Taxon: Etlingera hemisphaerica **Family:** Zingiberaceae

Common Name(s): Helani tulip Ginger
tulip ginger

Synonym(s): Amomum hemisphaericum (Blume)
Elettaria atropurpurea Teijsm. &
Elettaria hemisphaerica Blume
Nicolaia atropurpurea (Teijsm. &
Nicolaia hemisphaerica (Blume)

Assessor: Chuck Chimera **Status:** Assessor Approved **End Date:** 9 Jan 2015

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

Keywords: Tropical, Ornamental, Rhizomatous, Shade-tolerant, Bird-Pollinated

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		
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	n
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	n

Qsn #	Question	Answer Option	Answer
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	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		
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		
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	2
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)		
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	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**
	Lim, T.K. 2014. Edible Medicinal And Non-Medicinal Plants. Volume 8, Flowers. Springer, Dordrecht	No evidence

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"**	**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 10 Jan 2015]	"Native: ASIA-TROPICAL Malesia: Indonesia - Java, Sumatra"

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 9 Jan 2015]	

203	**Broad climate suitability (environmental versatility)**	**n**
	Source(s)	**Notes**
	Dave's Garden. 2015. PlantFiles: Helani Tulip Ginger - Etlingera hemisphaerica. http://davesgarden.com/guides/pf/go/82984/. [Accessed 9 Jan 2015]	"Hardiness: USDA Zone 10b: to 1.7 °C (35 °F)"
	Poulsen, A. D. 2007. Etlingera Giseke of Java. Gardens' Bulletin Singapore 59(1&2): 145-172	[Tropical climates <1000 m elevation] "Ecology and habitat: Primary and secondary lowland forests to 950 m."

Qsn #	Question	Answer
204	**Native or naturalized in regions with tropical or subtropical climates**	**y**
	Source(s)	**Notes**
	Lim, T.K. 2014. Edible Medicinal And Non-Medicinal Plants. Volume 8, Flowers. Springer, Dordrecht	"It is found in the lower mountainous forest in Java and perhaps also in Sumatra. It has been introduced and naturalized in other areas in Malesia and is also now grown elsewhere in the tropics."

205	**Does the species have a history of repeated introductions outside its natural range?**	**y**
	Source(s)	**Notes**
	Staples, G.W. & Herbst, D.R. 2005. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI	"...occasionally cultivated in Hawaii for its deep red inflorescences."
	Lim, T.K. 2014. Edible Medicinal And Non-Medicinal Plants. Volume 8, Flowers. Springer, Dordrecht	"It has been introduced and naturalized in other areas in Malesia and is also now grown elsewhere in the tropics."

301	**Naturalized beyond native range**	
	Source(s)	**Notes**
	Poulsen, A. D. 2007. Etlingera Giseke of Java. Gardens' Bulletin Singapore 59(1&2): 145-172	"Distribution: Sumatra, Java, and probably Peninsular Malaysia and Thailand. There are no definite records of this species from the wild in Borneo but it is cultivated at Tenom Agricultural Park in Sabah. A. Lamb (pers. comm.) found it near Tenon and believes it was introduced by Javanese workers who came to work in the tobacco estates at about 1850 and took useful plants with them from Java."
	Lim, T.K. 2014. Edible Medicinal And Non-Medicinal Plants. Volume 8, Flowers. Springer, Dordrecht	[Conflicting reports on whether this species is naturalized or native to Malaysia] "It is found in the lower mountainous forest in Java and perhaps also in Sumatra. It has been introduced and naturalized in other areas in Malesia and is also now grown elsewhere in the tropics."

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**

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

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 [Etlingera elatior naturalized in several locations, but no negative impacts have been documented to date]

401	Produces spines, thorns or burrs	n
	Source(s)	**Notes**
	Staples, G.W. & Herbst, D.R. 2005. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI	[No evidence] "Herb 10-22" tall. Lf peti 0.4-1.5" long; blades oblong-lanceolate, 6-30" x 1-7", upper size bronzy, underside purple-red, margins fringed."

402	Allelopathic	
	Source(s)	**Notes**
	WRA Specialist. 2015. Personal Communication	Unknown

403	Parasitic	n
	Source(s)	**Notes**
	Lim, T.K. 2014. Edible Medicinal And Non-Medicinal Plants. Volume 8, Flowers. Springer, Dordrecht	[No evidence. Zingiberaceae] "A clumping. robust. terrestrial geophyte with copiously branched subterraneous or partly superterraneous rhizome."

404	Unpalatable to grazing animals	
	Source(s)	**Notes**
	Hanelt, P. (ed.). 2001. Mansfeld's encyclopedia of agricultural & horticultural crops: (except ornamentals). Algae, Fungi, Pteridophyta, Gymnospermae, Angiospermae - Dicotyledones: Magnoliaceae - Chrysobalanaceae Vol. 1. Springer-Verlag, Berlin, Heidelberg, New York	[Palatability to animals unknown. Palatable to humans] "The inflorescences as well as the ripe and unripe fruits are eaten fresh, steamed or cooked."

405	Toxic to animals	n
	Source(s)	**Notes**
	Wagstaff, D.J. 2008. International poisonous plants checklist: an evidence-based reference. CRC Press, Boca Raton, FL	No evidence in genus

Qsn #	Question	Answer
406	**Host for recognized pests and pathogens**	**n**
	Source(s)	**Notes**
	Ibrahim, H.& Setyowati, F.M., 1999. Etlingera Giseke [Internet] Record from Proseabase. de Guzman, C.C. and Siemonsma, J.S. (Editors). PROSEA (Plant Resources of South-East Asia) Foundation, Bogor, Indonesia. http://www.proseanet.org. [Accessed 9 Jan 2015]	"Diseases and pests No serious diseases and pests are known to affect Etlingera. In cultivation trials in Sarawak some leaf-cutting insects were observed, but without significant damage to the crop."

407	Causes allergies or is otherwise toxic to humans	n
	Source(s)	**Notes**
	Hanelt, P. (ed.). 2001. Mansfeld's encyclopedia of agricultural & horticultural crops: (except ornamentals). Algae, Fungi, Pteridophyta, Gymnospermae, Angiospermae - Dicotyledones: Magnoliaceae - Chrysobalanaceae Vol. 1. Springer-Verlag, Berlin, Heidelberg, New York	[No evidence] "The inflorescences as well as the ripe and unripe fruits are eaten fresh, steamed or cooked."
	Wagstaff, D.J. 2008. International poisonous plants checklist: an evidence-based reference. CRC Press, Boca Raton, FL	No evidence in genus

408	Creates a fire hazard in natural ecosystems	n
	Source(s)	**Notes**
	Lim, T.K. 2014. Edible Medicinal And Non-Medicinal Plants. Volume 8, Flowers. Springer, Dordrecht	[No evidence. A herbaceous plant of wet environments] "A wet tropical plant species. it thrives in partial shade in moist, well-drained fertile soil rich in organic matter. It will grow in warm and wet subtropical areas."

409	Is a shade tolerant plant at some stage of its life cycle	y
	Source(s)	**Notes**
	Lim, T.K. 2014. Edible Medicinal And Non-Medicinal Plants. Volume 8, Flowers. Springer, Dordrecht	"A wet tropical plant species, it thrives in partial shade in moist. well-drained, fertile soil rich in organic matter."
	Staples, G.W. & Herbst, D.R. 2005. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI	"They require protection from wind and suffer near the beach; the ideal site is a shady forested area with ample, constant moisture."

Qsn #	Question	Answer
410	**Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)**	
	Source(s)	**Notes**
	Lim, T.K. 2014. Edible Medicinal And Non-Medicinal Plants. Volume 8, Flowers. Springer, Dordrecht	"A wet tropical plant species, it thrives in partial shade in moist, well-drained fertile soil rich in organic matter."
	Ibrahim, H.& Setyowati, F.M., 1999. Etlingera Giseke [Internet] Record from Proseabase. de Guzman, C.C. and Siemonsma, J.S. (Editors). PROSEA (Plant Resources of South-East Asia) Foundation, Bogor, Indonesia. http://www.proseanet.org. [Accessed 9 Jan 2015]	"Soils rich in organic matter are preferred."

411	Climbing or smothering growth habit	n
	Source(s)	**Notes**
	Poulsen, A. D. 2007. Etlingera Giseke of Java. Gardens' Bulletin Singapore 59(1&2): 145-172	"Rhizome in clump. Leafy shoot 3-6 m; base to 6-8 cm diam., bright red. Sheath green or yelllow-green with reddish blotches, red when young, glabrous. Ligule 12-13 mm, slightly emarginate, green. Petiole to 25 mm. Lamina narrowly elliptic, to 80 x 15 cm, dark green, with pale green midrib above; reddish or brownish beneath, margin undulating; average length to width ratio 4.8-5.4; base cuneate to ± auriculate."

412	Forms dense thickets	
	Source(s)	**Notes**
	Poulsen, A. D. 2007. Etlingera Giseke of Java. Gardens' Bulletin Singapore 59(1&2): 145-172	[Unknown] "Primary and secondary lowland forests to 950 m."

501	Aquatic	n
	Source(s)	**Notes**
	Lim, T.K. 2014. Edible Medicinal And Non-Medicinal Plants. Volume 8, Flowers. Springer, Dordrecht	[Terrestrial] "A clumping, robust, terrestrial, geophyte with copiously branched subterraneous or partly superterraneous rhizomes."

502	Grass	n
	Source(s)	**Notes**
	Poulsen, A. D. 2007. Etlingera Giseke of Java. Gardens' Bulletin Singapore 59(1&2): 145-172	Zingiberaceae

503	Nitrogen fixing woody plant	n
	Source(s)	**Notes**
	Poulsen, A. D. 2007. Etlingera Giseke of Java. Gardens' Bulletin Singapore 59(1&2): 145-172	Zingiberaceae

504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	n

Qsn #	Question	Answer
	Source(s)	**Notes**
	Ibrahim, H.& Setyowati, F.M., 1999. Etlingera Giseke [Internet] Record from Proseabase. de Guzman, C.C. and Siemonsma, J.S. (Editors). PROSEA (Plant Resources of South-East Asia) Foundation, Bogor, Indonesia. http://www.proseanet.org. [Accessed 9 Jan 2015]	"Robust, perennial, tillering herbs with a rhizome at or near the ground surface or embedded deep underneath."
	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. Plant Protection Quarterly, 25(2): 56-74	"This question is specifically to deal with plants that have specialized organs and should not include plants merely with rhizomes" [E. hemisphaerica is rhizomatous, and can likely can spread vegetatively]

601	**Evidence of substantial reproductive failure in native habitat**	
	Source(s)	**Notes**
	Poulsen, A. D. 2007. Etlingera Giseke of Java. Gardens' Bulletin Singapore 59(1&2): 145-172	[Habitat loss may be affecting reproduction] "Vulnerable by extent of occurrence estimated <20,000 km2, known from <10 locations, and decline in the extent and quality of lowland forest habitats in Java."

602	**Produces viable seed**	**y**
	Source(s)	**Notes**
	Ibrahim, H.& Setyowati, F.M., 1999. Etlingera Giseke [Internet] Record from Proseabase. de Guzman, C.C. and Siemonsma, J.S. (Editors). PROSEA (Plant Resources of South-East Asia) Foundation, Bogor, Indonesia. http://www.proseanet.org. [Accessed 9 Jan 2015]	"Propagation and planting Etlingera is propagated chiefly by rhizome fragments, but sometimes by seed as well. Rhizome fragments should be handled with care as the buds are rather sensitive to high temperatures and easily dry out."

603	**Hybridizes naturally**	
	Source(s)	**Notes**
	Luc-Cayol, F., & Fereol, L. 1997. X Alpingera martinica (Zingiberaceae): an intergeneric hybrid between Alpinia purpurata and Etlingera elatior. HortScience, 32(5): 914-915	"Artificial intergeneric crosses between Alpinia purpurata and Etlingera elatior (Zingiberaceae) have produced hybrids." [Artificial hyrbidization possible in genus, but unknown if natural hybridization occurs in any Etlingera species]

604	**Self-compatible or apomictic**	
	Source(s)	**Notes**
	Sabu, A.K.M. & Smisha, K. P. 2013. Reproductive biology of Etlingera elatior (Jack) R. M. Sm. Ornamental Torch Ginger. International Journal of Plant, Animal and Environmental Sciences (4): 75-80	[Unknown. Related species E. elatior is self-compatible, but with low fruit set] "There was no apomixis, as none of the emasculated and bagged flowers set fruit. To determine if the species is self-incompatible both self and cross pollinations were carried out. Bagged flowers without manual pollination did not set fruits, confirmed the absence of autogamy in the species. Bagged flowers was pollinated by pollen from another flower of the same plant resulted 8 % fruit set and pollinated with pollen from another plant resulted 24 % fruit set."

Qsn #	Question	Answer
605	**Requires specialist pollinators**	**y**
	Source(s)	**Notes**
	Endress, P.K. 1996. Diversity and evolutionary biology of tropical flowers. Cambridge University Press, Cambridge, UK	"Classen (1987) observed Nectarinidae as pollinators in the Botanical Garden, Singapore; Knuth (in Knueth et al. 1904) in the Botanical Garden, Bogor (Java). They perch in the centre of the stout inflorescence and push their bill downward into the open flowers." [Generic description]
	Ibrahim, H.& Setyowati, F.M., 1999. Etlingera Giseke [Internet] Record from Proseabase. de Guzman, C.C. and Siemonsma, J.S. (Editors). PROSEA (Plant Resources of South-East Asia) Foundation, Bogor, Indonesia. http://www.proseanet.org. [Accessed 9 Jan 2015]	"The inflorescence is adapted for pollination by birds, such as the sunbird Anthreptes malacensis."
	Kubitzki, K. (ed.). 1998. The Families and genera of vascular plants. Volume III. Flowering plants, Monocotyledons: Lilianae (except Orchidaceae). Springer-Verlag, Berlin, Heidelberg, New York	[Generic Description] "...geoflory in Etlingera (A chasma) is connected with pollination by birds hopping on the ground."

606	**Reproduction by vegetative fragmentation**	**y**
	Source(s)	**Notes**
	Ibrahim, H.& Setyowati, F.M., 1999. Etlingera Giseke [Internet] Record from Proseabase. de Guzman, C.C. and Siemonsma, J.S. (Editors). PROSEA (Plant Resources of South-East Asia) Foundation, Bogor, Indonesia. http://www.proseanet.org. [Accessed 9 Jan 2015]	"Etlingera is propagated chiefly by rhizome fragments, but sometimes by seed as well. Rhizome fragments should be handled with care as the buds are rather sensitive to high temperatures and easily dry out."
	Dave's Garden. 2015. PlantFiles: Helani Tulip Ginger - Etlingera hemisphaerica. http://davesgarden.com/guides/pf/go/82984/. [Accessed 9 Jan 2015]	"Propagation Methods: By dividing rhizomes, tubers, corms or bulbs (including offsets)" [Most gingers can establish if rhizome fragments are divided or break off]

607	**Minimum generative time (years)**	**2**
	Source(s)	**Notes**
	Ibrahim, H.& Setyowati, F.M., 1999. Etlingera Giseke [Internet] Record from Proseabase. de Guzman, C.C. and Siemonsma, J.S. (Editors). PROSEA (Plant Resources of South-East Asia) Foundation, Bogor, Indonesia. http://www.proseanet.org. [Accessed 9 Jan 2015]	"Etlingera starts flowering in the second year after planting a piece of rhizome." [Probably longer if propagated from seeds]

701	**Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)**	**n**
	Source(s)	**Notes**
	Ibrahim, H.& Setyowati, F.M., 1999. Etlingera Giseke [Internet] Record from Proseabase. de Guzman, C.C. and Siemonsma, J.S. (Editors). PROSEA (Plant Resources of South-East Asia) Foundation, Bogor, Indonesia. http://www.proseanet.org. [Accessed 9 Jan 2015]	"Fruiting head subglobose, up to 12 cm in diameter; individual fruits globose or obovoid, about 5 cm x 2.5 cm, with short hairs, beak up to 1.5 cm long, velvety yellow. Seeds numerous, ovoid angular, brownish-black with white aril" [No evidence, and unlikely as seedsm if produced, are adapted for bird dispersal, but otherwise lack means of external attachment]

Qsn #	Question	Answer
702	**Propagules dispersed intentionally by people**	**y**
	Source(s)	**Notes**
	Staples, G.W. & Herbst, D.R. 2005. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI	"...occasionally cultivated in Hawaii for its deep red inflorescences."
	Lim, T.K. 2014. Edible Medicinal And Non-Medicinal Plants. Volume 8, Flowers. Springer, Dordrecht	"It is grown as an ornamental in parks and gardens for its foliage with wine red undersurface und unusual inflorescence."

703	**Propagules likely to disperse as a produce contaminant**	**n**
	Source(s)	**Notes**
	Ibrahim, H.& Setyowati, F.M., 1999. Etlingera Giseke [Internet] Record from Proseabase. de Guzman, C.C. and Siemonsma, J.S. (Editors). PROSEA (Plant Resources of South-East Asia) Foundation, Bogor, Indonesia. http://www.proseanet.org. [Accessed 9 Jan 2015]	"Etlingera is propagated chiefly by rhizome fragments, but sometimes by seed as well." [No evidence, and seed may be rare in cultivation]

704	**Propagules adapted to wind dispersal**	**n**
	Source(s)	**Notes**
	Ibrahim, H.& Setyowati, F.M., 1999. Etlingera Giseke [Internet] Record from Proseabase. de Guzman, C.C. and Siemonsma, J.S. (Editors). PROSEA (Plant Resources of South-East Asia) Foundation, Bogor, Indonesia. http://www.proseanet.org. [Accessed 9 Jan 2015]	"Fruiting head subglobose, up to 12 cm in diameter; individual fruits globose or obovoid, about 5 cm x 2.5 cm, with short hairs, beak up to 1.5 cm long, velvety yellow. Seeds numerous, ovoid angular, brownish-black with white aril."

705	**Propagules water dispersed**	**n**
	Source(s)	**Notes**
	Ibrahim, H.& Setyowati, F.M., 1999. Etlingera Giseke [Internet] Record from Proseabase. de Guzman, C.C. and Siemonsma, J.S. (Editors). PROSEA (Plant Resources of South-East Asia) Foundation, Bogor, Indonesia. http://www.proseanet.org. [Accessed 9 Jan 2015]	"Etlingera is propagated chiefly by rhizome fragments, but sometimes by seed as well." [No evidence. Unlikely, unless grown near riparian areas and rhizome fragments are washed downstream]

706	**Propagules bird dispersed**	**y**
	Source(s)	**Notes**
	Ibrahim, H.& Setyowati, F.M., 1999. Etlingera Giseke [Internet] Record from Proseabase. de Guzman, C.C. and Siemonsma, J.S. (Editors). PROSEA (Plant Resources of South-East Asia) Foundation, Bogor, Indonesia. http://www.proseanet.org. [Accessed 9 Jan 2015]	"Fruiting head subglobose, up to 12 cm in diameter; individual fruits globose or obovoid, about 5 cm x 2.5 cm, with short hairs, beak up to 1.5 cm long, velvety yellow. Seeds numerous, ovoid angular, brownish-black with white aril." [Arillate seeds, when produced, presumably adapted for bird or other animal dispersal]

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

Qsn #	Question	Answer
	Ibrahim, H.& Setyowati, F.M., 1999. Etlingera Giseke [Internet] Record from Proseabase. de Guzman, C.C. and Siemonsma, J.S. (Editors). PROSEA (Plant Resources of South-East Asia) Foundation, Bogor, Indonesia. http://www.proseanet.org. [Accessed 9 Jan 2015]	"Fruiting head subglobose, up to 12 cm in diameter; individual fruits globose or obovoid, about 5 cm x 2.5 cm, with short hairs, beak up to 1.5 cm long, velvety yellow. Seeds numerous, ovoid angular, brownish-black with white aril." No evidence, but arillate seeds may possibly be dispersed by animals that are attracted to the aril without consuming the attached seed]
	Poulsen, A. D. 2007. Etlingera Giseke of Java. Gardens' Bulletin Singapore 59(1&2): 145-172	[Unknown, but if rodents depredate fruit, they may externally disperse seeds by caching or hoarding] "Fruits emptied by rodents."

708	Propagules survive passage through the gut	y
	Source(s)	**Notes**
	Ibrahim, H.& Setyowati, F.M., 1999. Etlingera Giseke [Internet] Record from Proseabase. de Guzman, C.C. and Siemonsma, J.S. (Editors). PROSEA (Plant Resources of South-East Asia) Foundation, Bogor, Indonesia. http://www.proseanet.org. [Accessed 9 Jan 2015]	[Presumably Yes, if produced] "Fruiting head subglobose, up to 12 cm in diameter; individual fruits globose or obovoid, about 5 cm x 2.5 cm, with short hairs, beak up to 1.5 cm long, velvety yellow. Seeds numerous, ovoid-angular, brownish-black with white aril."

801	Prolific seed production (>1000/m2)	
	Source(s)	**Notes**
	Ibrahim, H.& Setyowati, F.M., 1999. Etlingera Giseke [Internet] Record from Proseabase. de Guzman, C.C. and Siemonsma, J.S. (Editors). PROSEA (Plant Resources of South-East Asia) Foundation, Bogor, Indonesia. http://www.proseanet.org. [Accessed 9 Jan 2015]	[Unknown] "Fruiting head subglobose, up to 12 cm in diameter; individual fruits globose or obovoid, about 5 cm x 2.5 cm, with short hairs, beak up to 1.5 cm long, velvety yellow. Seeds numerous, ovoid-angular, brownish-black with white aril."

802	Evidence that a persistent propagule bank is formed (>1 yr)	
	Source(s)	**Notes**
	Royal Botanic Gardens Kew. 2008. Seed Information Database (SID). Version 7.1. http://data.kew.org/sid/. [Accessed 9 Jan 2015]	Unknown

803	Well controlled by herbicides	
	Source(s)	**Notes**
	WRA Specialist. 2015. 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**
	Ibrahim, H.& Setyowati, F.M., 1999. Etlingera Giseke [Internet] Record from Proseabase. de Guzman, C.C. and Siemonsma, J.S. (Editors). PROSEA (Plant Resources of South-East Asia) Foundation, Bogor, Indonesia. http://www.proseanet.org. [Accessed 9 Jan 2015]	"Etlingera is propagated chiefly by rhizome fragments, but sometimes by seed as well." [This and other Etlingera species are able to regrow from rhizomes after cutting]

Qsn #	Question	Answer
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
• Possibly naturalized, or native, in Malaysia
• Thrives in tropical climates
• Shade tolerant
• Spread by rhizomes & seeds
• Seeds dispersed by birds & intentionally by people
• Spreads vegetatively
• Able to resprout after cutting
• Limited ecological information makes accurate risk prediction difficult

Low Risk Traits
• No reports of invasiveness or negative impacts
• Unarmed (no spines, thorns or burrs)
• Non-toxic
• Ornamental
• Bird-pollinated (may limit seed set outside native range)

Second Screening Results for Low Stature Shrubby Life Form

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