

Key Words: High Risk, Spiny Shrub, Toxic Sap, Medicinal, Ornamental, Bird-dispersed

Family: *Euphorbiaceae*

Taxon: *Euphorbia ingens*

Synonym: *Euphorbia natalensis sensu Berg. non Bernh.* *Euphorbia similis* A. Berger
Common Name: cactus euphorbia
 cactus spurge
 candelabra tree

Questionnaire Status:	current 20090513 Assessor Approved	Assessor:	Chuck Chimera	Designation:	H(HPWRA)
Data Entry Person:	Chuck Chimera	WRA Score	7		
101	Is the species highly domesticated?	y=-3, n=0		n	
102	Has the species become naturalized where grown?	y=1, n=-1			
103	Does the species have weedy races?	y=1, n=-1			
201	Species suited to tropical or subtropical climate(s) - If island is primarily wet habitat, then substitute "wet tropical" for "tropical or subtropical"	(0-low; 1-intermediate; 2-high) (See Appendix 2)		High	
202	Quality of climate match data	(0-low; 1-intermediate; 2-high) (See Appendix 2)		High	
203	Broad climate suitability (environmental versatility)	y=1, n=0		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		?	
301	Naturalized beyond native range	y = 1*multiplier (see Appendix 2), n= question 205			
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)			
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	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		y	
406	Host for recognized pests and pathogens	y=1, n=0		n	
407	Causes allergies or is otherwise toxic to humans	y=1, n=0		y	
408	Creates a fire hazard in natural ecosystems	y=1, n=0		n	
409	Is a shade tolerant plant at some stage of its life cycle	y=1, n=0		n	
410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y=1, n=0		y	

411	Climbing or smothering growth habit	y=1, n=0	n
412	Forms dense thickets	y=1, n=0	
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	y
605	Requires specialist pollinators	y=-1, n=0	n
606	Reproduction by vegetative fragmentation	y=1, n=-1	n
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	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	
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	
805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	y=-1, n=1	

Designation: H(HPWRA)

WRA Score 7

Supporting Data:

101	2006. Gildenhuis, S.. The three most abundant tree Euphorbia species of the Transvaal (South Africa). <i>Euphorbia World</i> . 2(1): 9-14.	[Is the species highly domesticated? No evidence] "E. ingens is a very widespread species and with a high degree of variability throughout its distribution range that requires an in depth taxonomic study which will probably result in new species or varieties or E. ingens may remain a very complicated and extremely variable species."
102	2012. WRA Specialist. Personal Communication.	NA
103	2012. WRA Specialist. Personal Communication.	NA
201	2006. Gildenhuis, S.. The three most abundant tree Euphorbia species of the Transvaal (South Africa). <i>Euphorbia World</i> . 2(1): 9-14.	[Species suited to tropical or subtropical climate(s) 2-High] "This species is distributed from KwaZulu-Natal, Swaziland, Mpumalanga, Gauteng, North West Province, Limpopo province, Mozambique, Zimbabwe and northwards."
201	2012. USDA ARS National Genetic Resources Program. Germplasm Resources Information Network - (GRIN). http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl	[Species suited to tropical or subtropical climate(s) 2-High] "South Tropical Africa: Malawi; Mozambique; Zimbabwe Southern Africa: Botswana; South Africa - KwaZulu-Natal, Transvaal; Swaziland"
202	2012. USDA ARS National Genetic Resources Program. Germplasm Resources Information Network - (GRIN). http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl	[Quality of climate match data 2-High]
203	2008. Schmelzer, G.H./Gurib-Fakim, A. (Eds.). <i>Plant Resources of Tropical Africa 11(1). Medicinal Plants 1</i> . PROTA Foundation, Wageningen, Netherlands	[Broad climate suitability (environmental versatility)? Yes. Elevation range exceeds 1000 m] "Euphorbia ingens occurs in dry mopane and wooded grassland, often on rocky outcrops, from sea-level up to 1600 m altitude. It can survive in areas that go through long periods of drought or are generally very dry."
204	2008. Schmelzer, G.H./Gurib-Fakim, A. (Eds.). <i>Plant Resources of Tropical Africa 11(1). Medicinal Plants 1</i> . PROTA Foundation, Wageningen, Netherlands	[Native or naturalized in regions with tropical or subtropical climates? Yes] "Euphorbia ingens occurs from the Caprivi strip (Namibia), Zambia and Botswana east to Mozambique and south to eastern South Africa and Swaziland."
204	2012. USDA ARS National Genetic Resources Program. Germplasm Resources Information Network - (GRIN). http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl	[Native or naturalized in regions with tropical or subtropical climates? Yes] "South Tropical Africa: Malawi; Mozambique; Zimbabwe Southern Africa: Botswana; South Africa - KwaZulu-Natal, Transvaal; Swaziland"
205	2008. Schmelzer, G.H./Gurib-Fakim, A. (Eds.). <i>Plant Resources of Tropical Africa 11(1). Medicinal Plants 1</i> . PROTA Foundation, Wageningen, Netherlands	[Does the species have a history of repeated introductions outside its natural range?] "Euphorbia ingens is planted as an ornamental in succulent gardens or rock gardens in South Africa and the United States."
205	2009. DAISIE. Handbook of alien species in Europe Volume 3 of Invading nature. Springer Science and Business Media B.V.,	[Does the species have a history of repeated introductions outside its natural range?] Introduced into Europe
301	2007. McCormack, G.. Cook Islands Biodiversity Database, Version 2007.2.. Cook Islands Natural Heritage Trust, Rarotonga http://cookislands.bishopmuseum.org	[Naturalized beyond native range? Not in Cook Islands] "COOK ISLANDS STATUS: Introduced - Recent, Not naturalised; Land, lowlands, gardens"
301	2012. Randall, R.P.. <i>A Global Compendium of Weeds</i> . 2nd Edition. Department of Agriculture and Food, Western Australia	[Naturalized beyond native range? Possibly Naturalized in Madeira. Unable to confirm with references listed]
302	2012. Randall, R.P.. <i>A Global Compendium of Weeds</i> . 2nd Edition. Department of Agriculture and Food, Western Australia	[Garden/amenity/disturbance weed? No evidence]
303	1994. Bizimana, N.. <i>Traditional Veterinary Practice in Africa</i> . Deutsche Gesellschaft für Technische Zusammenarbeit, Eschborn, Germany	[Agricultural/forestry/horticultural weed? Potentially] "Cattle driven through dense brush containing the plant may suffer severe burns on the eyes, lips and face. It finally looks as if they have been splattered with acid, and the disfigurement is sometimes so severe that owners have killed the animals. The latex is said to contain a resin and euphorbon (W02)." [A potential problem for cattle ranching]
303	2012. Randall, R.P.. <i>A Global Compendium of Weeds</i> . 2nd Edition. Department of Agriculture and Food, Western Australia	[Agricultural/forestry/horticultural weed? Listed as an agricultural weed, but no specific details found on negative impacts]
304	2012. Randall, R.P.. <i>A Global Compendium of Weeds</i> . 2nd Edition. Department of Agriculture and Food, Western Australia	[Environmental weed? No evidence]

305	2003. Weber, E.. Invasive Plant Species of the World. A Reference Guide to Environmental Weeds. CABI Publishing, Wallingford, UK	[Congeneric weed? Yes] "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."
401	1997. Dudley, C.O.. The candelabra tree (Euphorbia ingens): a source of water for black rhinoceros in Liwonde National Park, Malawi. Koedoe. 40(1): 57-62.	[Produces spines, thorns or burrs? Yes] "Each stem bears 4-5 flanges which are constricted to some degree in relation to annual growth patterns. Paired spines are scattered along the ridges."
402	2012. WRA Specialist. Personal Communication.	[Allelopathic? Unknown]
403	2006. Gildenhuys, S.. The three most abundant tree Euphorbia species of the Transvaal (South Africa). Euphorbia World. 2(1): 9-14.	[Parasitic? No] "E. ingens have also been observed as a host plant of a hemiparasite plant in the Loranthaceae family (Mitich, 1984)."
404	1997. Dudley, C.O.. The candelabra tree (Euphorbia ingens): a source of water for black rhinoceros in Liwonde National Park, Malawi. Koedoe. 40(1): 57-62.	[Unpalatable to grazing animals? Palatable to rhinos] "The introduction of two rhinoceros into a 15 km2 fenced sanctuary within Liwonde National Park provided an opportunity for close observation of the animals feeding on the toxic succulent Euphorbia ingens. Feeding invariably caused the death of the plant! and for plants with basal diameters between 5-17 cm, mortality ranged from 40-90 %. During the severe drought of 1994 rhinoceros did not drink from the artificial waterhole from approximately 15 July to at least 23 September. As this waterhole was the only source of free water it is believed that the rhinoceros obtained their water from browsing on E. ingens."
404	2004. Codron, D.. Please don't feed the baboons - They eat toxic foods by themselves. Science in Africa. November 2004: http://www.scienceinafrica.co.za/2004/november/baboons.htm	[Unpalatable to grazing animals? Not to baboons] "E. ingens contains a milky latex notorious for its toxic properties, yet baboons seem to be unaffected by this plant. This behaviour is, however, not limited to Welgevonden; baboons from the Eastern Cape and the Namib Desert also consume Euphorbia species. In Queen Elizabeth National Park, Uganda, intensive foraging on E. ingens by baboons is believed to be responsible for the emergence of two morphologically distinct forms of the tree!"
404	2005. Codron, D./Codron, J./Lee-Thorp, J.A./Sponheimer, M./de Ruiter, D.. Animal diets in the Waterberg based on stable isotopic composition of faeces. South African Journal of Wildlife Research. 35(1): 43-52.	[Unpalatable to grazing animals? Palatable to baboons] "The balance of the diet may have included grasses, but CAM-photosynthesizing Euphorbia ingens, with a 13C value indistinguishable from that of C4 grasses, appears to contribute largely to baboon diets at least on Welgevonden (Codron 2003)."
404	2012. Plant this. Euphorbia ingens [Accessed 01 Oct 2012]. http://www.plantthis.com.au/plant-information.asp?gardener=26113&tabview=design&plantSpot=	[Unpalatable to grazing animals? Possibly Yes] "Animals: deer resistant"
404	2012. WRA Specialist. Personal Communication.	[Unpalatable to grazing animals? Unknown] Probably unpalatable to ungulates present in the Hawaiian Islands, but despite toxic sap, certain animals within native range will consume parts of this plant.
405	1994. Bizimana, N.. Traditional Veterinary Practice in Africa. Deutsche Gesellschaft für Technische Zusammenarbeit, Eschborn, Germany	[Toxic to animals? Yes] "Cattle driven through dense brush containing the plant may suffer severe burns on the eyes, lips and face. It finally looks as if they have been spattered with acid, and the disfigurement is sometimes so severe that owners have killed the animals. The latex is said to contain a resin and euphorbon (W02)."
405	2004. South African National Biodiversity Institute. PlantzAfrica.com - Euphorbia ingens. http://www.plantzfrica.com/plantefg/euphorbingen.htm	[Toxic to animals? Yes] "The latex of this tree is extremely toxic and can cause severe skin irritations, blindness and severe illness to humans and animals if swallowed. It is said that cattle driven through these plants can be so severely affected that they have to be put down."
406	2004. South African National Biodiversity Institute. PlantzAfrica.com - Euphorbia ingens. http://www.plantzfrica.com/plantefg/euphorbingen.htm	[Host for recognized pests and pathogens? No] "Because of its poisonous latex/sap no pests seem to bother these trees."
407	1997. Dudley, C.O.. The candelabra tree (Euphorbia ingens): a source of water for black rhinoceros in Liwonde National Park, Malawi. Koedoe. 40(1): 57-62.	[Causes allergies or is otherwise toxic to humans? Yes] "Like a number of other Euphorbia sp., the candelabra tree produces copious white latex which is extremely toxic, causing intense irritation and blistering to the skin (Coates PaJgrave 1977)."
407	2004. South African National Biodiversity Institute. PlantzAfrica.com - Euphorbia ingens. http://www.plantzfrica.com/plantefg/euphorbingen.htm	[Causes allergies or is otherwise toxic to humans? Yes] "The latex of this tree is extremely toxic and can cause severe skin irritations, blindness and severe illness to humans and animals if swallowed." ... "Please note that though these plants are suitable for gardens, they should not be planted where small children will be playing, as they contain a milky latex/sap that is very harmful if it comes into contact with the skin or eyes and if ingested."

407	2006. Gildenhuis, S.. The three most abundant tree Euphorbia species of the Transvaal (South Africa). <i>Euphorbia World</i> . 2(1): 9-14.	[Causes allergies or is otherwise toxic to humans? No] "As for all Euphorbia species of the Transvaal the latex of <i>E. ingens</i> is very poisonous. It can cause temporary to permanent blindness when it comes in contact with the eyes. It is also highly irritating to the skin, burning the skin and even forming large blisters."
408	2004. South African National Biodiversity Institute. PlantzAfrica.com - Euphorbia ingens. http://www.plantzafrika.com/plantefg/euphorbingen.htm	[Creates a fire hazard in natural ecosystems? Unlikely due to succulent habit] "An upright, succulent tree with a dark green crown which is well rounded and often shaped like a hot-air balloon. Grows up to 12 m."
408	2008. Schmelzer, G.H./Gurib-Fakim, A. (Eds.). Plant Resources of Tropical Africa 11(1). Medicinal Plants 1. PROTA Foundation, Wageningen, Netherlands	[Creates a fire hazard in natural ecosystems? No evidence]
409	2004. South African National Biodiversity Institute. PlantzAfrica.com - Euphorbia ingens. http://www.plantzafrika.com/plantefg/euphorbingen.htm	[Is a shade tolerant plant at some stage of its life cycle? No] "It does best in the open sun, needing very little water and can therefore withstand periods of drought."
409	2008. Schmelzer, G.H./Gurib-Fakim, A. (Eds.). Plant Resources of Tropical Africa 11(1). Medicinal Plants 1. PROTA Foundation, Wageningen, Netherlands	[Is a shade tolerant plant at some stage of its life cycle? No] "It does best in the open sun."
410	2006. Gildenhuis, S.. The three most abundant tree Euphorbia species of the Transvaal (South Africa). <i>Euphorbia World</i> . 2(1): 9-14.	[Tolerates a wide range of soil conditions? Yes] " <i>E. ingens</i> occupies a wide range of habitats and soils along its wide distribution range. Plants may be found growing on steep rock faces, rocky outcrops and ridges to the open veldt or to the bushveld."
411	2006. Gildenhuis, S.. The three most abundant tree Euphorbia species of the Transvaal (South Africa). <i>Euphorbia World</i> . 2(1): 9-14.	[Climbing or smothering growth habit? No] " <i>E. ingens</i> is a tree forming species with a multibranching habit reaching heights of about 10 metres and forms very sturdy main trunks with time. Its large and somewhat rounded crowns consist of a mass of irregularly branched 4-angled branches that are segmented and dark green in colour."
412	2006. Reynolds, L.. Country Pasture/Forage Resource Profiles - Malawi. FAO, Rome, Italy	[Forms dense thickets? Possibly. A component of thicket vegetation] "Base rich soils support <i>Euphorbia ingens</i> and <i>Commiphora</i> thicket, whilst <i>Hyphaene ventricosa</i> , <i>H. crinita</i> and <i>Borassus aethiopicum</i> palms occur where the water table is high."
501	2008. Schmelzer, G.H./Gurib-Fakim, A. (Eds.). Plant Resources of Tropical Africa 11(1). Medicinal Plants 1. PROTA Foundation, Wageningen, Netherlands	[Aquatic? No] " <i>Euphorbia ingens</i> occurs in dry mopane and wooded grassland, often on rocky outcrops, from sea-level up to 1600 m altitude."
502	2012. USDA ARS National Genetic Resources Program. Germplasm Resources Information Network - (GRIN). http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl	[Grass? No] Euphorbiaceae
503	2012. USDA ARS National Genetic Resources Program. Germplasm Resources Information Network - (GRIN). http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl	[Nitrogen fixing woody plant? No] Euphorbiaceae

504	2008. Schmelzer, G.H./Gurib-Fakim, A. (Eds.). Plant Resources of Tropical Africa 11(1). Medicinal Plants 1. PROTA Foundation, Wageningen, Netherlands	[Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)? No] "Monoecious, succulent small tree up to 12(–15) m tall, with abundant latex; bole stout; bark grey, roughly fissured; branches persistent from c. 3 m upwards, almost erect, rebranching, forming a large, broadly rounded crown; terminal branches fleshy, 6–12 cm in diameter, constricted at irregular intervals into oblong segments 10–15 cm long, 4 angled, wings up to 3 cm wide, margins of angles straight to wavy, with shallow tubercles 1–2 cm apart; spine shields obtusely triangular, c. 6 mm × 5 mm, soon becoming corky, with 2 pairs of spines, 1 pair stout, c. 5 mm long, 1 (stipular) pair triangular, c. 1.5 mm long, flexible, soon falling. Leaves at the end of branches, in 4 rows, sessile; stipules transformed into small spines; blade obovate, c. 3 mm × 3 mm, soon falling, in young plants up to 8 cm × 2 cm. Inflorescence an axillary cyme, 1–3 together crowded at the end of branches, consisting of clusters of flowers, each cluster called a 'cyathium', peduncle 8–20 mm long, branches 2, c. 5 mm long; bracts 2, c. 5 mm long; cyathia c. 5 mm × 10 mm, with a cup-shaped involucre, lobes c. 2.5 mm long, glands 5, transversely elliptical, c. 2 mm × 4 mm, golden-yellow, each involucre containing 1 female flower surrounded by many male flowers. Flowers unisexual; male flowers sessile, perianth absent, stamen c. 5.5 mm long; female flowers with pedicel c. 5 mm long in fruit, perianth irregularly 3 lobed, lobes filiform, 2–4 mm long, ovary superior, glabrous, 3-celled, styles 3, 3–3.5 mm long, fused at base, apex 2-fid. Fruit an obtusely 3 lobed capsule c. 7 mm × 10 mm, fleshy, green becoming red, hardening before dehiscence, 3 seeded. Seeds almost globose, c. 4 mm × 3 mm, greyish brown speckled with pale brown, smooth."
601	2008. Schmelzer, G.H./Gurib-Fakim, A. (Eds.). Plant Resources of Tropical Africa 11(1). Medicinal Plants 1. PROTA Foundation, Wageningen, Netherlands	[Evidence of substantial reproductive failure in native habitat? No] "Euphorbia ingens is relatively common in its distribution area; small trees are only browsed by rhinoceros, and therefore it is not threatened by genetic erosion. All succulent Euphorbia spp. Are listed in CITES appendix 2."
602	2008. Schmelzer, G.H./Gurib-Fakim, A. (Eds.). Plant Resources of Tropical Africa 11(1). Medicinal Plants 1. PROTA Foundation, Wageningen, Netherlands	[Produces viable seed? Yes] "The flowers of Euphorbia ingens are pollinated by butterflies, bees and other insects, and the seeds are dispersed by birds, which feed on the fruits. "
603	2012. WRA Specialist. Personal Communication.	[Hybridizes naturally? Unknown]
604	2006. Gildenhuys, S.. The three most abundant tree Euphorbia species of the Transvaal (South Africa). Euphorbia World. 2(1): 9-14.	[Self-compatible or apomictic?] "Inflorescences usually consist of 3 peduncled cymes that are vertically disposed each with 3 cyathia, the central one being male between two bisexual cyathia that mature after the male cyathium."
604	2012. eHow. Euphorbia Cactus Plant Information. http://www.ehow.com/about_6332157_euphorbia-cactus-plant-information.html	[Self-compatible or apomictic? Yes] "However, only certain Euphorbia are able to fertilize themselves. Any gardener wishing to propagate Euphorbia must know what type she has be successful. Typically, only the species E. groenwaldii and E. ingens are self fertile; other species will require more than one plant for successful propagation."
605	2004. South African National Biodiversity Institute. PlantzAfrica.com - Euphorbia ingens. http://www.plantzafrika.com/plantefg/euphorbingen.htm	[Requires specialist pollinators? No] "The flowers attract butterflies, bees and other insects, which collect pollen and nectar from them, pollinating the trees in the process."
605	2008. Schmelzer, G.H./Gurib-Fakim, A. (Eds.). Plant Resources of Tropical Africa 11(1). Medicinal Plants 1. PROTA Foundation, Wageningen, Netherlands	[Requires specialist pollinators? No] "Euphorbia ingens and several other tree-sized Euphorbia spp. produce much nectar, but the honey, known as 'noors honey', causes a burning sensation in the mouth, which is intensified by drinking water." ... "The flowers of Euphorbia ingens are pollinated by butterflies, bees and other insects, and the seeds are dispersed by birds, which feed on the fruits. Birds also like nesting in these trees; hole-nesting birds such as woodpeckers often use dead sections."
606	2009. Lemke, C.. Cal's plant of the week - Euphorbia ingens - Candelabra Tree. University of Oklahoma Department of Botany & Microbiology, http://www.plantoftheweek.org/week514.shtml	[Reproduction by vegetative fragmentation? No evidence] "Propagation: Euphorbia ingens is best propagated from cuttings or from seed when available. Cuttings should be taken carefully so not to get any of the milky sap on you. I like to seal the cut end with charcoal dust to stop the leaking of sap. Cuttings are allowed to harden off before planting, a period of one to two weeks should be sufficient. "
607	2006. Gildenhuys, S.. The three most abundant tree Euphorbia species of the Transvaal (South Africa). Euphorbia World. 2(1): 9-14.	[Minimum generative time (years)?] "E. ingens is a fast growing, easy obtainable and drought resistant hedge plant that is often used by the locals of the Limpopo province."
607	2012. Learn 2 Grow. Euphorbia ingens [Accessed 01 Oct 2012]. http://www.learn2grow.com/plants/euphorbia-ingens/	[Minimum generative time (years)?] "Growth Rate - Slow"

607	2012. Plant this. <i>Euphorbia ingens</i> [Accessed 01 Oct 2012]. http://www.plantthis.com.au/plant-information.asp?gardener=26113&tabview=design&plantSpot=	[Minimum generative time (years)?] "Growth rate: average"
701	2008. Schmelzer, G.H./Gurib-Fakim, A. (Eds.). <i>Plant Resources of Tropical Africa 11(1). Medicinal Plants 1</i> . PROTA Foundation, Wageningen, Netherlands	[Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)? No evidence] "Fruit an obtusely 3-lobed capsule c. 7 mm x 10 mm, fleshy, green becoming red, hardening before dehiscence, 3-seeded. Seeds almost globose, c. 4 mm x 3 mm, greyish brown speckled with pale brown, smooth." [Small seeds may adhere to mud on vehicle or in boots, but no evidence has been found that this has occurred]
702	2008. Schmelzer, G.H./Gurib-Fakim, A. (Eds.). <i>Plant Resources of Tropical Africa 11(1). Medicinal Plants 1</i> . PROTA Foundation, Wageningen, Netherlands	[Propagules dispersed intentionally by people? Yes] "Euphorbia ingens is planted as an ornamental in succulent gardens or rock gardens in South Africa and the United States."
703	2008. Schmelzer, G.H./Gurib-Fakim, A. (Eds.). <i>Plant Resources of Tropical Africa 11(1). Medicinal Plants 1</i> . PROTA Foundation, Wageningen, Netherlands	[Propagules likely to disperse as a produce contaminant? No evidence] "Fruit an obtusely 3-lobed capsule c. 7 mm x 10 mm, fleshy, green becoming red, hardening before dehiscence, 3-seeded. Seeds almost globose, c. 4 mm x 3 mm, greyish brown speckled with pale brown, smooth." [Not grown with produce, and unlikely that seeds would become a contaminant]
704	1998. Thrash, I.. Association of three succulent plant species with woody canopy in the mixed bushveld, South Africa. <i>Koedoe</i> . 41(2): 95-101.	[Propagules adapted to wind dispersal? Gravity] "This species produces capsular fruits which burst when ripe, dispersing the seeds."
705	2008. Schmelzer, G.H./Gurib-Fakim, A. (Eds.). <i>Plant Resources of Tropical Africa 11(1). Medicinal Plants 1</i> . PROTA Foundation, Wageningen, Netherlands	[Propagules water dispersed? No evidence. Fruit morphology and distribution suggest seeds are not water dispersed] "The flowers of <i>Euphorbia ingens</i> are pollinated by butterflies, bees and other insects, and the seeds are dispersed by birds, which feed on the fruits." ... "Euphorbia ingens occurs in dry montane and wooded grassland, often on rocky outcrops, from sea-level up to 1600 m altitude."
706	2004. South African National Biodiversity Institute. <i>PlantzAfrica.com - Euphorbia ingens</i> . http://www.plantzfrica.com/plantefg/euphorbingen.htm	[Propagules bird dispersed? Presumably Yes] "It is well suited to dry areas and is very attractive with its dark green trunk, yellow to yellow-green flowers and dark red to purple fruits." ... "The seeds are a good source of food for many fruit and berry eating birds. Birds also like nesting in these trees; hole-nesting birds such as woodpeckers often use dead sections."
706	2006. Gildenhuis, S.. The three most abundant tree <i>Euphorbia</i> species of the Transvaal (South Africa). <i>Euphorbia World</i> . 2(1): 9-14.	[Propagules bird dispersed? Yes] "The ovaries become exerted soon after pollination and ripen to a globose fruit of about 1cm in diameter that is covered in a fleshy outer layer. It is reported that the fruits of <i>E. ingens</i> are eaten and dispersed by guinea fowl in South Africa."
706	2008. Schmelzer, G.H./Gurib-Fakim, A. (Eds.). <i>Plant Resources of Tropical Africa 11(1). Medicinal Plants 1</i> . PROTA Foundation, Wageningen, Netherlands	[Propagules bird dispersed? Yes] "The flowers of <i>Euphorbia ingens</i> are pollinated by butterflies, bees and other insects, and the seeds are dispersed by birds, which feed on the fruits. Birds also like nesting in these trees; hole-nesting birds such as woodpeckers often use dead sections."
707	2008. Schmelzer, G.H./Gurib-Fakim, A. (Eds.). <i>Plant Resources of Tropical Africa 11(1). Medicinal Plants 1</i> . PROTA Foundation, Wageningen, Netherlands	[Propagules dispersed by other animals (externally)? No evidence] "Fruit an obtusely 3-lobed capsule c. 7 mm x 10 mm, fleshy, green becoming red, hardening before dehiscence, 3-seeded. Seeds almost globose, c. 4 mm x 3 mm, greyish brown speckled with pale brown, smooth." [No means of external attachment]
708	2008. Schmelzer, G.H./Gurib-Fakim, A. (Eds.). <i>Plant Resources of Tropical Africa 11(1). Medicinal Plants 1</i> . PROTA Foundation, Wageningen, Netherlands	[Propagules survive passage through the gut? Presumably Yes. Bird-dispersed] "The flowers of <i>Euphorbia ingens</i> are pollinated by butterflies, bees and other insects, and the seeds are dispersed by birds, which feed on the fruits. Birds also like nesting in these trees; hole-nesting birds such as woodpeckers often use dead sections."
801	2008. Schmelzer, G.H./Gurib-Fakim, A. (Eds.). <i>Plant Resources of Tropical Africa 11(1). Medicinal Plants 1</i> . PROTA Foundation, Wageningen, Netherlands	[Prolific seed production (>1000/m ²)? Unknown] "Monoecious, succulent small tree up to 12(-15) m tall, with abundant latex; bole stout; bark grey, roughly fissured; branches persistent from c. 3 m upwards, almost erect, rebranching, forming a large, broadly rounded crown;" ... "Flowers unisexual; male flowers sessile, perianth absent, stamen c. 5.5 mm long; female flowers with pedicel c. 5 mm long in fruit, perianth irregularly 3-lobed, lobes filiform, 2-4 mm long, ovary superior, glabrous, 3-celled, styles 3, 3-3.5 mm long, fused at base, apex 2 fid. Fruit an obtusely 3-lobed capsule c. 7 mm x 10 mm, fleshy, green becoming red, hardening before dehiscence, 3-seeded. Seeds almost globose, c. 4 mm x 3 mm, greyish brown speckled with pale brown, smooth"
802	2012. WRA Specialist. Personal Communication.	[Evidence that a persistent propagule bank is formed (>1 yr)? Unknown]
803	2012. WRA Specialist. Personal Communication.	[Well controlled by herbicides? Unknown] No information on herbicide efficacy or chemical control of this species.

804	1997. Dudley, C.O.. The candelabra tree (<i>Euphorbia ingens</i>): a source of water for black rhinoceros in Liwonde National Park, Malawi. <i>Koedoe</i> . 40(1): 57-62.	[Tolerates, or benefits from, mutilation, cultivation, or fire? Possibly. Can resprout if damaged by rhinos] "Plants pushed over or broken at the base always died. Plant less than 6 cm BD often survived through coppice regrowth if at least 50 cm of the basal stem remained. No mortality occurred where rhinoceros simply removed some of the bark of the main stems or larger branches."
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

- Thrives in tropical & sub-tropical climates
- Elevation range exceeds 1000 m
- Other *Euphorbia* species are invasive
- Spiny
- Sap toxic to animals and humans
- Tolerates many soil conditions (and potentially able to exploit many different habitat types)
- Self-fertile
- Seeds dispersed by birds

Low Risk / Desirable Traits

- Questionably naturalized
- Ornamental and medicinal value
- Can be grown in arid areas and requires little water