Taxon: Rafflesia arnoldii R.Br. **Family:** Rafflesiaceae

Common Name(s): corpse flower **Synonym(s):** Rafflesia atjehensis

Assessor: Chuck Chimera **Status:** Assessor Approved **End Date:** 12 Dec 2016

WRA Score: **-3.0** **Designation:** L **Rating:** Low Risk

Keywords: Parasitic, Tropical, Dioecious, Fly-Pollinated, Animal-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	n
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)	n
401	Produces spines, thorns or burrs	y=1, n=0	n
402	Allelopathic		
403	Parasitic	y=1, n=0	y
404	Unpalatable to grazing animals		
405	Toxic to animals	y=1, n=0	n
406	Host for recognized pests and pathogens		
407	Causes allergies or is otherwise toxic to humans	y=1, n=0	n
408	Creates a fire hazard in natural ecosystems	y=1, n=0	n
409	Is a shade tolerant plant at some stage of its life cycle		
410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y=1, n=0	n

Qsn #	Question	Answer Option	Answer
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		
604	Self-compatible or apomictic	y=1, n=-1	n
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	>3
701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)		
702	Propagules dispersed intentionally by people	y=1, n=-1	n
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	n
707	Propagules dispersed by other animals (externally)	y=1, n=-1	y
708	Propagules survive passage through the gut	y=1, n=-1	y
801	Prolific seed production (>1000/m2)		
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**
	Meijer, W. (1997). Rafflesiaceae. Flora Malesiana-Series 1, Spermatophyta, 13(1), 1-42	[No evidence] "Parasitic plants, endophytic body growing like a thallus inside the woody stems and roots of species of Tetrastigma (Vitaceae)."

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**
	Meijer, W. (1997). Rafflesiaceae. Flora Malesiana-Series 1, Spermatophyta, 13(1), 1-42	"var. arnoldii ... Distribution — Malesia: Sumatra (Aceh, W Sumatra, Bengkulu, Lampong), Borneo (W Sarawak, W Kalimantan" ... "var. atjehensis ... Distribution— So far only known from the type locality Aceh, Locop. Possibly also near Bohorok near the boundary of the Leuser National Park."

202	**Quality of climate match data**	**High**
	Source(s)	**Notes**
	Meijer, W. (1997). Rafflesiaceae. Flora Malesiana-Series 1, Spermatophyta, 13(1), 1-42	

Qsn #	Question	Answer
203	**Broad climate suitability (environmental versatility)**	**n**
	Source(s)	**Notes**
	A Fascinating Green World. (2014). Rafflesia arnoldii (Rafflesia, Corpse Flower). April 7. https://austinbotany.wordpress.com/2014/04/07/rafflesia-arnoldii-rafflesia-corpse-flower/. [Accessed 11 Dec 2016]	"Hardiness Zones: native to zone 13"
	Meijer, W. (1997). Rafflesiaceae. Flora Malesiana-Series 1, Spermatophyta, 13(1), 1-42	"Primary and disturbed lower montane forests, up to c. 1000 m altitude."
	Akhriadi, P., HA. Kiswanto, A. Taufiq, D. Alfajri & R. Kardiman. (2010). Assessment of Conservation Status of Rafflesia in West Sumatra, Indonesia. 2010 Final Report to Rufford Small Grant (for Nature Conservation). Rafflesia Monitoring Team (RMT) Padang. Padang.	"Sumatra has ever-wet or semi-wet climate, except the northern coastal trip of Sumatra"

204	**Native or naturalized in regions with tropical or subtropical climates**	**y**
	Source(s)	**Notes**
	Meijer, W. (1997). Rafflesiaceae. Flora Malesiana-Series 1, Spermatophyta, 13(1), 1-42	"var. arnoldii ... Distribution — Malesia: Sumatra (Aceh, W Sumatra, Bengkulu, Lampong), Borneo (W Sarawak, W Kalimantan" ... "var. atjehensis ... Distribution— So far only known from the type locality Aceh, Locop. Possibly also near Bohorok near the boundary of the Leuser National Park."

205	**Does the species have a history of repeated introductions outside its natural range?**	**n**
	Source(s)	**Notes**
	Kew Royal Botanic Gardens. (2016). Rafflesia arnoldii (corpse flower). http://www.kew.org/science-conservation/plants-fungi/rafflesia-arnoldii-corpse-flower. [Accessed 11 Dec 2016]	"There are a number of reports of Rafflesia plants being grown in cultivation, but it is usually assumed that this is the result of transplanting the host plant rather than successful artificial infection of a healthy host in cultivation."

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

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**

Qsn #	Question	Answer
	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**
	Meijer, W. (1997). Rafflesiaceae. Flora Malesiana-Series 1, Spermatophyta, 13(1), 1-42	"Parasitic plants, endophytic body growing like a thallus inside the woody stems and roots of species of Tetrastigma (Vitaceae). Flower buds sessile, first protruding as a corky swelling with hexagonal patches, the corky base remaining as a cup-shaped body (cupule) below the scales on the flowering sessile shoot. Scales (bracts) in a series of 3 whorls of 5 scales, imbricate, at first appearance white, but turning black or dark brown after exposure, with prominent veins, inner gradually larger."

402	Allelopathic	
	Source(s)	**Notes**
	WRA Specialist. 2016. Personal Communication	Unknown. No evidence

403	Parasitic	y
	Source(s)	**Notes**
	Meijer, W. (1997). Rafflesiaceae. Flora Malesiana-Series 1, Spermatophyta, 13(1), 1-42	"Parasitic plants, endophytic body growing like a thallus inside the woody stems and roots of species of Tetrastigma (Vitaceae)."

Qsn #	Question	Answer
404	**Unpalatable to grazing animals**	
	Source(s)	**Notes**
	Bouman, F., & Meijer, W. (1994). Comparative structure of ovules and seeds in Rafflesiaceae. Plant Systematics and Evolution, 19 (1-4), 187-212	"Ground squirrels eat fruits of Rafflesia and may also dig into the soil and injure roots with their sharp claws, or stems when climbing about the lianas." [Unknown, but as a parasitic plant, probably never consumed by animals]

405	**Toxic to animals**	**n**
	Source(s)	**Notes**
	Kew Royal Botanic Gardens. (2016). Rafflesia arnoldii (corpse flower). http://www.kew.org/science-conservation/plants-fungi/rafflesia-arnoldii-corpse-flower. [Accessed 11 Dec 2016]	"Known hazards: None known."
	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

406	**Host for recognized pests and pathogens**	
	Source(s)	**Notes**
	Strange, R. N. (2003). Introduction to Plant Pathology. John Wiley & Sons Ltd, Chichester, UK	[No evidence] "Disease symptoms in plants are diverse and range from biochemical perturbations of a few cells to death of the whole plant. In the case of parasitic angiosperms, the pathogen itself is often one of the most distinctive signs of infection. Rafflesia, in fact, has the largest flowers in the entire plant kingdom"
	Kew Royal Botanic Gardens. (2016). Rafflesia arnoldii (corpse flower). http://www.kew.org/science-conservation/plants-fungi/rafflesia-arnoldii-corpse-flower. [Accessed 12 Dec 2016]	Unknown

407	**Causes allergies or is otherwise toxic to humans**	**n**
	Source(s)	**Notes**
	Kew Royal Botanic Gardens. (2016). Rafflesia arnoldii (corpse flower). http://www.kew.org/science-conservation/plants-fungi/rafflesia-arnoldii-corpse-flower. [Accessed 11 Dec 2016]	"Known hazards: None known."
	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

Qsn #	Question	Answer
408	**Creates a fire hazard in natural ecosystems**	**n**
	Source(s)	**Notes**
	Kew Royal Botanic Gardens. (2016). Rafflesia arnoldii (corpse flower). http://www.kew.org/science-conservation/plants-fungi/rafflesia-arnoldii-corpse-flower. [Accessed 11 Dec 2016]	[No evidence] "Rafflesia arnoldii is a parasitic plant, without roots or leaves. The main body of the plant resides inside the host plant. The only visible parts are the flowers, which burst through the host plant's bark as compact buds, and later the fruits."

409	**Is a shade tolerant plant at some stage of its life cycle**	
	Source(s)	**Notes**
	Meijer, W. (1997). Rafflesiaceae. Flora Malesiana-Series 1, Spermatophyta, 13(1), 1-42	[Irrelevant, although host plants may be shade tolerant] "Parasitic plants, endophytic body growing like a thallus inside the woody stems and roots of species of Tetrastigma (Vitaceae)."

410	**Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)**	**n**
	Source(s)	**Notes**
	Meijer, W. (1997). Rafflesiaceae. Flora Malesiana-Series 1, Spermatophyta, 13(1), 1-42	"In primary and secondary forest, the host Tetrastigma species prefer to grow in rich alluvial or limestone derived soils."
	Kurniawan, A. (2010). Rafflesia Flower Information Center. http://www.rafflesia-online.info/jo/index.php/index.php/home. [Accessed 12 Dec 2016]	"Soil type ever observed in the growing host of Rafflesia is Ultisol with weak consistency, teksur (sic) moderate, with a low content of nutrients."

411	**Climbing or smothering growth habit**	**n**
	Source(s)	**Notes**
	Meijer, W. (1997). Rafflesiaceae. Flora Malesiana-Series 1, Spermatophyta, 13(1), 1-42	"Parasitic plants, endophytic body growing like a thallus inside the woody stems and roots of species of Tetrastigma (Vitaceae)."

412	**Forms dense thickets**	**n**
	Source(s)	**Notes**
	Meijer, W. (1997). Rafflesiaceae. Flora Malesiana-Series 1, Spermatophyta, 13(1), 1-42	"Parasitic plants, endophytic body growing like a thallus inside the woody stems and roots of species of Tetrastigma (Vitaceae)."

501	**Aquatic**	**n**
	Source(s)	**Notes**
	Meijer, W. (1997). Rafflesiaceae. Flora Malesiana-Series 1, Spermatophyta, 13(1), 1-42	"Habitat — Primary and disturbed lower montane forests, up to c. 1000 m altitude."

Qsn #	Question	Answer
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 11 Dec 2016]	Rafflesiaceae

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 11 Dec 2016]	Rafflesiaceae

504	**Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)**	**n**
	Source(s)	**Notes**
	Meijer, W. (1997). Rafflesiaceae. Flora Malesiana-Series 1, Spermatophyta, 13(1), 1-42	"Parasitic plants, endophytic body growing like a thallus inside the woody stems and roots of species of Tetrastigma (Vitaceae)."

601	**Evidence of substantial reproductive failure in native habitat**	**n**
	Source(s)	**Notes**
	Kew Royal Botanic Gardens. (2016). Rafflesia arnoldii (corpse flower). http://www.kew.org/science-conservation/plants-fungi/rafflesia-arnoldii-corpse-flower. [Accessed 11 Dec 2016]	"Conservation status: Not yet assessed according to IUCN Red List criteria. Considered vulnerable due to disturbance by tourists and collecting of flower buds for traditional medicine." ... "Many sites where Rafflesia grows are now popular with tourists, who provide an income for local people and also an incentive to preserve the species. Unfortunately, as a result of this ecotourism and the resulting human disturbance, the number of flower buds produced per year has decreased significantly at many sites."

602	**Produces viable seed**	**y**
	Source(s)	**Notes**
	Kew Royal Botanic Gardens. (2016). Rafflesia arnoldii (corpse flower). http://www.kew.org/science-conservation/plants-fungi/rafflesia-arnoldii-corpse-flower. [Accessed]	"The fruits are berries with minute seeds."

603	**Hybridizes naturally**	
	Source(s)	**Notes**

Qsn #	Question	Answer
	Meijer, W. (1997). Rafflesiaceae. Flora Malesiana-Series 1, Spermatophyta, 13(1), 1-42	"Rafflesia hasseltii ... This species is closely related to Rafflesia cantleyi and seems to hybridize with it in the Malay Peninsula." ... "Rafflesia keithii ... At first sight this taxon comes close to R. arnoldii as defined in this revision. However, close study of the ramenta reveals that the single, toadstool-shaped ones that are typical for arnoldii are missing in keithii (and in pricei, possibly the nearest relative of keithii). This view is supported by the occurrence of a hybrid at the Mamut copper mine Rafflesia sanctuary in Sabah (Jamili Nais, oral comm.)."

604	Self-compatible or apomictic	n
	Source(s)	**Notes**
	Wicaksono, A., Mursidawati, S., Sukamto, L. A., & da Silva, J. A. T. (2016). Rafflesia spp.: propagation and conservation. Planta, 244: 289–296	"limiting biological factors might include the dioecious nature of the plant (i.e., separated male and female flowers on different individual), limited populations, and the fact that the majority of Rafflesia flowers found in the field are male (Susatya 2011)." ... "Rafflesia spp. flowers are dioecious (Fig. 4) and their corpse-like scent attracts insects such as flies, although the precise organ and compounds responsible for this mechanism remain unknown."
	Beaman, R. S., Decker, P. J., & Beaman, J. H. (1988). Pollination of Rafflesia (Rafflesiaceae). American Journal of Botany, 75(8): 1148-1162	"The dioecious condition of Rafflesia was suggested by Jack (in his 1820 letter to Brown) with the statement: "The flowers I find to be unisexual, which I did not before suspect, and consequently dioecious." Proof of dioecism, which would require controlled inoculation and culture of host plants, still has not been re- ported, but the fact that all flowers produced on a single root are of only one sex (W. Meijer, personal communication) suggests dioecism, as does the population structure (discussed on p. 1161)."

605	Requires specialist pollinators	n
	Source(s)	**Notes**
	Meijer, W. (1997). Rafflesiaceae. Flora Malesiana-Series 1, Spermatophyta, 13(1), 1-42	"The foetid smell of the flowers of Rafflesia attracts carrion-flies of the genus Lucilia (Docters van Leeuwen 1929; Ross in Meijer 1985; Beaman et al. 1988; Banziger 1991). The smell is produced by fresh flowers, especially during sunny warm periods of the day. Beaman et al. suggested they observed green flies in action in Rafflesia at the upper part of the gullies in the column leading to the anther cavities between rows of hairs (Meijer 1985). The actual act of pollination is well illustrated by Banziger (1991), see Fig. 2. Still nobody has fully documented with a video camera what the flies do: laying eggs, collecting nectar (Haak 1885) or just using the carpet oframentae as a mating ground (as insects do inside the odorous inflorescences of aroids: Croat, verbal comm.). The flies carry the pollen on their backs but have not been observed to use it as food. The actual source area (osmophore) of the bad odour is also still not yet known. Banziger (1991) suggested from his own observations that the smell originates from the perigone lobes. Maybe the stomata described by Cammerloher (1920) have a function after all."

606	Reproduction by vegetative fragmentation	n

Qsn #	Question	Answer
	Source(s)	**Notes**
	Wicaksono, A., Mursidawati, S., Sukamto, L. A., & da Silva, J. A. T. (2016). Rafflesia spp.: propagation and conservation. Planta, 244: 289–296	[No evidence] "After pollination, fruit develop (Fig. 1b, c), in some cases by agamospermy (i.e., without pollination), but in such cases the fruit contain sterile seeds (Nais 2001). Large animals can serve to disperse seed (Meijer 1997)." ... "Rafflesia was successfully propagated by grafting a Rafflesia- infected Tetrastigma stem from Pangandaran, West Java, onto an uninfected Tetrastigma rootstock ir Bogor Botanical Garden."

607	Minimum generative time (years)	>3
	Source(s)	**Notes**
	Meijer, W. (1997). Rafflesiaceae. Flora Malesiana-Series 1, Spermatophyta, 13(1), 1-42	"Docters van Leeuwen (1929), Meijer (1958 and recent unpublished observations) that the total life cycle in that genus from seed to seed is about 3-4.5 years."

701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	
	Source(s)	**Notes**
	Bouman, F., & Meijer, W. (1994). Comparative structure of ovules and seeds in Rafflesiaceae. Plant Systematics and Evolution, 19 (1-4), 187-212	[Possible, but unlikely] "Epizoochorous dispersal by the feet of mammals passing along the regular game trails and crushing the fruits has been suggested in the older scientific publications (ERNST & SCHMZD 1913, JUSTESEN 1922, WINKLER 1927)."

702	Propagules dispersed intentionally by people	n
	Source(s)	**Notes**
	Wicaksono, A., Mursidawati, S., Sukamto, L. A., & da Silva, J. A. T. (2016). Rafflesia spp.: propagation and conservation. Planta, 244: 289–296	[No evidence. Seeds difficult to acquire and germinate] "Attempts to propagate Rafflesia by seeds have taken place in Bogor, Indonesia under controlled greenhouse conditions since 1930, but with only negative results to date."

703	Propagules likely to disperse as a produce contaminant	n
	Source(s)	**Notes**
	Wicaksono, A., Mursidawati, S., Sukamto, L. A., & da Silva, J. A. T. (2016). Rafflesia spp.: propagation and conservation. Planta, 244: 289–296	[No evidence. Difficult to propagate, and does not reach maturity for several years] "Attempts to propagate Rafflesia by seeds have taken place in Bogor, Indonesia under controlled greenhouse conditions since 1930, but with only negative results to date. Meijer in 1997 [citing Teijsmann (1856a, b, 1858), Dokters van Leewen (1929) and Meijer (1958)] and unpublished observations by the authors of this review note that it takes 3–4.5 years for Rafflesia seeds to complete their life cycle while Rhizanthes lowii Beccari (Harms), another member of the Rafflesiaceae, takes around 200–255 days from emergence from the host tissue to open flowers (3.7–4.1 cm in diameter) (Meijer 1997). The life cycle of other genera in the Rafflesiaceae remains unknown (Meijer 1997)."

704	Propagules adapted to wind dispersal	n

Qsn #	Question	Answer
	Source(s)	**Notes**
	Bouman, F., & Meijer, W. (1994). Comparative structure of ovules and seeds in Rafflesiaceae. Plant Systematics and Evolution, 19 (1-4), 187-212	"As far as known seed dispersal is endo- or exozoochorous in all genera."
	Meijer, W. (1997). Rafflesiaceae. Flora Malesiana-Series 1, Spermatophyta, 13(1), 1-42	"Fruit berry-like. Seeds thick-walled, c. 1 mm long and with a shorter appendage."

705	Propagules water dispersed	n
	Source(s)	**Notes**
	Bouman, F., & Meijer, W. (1994). Comparative structure of ovules and seeds in Rafflesiaceae. Plant Systematics and Evolution, 19 (1-4), 187-212	"As far as known seed dispersal is endo- or exozoochorous in all genera."

706	Propagules bird dispersed	n
	Source(s)	**Notes**
	Bouman, F., & Meijer, W. (1994). Comparative structure of ovules and seeds in Rafflesiaceae. Plant Systematics and Evolution, 19 (1-4), 187-212	[Presumably mammal or ant dispersed] "Summarising, we have to conclude that seed dispersal in Rafflesia is still mysterious, and in Rhizanthes and Sapria is fully unknown. Animals eating the ripe fruits of Rafflesia and also digging into the soil in search of edible roots, subterranean fruits or termites and ant nests have to be considered as the most probable dispersers of Rafflesia."

707	Propagules dispersed by other animals (externally)	y
	Source(s)	**Notes**
	Bouman, F., & Meijer, W. (1994). Comparative structure of ovules and seeds in Rafflesiaceae. Plant Systematics and Evolution, 19 (1-4), 187-212	"Epizoochorous dispersal by the feet of mammals passing along the regular game trails and crushing the fruits has been suggested in the older scientific publications (ERNST & SCHMZD 1913, JUSTESEN 1922, WINKLER 1927)."

Qsn #	Question	Answer
708	**Propagules survive passage through the gut**	**y**
	Source(s)	**Notes**
	Bouman, F., & Meijer, W. (1994). Comparative structure of ovules and seeds in Rafflesiaceae. Plant Systematics and Evolution, 19 (1-4), 187-212	"In Rafflesia and Rhizanthes, the seeds are embedded in a whitish, sticky and edible pulp." ... "In the more popular literature impressive animals like elephants, tapirs and wild pigs have been nominated as dispersers. According to MEIJEP. (1958, 1983), wild pigs and smaller mammals like ground squirrels, other rodents, scaly anteaters and pangolins are plausible dispersers." ... "Ground squirrels eat fruits of Rafflesia and may also dig into the soil and injure roots with their sharp claws, or stems when climbing about the lianas. The relationship between Rafflesia and squirrels was substained by later observations in 1983 by MEIJER, LAUMONIER, and Ross (MEIJER, pers. comm.) on ground squirrels opening flower buds and eating away anthers. By field observations on Rafflesia keithii, fruits in a disturbed, secondary forest in Sabah, Malaysia, EMMONS & al. (1991) recently verified that squirrels (Callosciurus) and treeshrews (Tupaia) potentially serve as dispersers."

801	**Prolific seed production (>1000/m2)**	
	Source(s)	**Notes**
	Wicaksono, A., Mursidawati, S., Sukamto, L. A., & da Silva, J. A. T. (2016). Rafflesia spp.: propagation and conservation. Planta, 244: 289–296	"After pollination, fruit develop (Fig. 1b, c), in some cases by agamospermy (i.e., without pollination), but in such cases the fruit contain sterile seeds (Nais 2001)."

802	**Evidence that a persistent propagule bank is formed (>1 yr)**	
	Source(s)	**Notes**
	Wicaksono, A., Mursidawati, S., Sukamto, L. A., & da Silva, J. A. T. (2016). Rafflesia spp.: propagation and conservation. Planta, 244: 289–296	"An early in vitro seed germination trial was performed by Sukamto (2001) using R. arnoldii seeds obtained from Bengkulu and Lampung, Indonesia and stored at 5 □C." ... "Seed cultures were stored under photoperiodic room (dark and light cycles). No growth was observed even after 18 months."
	Royal Botanic Gardens Kew. (2016) Seed Information Database (SID). Version 7.1. http://data.kew.org/sid/. [Accessed 12 Dec 2016]	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**	
	Source(s)	**Notes**

Qsn #	Question	Answer
	Bouman, F., & Meijer, W. (1994). Comparative structure of ovules and seeds in Rafflesiaceae. Plant Systematics and Evolution, 19 (1-4), 187-212	[Unknown, but disturbance by animals may facilitate dispersal] "Epizoochorous dispersal by the feet of mammals passing along the regular game trails and crushing the fruits has been suggested in the older scientific publications (ERNST & SCHMZD 1913, JUSTESEN 1922, WINKLER 1927). In the more popular literature impressive animals like elephants, tapirs and wild pigs have been nominated as dispersers. According to MEIJEP. (1958, 1983), wild pigs and smaller mammals like ground squirrels, other rodents, scaly anteaters and pangolins are plausible dispersers. Old fruits and unfertilized older ovaries of Rafflesia are often connected with termite nests."

805	**Effective natural enemies present locally (e.g. introduced biocontrol agents)**	
	Source(s)	**Notes**
	WRA Specialist. 2016. Personal Communication	Unknown

Summary of Risk Traits:

High Risk / Undesirable Traits
• Thrives in tropical climates
• Parasitic
• Reproduces by seeds
• Seeds suspected of being dispersed by animals, externally & internally
• Limited ecological information may reduce accuracy of risk prediction

Low Risk Traits
• No reports of invasiveness or naturalization, but no evidence of widespread introduction outside native range
• Unarmed (no spines, thorns or burrs)
• Ornamental
• Dioecious
• Not reported to spread vegetatively
• Life-cycle, specialized growing & host requirements may limit ability to naturalize