

Taxon: Euphorbia resinifera	Family: Euphorbiaceae
Common Name(s): African spurge Moroccan mound resin spurge	Synonym(s): Euphorbia resinifera var. chlorosoma Tithymalus resiniferus (O.Berg)

Assessor: Chuck Chimera	Status: Assessor Approved	End Date: 18 Jun 2015
WRA Score: 2.0	Designation: L	Rating: Low Risk

Keywords: Dense shrub, Cactus-like, Spiny, Toxic, Medicinal

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)	Intermediate
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	n
302	Garden/amenity/disturbance weed		
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	y
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	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		

Qsn #	Question	Answer Option	Answer
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		
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		
604	Self-compatible or apomictic		
605	Requires specialist pollinators	y=-1, n=0	n
606	Reproduction by vegetative fragmentation	y=1, n=-1	y
607	Minimum generative time (years)		
701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)		
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		
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	n
801	Prolific seed production (>1000/m ²)	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
	Hodgkiss, R.J. 2015. The Succulent Plant Page - The Spurge Page. http://succulent-plant.com/families/euphorbiaceae.html . [Accessed 17 Jun 2015]	[Long history of use, but not of domestication] "Euphorbia resinifera Linnaeus 1753 (Euphorbium Officinatum) is the succulent spurge of antiquity, known to the Greek physician Dioscorides (40-90 AD) and Pliny the Elder (23-79 AD) for its purgative sap (euphorbium). This is probably the thorny plant from Mount Atlas in Morocco recorded by King Juba II of Mauretania (ca. 50 BC- 19 AD). The King is said to have named the plant "Euphorbea", after his rotund Greek physician, Euphorbus. The name was later formalised by Linnaeus (Species Plantarum, 1753) as the official botanical name for the genus. "

102	Has the species become naturalized where grown?	
	Source(s)	Notes
	WRA Specialist. 2015. Personal Communication	NA

103	Does the species have weedy races?	
	Source(s)	Notes
	WRA Specialist. 2015. 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"	Intermediate
	Source(s)	Notes
	USDA, ARS, National Genetic Resources Program. 2015. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland. URL: http://www.ars-grin.gov/ . [Accessed 18 Jun 2015]	"Native: AFRICA Northern Africa: Morocco"

202	Quality of climate match data	High
	Source(s)	Notes
	USDA, ARS, National Genetic Resources Program. 2015. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland. URL: http://www.ars-grin.gov/ . [Accessed 18 Jun 2015]	

203	Broad climate suitability (environmental versatility)	n
	Source(s)	Notes

Qsn #	Question	Answer
	Dave's Garden. 2015. Moroccan Mound, Official Spurge, Resin Spurge - <i>Euphorbia resinifera</i> . http://davesgarden.com/guides/pf/go/62524/ . [Accessed 18 Jun 2015]	"Hardiness: USDA Zone 9a: to -6.6 °C (20 °F) 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)"
	Martin, C.A. 2015. Virtual Library of Phoenix Landscape Plants - <i>Euphorbia resinifera</i> . http://www.public.asu.edu/~camartin/plants/Plant%20html%20files/euphorbiaresinifera.html . [Accessed 18 Jun 2015]	"USDA 9-11"

204	Native or naturalized in regions with tropical or subtropical climates	y
	Source(s)	Notes
	USDA, ARS, National Genetic Resources Program. 2015. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland. URL: http://www.ars-grin.gov/ . [Accessed 18 Jun 2015]	"Native: AFRICA Northern Africa: Morocco" [Marginally subtropical to arid, Mediterranean climates]

205	Does the species have a history of repeated introductions outside its natural range?	y
	Source(s)	Notes
	Dave's Garden. 2015. Moroccan Mound, Official Spurge, Resin Spurge - <i>Euphorbia resinifera</i> . http://davesgarden.com/guides/pf/go/62524/ . [Accessed 18 Jun 2015]	"This plant has been said to grow in the following regions: Fountain Hills, Arizona Green Valley, Arizona Phoenix, Arizona (2 reports) Scottsdale, Arizona (4 reports) Tucson, Arizona Hayward, California Hesperia, California Reseda, California San Diego, California San Marino, California Thousand Oaks, California Fort Myers, Florida Austin, Texas"

301	Naturalized beyond native range	n
	Source(s)	Notes
	Randall, R.P. 2012. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	No evidence

Qsn #	Question	Answer
302	Garden/amenity/disturbance weed	
	Source(s)	Notes
	Hodgkiss, R.J. 2015. The Succulent Plant Page - The Spurge Page. http://succulent-plant.com/families/euphorbiaceae.html . [Accessed 17 Jun 2015]	[Potentially weedy] "Euphorbia resinifera is easily grown in a Mediterranean climate but may become a noxious weed in some places. It is readily propagated from cuttings. All parts are toxic, but the resin (dried sap) has been used as an extreme purgative and wood preservative. "
	WRA Specialist. 2015. Personal Communication	No evidence

303	Agricultural/forestry/horticultural weed	n
	Source(s)	Notes
	Randall, R.P. 2012. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	No evidence

304	Environmental weed	n
	Source(s)	Notes
	Randall, R.P. 2012. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	No evidence

305	Congeneric weed	y
	Source(s)	Notes
	Weber, E. 2003. Invasive Plant Species of the World. A Reference Guide to Environmental Weeds. CABI Publishing, Wallingford, UK	"Euphorbia esula...spreads by seeds and by vegetative growth from the rootstock. It rapidly expands and forms large and dense patches that displace native grasses and forbs."
	Randall, R.P. 2012. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	Numerous Euphorbia species have become invasive weeds

401	Produces spines, thorns or burrs	y
	Source(s)	Notes
	Cactus Art Nursery. 2015. Euphorbia resinifera. http://www.cactusart.biz/schede/EUPHORBIA/Euphorbia_resinifera/Euphorbia_resinifera/Euphorbia_resinifera.htm . [Accessed 17 Jun 2015]	"Description: It is a dense succulent shrub growing to 60 cm tall, forming multi-stemmed cushion-shaped clumps up to 2 m wide. Stems: Erect, succulent, 4 sided (almost square) that look superficially like a cactus. Light green to glaucous blue color, depending upon light. Spines: Brown and short, but sharp in pairs of 6 mm spines on the angles of the ribs, spaced about 1 cm apart up the stem."

Qsn #	Question	Answer
402	Allelopathic	
	Source(s)	Notes
	WRA Specialist. 2015. Personal Communication	Unknown

403	Parasitic	n
	Source(s)	Notes
	Eggl, U. 2002. Illustrated handbook of succulent plants: Dicotyledons. Springer-Verlag, Berlin - Heidelberg - New York	"Densely branching shrubs, forming compact mounds to 1.5 x 1.5 m" [No evidence. Euphorbiaceae]

404	Unpalatable to grazing animals	y
	Source(s)	Notes
	Horticulture Unlimited, Inc. 2015. <i>Euphorbia resinifera</i> . http://www.horticultureunlimited.com/succulents/euphorbia-resinifera/ . [Accessed 18 Jun 2015]	"Also use it in areas with high animal and rodent populations. Animals will not touch it, since it is highly toxic."
	Rau, E. 2015. President, Sustainable Bioresources, LLC. Personal Communication. 14 April	"I have noticed attacks on some affected plants by some animal, perhaps rats (see photo)."
	Dave's Garden. 2015. Moroccan Mound, Official Spurge, Resin Spurge - <i>Euphorbia resinifera</i> . http://davesgarden.com/guides/pf/go/62524/ . [Accessed 18 Jun 2015]	[Grower comment on lack of herbivory. Toxic sap & spines likely deter browsers] "On Aug 28, 2004, TucsonJen from Tucson, AZ (Zone 9a) wrote: I like my first Moroccan Mound so much that I planted another today. It's great on it's own but groups well with my other succulents - it's structure is an interesting contrast. It also ranks high in that the critters won't eat it!"
	Poppenga, R. H. (2010). Poisonous plants. Pp. 123-175 In Molecular, Clinical and Environmental Toxicology Volume 2: Clinical Toxicology. Birkhäuser, Basel	[Highly toxic sap would likely make plants unpalatable to most browsing animals in the Hawaiian Islands] "Many toxic plants are not palatable, so livestock avoid their ingestion if other good quality forage is available [9]. Ingestion of toxic plants is much more likely during periods of forage scarcity such as during droughts..."

405	Toxic to animals	y
	Source(s)	Notes
	Horticulture Unlimited, Inc. 2015. <i>Euphorbia resinifera</i> . http://www.horticultureunlimited.com/succulents/euphorbia-resinifera/ . [Accessed 18 Jun 2015]	"Also use it in areas with high animal and rodent populations. Animals will not touch it, since it is highly toxic."

406	Host for recognized pests and pathogens	n
	Source(s)	Notes
	Martin, C.A. 2015. Virtual Library of Phoenix Landscape Plants - <i>Euphorbia resinifera</i> . http://www.public.asu.edu/~camartin/plants/Plant%20html%20files/euphorbiarresinifera.html . [Accessed 18 Jun 2015]	"Disease and pests: None"
	Rau, E. 2015. President, Sustainable Bioresources, LLC. Personal Communication. 14 April	"No insect pests were observed."

Qsn #	Question	Answer
407	Causes allergies or is otherwise toxic to humans	y
	Source(s)	Notes
	Dave's Garden. 2015. Moroccan Mound, Official Spurge, Resin Spurge - <i>Euphorbia resinifera</i> . http://davesgarden.com/guides/pf/go/62524/ . [Accessed 18 Jun 2015]	"All parts of plant are poisonous if ingested Handling plant may cause skin irritation or allergic reaction"
	Spoerke, D.G. & Smolinske, S.C. 1990. Toxicity of Houseplants. CRC Press, Boca Raton, FL	"Toxic Class: Diterpene esters are suspected of being the active components. There have also been a number of biologically inactive triterpenes isolated from this plant." ... "This plant has been used by herbalists and as a houseplant. Exposure to the latex may produce oral, dermal, and ocular symptoms. In work done by Kinghorn and Evans using mouse ear irritancy test, <i>Euphorbia resinifera</i> was one of the most irritating..." ... "Compared to other <i>Euphorbia</i> species, the risk of producing irritant reactions after an exposure should be high."
	Cactus Art Nursery. 2015. <i>Euphorbia resinifera</i> . http://www.cactusart.biz/schede/EUPHORBIA/Euphorbia_resinifera/Euphorbia_resinifera/Euphorbia_resinifera.htm . [Accessed 17 Jun 2015]	"Warning: As with all other <i>Euphorbias</i> when a plant get damaged it exudes a thick white milky sap known as latex. This latex (resin) is poisonous contains some of the most potent irritants known. The very high irritant activity of the latex may be ascribed to resiniferatoxin (A potent toxin). The latex is particularly dangerous for the eyes, skin and mucous membranes. It can produce burning pain in bones. Pains in limbs and paralytic weakness in the joints. Important respiratory and skin symptoms, terrible burning pains. So pay extreme attention not to get any in your eyes or mouth. Cultivated plants must be handled carefully."

408	Creates a fire hazard in natural ecosystems	n
	Source(s)	Notes
	Worldwide Exotics, Inc. 2015. <i>Euphorbia resinifera</i> . http://www.worldwideexoticsnursery.com/EUPHORBIA_RESINIFERA.html . [Accessed 18 Jun 2015]	"Fire resistant"
	B & T World Seeds. 2015. https://b-and-t-world-seeds.com/aleCatm.asp?title=%20Fire%20Resistant%20Plants&list=720 . [Accessed 18 Jun 2015]	List includes <i>Euphorbia resinifera</i>

409	Is a shade tolerant plant at some stage of its life cycle	
	Source(s)	Notes
	San Marcos Growers. 2015. Products > <i>Euphorbia resinifera</i> . http://www.smgrowers.com/products/plants/plantdisplay.asp?plant_id=3414 . [Accessed 18 Jun 2015]	"Exposure: Full Sun"
	Dave's Garden. 2015. Moroccan Mound, Official Spurge, Resin Spurge - <i>Euphorbia resinifera</i> . http://davesgarden.com/guides/pf/go/62524/ . [Accessed 18 Jun 2015]	"Sun Exposure: Sun to Partial Shade"

410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y
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Qsn #	Question	Answer
	Source(s)	Notes
	Dave's Garden. 2015. Moroccan Mound, Official Spurge, Resin Spurge - <i>Euphorbia resinifera</i> . http://davesgarden.com/guides/pf/go/62524/ . [Accessed 18 Jun 2015]	"Soil pH requirements: 6.1 to 6.5 (mildly acidic) 6.6 to 7.5 (neutral) 7.6 to 7.8 (mildly alkaline)"
	Martin, C.A. 2015. Virtual Library of Phoenix Landscape Plants - <i>Euphorbia resinifera</i> . http://www.public.asu.edu/~camartin/plants/Plant%20html%20files/euphorbiarresinifera.html . [Accessed 18 Jun 2015]	"Soil: Very tolerant of alkaline and saline soils; however, soils must be well drained!"
	Cactus Art Nursery. 2015. <i>Euphorbia resinifera</i> . http://www.cactusart.biz/schede/EUPHORBIA/Euphorbia_resinifera/Euphorbia_resinifera/Euphorbia_resinifera.htm . [Accessed 17 Jun 2015]	"They grow well in a very draining mineral potting substrate, but they aren't picky about soil."

411	Climbing or smothering growth habit	n
	Source(s)	Notes
	Eggle, U. 2002. Illustrated handbook of succulent plants: Dicotyledons. Springer-Verlag, Berlin - Heidelberg - New York	"Densely branching shrubs, forming compact mounds to 1.5 x 1.5 m"

412	Forms dense thickets	n
	Source(s)	Notes
	Eggle, U. 2002. Illustrated handbook of succulent plants: Dicotyledons. Springer-Verlag, Berlin - Heidelberg - New York	"Densely branching shrubs forming compact mounts to 1.5 x 1.5 m" [Unknown if dense mounds can form contiguous cover or competitively exclude other vegetation]

501	Aquatic	n
	Source(s)	Notes
	WRA Specialist. 2015. Personal Communication	Terrestrial

502	Grass	n
	Source(s)	Notes
	USDA, ARS, National Genetic Resources Program. 2015. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland. URL: http://www.ars-grin.gov/ . [Accessed 17 Jun 2015]	"Family: Euphorbiaceae subfamily: Euphorbioideae tribe: Euphorbieae subtribe: Euphorbiinae"

503	Nitrogen fixing woody plant	n
	Source(s)	Notes

Qsn #	Question	Answer
	USDA, ARS, National Genetic Resources Program. 2015. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland. URL: http://www.ars-grin.gov/ . [Accessed 17 Jun 2015]	"Family: Euphorbiaceae subfamily: Euphorbioideae tribe: Euphorbieae subtribe: Euphorbiinae"
504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	n
	Source(s)	Notes
	Eggl, U. 2002. Illustrated handbook of succulent plants: Dicotyledons. Springer-Verlag, Berlin - Heidelberg - New York	"Densely branching shrubs, forming compact mounds to 1.5 x 1.5 m"
601	Evidence of substantial reproductive failure in native habitat	n
	Source(s)	Notes
	Wiersema, J.H. & León, B. 1999. World Economic Plants: A Standard Reference. CRC Press, Boca Raton, FL	CITES-II (Appendix II includes species not necessarily threatened with extinction, but in which trade must be controlled in order to avoid utilization incompatible with their survival.)
602	Produces viable seed	y
	Source(s)	Notes
	Rau, E. 2015. President, Sustainable Bioresources, LLC. Personal Communication. 14 April	"From past experience in Maryland, growing it outdoors in summer, greenhouse in winter, well established plants occasionally bloomed and set seeds, suggesting that they may be self-fertile. Seeds formed but no germinating seeds were noted near the plants. So far, I have not observed blooms on the plants here in Hawaii."
	Dave's Garden. 2015. Moroccan Mound, Official Spurge, Resin Spurge - <i>Euphorbia resinifera</i> . http://davesgarden.com/guides/pf/go/62524/ . [Accessed 18 Jun 2015]	"Propagation Methods: From herbaceous stem cuttings From seed; sow indoors before last frost"
603	Hybridizes naturally	
	Source(s)	Notes
	WRA Specialist. 2015. Personal Communication	Unknown. Hybridization documented in genus <i>Euphorbia</i>
604	Self-compatible or apomictic	
	Source(s)	Notes
	Rau, E. 2015. President, Sustainable Bioresources, LLC. Personal Communication. 14 April	"well established plants occasionally bloomed and set seeds, suggesting that they may be self-fertile."
605	Requires specialist pollinators	n
	Source(s)	Notes

Qsn #	Question	Answer
	Chakir, A., Romane, A., Marcazzan, G. L., & Ferrazzi, P. (2011). Physicochemical properties of some honeys produced from different plants in Morocco. <i>Arabian Journal of Chemistry</i> . doi:10.1016/j.arabjc.2011.10.013	[Visited, and presumably pollinated by honey bees] "Three races of bees that live in Morocco (Hepburn and Radloff, 1998) are <i>Apis mellifera intermissa</i> (Buttel-Reepen, 1906) present in most regions, <i>Apis mellifera major</i> (Ruttner, 1987) in the Rif mountains in the North, and it is considered as an ecotype not differing from <i>Apis mellifera intermissa</i> in behaviour and its taxonomic status, and <i>Apis mellifera sahariensis</i> (Baldensperger, 1932) in the South." ... " ... "E. resinifera honey has strong antimicrobial activity on bacterial strains (Noaman et al., 2004); it has a pungent flavour, very much appreciated by the Moroccan customers and highly used in traditional medicine."

606	Reproduction by vegetative fragmentation	y
	Source(s)	Notes
	Rau, E. 2015. President, Sustainable Bioresources, LLC. Personal Communication. 14 April	"Propagation is from cuttings. Cuttings form calluses and can be stored for prolonged periods without loss of viability. They are very slow to root."
	Cactus Art Nursery. 2015. <i>Euphorbia resinifera</i> . http://www.cactusart.biz/schede/EUPHORBIA/Euphorbia_resinifera/Euphorbia_resinifera.htm . [Accessed 17 Jun 2015]	"They will rapidly mound, branch and spread." ... "Propagation: It is propagated by cuttings (It branches enthusiastically and offsets are readily available). If you remove an offset, remember to let it dry for a week or so, letting the wound heal (cuttings planted too soon will easily rot before they can grow roots). It is better to wash the cut to remove the latex."

607	Minimum generative time (years)	
	Source(s)	Notes
	Feiter, U. 2013. Cultivation of Novel Medicinal Crops—Challenges of Domestication of Wild Species. Parceval (Pty) Ltd, Wellington, South Africa. http://labs.intercedd.com.ng/download/ . [Accessed 17 Jun 2015]	" <i>Euphorbia resinifera</i> grows extremely slowly. It is estimated that it takes at least 3-4 years until a commercial harvest can be expected." [Slow growth rate. Probably >3+ years]

701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	
	Source(s)	Notes
	WRA Specialist. 2015. Personal Communication	No evidence, and seeds lack any means of external attachment. Small size may aid in dispersal, but limited information is available about the dispersal ecology of this species.

702	Propagules dispersed intentionally by people	y
	Source(s)	Notes
	Cactus Art Nursery. 2015. <i>Euphorbia resinifera</i> . http://www.cactusart.biz/schede/EUPHORBIA/Euphorbia_resinifera/Euphorbia_resinifera.htm . [Accessed 17 Jun 2015]	"Commonly sold at garden outlet centres they are some of the easiest and care-free <i>Euphorbias</i> to grow, both in pots and in the ground in areas with a mild climate, but they can even be grown indoors."

Qsn #	Question	Answer
	Dave's Garden. 2015. Moroccan Mound, Official Spurge, Resin Spurge - <i>Euphorbia resinifera</i> . http://davesgarden.com/guides/pf/go/62524/ . [Accessed 18 Jun 2015]	"On Jan 30, 2004, palmbob from Acton, CA (Zone 8b) wrote: Though in some parts of the world (probably S Africa) this small rapidly suckering plant is considered a toxic weed. But in So Cal it just is a nice landscaping succulent, making an attractive colony of short, blue-green, 4 sided hardy little columns. I have seen some plantings where this plant covered many square yards of yard. Very commonly sold at garden outlet centers and is one of the easiest and carefree Euphorbias to grow in both pots and in the ground in southern California."

703	Propagules likely to disperse as a produce contaminant	n
	Source(s)	Notes
	Martin, C.A. 2015. Virtual Library of Phoenix Landscape Plants - <i>Euphorbia resinifera</i> . http://www.public.asu.edu/~camartin/plants/Plant%20html%20files/euphorbiaresinifera.html . [Accessed]	"Flowers & fruits: The flowers are small, simple, and bright yellow, and the fruit a small capsule with one seed in each cell. Flowering is rare out of its native range." [No evidence. Seed set may be limited, & flowering may be infrequent in cultivation]

704	Propagules adapted to wind dispersal	n
	Source(s)	Notes
	Eggl, U. 2002. Illustrated handbook of succulent plants: Dicotyledons. Springer-Verlag, Berlin - Heidelberg - New York	[Fruit] "obtusely lobed, 4 x 7 mm" [Seed] "subglobose, 2.5 mm [diameter], minutely tuberculate" [No obvious adaptation for wind dispersal. Dehiscence & gravity are likely mechanisms, although wind may aid in short-distance dispersal]

705	Propagules water dispersed	n
	Source(s)	Notes
	Eggl, U. 2002. Illustrated handbook of succulent plants: Dicotyledons. Springer-Verlag, Berlin - Heidelberg - New York	[Fruit] "obtusely lobed, 4 x 7 mm" [Seed] "subglobose, 2.5 mm [diameter], minutely tuberculate" [No specific adaptations for water dispersal, but water may aid in dispersal away from parent plant after seeds have dehisced]

706	Propagules bird dispersed	n
	Source(s)	Notes
	Eggl, U. 2002. Illustrated handbook of succulent plants: Dicotyledons. Springer-Verlag, Berlin - Heidelberg - New York	[Fruit] "obtusely lobed, 4 x 7 mm" [Seed] "subglobose, 2.5 mm [diameter], minutely tuberculate" [Not fleshy-fruited]

707	Propagules dispersed by other animals (externally)	n
	Source(s)	Notes
	Eggl, U. 2002. Illustrated handbook of succulent plants: Dicotyledons. Springer-Verlag, Berlin - Heidelberg - New York	[Fruit] "obtusely lobed, 4 x 7 mm" [Seed] "subglobose, 2.5 mm [diameter], minutely tuberculate" [No evidence, or means of external attachment. Some Euphorbia seeds have arils and are adapted for myrmecochory, but there is no evidence that <i>E. resinifera</i> seeds possess such adaptations]

Qsn #	Question	Answer
708	Propagules survive passage through the gut	n
	Source(s)	Notes
	Gordon, D. R., Mitterdorfer, B., Pheloung, P. C., Ansari, S., Buddenhagen, C., Chimera, C., ... & Williams, P. A. 2010). Guidance for addressing the Australian Weed Risk Assessment questions. <i>Plant Protection Quarterly</i> , 25(2): 56-74	[Toxicity makes it unlikely that plants or seeds would be consumed] "Answer 'no' where the taxon is unlikely to be eaten by animals or if seeds are not viable following passage through the gut."

801	Prolific seed production (>1000/m2)	n
	Source(s)	Notes
	Martin, C.A. 2015. Virtual Library of Phoenix Landscape Plants - <i>Euphorbia resinifera</i> . http://www.public.asu.edu/~camartin/plants/Plant%20html%20files/euphorbiarresinifera.html . [Accessed 18 Jun 2015]	"Flowers & fruits: The flowers are small, simple, and bright yellow, and the fruit a small capsule with one seed in each cell. Flowering is rare out of its native range."
	Rau, E. 2015. President, Sustainable Bioresources, LLC. Personal Communication. 14 April	"From past experience in Maryland, growing it outdoors in summer, greenhouse in winter, well established plants occasionally bloomed and set seeds, suggesting that they may be self-fertile. Seeds formed but no germinating seeds were noted near the plants. So far, I have not observed blooms on the plants here in Hawaii."

802	Evidence that a persistent propagule bank is formed (>1 yr)	
	Source(s)	Notes
	WRA Specialist. 2015. Personal Communication	Unknown

803	Well controlled by herbicides	
	Source(s)	Notes
	WRA Specialist. 2015. Personal Communication	No information on herbicide efficacy or chemical control of this species.

804	Tolerates, or benefits from, mutilation, cultivation, or fire	
	Source(s)	Notes
	Cactus Art Nursery. 2015. <i>Euphorbia resinifera</i> . http://www.cactusart.biz/schede/EUPHORBIA/Euphorbia_resinifera/Euphorbia_resinifera/Euphorbia_resinifera.htm . [Accessed 18 Jun 2015]	[Unknown. Possibly may resprout from damage] "They will rapidly mound, branch and spread." ... "Propagation: It is propagated by cuttings (It branches enthusiastically and offsets are readily available)."

805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	
	Source(s)	Notes
	WRA Specialist. 2015. Personal Communication	Unknown

Summary of Risk Traits:

High Risk / Undesirable Traits

- Able to grow in dry subtropical climates
- One unconfirmed comment of weediness in South Africa
- Many Euphorbia species have become highly invasive weeds
- Spiny
- Unpalatable to animals
- Latex caustic to the skin, poisonous to animals & humans
- Tolerates many soil types (well-drained)
- Reproduces by seeds and vegetatively
- Seeds dispersed by gravity & intentionally by people
- Limited ecological information may minimize accuracy of risk prediction

Low Risk Traits

- No confirmed reports of invasiveness or naturalization outside native range
- Medicinal uses
- Limited seed production in cultivation

Second Screening Results for low stature shrubby life form

(A) Reported as a weed of cultivated lands? No

Outcome = Accept (Low Risk)