

Taxon: <i>Clivia nobilis</i> Lindl.	Family: Amaryllidaceae
Common Name(s): bush lily cape clivia drooping clivia	Synonym(s): <i>Haemanthus cernuiflorus</i> J.Bell ex <i>Himantophyllum aitonii</i> (Hook.) <i>Imatophyllum aitonii</i> Hook. <i>Imatophyllum maximum</i> Guillon

Assessor: Chuck Chimera	Status: Assessor Approved	End Date: 7 Sep 2016
WRA Score: 6.0	Designation: L	Rating: Low Risk

Keywords: Perennial Herb, Naturalized, Toxic, Rhizomatous, Bird-Dispersed

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	n
204	Native or naturalized in regions with tropical or subtropical climates	y=1, n=0	y
205	Does the species have a history of repeated introductions outside its natural range?	y=-2, ?=-1, n=0	y
301	Naturalized beyond native range	y = 1*multiplier (see Appendix 2), n= question 205	y
302	Garden/amenity/disturbance weed	n=0, y = 1*multiplier (see Appendix 2)	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)	n
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		
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

Qsn #	Question	Answer Option	Answer
409	Is a shade tolerant plant at some stage of its life cycle	y=1, n=0	y
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		
602	Produces viable seed	y=1, n=-1	y
603	Hybridizes naturally	y=1, n=-1	y
604	Self-compatible or apomictic		
605	Requires specialist pollinators	y=-1, n=0	y
606	Reproduction by vegetative fragmentation	y=1, n=-1	y
607	Minimum generative time (years)	1 year = 1, 2 or 3 years = 0, 4+ years = -1	>3
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		
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/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	y=1, n=-1	y
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
	South African National Biodiversity Institute. 2006. PlantzAfrica.com. <i>Clivia nobilis</i> . http://www.plantzafrika.com/plantcd/clivianobilis.htm . [Accessed 6 Sep 2016]	[No evidence of domestication] " <i>Clivia nobilis</i> was the first species of <i>Clivia</i> to be described in 1828. It was a popular plant in England until the more spectacular <i>Clivia miniata</i> appeared on the scene 30 years later."

102	Has the species become naturalized where grown?	
	Source(s)	Notes
	WRA Specialist. 2016. Personal Communication	NA

103	Does the species have weedy races?	
	Source(s)	Notes
	WRA Specialist. 2016. 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, 2016. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html . [Accessed 6 Sep 2016]	"Native: Africa Southern Africa: South Africa - Eastern Cape"

202	Quality of climate match data	High
	Source(s)	Notes
	USDA, ARS, Germplasm Resources Information Network, 2016. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html . [Accessed]	

Qsn #	Question	Answer
203	Broad climate suitability (environmental versatility)	n
	Source(s)	Notes
	Clivia PE. 2016. <i>Clivia nobilis</i> . http://www.cliviape.co.za/clivia_nobilis.htm . [Accessed 6 Sep 2016]	" <i>C. nobilis</i> is only found in the Eastern Cape Province, specifically from the Sundays River Mouth, extending up along the coast to the Mbashe River area, with colonies occurring as far inland as in the vicinity of Grahamstown, the Olifants Kop pass. The coastal areas have a mild climate (9-25 C) and receive 600-900 mm rainfall annually, and does not have the same threat of frost and snow. "
	The Royal Horticultural Society. 2016. <i>Clivia</i> . https://www.rhs.org.uk/advice/profile?PID=655 . [Accessed 6 Sep 2016]	"Hardiness Frost tender"

204	Native or naturalized in regions with tropical or subtropical climates	y
	Source(s)	Notes
	USDA, ARS, Germplasm Resources Information Network, 2016. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html . [Accessed 6 Sep 2016]	"Native: Africa Southern Africa: South Africa - Eastern Cape"

205	Does the species have a history of repeated introductions outside its natural range?	y
	Source(s)	Notes
	Imada, C.T., Staples, G.W. & Herbst, D.R. 2005. Annotated Checklist of Cultivated Plants of Hawai'i. http://www2.bishopmuseum.org/HBS/botany/cultivatedplants/ . [Accessed 6 Sep 2016]	" <i>Clivia nobilis</i> Lindley Locations: Foster Botanical Garden Harold L. Lyon Arboretum"
	USDA, ARS, Germplasm Resources Information Network, 2016. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html . [Accessed 6 Sep 2016]	"Cultivated: . also cult."
	Randall, R.P. 2007. The introduced flora of Australia and its weed status. CRC for Australian Weed Management, Glen Osmond, Australia	Cultivated in Australia

301	Naturalized beyond native range	y
	Source(s)	Notes
	Guillot, D. & Lumbreras, E. L. (2012). Algunas especies y formas horticolas escapadas de cultivo o pertenecientes a cultivos abandonados presentes en la Comunidad Valenciana (citas y aspectos históricos). <i>Bouteloua</i> 9: 3-10	"This paper cites several species and horticultural plants escaped from culture and found in the Valencian Community (Eastern Spain): <i>Asclepias curassavica</i> 'Red Butterfly', <i>Asparagus setaceus</i> 'Nanus', <i>Clivia nobilis</i> , <i>Ficus microcarpa</i> , <i>Haworthia fasciata</i> , <i>Mirabilis jalapa</i> 'Broken colours', and <i>Papaver somniferum</i> Paeoniflorum 'Scarlet"
	Wagner, W.L., Herbst, D.R. & Lorence, D.H. 2016. Flora of the Hawaiian Islands. Smithsonian Institution, Washington, D.C. http://botany.si.edu/ . [Accessed 6 Sep 2016]	No evidence to date

Qsn #	Question	Answer
	Randall, R.P. 2007. The introduced flora of Australia and its weed status. CRC for Australian Weed Management, Glen Osmond, Australia	Not reported to be naturalized
302	Garden/amenity/disturbance 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
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	n
	Source(s)	Notes
	Randall, R.P. 2012. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	No evidence
401	Produces spines, thorns or burrs	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] "S. Africa. Herb, bulbous, evergreen, pendulous flowers orange-green to red, clusters of bright red berries"
402	Allelopathic	
	Source(s)	Notes
	WRA Specialist. 2016. Personal Communication	Unknown
403	Parasitic	n
	Source(s)	Notes

Qsn #	Question	Answer
	Quattrocchi, U. 2012. CRC World Dictionary of Medicinal and Poisonous Plants: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	"Herb, bulbous, evergreen, pendulous flowers orange-green to red, clusters of bright red berries" [Amaryllidaceae. No evidence]

404	Unpalatable to grazing animals	
	Source(s)	Notes
	Spies, P., Grobler, J. P., & Spies, J. J. (2011). A review of phylogenetic relationships in the genus <i>Clivia</i> . <i>Philosophical Transactions in Genetics</i> , 1, 168-207	[Unknown. Consumed by a species of mouse] "Nobilisine is an alkaloid only observed in <i>C. nobilis</i> (Jeffs et al., 1988; Vildomat et al., 1997). As already mentioned, many alkaloids act as a defence mechanism for the plant due to a bitter taste that repels animals and insects from eating the plant. An interesting observation was made amongst <i>Clivia</i> species (JJ Spies, pers. communication). <i>Clivia nobilis</i> plants were brought from East London to Bloemfontein and kept amongst other <i>Clivia</i> species. The mouse species <i>Mus orangeriae</i> (or the Free State Pygmy mouse) is a species found in the Free State area in high altitudes and short, open grassland. Mice probably from this group or another rodent species fed on the entire <i>C. nobilis</i> collection, leaving only the underground rhizomes and not harming any of the other species. This phenomenon has not previously been reported and further studies on the chemical composition in <i>C. nobilis</i> might shed light on the preference that the mice had in eating the leaves of <i>C. nobilis</i> ."

405	Toxic to animals	y
	Source(s)	Notes
	Nelson, L., Shih, R.D. & Balick, M.J. 2007. Handbook of poisonous and injurious plants, The New York Botanical Garden. Springer, New York, NY	"Toxic Part: All parts of this plant are toxic. Toxin: Lycorine and related phenanthridine alkaloids. Clinical Findings: Ingestion of small amounts produces few or no symptoms. Large exposures may cause nausea,"

406	Host for recognized pests and pathogens	n
	Source(s)	Notes
	The Royal Horticultural Society. 2016. <i>Clivia</i> . https://www.rhs.org.uk/advice/profile?PID=655 . [Accessed 7 Sep 2016]	" <i>Clivia</i> are generally trouble-free, suffering few pests and diseases. However, conspicuous tufts of white, waxy wool appearing on the leaves indicates an infestation of mealybug, which may be troublesome. Slugs and snails can also cause damage to flowers and leaves."
	South African National Biodiversity Institute. 2006. <i>PlantzAfrica.com. Clivia nobilis</i> . http://www.plantzafrika.com/plantcd/clivianobilis.htm . [Accessed 7 Sep 2016]	"Pests which occur in moist shady areas are slugs and snails and they do much damage to the young tender growths. Care must be taken to eliminate these pests. Another pest which can do much damage is the snout beetle. It is nocturnal and damages the leaves. A contact insecticide will eliminate this pest. "

407	Causes allergies or is otherwise toxic to humans	y
	Source(s)	Notes

Qsn #	Question	Answer
	Nelson, L., Shih, R.D. & Balick, M.J. 2007. Handbook of poisonous and injurious plants, The New York Botanical Garden. Springer, New York, NY	"Toxic Part: All parts of this plant are toxic. Toxin: Lycorine and related phenanthridine alkaloids. Clinical Findings: Ingestion of small amounts produces few or no symptoms. Large exposures may cause nausea,"

408	Creates a fire hazard in natural ecosystems	n
	Source(s)	Notes
	South African National Biodiversity Institute. 2006. PlantzAfrica.com. <i>Clivia nobilis</i> . http://www.plantzafrica.com/plantcd/clivianobilis.htm . [Accessed 7 Sep 2016]	[No evidence. Unlikely given habit and habitat] " <i>Clivia nobilis</i> is a bulbous plant which develops a rhizome and forms a tight clump as new suckers are produced and the plant becomes larger." ... "Rainfall in the area ranges from 1000mm to 1400mm which occurs in summer. Temperatures range from as low as 3° C to 30° C however the evergreen forests always have a cooling effect."

409	Is a shade tolerant plant at some stage of its life cycle	y
	Source(s)	Notes
	South African National Biodiversity Institute. 2006. PlantzAfrica.com. <i>Clivia nobilis</i> . http://www.plantzafrica.com/plantcd/clivianobilis.htm . [Accessed 6 Sep 2016]	"In light shade the leaves are almost horizontal and are relatively short, approximately 300mm in length while in dense shade the leaves are fairly upright and grow to 800mm in length."

410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	
	Source(s)	Notes
	Vibrant Earth. 2016. <i>Clivia nobilis</i> . http://www.vibrantearth.nz/catalogue/plantsdetail.php?pid=2359&name=Clivia%20nobilis . [Accessed 7 Sep 2016]	"Grows in most soil types / Needs well drained soil"
	<i>Clivia</i> PE. 2016. Growing <i>Clivias</i> - Frequently asked questions. http://www.cliviape.co.za/clivia_faq.htm#faq8 . [Accessed 7 Sep 2016]	[Possibly] "Q. What type of soil is the best? A. In pots <i>Clivias</i> prefer a well drained, slightly acidic potting mix such as composted pine bark. If grown in the garden they grow in virtually any soil type with varying degree of success, provided that they are not over watered."

411	Climbing or smothering growth habit	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	"S. Africa. Herb, bulbous, evergreen, pendulous flowers orange-green to red, clusters of bright red berries"

412	Forms dense thickets	n
	Source(s)	Notes

Qsn #	Question	Answer
	South African National Biodiversity Institute. 2006. PlantzAfrica.com. <i>Clivia nobilis</i> . http://www.plantzafrika.com/plantcd/clivianobilis.htm . [Accessed 7 Sep 2016]	[No evidence] " <i>Clivia nobilis</i> occurs as isolated populations on the east coast from Alexandria Forest near Port Elizabeth northwards to Hole in the Wall (in former Transkei). Occasional populations occur inland with the most westerly population occurring in the Zuurberge up to an altitude of 600m. Coastal populations occur on dune sand, while forest and inland populations are found on river banks, on shale and rocky outcrops. Both on the coast and in inland populations, <i>C. nobilis</i> has been found growing both in low bush cover and with a high forest canopy. "

501	Aquatic	n
	Source(s)	Notes
	South African National Biodiversity Institute. 2006. PlantzAfrica.com. <i>Clivia nobilis</i> . http://www.plantzafrika.com/plantcd/clivianobilis.htm . [Accessed 7 Sep 2016]	[Terrestrial Herb] "Occasional populations occur inland with the most westerly population occurring in the Zuurberge up to an altitude of 600m. Coastal populations occur on dune sand, while forest and inland populations are found on river banks, on shale and rocky outcrops. Both on the coast and in inland populations, <i>C. nobilis</i> has been found growing both in low bush cover and with a high forest canopy. "

502	Grass	n
	Source(s)	Notes
	USDA, ARS, Germplasm Resources Information Network, 2016. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html . [Accessed 7 Sep 2016]	Family: Amaryllidaceae Subfamily: Amaryllidoideae Tribe: Haemantheae

503	Nitrogen fixing woody plant	n
	Source(s)	Notes
	USDA, ARS, Germplasm Resources Information Network, 2016. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html . [Accessed 7 Sep 2016]	Family: Amaryllidaceae Subfamily: Amaryllidoideae Tribe: Haemantheae

504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	n
	Source(s)	Notes
	South African National Biodiversity Institute. 2006. PlantzAfrica.com. <i>Clivia nobilis</i> . http://www.plantzafrika.com/plantcd/clivianobilis.htm . [Accessed 7 Sep 2016]	" <i>Clivia nobilis</i> is a bulbous plant which develops a rhizome and forms a tight clump as new suckers are produced and the plant becomes larger."
	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	"This question is specifically to deal with plants that have specialized organs and should not include plants merely with rhizomes"

Qsn #	Question	Answer
601	Evidence of substantial reproductive failure in native habitat	
	Source(s)	Notes
	Raimondo, D., Von Staden, L., Foden, W., Victor, J.E., HemeE, N.A., Turner, R.C., Kamundi, D.A. & Manyama, P.A. (eds). 2009. Red List of South African plants 2009. <i>Strelitzia</i> 25. South African National Biodiversity Institute, Pretoria	"The population has declined by at least 30% over the last 120 years (generation length 40 years) because of harvesting for the medicinal plant trade, horticultural acquisitions and some habitat destruction caused by coastal development."

602	Produces viable seed	y
	Source(s)	Notes
	South African National Biodiversity Institute. 2006. PlantzAfrica.com. <i>Clivia nobilis</i> . http://www.plantzafrika.com/plantcd/clivianobilis.htm . [Accessed 7 Sep 2016]	"Propagate <i>C. nobilis</i> by sowing the seed once all the soft tissue has been removed from the berry. Sow the seed while fresh in a mixture of equal parts milled pine bark and sand. Cover lightly with milled pine bark. Once the seedlings are large enough to handle they need to be planted out into 15cm pots. Three in each pot. Every 9 months they need to be repotted in fresh growing medium as the old medium breaks down and the drainage is impaired. "

603	Hybridizes naturally	y
	Source(s)	Notes
	Gagiano, A. (2006). Genetic variation in <i>Clivia miniata</i> var. <i>citrina</i> . MS Thesis. University of the Free State, Bloemfontein, South Africa	" <i>Clivia miniata</i> appears to cross easily with other <i>Clivia</i> species, notably <i>C. nobilis</i> , <i>C. gardenii</i> and <i>C. caulescens</i> . Natural hybrids between <i>C. miniata</i> and other <i>Clivia</i> species are known where <i>C. miniata</i> occurs together with other <i>Clivia</i> species, notably <i>C. nobilis</i> and <i>C. caulescens</i> (Winter, 2000). All <i>Clivia</i> species can cross and produce vigorous, fertile progeny, suggesting a close relationship (Ran et al., 2001a, b). In contrast to Winter (2000), Swanevelder (2003) suggested that due to geographical distances between these individuals, such hybrids would probably not occur in nature, however they are reported to occur in natural populations (F. van Niekerk, personal communication)."
	Spies, P., Grobler, J. P., & Spies, J. J. (2011). A review of phylogenetic relationships in the genus <i>Clivia</i> . <i>Philosophical Transactions in Genetics</i> , 1, 168-207	[Unknown] "Although natural hybridization can occur freely between <i>Clivia</i> species when growing sympatrically, only one natural hybrid, <i>C. ×nimbicola</i> Z.H.Swanevelder et al. which is a cross between <i>C. caulescens</i> and <i>C. miniata</i> , is recognised (Swanevelder et al., 2006)."

604	Self-compatible or apomictic	
	Source(s)	Notes
	Kiepiel, I., & Johnson, S. D. (2014). Shift from bird to butterfly pollination in <i>Clivia</i> (Amaryllidaceae). <i>American Journal of Botany</i> , 101(1), 190-200	"Although horticulturists sometimes succeed in producing <i>Clivia</i> seeds from hand-selfing (Swanevelder and Fisher, 2009), our studies indicate that <i>Clivia</i> species have a late-acting self-incompatibility system, and are therefore fully reliant on pollinator visits for seed production (I. Kiepiel, unpublished data). <i>Clivia</i> flowers are protogynous and remain open for up to three weeks if not pollinated."

Qsn #	Question	Answer
	South African National Biodiversity Institute. 2006. PlantzAfrica.com. <i>Clivia nobilis</i> . http://www.plantzafrica.com/plantcd/clivianobilis.htm . [Accessed 6 Sep 2016]	"Not a great deal is known about the pollination of <i>C nobilis</i> . It is possible that they are self pollinating or wind pollinated. However, the flowers produce copious amounts of nectar so bees and sunbirds could also be pollinators of this fascinating plant."
	<i>Clivia</i> PE. 2016. <i>Clivia nobilis</i> . http://www.cliviape.co.za/clivia_nobilis.htm . [Accessed 6 Sep 2016]	"The inflorescence consists of an umbel of 20-60 florets borne on a peduncle about 300 mm long The florets are pinkish yellow to dark red with green tips . They are pendulous tubular, about 11 mm wide and 25 - 40 mm long. The stamens slightly longer than the stamens and has an excellent self pollinating system."

605	Requires specialist pollinators	y
	Source(s)	Notes
	Kiepiel, I., & Johnson, S. D. (2014). Shift from bird to butterfly pollination in <i>Clivia</i> (Amaryllidaceae). <i>American Journal of Botany</i> , 101(1), 190-200	"Four of the species (<i>C. nobilis</i> Lindl., <i>C. gardenii</i> Hook., <i>C. caulescens</i> R. A. Dyer, and <i>C. mirabilis</i> Rourke) have tubular-pendulous flowers that conform to the syndrome of bird pollination,..."
	South African National Biodiversity Institute. 2006. PlantzAfrica.com. <i>Clivia nobilis</i> . http://www.plantzafrica.com/plantcd/clivianobilis.htm . [Accessed 6 Sep 2016]	[Most likely bird-pollinated] "Not a great deal is known about the pollination of <i>C nobilis</i> . It is possible that they are self pollinating or wind pollinated. However, the flowers produce copious amounts of nectar so bees and sunbirds could also be pollinators of this fascinating plant."

606	Reproduction by vegetative fragmentation	y
	Source(s)	Notes
	South African National Biodiversity Institute. 2006. PlantzAfrica.com. <i>Clivia nobilis</i> . http://www.plantzafrica.com/plantcd/clivianobilis.htm . [Accessed 6 Sep 2016]	" <i>Clivia nobilis</i> is a bulbous plant which develops a rhizome and forms a tight clump as new suckers are produced and the plant becomes larger."

607	Minimum generative time (years)	>3
	Source(s)	Notes
	South African National Biodiversity Institute. 2006. PlantzAfrica.com. <i>Clivia nobilis</i> . http://www.plantzafrica.com/plantcd/clivianobilis.htm . [Accessed 6 Sep 2016]	[6+ years from seed to flower] "The rate of growth of <i>C nobilis</i> is considerably slower than all of the other <i>Clivia</i> species. From seed <i>C. nobilis</i> takes at least 6 years or more to flower. Under favourable conditions this species is a long lived plant and will outlive many generations."

701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	n
	Source(s)	Notes
	South African National Biodiversity Institute. 2006. PlantzAfrica.com. <i>Clivia nobilis</i> . http://www.plantzafrica.com/plantcd/clivianobilis.htm . [Accessed 7 Sep 2016]	"Flowers are followed by clusters of bright red berries the size of a marbles which take a year to ripen. The seed is round and about 6mm in diameter." [No evidence. Fruit & seeds lack means of external attachment]

702	Propagules dispersed intentionally by people	y
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Qsn #	Question	Answer
	Source(s)	Notes
	USDA, ARS, Germplasm Resources Information Network, 2016. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html . [Accessed 7 Sep 2016]	"Cultivated: . also cult."
	WRA Specialist. 2016. Personal Communication	Grown and sold as an ornamental

703	Propagules likely to disperse as a produce contaminant	n
	Source(s)	Notes
	South African National Biodiversity Institute. 2006. PlantzAfrica.com. <i>Clivia nobilis</i> . http://www.plantzafrica.com/plantcd/clivianobilis.htm . [Accessed 7 Sep 2016]	"Flowers are followed by clusters of bright red berries the size of a marbles which take a year to ripen. The seed is round and about 6mm in diameter. " [No evidence. Adapted for frugivory]

704	Propagules adapted to wind dispersal	n
	Source(s)	Notes
	Rourke, J. P. (2002). <i>Clivia mirabilis</i> (Amaryllidaceae: Haemantheae) a new species from Northern Cape, South Africa. <i>Bothalia</i> , 32(1), 1-7	"Birds are probably the main seed dispersal vectors." ... "While the dispersal of <i>Clivia</i> seed by birds between closely adjacent forest patches is a strong possibility, dispersal over distances of 800 km of arid country seems highly unlikely."
	South African National Biodiversity Institute. 2006. PlantzAfrica.com. <i>Clivia nobilis</i> . http://www.plantzafrica.com/plantcd/clivianobilis.htm . [Accessed 7 Sep 2016]	"Flowers are followed by clusters of bright red berries the size of a marbles which take a year to ripen. The seed is round and about 6mm in diameter. "

705	Propagules water dispersed	
	Source(s)	Notes
	South African National Biodiversity Institute. 2006. PlantzAfrica.com. <i>Clivia nobilis</i> . http://www.plantzafrica.com/plantcd/clivianobilis.htm . [Accessed 7 Sep 2016]	"Coastal populations occur on dune sand, while forest and inland populations are found on river banks, on shale and rocky outcrops." [Unknown. Distribution near rivers suggests possibility of water dispersal"

706	Propagules bird dispersed	y
	Source(s)	Notes
	Rourke, J. P. (2002). <i>Clivia mirabilis</i> (Amaryllidaceae: Haemantheae) a new species from Northern Cape, South Africa. <i>Bothalia</i> , 32(1), 1-7	"Birds are probably the main seed dispersal vectors." ... "While the dispersal of <i>Clivia</i> seed by birds between closely adjacent forest patches is a strong possibility, dispersal over distances of 800 km of arid country seems highly unlikely."
	South African National Biodiversity Institute. 2006. PlantzAfrica.com. <i>Clivia nobilis</i> . http://www.plantzafrica.com/plantcd/clivianobilis.htm . [Accessed 6 Sep 2016]	"Flowers are followed by clusters of bright red berries the size of a marbles which take a year to ripen. The seed is round and about 6mm in diameter. " ... "Birds are known to distribute the seed."

707	Propagules dispersed by other animals (externally)	n
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Qsn #	Question	Answer
	Source(s)	Notes
	Rourke, J. P. (2002). <i>Clivia mirabilis</i> (Amaryllidaceae: Haemantheae) a new species from Northern Cape, South Africa. <i>Bothalia</i> , 32(1), 1-7	"Birds are probably the main seed dispersal vectors."
	South African National Biodiversity Institute. 2006. PlantzAfrica.com. <i>Clivia nobilis</i> . http://www.plantzafrica.com/plantcd/clivianobilis.htm . [Accessed 7 Sep 2016]	"Flowers are followed by clusters of bright red berries the size of a marbles which take a year to ripen. The seed is round and about 6mm in diameter. " [Unlikely. No means of external attachment]

708	Propagules survive passage through the gut	y
	Source(s)	Notes
	South African National Biodiversity Institute. 2006. PlantzAfrica.com. <i>Clivia nobilis</i> . http://www.plantzafrica.com/plantcd/clivianobilis.htm . [Accessed 6 Sep 2016]	[Presumably Yes] "Flowers are followed by clusters of bright red berries the size of a marbles which take a year to ripen. The seed is round and about 6mm in diameter. " ... "Birds are known to distribute the seed."

801	Prolific seed production (>1000/m ²)	n
	Source(s)	Notes
	South African National Biodiversity Institute. 2006. PlantzAfrica.com. <i>Clivia nobilis</i> . http://www.plantzafrica.com/plantcd/clivianobilis.htm . [Accessed 8 Sep 2016]	"This evergreen, long lived plant produces an inflorescence containing between 40 - 60 pendulous flowers ranging from orange-green to red in colour. It flowers between late autumn and spring. Flowers are followed by clusters of bright red berries the size of a marbles which take a year to ripen. The seed is round and about 6mm in diameter. "

802	Evidence that a persistent propagule bank is formed (>1 yr)	
	Source(s)	Notes
	WRA Specialist. 2016. Personal Communication	Unknown

803	Well controlled by herbicides	
	Source(s)	Notes
	WRA Specialist. 2016. Personal Communication	Unknown. No information on herbicide efficacy or chemical control of this species

804	Tolerates, or benefits from, mutilation, cultivation, or fire	y
	Source(s)	Notes
	South African National Biodiversity Institute. 2006. PlantzAfrica.com. <i>Clivia nobilis</i> . http://www.plantzafrica.com/plantcd/clivianobilis.htm . [Accessed 7 Sep 2016]	" <i>Clivia nobilis</i> is a bulbous plant which develops a rhizome and forms a tight clump as new suckers are produced and the plant becomes larger." [Probably yes. Likely able to resprout from rhizomes]

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

Qsn #	Question	Answer
	Source(s)	Notes
	WRA Specialist. 2016. Personal Communication	Unknown

Summary of Risk Traits:

High Risk / Undesirable Traits

- Able to grow in regions with subtropical climates
- Naturalized in Spain & possibly elsewhere
- All parts of the plant are poisonous to humans & animals if ingested
- Shade-tolerant
- Reproduces by seeds & vegetatively by rhizomes & suckers
- Seeds dispersed by birds & intentionally by people
- Resprouts after fire & possibly cutting

Low Risk Traits

- Despite naturalization, no negative impacts documented in introduced range
- Unarmed (no spines, thorns or burrs)
- Ornamental
- Predominantly self-incompatible

Second Screening Results for Herbs

(A) Reported as a weed of cultivated lands?> No
Outcome = Accept (Low Risk)