 meters) tall with dark green, glossy, alternate linear leaves up to 6 inches (15 cm) long and 0.5 inch (1 to 2 cm) wide, with milky sap."
	Woodson, Jr., R.E. 1914. North American Flora, Volume 29, Part 2. (Asclepiadales) Apocynaceae. The New York Botanical Garden, New York, NY	"Shrub or small tree, occasionally attaining a height of 10 m.; leaves membranaceous, linear oblanceolate, 6-10 cm. long, 4-12 mm. broad, acutely acuminate, attenuate at the base, glabrous or essentially so above, minutely puberulent or rarely glabrate beneath, the secondary veins conspicuous on both sides, the petioles 3-5 mm. long"

412	**Forms dense thickets**	**n**
	Source(s)	**Notes**
	Alvarado-Cárdenas, L. O., Villaseñor, J. L., López-Mata, L., Cadena, J., & Ortiz, E. (2017). Systematics, distribution and conservation of Cascabela (Apocynaceae: Rauvolfioideae: Plumerieae) in Mexico. Plant Systematics and Evolution, 303(3), 337-369	[No evidence] "Near threatened (NT). The species is distributed in the states located along the Trans-Mexican Volcanic Belt and southwestern Mexico. The SDM projected an area of occupancy of 250,383 km2 (EOO 121,062 km2 and AOO 504 km2). It grows in different vegetation types, but mainly in the tropical dry forests of several natural protected areas, such as the Tehuaca´n– Cuicatla´n Biosphere Reserve. Its tolerance to some anthropogenic disturbance easily allows its cultivation."

501	**Aquatic**	**n**

Qsn #	Question	Answer
	Source(s)	**Notes**
	Alvarado-Cárdenas, L. O., Villaseñor, J. L., López-Mata, L., Cadena, J., & Ortiz, E. (2017). Systematics, distribution and conservation of Cascabela (Apocynaceae: Rauvolfioideae: Plumerieae) in Mexico. Plant Systematics and Evolution, 303(3), 337-369	[Terrestrial] "Cascabela thevetioides… Habitat and ecology: The species mainly grows in tropical dry forests (Fig. 4), scrublands, riparian forests, Pinus– Quercus and Quercus forests, as well as in disturbed vegetation, at elevations (750–) 1200–2300 m a. s. l.. The SDM suggests that the species grows in the tropical dry forests as well as in other kinds of vegetation, due to its ability to reach elevations above 2000 m."

502	Grass	n
	Source(s)	**Notes**
	USDA, ARS, Germplasm Resources Information Network. 2018. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html. [Accessed 26 Jun 2018]	Family: Apocynaceae Subfamily: Rauvolfioideae Tribe: Plumerieae

503	Nitrogen fixing woody plant	n
	Source(s)	**Notes**
	USDA, ARS, Germplasm Resources Information Network. 2018. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html. [Accessed 26 Jun 2018]	Family: Apocynaceae Subfamily: Rauvolfioideae Tribe: Plumerieae

504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	n
	Source(s)	**Notes**
	Alvarado-Cárdenas, L. O., Villaseñor, J. L., López-Mata, L., Cadena, J., & Ortiz, E. (2017). Systematics, distribution and conservation of Cascabela (Apocynaceae: Rauvolfioideae: Plumerieae) in Mexico. Plant Systematics and Evolution, 303(3), 337-369	"Description: Trees or shrubs 2.5–10 m tall, young branches sparsely pubescent."

601	Evidence of substantial reproductive failure in native habitat	n
	Source(s)	**Notes**

Qsn #	Question	Answer
	Alvarado-Cárdenas, L. O., Villaseñor, J. L., López-Mata, L., Cadena, J., & Ortiz, E. (2017). Systematics, distribution and conservation of Cascabela (Apocynaceae: Rauvolfioideae: Plumerieae) in Mexico. Plant Systematics and Evolution, 303(3), 337-369	[Near threatened] "Conservation status: Near threatened (NT). The species is distributed in the states located along the Trans-Mexican Volcanic Belt and southwestern Mexico. The SDM projected an area of occupancy of 250,383 km2 (EOO 121,062 km2 and AOO 504 km2). It grows in different vegetation types, but mainly in the tropical dry forests of several natural protected areas, such as the Tehuacan–Cuicatlan Biosphere Reserve. Its tolerance to some anthropogenic disturbance easily allows its cultivation. Although these characteristics may suggest that does not have conservation problems, it shows a restricted distribution in states that suffer high rates of land use changes and landscape disturbances. For example, the natural habitats in the Trans-Mexican Volcanic have been drastically transformed (Mas et al. 2004; Sanchez-Cordero et al. 2005). In addition, the uses of its fruits by folk dancers and the uses of the seeds in traditional weight-loss programs, may affect the natural populations because management is not sustainable. We would suggest placing the species in the near threatened category."

602	Produces viable seed	y
	Source(s)	**Notes**
	Alvarado-Cárdenas, L. O., Villaseñor, J. L., López-Mata, L., Cadena, J., & Ortiz, E. (2017). Systematics, distribution and conservation of Cascabela (Apocynaceae: Rauvolfioideae: Plumerieae) in Mexico. Plant Systematics and Evolution, 303(3), 337-369	"Drupe (25–) 30–45 9 30–65 mm, subglobose, glabrous, black, endocarp stony, irregularly deltoid, lenticellate; seeds oblongate,15–18 9 15–20 mm, white to yellowish."
	Dave's Garden. 2018. Giant Thevetia, Be-Still Tree - Thevetia thevetioides. https://davesgarden.com/guides/pf/go/57964/. [Accessed 26 Jun 2018]	"Propagation Methods: From seed; direct sow outdoors in fall Scarify seed before sowing"
	Oakman, H.1995. Harry Oakman's what flowers when: the complete guide to flowering times in tropical and subtropical gardens. Univ. of Queensland Press, St. Lucia, Australia	"raised from seed"

603	Hybridizes naturally	n
	Source(s)	**Notes**
	Alvarado-Cárdenas, L. O., Villaseñor, J. L., López-Mata, L., Cadena, J., & Ortiz, E. (2017). Systematics, distribution and conservation of Cascabela (Apocynaceae: Rauvolfioideae: Plumerieae) in Mexico. Plant Systematics and Evolution, 303(3), 337-369	No evidence

604	Self-compatible or apomictic	n
	Source(s)	**Notes**
	Sharma, O.P. (2009). Plant Taxonomy. Second Edition. Tata McGraw-Hill, New Delhi, India	"Self-pollination is absent"

Qsn #	Question	Answer
	Alvarado-Cárdenas, L. O., Villaseñor, J. L., López-Mata, L., Cadena, J., & Ortiz, E. (2017). Systematics, distribution and conservation of Cascabela (Apocynaceae: Rauvolfioideae: Plumerieae) in Mexico. Plant Systematics and Evolution, 303(3), 337-369	"The pollination system showed by Thevetiineae could be one of the most complex in Plumerieae. The synorganization of anthers, style head and corolline appendages in Cascabela (Fig. 1d), as well as in Thevetia, suggests a system that would favor cross-fertilization and avoid self-fertilization."

605	Requires specialist pollinators	y
	Source(s)	**Notes**
	Rahman, M. M., Baksha, M. W., & Sterringa, J. T. (1993). Ethological observations on the purple sunbird (Nectarinia asiatica Latham): a mistletoe-frequenting bird. Indian Forester, 119(5), 388-394	bird sucks nectar of the ornamental tree Thevetia peruviana [bird-pollinated, consistent with floral morphology]
	Barrows, E. M. 1980. Robbing of exotic plants by introduced carpenter and honey bees in Hawaii, with comparative notes. Biotropica, 12(1): 23-29	flower robbed by Xylocopa sonorina and Apis mellifera without pollinating [related species, T. peruviana, with similar flower morphology, so T. thevetioides, with larger flowers also assumed to share similar pollinator guild]

606	Reproduction by vegetative fragmentation	n
	Source(s)	**Notes**
	Dave's Garden. 2018. Giant Thevetia, Be-Still Tree - Thevetia thevetioides. https://davesgarden.com/guides/pf/go/57964/. [Accessed 26 Jun 2018]	"Propagation Methods: From seed; direct sow outdoors in fall Scarify seed before sowing"
	Everett, T.H. 1982. The New York Botanical Garden Illustrated Encyclopedia of Horticulture. Garland Publishing, Inc., New York, NY	No evidence

607	Minimum generative time (years)	
	Source(s)	**Notes**
	WRA Specialist. 2018. Personal Communication	Unknown

701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	n
	Source(s)	**Notes**
	Woodson, Jr., R.E. 1914. North American Flora, Volume 29, Part 2. (Asclepiadales) Apocynaceae. The New York Botanical Garden, New York, NY	"Drupes 6-6.5 cm, broad" [no means of external attachment]

702	Propagules dispersed intentionally by people	y
	Source(s)	**Notes**
	Llamas, K.A. 2003. Tropical Flowering Plants. Timber Press, Portland, OR	[Cultivated as an ornamental] "This large, xeric shrub thrives in Mediterranean-type climates with hot, dry summers. Excellent for coastal locations. A more prolific bloomer than T. peruviana."

Qsn #	Question	Answer
703	**Propagules likely to disperse as a produce contaminant**	**n**
	Source(s)	**Notes**
	Alvarado-Cárdenas, L. O., Villaseñor, J. L., López-Mata, L., Cadena, J., & Ortiz, E. (2017). Systematics, distribution and conservation of Cascabela (Apocynaceae: Rauvolfioideae: Plumerieae) in Mexico. Plant Systematics and Evolution, 303(3), 337-369	"Drupe (25–) 30–45 9 30–65 mm, subglobose, glabrous, black, endocarp stony, irregularly deltoid, lenticellate; seeds oblongate,15–18 9 15–20 mm, white to yellowish." [No evidence & fruit too large to contaminate produce]

704	Propagules adapted to wind dispersal	n
	Source(s)	**Notes**
	Alvarado-Cárdenas, L. O., Villaseñor, J. L., López-Mata, L., Cadena, J., & Ortiz, E. (2017). Systematics, distribution and conservation of Cascabela (Apocynaceae: Rauvolfioideae: Plumerieae) in Mexico. Plant Systematics and Evolution, 303(3), 337-369	"Drupe (25–) 30–45 9 30–65 mm, subglobose, glabrous, black, endocarp stony, irregularly deltoid, lenticellate; seeds oblongate,15–18 9 15–20 mm, white to yellowish." [No evidence]
	Ceccon, E., & Hernández, P. (2009). Seed rain dynamics following disturbance exclusion in a secondary tropical dry forest in Morelos, Mexico. Revista de Biología Tropical, 57 (1-2), 257-269	"TABLE 1 … Thevetia thevetioides - Dispersal Syndrome- Z= zoochory"

705	Propagules water dispersed	n
	Source(s)	**Notes**
	Alvarado-Cárdenas, L. O., Villaseñor, J. L., López-Mata, L., Cadena, J., & Ortiz, E. (2017). Systematics, distribution and conservation of Cascabela (Apocynaceae: Rauvolfioideae: Plumerieae) in Mexico. Plant Systematics and Evolution, 303(3), 337-369	"Drupe (25–) 30–45 9 30–65 mm, subglobose, glabrous, black, endocarp stony, irregularly deltoid, lenticellate; seeds oblongate,15–18 9 15–20 mm, white to yellowish." [No evidence that fruit are buoyant]
	Knight, A.P. and R. G. Walter (Eds.). 2002. A Guide to Plant Poisoning of Animals in North America. Teton NewMedia, Jackson WY	"Drupes 6-6.5 cm, broad" [No evidence that fruit are buoyant]

706	Propagules bird dispersed	y
	Source(s)	**Notes**
	Knight, A.P. and R. G. Walter (Eds.). 2002. A Guide to Plant Poisoning of Animals in North America. Teton NewMedia, Jackson WY	"Fruits are fleshy drupes turning yellow to black when ripe." [Presumably Yes]
	Ceccon, E., & Hernández, P. (2009). Seed rain dynamics following disturbance exclusion in a secondary tropical dry forest in Morelos, Mexico. Revista de Biología Tropical, 57 (1-2), 257-269	"TABLE 1 … Thevetia thevetioides - Dispersal Syndrome- Z= zoochory"

707	Propagules dispersed by other animals (externally)	n
	Source(s)	**Notes**

Qsn #	Question	Answer
	Alvarado-Cárdenas, L. O., Villaseñor, J. L., López-Mata, L., Cadena, J., & Ortiz, E. (2017). Systematics, distribution and conservation of Cascabela (Apocynaceae: Rauvolfioideae: Plumerieae) in Mexico. Plant Systematics and Evolution, 303(3), 337-369	"Drupe (25–) 30–45 9 30–65 mm, subglobose, glabrous, black, endocarp stony, irregularly deltoid, lenticellate; seeds oblongate,15–18 9 15–20 mm, white to yellowish." [No means of external attachment]

708	Propagules survive passage through the gut	y
	Source(s)	**Notes**
	Ceccon, E., & Hernández, P. (2009). Seed rain dynamics following disturbance exclusion in a secondary tropical dry forest in Morelos, Mexico. Revista de Biología Tropical, 57 (1-2), 257-269	"TABLE 1 … Thevetia thevetioides - Dispersal Syndrome- Z= zoochory" [Presumably Yes]

801	Prolific seed production (>1000/m2)	n
	Source(s)	**Notes**
	Knight, A.P. and R. G. Walter (Eds.). 2002. A Guide to Plant Poisoning of Animals in North America. Teton NewMedia, Jackson WY	"Each fruit contains two black seeds."
	Ceccon, E., & Hernández, P. (2009). Seed rain dynamics following disturbance exclusion in a secondary tropical dry forest in Morelos, Mexico. Revista de Biología Tropical, 57 (1-2), 257-269	"TABLE I Dispersal syndrome, seed weight, total seed density and relative importance value index (RIVI) of species at the exclusion (E) site and the site without exclusion (WE) in the seed rain of AZX" [Thevetia thevetioides - Density (seeds. m-2) = 0.06]

802	Evidence that a persistent propagule bank is formed (>1 yr)	
	Source(s)	**Notes**
	Royal Botanic Gardens Kew. (2018) Seed Information Database (SID). Version 7.1. Available from: http://data.kew.org/sid/. [Accessed 26 Jun 2018]	"Storage Behaviour: No data available for species or genus. Of 216 known taxa of family APOCYNACEAE, 96.30% Orthodox(p/?), 1.39% Recalcitrant(?), 2.31% Uncertain"

803	Well controlled by herbicides	
	Source(s)	**Notes**
	WRA Specialist. 2018. Personal Communication	Unknown. No information on herbicide efficacy or chemical control of this species

804	Tolerates, or benefits from, mutilation, cultivation, or fire	
	Source(s)	**Notes**
	Missouri Botanical Garden. 2018. Cascabela thevetioides. http://www.missouribotanicalgarden.org/PlantFinder/PlantFinderDetails.aspx?taxonid=274295&isprofile=0&=. [Accessed 26 Jun 2018]	"Prune lightly as needed to shape after flowering (late summer to fall)." [Possibly]

805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	

Qsn #	Question	Answer
	Source(s)	**Notes**
	WRA Specialist. 2018. Personal Communication	Unknown

Summary of Risk Traits:

High Risk / Undesirable Traits
• Elevation range exceeds 1000 m, demonstrating environmental versatility
• Thrives in tropical climates
• Other Thevetia species are invasive
• Unpalatable to animals
• Poisonous to animals & humans
• Reproduces by seeds
• Seeds dispersed by animals & intentionally by people

Low Risk Traits
• No reports of invasiveness or naturalization
• Unarmed (no spines, thorns, or burrs)
• Ornamental
• Self-pollination is absent
• Requires specialized pollinators (birds & possibly moths)
• Not reported to spread vegetatively
• Fruit & seeds relatively large & unlikely to be accidentally dispersed