Taxon: Johannesteijsmannia altifrons **Family:** Arecaceae

Common Name(s): diamond Joey
Joey palm

Synonym(s): Teysmannia altifrons Rchb.f. & Zoll.

Assessor: Assessor **Status:** Assessor Approved **End Date:** 8 Aug 2014

WRA Score: **-1.0** **Designation:** L **Rating:** Low Risk

Keywords: Tropical Palm, Thorny, Shade tolerant, Monoculture forming, Disperser-limited

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	y
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		
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	y=1, n=0	y

Qsn #	Question	Answer Option	Answer
410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y=1, n=0	n
411	Climbing or smothering growth habit	y=1, n=0	n
412	Forms dense thickets	y=1, n=0	y
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	n
604	Self-compatible or apomictic	y=1, n=-1	y
605	Requires specialist pollinators	y=-1, n=0	n
606	Reproduction by vegetative fragmentation		
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	n
707	Propagules dispersed by other animals (externally)		
708	Propagules survive passage through the gut		
801	Prolific seed production (>1000/m2)	y=1, n=-1	n
802	Evidence that a persistent propagule bank is formed (>1 yr)	y=1, n=-1	n
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**
	Lucas, G. & Synge, H.(eds.). 1978. The IUCN Plant Red Data Book. IUCN, Gland, Switzerland	[No evidence] "Although many attempts have been made to introduce members of this genus into cultivation, very few have been successful; it is very difficult to obtain ripe seed and care of seedlings is problematical."

102	**Has the species become naturalized where grown?**	
	Source(s)	**Notes**
	WRA Specialist. 2014. Personal Communication	NA

103	**Does the species have weedy races?**	
	Source(s)	**Notes**
	WRA Specialist. 2014. 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**
	Chan, Y. M., Chua, L. S. L., & Saw, L. G. 2011. Towards the conservation of Malaysian Johannesteijsmannia (Palmae). Gardens' Bulletin Singapore, 63(1&2): 425-432	"Johannesteijsmannia is a small genus with only four species, i.e., Johannesteijsmannia altifrons (Reichb.f. et Zoll.) Moore, J. magnifica J.Dransf., J. lanceolata J.Dransf. and J. perakensis J.Dransf. (Dransfielc 1972). All species are endemic to Peninsular Malaysia except J. altifrons, which is distributed from south Thailand to Peninsular Malaysia, Sumatra and Borneo."

202	**Quality of climate match data**	**High**
	Source(s)	**Notes**
	Chan, Y. M., Chua, L. S. L., & Saw, L. G. 2011. Towards the conservation of Malaysian Johannesteijsmannia (Palmae). Gardens' Bulletin Singapore, 63(1&2): 425-432	

203	**Broad climate suitability (environmental versatility)**	**n**
	Source(s)	**Notes**
	Squire, D. 2007. Palms and Cycads. A Complete Guide to Selecting, Growing and Propagating. Ball Publishing, Batavia, Illinois	"Fertile, moisture-retentive but well-drained soil, warmth, high humidity and partial shade are essential. It is therefore best reserved for planting in tropical regions."
	Ellison, D. & Ellison, A. 2001. Cultivated Palms of the World. UNSW Press, Sydney, Australia	"Not yet common in cultivation, it requires adequate moisture and a shaded, sheltered location in subtropical to tropical climates."

Qsn #	Question	Answer
	Lee, L. S. 2007. Population genetics and phylogeny of the Malesian palm genus Johannesteijsmannia HE Moore (Palmae). PhD Dissertation. The National University of Singapore	[Elevation range may exceed 1000 m, but majority occur at lower elevations] "Most of the Jt. altifrons populations occur on hill slopes at more than 300 m above sea level (asl) (Dransfield, 1972). However, it was recorded occurring at 65 m asl on mild slopes and between fresh water swamps in Johor. In the Bako National Park, Sarawak, it occurs at 100 m asl in heath forest. The lowest record was in Sumatra, where the palm was found growing at 25 m asl (Palm and Jochems, 1924). Nevertheless, this palm can also occur as high as 1,200 m asl on Gunung Mandi Angin, the border of the states of Kelantan, Terengganu and Pahang (Dransfield, 1972)."
	Henderson, A. 2009. Palms of Southern Asia. Princeton University Press, Princeton, NJ	'Range and habitat. Thailand (Peninsular) (also in Borneo, Peninsular Malaysia, and Sumatra); lowland rain forest up to 900 m elevation."

204	Native or naturalized in regions with tropical or subtropical climates	y
	Source(s)	**Notes**
	Chan, Y. M., Chua, L. S. L., & Saw, L. G. 2011. Towards the conservation of Malaysian Johannesteijsmannia (Palmae). Gardens' Bulletin Singapore, 63(1&2): 425-432	"Johannesteijsmannia is a small genus with only four species, i.e., Johannesteijsmannia altifrons (Reichb.f. et Zoll.) Moore, J. magnifica J.Dransf., J. lanceolata J.Dransf. and J. perakensis J.Dransf. (Dransfielc 1972). All species are endemic to Peninsular Malaysia except J. altifrons, which is distributed from south Thailand to Peninsular Malaysia, Sumatra and Borneo."
	Lee, L. S. 2007. Population genetics and phylogeny of the Malesian palm genus Johannesteijsmannia HE Moore (Palmae). PhD Dissertation. The National University of Singapore	"Jt. altifrons occurs in the east of southern Thailand, Peninsular Malaysia (the states of Kelantan, Terengganu, Pahang, Johor and Selangor), the east of northern Sumatra and western Borneo (from Kuching, Sarawak, East Malaysia westwards) (Figure 1.4). Jt. altifrons is more widespread but localized in distribution (Drandsfield, 1972)."

205	Does the species have a history of repeated introductions outside its natural range?	n
	Source(s)	**Notes**
	Lucas, G. & Synge, H.(eds.). 1978. The IUCN Plant Red Data Book. IUCN, Gland, Switzerland	"Although many attempts have been made to introduce members of this genus into cultivation, very few have been successful; it is very difficult to obtain ripe seed and care of seedlings is problematical."

301	Naturalized beyond native range	n
	Source(s)	**Notes**
	Meyer, J. Y., Lavergne, C., & Hodel, D. R. 2008. Time bombs in gardens: invasive ornamental palms in tropical islands, with emphasis on French Polynesia (Pacific Ocean) and the Mascarenes (Indian Ocean). Palms, 52(2): 71-83	No evidence
	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

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

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**
	Meyer, J. Y., Lavergne, C., & Hodel, D. R. 2008. Time bombs in gardens: invasive ornamental palms in tropical islands, with emphasis on French Polynesia (Pacific Ocean) and the Mascarenes (Indian Ocean). Palms, 52(2): 71-83	No evidence
	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**
	Meyer, J. Y., Lavergne, C., & Hodel, D. R. 2008. Time bombs in gardens: invasive ornamental palms in tropical islands, with emphasis on French Polynesia (Pacific Ocean) and the Mascarenes (Indian Ocean). Palms, 52(2): 71-83	No evidence
	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	y
	Source(s)	**Notes**
	Lucas, G. & Synge, H.(eds.). 1978. The IUCN Plant Red Data Book. IUCN, Gland, Switzerland	[Stalk armed with short thorns] "Palm with a creeping underground stem which bears a tuft of about 20-30 very large, erect, diamond-shaped leaves up to 6 m high. The stalk, armed with short thorns, is 2.5 m long and the lamina up to 3.5 x 1.8 m, slightly lobed on the 2 upper edges and with prominent veins parallel to the 2 lower edges."

402	Allelopathic	
	Source(s)	**Notes**
	WRA Specialist. 2014. Personal Communication	Unknown

Qsn #	Question	Answer
403	**Parasitic**	**n**
	Source(s)	**Notes**
	Kubitzki, K. (ed.). 1998. The Families and genera of vascular plants. Volume IV. Flowering plants, Monocotyledons: Alismatanae and Commelinanae (except Gramineae). Springer-Verlag, Berlin, Heidelberg, New York	[Genus Description] "Solitary, acaulescent or short-trunked. Stem decumbent or erect. Leaves diamond-shaped; petiole toothed; blade subpinnately ribbed, lower margins toothed."

404	Unpalatable to grazing animals	
	Source(s)	**Notes**
	WRA Specialist. 2014. Personal Communication	Unknown

405	Toxic to animals	n
	Source(s)	**Notes**
	Lewis, C. E., & Zona, S. 2000. A survey of cyanogenesis in palms (Arecaceae). Biochemical Systematics and Ecology, 28(3): 219-228	"Table 1 Results of cyanogenesis survey in leaf tissue of 167 palm accessions. Accession numbers refer to plants in cultivation at Fairchild Tropical Garden or the Montgomery Botanical Center"
	Wagstaff, D.J. 2008. International poisonous plants checklist: an evidence-based reference. CRC Press, Boca Raton, FL	No evidence

406	Host for recognized pests and pathogens	
	Source(s)	**Notes**
	WRA Specialist. 2014. Personal Communication	Unknown

Qsn #	Question	Answer
407	**Causes allergies or is otherwise toxic to humans**	**n**
	Source(s)	**Notes**
	Lucas, G. & Synge, H.(eds.). 1978. The IUCN Plant Red Data Book. IUCN, Gland, Switzerland	[No evidence] "The foliage is an excellent thatch for huts and shelters, and a single leaf makes a good umbrella; the young endosperm is said to be edible."
	Johnson, D.V. 1998. Non-Wood Forest Products 10: Tropical Palms. FAO, Rome	[No evidence] "The spectacular umbrella leaf palm (Johannesteilmannia altifrons) is a case in point. Referred to as nature's answer to corrugated iron. the enormous undivided leaves are up to 3 m long and 1 m wide. Highly prized for thatching roofs and walls (which last 3-4 years) the leaves are cut and sold for this purpose in Peninsular Malaysia. Providing 2-3 leaves are left on each plant, the practice may be sustainable (Kiew, 1991). However, almost nothing is known about the flowering and fruiting characteristics of palms in this genus; periodic leaf harvest could, over time, adversely affect fruit production and lead to a decline in natural regeneration. This biological factor is apart from habitat destruction; these palms require an understory forest habitat. In addition. illegal seed collection and export of these highly-desirable ornamental palms is having detrimental effects on the wild populations in Peninsular Malaysia."
	Wagstaff, D.J. 2008. International poisonous plants checklist: an evidence-based reference. CRC Press, Boca Raton, FL	No evidence

408	Creates a fire hazard in natural ecosystems	n
	Source(s)	**Notes**
	Lucas, G. & Synge, H.(eds.). 1978. The IUCN Plant Red Data Book. IUCN, Gland, Switzerland	[No evidence, and unlikely given rainforest habitat] "In primary rain-forest on ridge-tops and hillsides on well-drained soils, mostly above 300 m."

409	Is a shade tolerant plant at some stage of its life cycle	y
	Source(s)	**Notes**
	Ellison, D. & Ellison, A. 2001. Cultivated Palms of the World. UNSW Press, Sydney, Australia	"Not yet common in cultivation, it requires adequate moisture and a shaded, sheltered location in subtropical to tropical climates."
	Lucas, G. & Synge, H.(eds.). 1978. The IUCN Plant Red Data Book. IUCN, Gland, Switzerland	[Requires primary rain-forest & shade to thrive] "It is never found in belukar (secondary regrowth) and it rarely survives any clear-felling of trees. It can, however, survive in selectively logged forest, but often sustains considerable damage from falling trees and scorching when exposed to direct sunlight." ... "A very spectacular undergrowth palm with immense undivided leaves rising gracefully from the base."

410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	n
	Source(s)	**Notes**

Qsn #	Question	Answer
	Dave's Garden. 2014. PlantFiles: Joey Palm - Johannesteijsmannia altifrons. http://davesgarden.com/guides/pf/go/57989/. [Accessed 7 Aug 2014]	"Soil pH requirements: 5.6 to 6.0 (acidic) 6.1 to 6.5 (mildly acidic) 6.6 to 7.5 (neutral)"
	Palmpedia. 2014. Johannesteijsmannia altifrons. http://www.palmpedia.net/wiki/Johannesteijsmannia_altifrons. [Accessed 7 Aug 2014]	"Soil type: Rich"
	Riffle, R.L.& Craft, P. 2003. An Encyclopedia of Cultivated Palms. Timber Press, Portland, OR.	"They need a humus-laden, friable soil that is currently moist but quickly draining, and they are difficult to maintain without constantly high relative humidity."

411	Climbing or smothering growth habit	n
	Source(s)	**Notes**
	Kubitzki, K. (ed.). 1998. The Families and genera of vascular plants. Volume IV. Flowering plants, Monocotyledons: Alismatanae and Commelinanae (except Gramineae). Springer-Verlag, Berlin, Heidelberg, New York	[Genus Description] "Solitary, acaulescent or short-trunked. Stem decumbent or erect. Leaves diamond-shaped; petiole toothed; blade subpinnately ribbed, lower margins toothed."

412	Forms dense thickets	y
	Source(s)	**Notes**
	Lucas, G. & Synge, H.(eds.). 1978. The IUCN Plant Red Data Book. IUCN, Gland, Switzerland	"Vulnerable; a very local species of scattered but wide distribution which only occurs in primary rain-forest and is threatened by destructive exploitation of the habitat for timber."
	Baas, P. , Kalkman, K. &Geesink. R. 1990. The Plant Diversity of Malesia. Kluwer Academic Publishers, Dordrecht, Netherlands	[Found as pure stands in Malesia] "The differences in flora could as well be attributed to a difference in age of the geological formations, and not only to lithological features. The comparison of the flora of an old eroded Tertiary metamorphic mass (Tigapuluh Mts) with neighbouring sedimentary Quaternary plains, showed a flora which was more specific to this very interesting massif, the most obvious plants being Shorea peltata and Johannesteijsmannia altifrons, which is found as pure stands in the undergrowth."

501	Aquatic	n
	Source(s)	**Notes**
	Chan, Y. M., Chua, L. S. L., & Saw, L. G. 2011. Towards the conservation of Malaysian Johannesteijsmannia (Palmae). Gardens' Bulletin Singapore, 63(1&2): 425-432	[Terrestrial] "This species commonly inhabits valleys and hill slopes with lowland and hill dipterocarp forests on well-drained soils. It also grows at elevations of 1000–1200 m in the lower montane forests of Taman Negara, i.e., Gunung Tahan and Gunung Mandi Angin (Dransfield 1972). The population in Jerangau, Terengganu grows on waterlogged sandy soil in low-lying areas. The habitat of J. altifrons in the peninsula now seems more general and diverse than previously thought. In Sarawak, it is confined to the heath forests (Dransfield 1972) in sheltered valleys."

502	Grass	n

Qsn #	Question	Answer
	Source(s)	**Notes**
	Kubitzki, K. (ed.). 1998. The Families and genera of vascular plants. Volume IV. Flowering plants, Monocotyledons: Alismatanae and Commelinanae (except Gramineae). Springer-Verlag, Berlin, Heidelberg, New York	Palmae [Arecaceae]

503	Nitrogen fixing woody plant	n
	Source(s)	**Notes**
	Kubitzki, K. (ed.). 1998. The Families and genera of vascular plants. Volume IV. Flowering plants, Monocotyledons: Alismatanae and Commelinanae (except Gramineae). Springer-Verlag, Berlin, Heidelberg, New York	Palmae [Arecaceae]

504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	n
	Source(s)	**Notes**
	Kubitzki, K. (ed.). 1998. The Families and genera of vascular plants. Volume IV. Flowering plants, Monocotyledons: Alismatanae and Commelinanae (except Gramineae). Springer-Verlag, Berlin, Heidelberg, New York	"Solitary, acaulescent or short-trunked. Stem decumbent or erect. Leaves diamond-shaped; petiole toothed; blade subpinnately ribbed, lower margins toothed. Inflorescences short, curved; peduncular bracts to 7, slightly inflated. Flowers solitary or in cincinni of 2-4; calyx cup-shaped with 3 lobes; corolla divided almost to base into 3 valvate lobes; stamens epipetalous; filaments broad, fleshy, connate basally to form a ring; ovule anatropous. Fruit rounded, mesocarp cracking to produce thick, corky warts. Seed globose. Germination remote-tubular; eophyll simple. Four spp., one widespread but very local in south Thailand, Malay Peninsula, Sumatra, and the western part of Borneo, the other three endemic to the Malay Peninsula."

601	Evidence of substantial reproductive failure in native habitat	n
	Source(s)	**Notes**
	Chan, Y. M., Chua, L. S. L., & Saw, L. G. 2011. Towards the conservation of Malaysian Johannesteijsmannia (Palmae). Gardens' Bulletin Singapore, 63(1&2): 425-432	"Johannesteijsmannia altifrons is far more commonly distributed than once thought, especially in the east of the peninsula, with the majority of the populations occurring in Terengganu and Johor. The collection from Temengor Forest Reserve (FR) is a new record for Perak. With 16 additions of new localities since 1972, the EOO and AOO have dramatically increased for J. altifrons (Table 1)."

602	Produces viable seed	y
	Source(s)	**Notes**
	Ellison, D. & Ellison, A. 2001. Cultivated Palms of the World. UNSW Press, Sydney, Australia	"Ripe fruit is brown and lumpy and seed germinates in 3 to 4 months with bottom heat."
	Squire, D. 2007. Palms and Cycads. A Complete Guide to Selecting, Growing and Propagating. Ball Publishing, Batavia, Illinois	"Sow fresh seed; germination is invariably erratic and may take 10-12 weeks, sometimes longer."

Qsn #	Question	Answer
603	**Hybridizes naturally**	**n**
	Source(s)	**Notes**
	Lee, L. S. 2007. Population genetics and phylogeny of the Malesian palm genus Johannesteijsmannia HE Moore (Palmae). PhD Dissertation. The National University of Singapore	"Results suggested that no hybridisation occurred between Jt. altifrons, Jt. lanceolata and Jt. magnifica despite their sympatric occurrence at Sungai Lalang Forest Reserve, Selangor, Peninsular Malaysia."
	Chan, Y. M., Chua, L. S. L., & Saw, L. G. 2011. Towards the conservation of Malaysian Johannesteijsmannia (Palmae). Gardens' Bulletin Singapore, 63(1&2): 425-432	[No evidence of hybrids reported in this publication] "The Sungai Lalang FR is a special area where three species, J. altifrons, J. lanceolata and J. magnifica, grow sympatrically."

604	**Self-compatible or apomictic**	**y**
	Source(s)	**Notes**
	Chan, Y. M., & Saw, L. G. 2012. Notes on the pollination ecology of the palm genus Johannesteijsmannia (Arecaceae). Journal of Pollination Ecology, 6(15): 108-117	"The breeding system is facultative selfing, indicating the ability of the species to reproduce in the absence of pollinators or in isolation."

605	**Requires specialist pollinators**	**n**
	Source(s)	**Notes**
	Henderson, A. 1986. A review of pollination studies in the Palmae. The Botanical Review, 52(3): 221-259	"Beetle pollination is found in Rhapidophyllum, Cryosophila and possibly Johannesteijsmannia ... "
	Lee, L. S. 2007. Population genetics and phylogeny of the Malesian palm genus Johannesteijsmannia HE Moore (Palmae). PhD Dissertation. The National University of Singapore	"Field observations suggested that rodents and bees are the likely agents for fruit and pollen dispersal, respectively of Jt. altifrons."
	Chan, Y. M., Chua, L. S. L., & Saw, L. G. 2011. Towards the conservation of Malaysian Johannesteijsmannia (Palmae). Gardens' Bulletin Singapore, 63(1&2): 425-432	"The floral biology and flower visitors of the tropical palms Johannesteijsmannia altifrons, J. magnifica and J. perakensis were investigated. We combined the data from this study with published data of J. lanceolata to give an overview of the reproductive biology and pollination system of the genus. Anthesis peaks from 0500–1100 hrs when the inflorescences are visited mainly by flies, beetles and stingless bees (Trigona), the last are potential pollinators."

606	**Reproduction by vegetative fragmentation**	
	Source(s)	**Notes**
	Lucas, G. & Synge, H.(eds.). 1978. The IUCN Plant Red Data Book. IUCN, Gland, Switzerland	[Unknown. Possible that creeping stem may allow for some vegetative spread] "Palm with a creeping underground stem which bears a tuft of about 20-30 very large, erect, diamond-shaped leaves up to 6 m high."

607	**Minimum generative time (years)**	**>3**
	Source(s)	**Notes**
	Squire, D. 2007. Palms and Cycads. A Complete Guide to Selecting, Growing and Propagating. Ball Publishing, Batavia, Illinois	"...slow to moderately fast-growing palm..."

Qsn #	Question	Answer
	iVillage Garden Web. 2008. Palms & Cycads Forum - Diamond Joey Palm/J. altifrons. http://forums.gardenweb.com/forums/load/palms/msg1015111124783.html. [Accessed 7 Aug 2014]	"Still have one that I got as a seedling in 01.. Still under two feet tall with only 3 fronds.lol From what I can gather it requires about 30 years to maturity"
	WRA Specialist. 2014. Personal Communication	Exact age to reproductive maturity unknown, but growth rate and anecdotal evidence suggests it is more than 4 years

701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	n
	Source(s)	**Notes**
	Henderson, A. 2009. Palms of Southern Asia. Princeton University Press, Princeton, NJ	[No evidence, and relatively large fruits lack means of external attachment] "fruit globose, to 5 cm diameter, warty, brownish."

702	Propagules dispersed intentionally by people	y
	Source(s)	**Notes**
	Riffle, R.L.& Craft, P. 2003. An Encyclopedia of Cultivated Palms. Timber Press, Portland, OR.	[Ornamental] "This is the most widely cultivated species in the genus, and for good reason: it is supremely attractive."

703	Propagules likely to disperse as a produce contaminant	n
	Source(s)	**Notes**
	Henderson, A. 2009. Palms of Southern Asia. Princeton University Press, Princeton, NJ	[No evidence, and unlikely that relatively large fruit would become an inadvertent contaminant of produce] "fruit globose, to 5 cm diameter, warty, brownish."

704	Propagules adapted to wind dispersal	n
	Source(s)	**Notes**
	Henderson, A. 2009. Palms of Southern Asia. Princeton University Press, Princeton, NJ	"fruit globose, to 5 cm diameter, warty, brownish."

705	Propagules water dispersed	
	Source(s)	**Notes**
	Ummul-Nazrah, A.R., Kiew, A.R.R., & Imin, K. 2013. The Botany of Gunung Padang, Terengganu, Malaysia. The Malayan Nature Journal, 63(4): 625-660	[Distribution along stream suggests fruit may be dispersed by water] "The next day we walked along old logging roads eventually camping (Camp 2) by a small stream in a narrow valley with an abundance of pokok koh (Johannesteijsmannia altifrons)."

706	Propagules bird dispersed	n
	Source(s)	**Notes**
	Chan, Y. M., Chua, L. S. L., & Saw, L. G. 2011. Towards the conservation of Malaysian Johannesteijsmannia (Palmae). Gardens' Bulletin Singapore, 63(1&2): 425-432	"Generally, Johannesteijsmannia spp. are gregarious but with patchy distribution and probably limited dispersal ability."

Qsn #	Question	Answer
	Lee, L. S. 2007. Population genetics and phylogeny of the Malesian palm genus Johannesteijsmannia HE Moore (Palmae). PhD Dissertation. The National University of Singapore	"Table 2.1. Morphological character states of Johannesteijsmannia from Dransfield (1972)." ... "Fruits 3.9–4.6 cm in diameter. Usually developing from 1 carpel, rarely from 2–3 carpels. Covered with 60–80 brown, corky warts." ... "Field observations suggested that rodents and bees are the likely agents for fruit and pollen dispersal, respectively of Jt. altifrons. The gene flow would be restricted because there is a limitation on the dispersal range by rodents and bees." ;Fruits relatively large for birds. No evidence of bird dispersal]

707	Propagules dispersed by other animals (externally)	
	Source(s)	**Notes**
	Lee, L. S. 2007. Population genetics and phylogeny of the Malesian palm genus Johannesteijsmannia HE Moore (Palmae). PhD Dissertation. The National University of Singapore	[Unknown if carried externally or consumed & internally dispersed by rodents. Fruit size suggests external dispersal] "Table 2.1. Morphological character states of Johannesteijsmannia from Dransfield (1972)." ... "Fruits 3.9–4.6 cm in diameter. Usually developing from 1 carpel, rarely from 2–3 carpels. Covered with 60–80 brown, corky warts." ... "Field observations suggested that rodents and bees are the likely agents for fruit and pollen dispersal, respectively of Jt. altifrons. The gene flow would be restricted because there is a limitation on the dispersal range by rodents and bees."

708	Propagules survive passage through the gut	
	Source(s)	**Notes**
	Lee, L. S. 2007. Population genetics and phylogeny of the Malesian palm genus Johannesteijsmannia HE Moore (Palmae). PhD Dissertation. The National University of Singapore	[Unknown if carried externally or consumed & internally dispersed by rodents. Fruit size suggests external dispersal] "Table 2.1. Morphological character states of Johannesteijsmannia from Dransfield (1972)." ... "Fruits 3.9–4.6 cm in diameter. Usually developing from 1 carpel, rarely from 2–3 carpels. Covered with 60–80 brown, corky warts." ... "Field observations suggested that rodents and bees are the likely agents for fruit and pollen dispersal, respectively of Jt. altifrons. The gene flow would be restricted because there is a limitation on the dispersal range by rodents and bees."

801	Prolific seed production (>1000/m2)	n
	Source(s)	**Notes**
	Chan, Y. M., Chua, L. S. L., & Saw, L. G. 2011. Towards the conservation of Malaysian Johannesteijsmannia (Palmae). Gardens' Bulletin Singapore, 63(1&2): 425-432	[Description for all species in the genus] "As the number of mature seeds is usually low, ranging from only 5 to 40 per palm in each flowering episode (Dransfield 1970; pers. obs.), the long-term impact of over-harvesting of seeds for the local ornamental trade needs to be examined."

802	Evidence that a persistent propagule bank is formed (>1 yr)	n
	Source(s)	**Notes**

Qsn #	Question	Answer
	Dave's Garden. 2014. PlantFiles: Joey Palm - Johannesteijsmannia altifrons. http://davesgarden.com/guides/pf/go/57989/. [Accessed 7 Aug 2014]	"Seed Collecting: Seed does not store well; sow as soon as possible"

803	Well controlled by herbicides	
	Source(s)	**Notes**
	WRA Specialist. 2014. 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**
	WRA Specialist. 2014. Personal Communication	Unknown

805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	
	Source(s)	**Notes**
	WRA Specialist. 2014. Personal Communication	Unknown

Summary of Risk Traits:

High Risk / Undesirable Traits
• Thrives in tropical climates
• Leaf stalks armed with short thorns
• Shade tolerant
• Forms pure stands in native range
• Seeds dispersed by rodents & intentionally by people
• Self-compatible
• Limited ecological information makes accurate risk prediction difficult

Low Risk Traits
• No reports of invasiveness or naturalization, but no evidence of widespread introduction outside native range
• Non-toxic
• Ornamental
• Slow growth rate and long time to reproductive maturity
• Disperser limited (but little information available)
• Limited seed production