

Taxon: Moringa ovalifolia	Family: Moringaceae
Common Name(s): African moring ghost tree meelsakboom oluhongwe omutindi phantom tree sprokiesboom	Synonym(s): NA

Assessor: Chuck Chimera	Status: Assessor Approved	End Date: 15 May 2015
WRA Score: -2.0	Designation: L	Rating: Low Risk

Keywords: Succulent Tree, Medicinal, Seed-propagated, Rapid Growth, Wind-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		
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	y=1, n=-1	n
405	Toxic to animals	y=1, n=0	n

Qsn #	Question	Answer Option	Answer
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		
409	Is a shade tolerant plant at some stage of its life cycle	y=1, n=0	n
410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y=1, n=0	y
411	Climbing or smothering growth habit	y=1, n=0	n
412	Forms dense thickets	y=1, n=0	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		
604	Self-compatible or apomictic		
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)	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	y
705	Propagules water dispersed		
706	Propagules bird dispersed	y=1, n=-1	n
707	Propagules dispersed by other animals (externally)	y=1, n=-1	n
708	Propagules survive passage through the gut	y=1, n=-1	n
801	Prolific seed production (>1000/m ²)		
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
	Curtis, B. & Mannheimer, C. 2005. Tree Atlas of Namibia. National Botanical Research Institute, Windhoek	[No evidence of domestication] "Generally uncommon, but widespread in western Namibia, as far south as 26° S; scattered localities in the Karstveld. Occasional in the south, locally common in the central areas."

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
	Verdcourt, B. (1985). A synopsis of the Moringaceae. Kew Bulletin 40(1): 1-23	"The distribution of this species in Angola (Mocamedes) and southwest Africa is adequately summarized by Mendes and Friedrich-Holzhammer and Nordenstam..."

202	Quality of climate match data	High
	Source(s)	Notes
	Verdcourt, B. (1985). A synopsis of the Moringaceae. Kew Bulletin 40(1): 1-23	

Qsn #	Question	Answer
203	Broad climate suitability (environmental versatility)	n
	Source(s)	Notes
	Useful Tropical Plants Database. 2015. <i>Moringa ovalifolia</i> . http://tropical.theferns.info/viewtropical.php?id=Moringa+ovalifolia . [Accessed 15 May 2015]	"A tree of the arid and semi-arid tropics and subtropics, where it is found at elevations up to 600 metres. Although it requires little water, the tree can cope with quite a lot of rain[385]. It cannot tolerate frost[295]."
	South African National Biodiversity Institute. 2007. <i>Moringa ovalifolia</i> . http://www.plantzafrica.com/plantklm/moringoval.htm . [Accessed 15 May 2015]	"Moringa is adapted to the subtropical, hot, dry Namib Desert. Its succulent stem stores water and nutrients help it through the dry winter months. The plant is deciduous during its resting phase in the winter months. The silvery bark reflects the sun's rays, preventing the plant from overheating. " ... "Moringa ovalifolia is an ornamental tree with horticultural value. However, it is best suited to warm, dry, frost-free, bushveld or desert gardens. It is a decorative species, either planted singly or in groups."

204	Native or naturalized in regions with tropical or subtropical climates	y
	Source(s)	Notes
	South African National Biodiversity Institute. 2007. <i>Moringa ovalifolia</i> . http://www.plantzafrica.com/plantklm/moringoval.htm . [Accessed 15 May 2015]	"Moringa is adapted to the subtropical, hot, dry Namib Desert."
	Verdcourt, B. (1985). A synopsis of the Moringaceae. Kew Bulletin 40(1): 1-23	"The distribution of this species in Angola (Mocamedes) and southwest Africa is adequately summarized by Mendes and Friedrich-Holzhammer and Nordenstam..."

205	Does the species have a history of repeated introductions outside its natural range?	n
	Source(s)	Notes
	Trade Winds Fruit. 2015. <i>Moringa ovalifolia</i> - Phantom Tree. http://www.tradewindsfruit.com/moringa-ovalifolia-phantom-tree-seeds . [Accessed 15 May 2015]	"seeds per pack." [Available for purchase]
	Healing Moringa Tree. 2015. Buy Moringa Ovalifolia, aka ghost tree! (OUT OF STOCK). https://www.healingmoringatree.com/store/p17/Buy_Moringa_Ovalifolia%2C_aka_ghost_tree!_%28OUT_OF_STOCK%29.html . [Accessed 15 May 2015]	Available for on-line purchase [although not currently]
	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 15 May 2015]	No records of 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

Qsn #	Question	Answer
	Wagner, W.L., Herbst, D.R.& Lorence, D.H. 2015. Flora of the Hawaiian Islands. Smithsonian Institution, Washington, D.C. http://botany.si.edu/pacificislandbiodiversity/hawaiianflora/index.htm . [Accessed 15 May 2015]	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
	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
	Navie, S. & Csurhes, S. 2010. Weed Risk Assessment. Horseradish tree. <i>Moringa oleifera</i> . The State of Queensland, Department of Employment, Economic Development and Innovation	[Regarded as a minor weed] "This species is regarded as potentially invasive or moderately invasive in tropical regions of the world. It has escaped from gardens in northern Australia, and is currently naturalised in north Queensland and northern Western Australia. Currently, it is considered a minor weed in northern Australia, but its status may change over time. <i>Moringa oleifera</i> appears to spread relatively slowly, eventually forming dense thickets around parent trees. Like other tree species with similar ecological characteristics, it may pose a long term threat to certain natural ecosystems in the wet/dry tropics of northern Australia. The large scale commercial cultivation of this species might accelerate the rate of naturalization and population development in northern Australia."

401	Produces spines, thorns or burrs	n
	Source(s)	Notes

Qsn #	Question	Answer
	South African National Biodiversity Institute. 2007. <i>Moringa ovalifolia</i> . http://www.plantzafrica.com/plantklm/moringoval.htm . [Accessed 15 May 2015]	[No evidence] " <i>Moringa ovalifolia</i> is a conspicuous, erect, deciduous tree up to 7 m high, bearing a succulent, often bottle-shaped main branch up to 1 m in diameter. The roots are fleshy. The bark is smooth, brown to silvery copper, with a shiny green sheen, and resinous. The leaves (tending to droop) are alternately arranged, twice-compound and up to 0.6 m long with up to 4 pairs of pinna, each with up to 7 pairs of opposite, oval leaflets and a terminal leaflet. The leaflets can grow up to 25 mm long. "

402	Allelopathic	
	Source(s)	Notes
	Hossain, M. M., Miah, G., Ahamed, T., & Sarmin, N. S. (2012). Allelopathic effect of <i>Moringa oleifera</i> on the germination of <i>Vigna radiata</i> . <i>Intl. J. Agri. Crop Sci</i> , 4(3): 114-121	[Unknown for <i>M. hildebrandtii</i> . Allelopathic properties documented in <i>M. oleifera</i>] "Abstract: The objectives of the study were to examine the allelopathic effect of different concentrations of leaf, root, bark, fruit kernel and seed aqueous extracts of <i>Moringa oleifera</i> on the germination of <i>Vigna radiata</i> ... The inhibitory effect of leaf, fruit kernel and seed aqueous extracts were almost similar, while those were relatively less than bark and root extracts. The effects of light and dark conditions on the rate of germination were not distinct. Therefore, the study revealed that allelochemicals released from different plant parts of <i>M. oleifera</i> impeded the rate of germination in laboratory condition."

403	Parasitic	n
	Source(s)	Notes
	Van Wyk, B. & Van Wyk, P. 1997. <i>Field Guide to Trees of Southern Africa</i> . Struik Publishers, Cape Town, South Africa	"Small tree with distinctive, squat, swollen stem and branches" [No evidence. Moringaceae]

404	Unpalatable to grazing animals	n
	Source(s)	Notes
	Van Wyk, B. & Van Wyk, P. 1997. <i>Field Guide to Trees of Southern Africa</i> . Struik Publishers, Cape Town, South Africa	"The leaves and fruit are browsed by elephant, giraffe and springbok. Bark, wood, and root eaten by small stock and porcupine. Root edible, but sour-tasting."

405	Toxic to animals	n
	Source(s)	Notes
	South African National Biodiversity Institute. 2007. <i>Moringa ovalifolia</i> . http://www.plantzafrica.com/plantklm/moringoval.htm . [Accessed 15 May 2015]	[No evidence] " <i>Moringa</i> leaves and stems are often utilized by game. Elephant, giraffe and springbok eat the fruit and leaves, whilst elephant and porcupine utilize the fleshy stems, resulting in their peculiar main stem architecture (Curtis & Mannheimer 2005). It is also reportedly eaten by the local indigenous people."

406	Host for recognized pests and pathogens	
	Source(s)	Notes

Qsn #	Question	Answer
	Olson, M.E. 2015. The International Moringa Germplasm Collection. Universidad Nacional Autónoma de México, México DF. http://www.moringaceae.org/ . [Accessed 15 May 2015]	"Moringas planted out in the ground tend to have few pests, at least here far from their native range. Here at the collection the only real problem are leafcutter ants. ... Once the trees get bigger, a few leafcutters won't make much of a difference. "

407	Causes allergies or is otherwise toxic to humans	n
	Source(s)	Notes
	South African National Biodiversity Institute. 2007. <i>Moringa ovalifolia</i> . http://www.plantzafrica.com/plantklm/moringoval.htm . [Accessed 15 May 2015]	[No evidence] "Moringa leaves and stems are often utilized by game. Elephant, giraffe and springbok eat the fruit and leaves, whilst elephant and porcupine utilize the fleshy stems, resulting in their peculiar main stem architecture (Curtis & Mannheimer 2005). It is also reportedly eaten by the local indigenous people."
	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	
	Source(s)	Notes
	Curtis, B. & Mannheimer, C. 2005. Tree Atlas of Namibia. National Botanical Research Institute, Windhoek	[Unlikely. Succulent tree of rocky areas] "Deciduous tree with a thick, succulent trunk (up to 1 m in diameter) and feathery-looking canopy..." ... "Various, but mainly hill slopes and rocky outcrops. There is a large population of old trees growing on a sandy plain in Etosha National Park (Sprokieswoud, 1915BA)."

409	Is a shade tolerant plant at some stage of its life cycle	n
	Source(s)	Notes
	South African National Biodiversity Institute. 2007. <i>Moringa ovalifolia</i> . http://www.plantzafrica.com/plantklm/moringoval.htm . [Accessed 15 May 2015]	"It is best grown in a sunny situation on a well-drained slope."
	Bihrmann's Caudiciforms. 2015. <i>Moringa ovalifolia</i> . http://www.bihrmann.com/caudiciforms/subs/mor-ova-sub.asp . [Accessed 15 May 2015]	"Sun: Maximum"

Qsn #	Question	Answer
410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y
	Source(s)	Notes
	Top Tropicals. 2015. <i>Moringa ovalifolia</i> . https://toptropicals.com/catalog/uid/Moringa_ovalifolia.htm . [Accessed 15 May 2015]	"Moringa tolerate most soil types and grow well in full sun."
	Useful Tropical Plants Database. 2015. <i>Moringa ovalifolia</i> . http://tropical.theferns.info/viewtropical.php?id=Moringa+ovalifolia . [Accessed 15 May 2015]	"Succeeds in most soils, so long as they are well drained."
	South African National Biodiversity Institute. 2007. <i>Moringa ovalifolia</i> . http://www.plantzafrica.com/plantklm/moringoval.htm . [Accessed 15 May 2015]	"The soil is sandy, rich in gravel and may be alkaline, neutral to slightly acid; the plants are often associated with rocky, mountainous terrain."

411	Climbing or smothering growth habit	n
	Source(s)	Notes
	Van Wyk, B. & Van Wyk, P. 1997. Field Guide to Trees of Southern Africa. Struik Publishers, Cape Town, South Africa	"Small tree with distinctive, squat, swollen stem and branches"

412	Forms dense thickets	y
	Source(s)	Notes
	South African National Biodiversity Institute. 2007. <i>Moringa ovalifolia</i> . http://www.plantzafrica.com/plantklm/moringoval.htm . [Accessed 15 May 2015]	"The Sprokieswoud in Etosha National Park is famous for its dense stands of these trees."
	Cloudsley-Thompson, J. L. (1990). Etosha and the Kaokoveld: Problems of conservation in Namibia. Environmental Conservation, 17(04): 351-354	[Yes in native range] "Etosha National Park in NW Namibia is an area extremely rich in game. " ... "Moringa (<i>Moringa ovalifolia</i>), an endemic tree of rocky ledges from Naukluft in the south to the Kaokoveld to the NW of Etosha, forms a dense stand 32 km west of Okaukuejo, a tourist rest camp on the SW of the Pan."

501	Aquatic	n
	Source(s)	Notes
	Van Wyk, B. & Van Wyk, P. 1997. Field Guide to Trees of Southern Africa. Struik Publishers, Cape Town, South Africa	[Terrestrial] "Small tree ... occurring in arid areas, usually on rocky hillsides, rarely on sandy flats."

Qsn #	Question	Answer
502	Grass	n
	Source(s)	Notes
	Kubitzki, K. & Bayer, C. (eds.). 2003. The Families and genera of vascular plants. Volume V. Flowering Plants. Dicotyledons: Capparales, Malvales and Non-betain Caryophyllales. Springer Verlag, Berlin, Heidelberg, New York	Moringaceae
503	Nitrogen fixing woody plant	n
	Source(s)	Notes
	Olson, M.E. 2014. Does Moringa fix nitrogen? The International Moringa Germplasm Collection, Mexico City, Mexico. http://moringaceae.org/1/post/2014/02/does-moringa-fix-nitrogen.html . [Accessed 15 May 2015]	"Moringaceae is a member of the mustard-oil plants, the great group of families that includes the mustards, the capers, the papayas, and a lot else besides. None of these plants seem to have learned the trick of living with nitrogen fixing bacteria."
504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	n
	Source(s)	Notes
	Van Wyk, B. & Van Wyk, P. 1997. Field Guide to Trees of Southern Africa. Struik Publishers, Cape Town, South Africa	"Small tree with a distinctive, squat, swollen stem and branches"
601	Evidence of substantial reproductive failure in native habitat	n
	Source(s)	Notes
	South African National Biodiversity Institute. 2007. <i>Moringa ovalifolia</i> . http://www.plantzafrica.com/plantklm/moringoval.htm . [Accessed 15 May 2015]	" <i>Moringa ovalifolia</i> is widespread and locally common in some areas. It is, however, protected by a nature conservation ordinance in Namibia."
602	Produces viable seed	y
	Source(s)	Notes
	South African National Biodiversity Institute. 2007. <i>Moringa ovalifolia</i> . http://www.plantzafrica.com/plantklm/moringoval.htm . [Accessed 15 May 2015]	" <i>Moringa ovalifolia</i> is easily propagated from seed during the warm summer months. It is best to treat the seed with a systemic fungicide prior to sowing to prevent damping off. Sow in a sandy mixture and cover the seed lightly with sand. Germination is fast and the seedlings grow rapidly."
603	Hybridizes naturally	
	Source(s)	Notes
	Olson, M.E. 2015. The International Moringa Germplasm Collection. Universidad Nacional Autónoma de México, México DF. http://www.moringaceae.org/ . [Accessed 15 May 2015]	[Hybridization documented in genus] "Flowers of a pretty and very vigorous <i>Moringa oleifera</i> X <i>Moringa concanensis</i> hybrid. They have the wide petals of <i>M. oleifera</i> and the pink streaks of <i>M. concanensis</i> "

Qsn #	Question	Answer
604	Self-compatible or apomictic	
	Source(s)	Notes
	East, E. M. 1940. The distribution of self-sterility in the flowering plants. Proceedings of the American Philosophical Society 82: 449-518	[Unknown for <i>M. ovalifolia</i>] " <i>Moringa oleifera</i> Lam. is self-fertile though slightly protandrous."
	Kubitzki, K. & Bayer, C. (eds.). 2003. The Families and genera of vascular plants. Volume V. Flowering Plants. Dicotyledons: Capparales, Malvales and Non-betain Caryophyllales. Springer Verlag, Berlin, Heidelberg, New York	[Unknown. Family description] "Flowers regular to zygomorphic, hermaphroditic, white, yellow or red, with cup-like or in one species tubular, nectar-secreting receptacle. Sepals 5, much like the petals, free above the receptacle, equal or unequal, imbricate in bud. Petals 5, equal or unequal, imbricate. Fertile stamens 5, antepetalous, inserted on the margin of the disk, sometimes declinate, alternating with 3-5 staminodes; filaments free or partly adherent; anthers dorsifixed, 1-thecous, opening length-wise by a slit. Ovary superior, stipitate, cylindrical, 3-carpellate, 1-locular, with 3 parietal placentas; style terminal, slender, tubular with open canal, truncate at apex and without stigmatic lobes; ovules numerous in 2 series on each placenta, pendulous, anatropous, crassinucellate."

605	Requires specialist pollinators	n
	Source(s)	Notes
	Olson, M.E. 2015. The International Moringa Germplasm Collection. Universidad Nacional Autónoma de México, México DF. http://www.moringaceae.org/ . [Accessed 15 May 2015]	"The four bottle tree <i>Moringa</i> species (<i>M. drouhardii</i> , <i>M. hildebrandtii</i> , <i>M. stenopetala</i> , and <i>M. ovalifolia</i>) have flowers that are very much unlike <i>M. oleifera</i> . Instead of being bilaterally symmetrical when seen from the front, they are more or less radially symmetrical." ... "They have a powerful jasmine scent that you can smell from several meters away, perfuming the air around the trees. The flowers were perfumed during the day in Madagascar and were visited by bees, and here they are attracting bees and bumblebees as well."
	Kubitzki, K. & Bayer, C. (eds.). 2003. The Families and genera of vascular plants. Volume V. Flowering Plants. Dicotyledons: Capparales, Malvales and Non-betain Caryophyllales. Springer Verlag, Berlin, Heidelberg, New York	[Family description] "The sweet-scented flowers are clearly bee-pollinated, and nectar secretion seems to take place on the inside of the receptacle"

606	Reproduction by vegetative fragmentation	n
	Source(s)	Notes
	South African National Biodiversity Institute. 2007. <i>Moringa ovalifolia</i> . http://www.plantzafrica.com/plantklm/moringoval.htm . [Accessed 15 May 2015]	[No evidence] " <i>Moringa ovalifolia</i> is easily propagated from seed during the warm summer months."

Qsn #	Question	Answer
607	Minimum generative time (years)	>3
	Source(s)	Notes
	Olson, M.E. 2015. The International Moringa Germplasm Collection. Universidad Nacional Autónoma de México, México DF. http://www.moringaceae.org/ . [Accessed 15 May 2015]	[Grows underground before emerging. Suggest maturity is not reached until 3+ years] "Moringa ovalifolia for the first few years of life tend to grow mostly underground. The tuber becomes massive before much aboveground growth occurs."

701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	n
	Source(s)	Notes
	Curtis, B. & Mannheimer, C. 2005. Tree Atlas of Namibia. National Botanical Research Institute, Windhoek	[No evidence. Fruit & winged-seeds lack means of external attachment] "FRUIT a long, light grey-brown, pendulous pod, triangular in cross section, swollen over the seeds, splitting into three sections. SEEDS with membranous wings"

702	Propagules dispersed intentionally by people	y
	Source(s)	Notes
	South African National Biodiversity Institute. 2007. <i>Moringa ovalifolia</i> . http://www.plantzafrica.com/plantklm/moringoval.htm . [Accessed 15 May 2015]	"Moringa ovalifolia is an ornamental tree with horticultural value."
	Trade Winds Fruit. 2015. <i>Moringa ovalifolia</i> - Phantom Tree. http://www.tradewindsfruit.com/moringa-ovalifolia-phantom-tree-seeds . [Accessed 15 May 2015]	"seeds per pack." [Available for purchase]

703	Propagules likely to disperse as a produce contaminant	n
	Source(s)	Notes
	South African National Biodiversity Institute. 2007. <i>Moringa ovalifolia</i> . http://www.plantzafrica.com/plantklm/moringoval.htm . [Accessed 15 May 2015]	[No evidence. Unlikely. Rare in cultivation & not grown with produce] "They are followed by grey-brown, three-angled pods, up to 400 mm long, which split along three valves, releasing the winged seeds."

Qsn #	Question	Answer
704	Propagules adapted to wind dispersal	y
	Source(s)	Notes
	Kubitzki, K. & Bayer, C. (eds.). 2003. The Families and genera of vascular plants. Volume V. Flowering Plants. Dicotyledons: Capparales, Malvales and Non-betalain Caryophyllales. Springer Verlag, Berlin, Heidelberg, New York	"Dispersal for species with alate seeds is by wind"
	South African National Biodiversity Institute. 2007. <i>Moringa ovalifolia</i> . http://www.plantzafrica.com/plantklm/moringoval.htm . [Accessed 15 May 2015]	[Winged-seeds. Adapted for wind dispersal] "The white flowers are borne in branched axillary sprays (panicles), each up to 3 mm in diameter with 4-5 petals. They are followed by grey-brown, three-angled pods, up to 400 mm long, which split along three valves, releasing the winged seeds." ... "The winged seeds are released during the summer and autumn, when the greatest incidence of rain occurs and are dispersed by the wind."
705	Propagules water dispersed	
	Source(s)	Notes
	Navie, S. & Csurhes, S. 2010. Weed Risk Assessment. Horseradish tree. <i>Moringa oleifera</i> . The State of Queensland, Department of Employment, Economic Development and Innovation	[<i>M. oleifera</i> possibly water dispersed. Unknown if <i>M. ovalifolia</i> could be dispersed in a similar manner] "While the seeds are relatively large, they are strongly winged. This may allow them to be spread short distances from the parent tree by wind. It may also aid their dispersal downstream in water during floods (the mature pods may also float in water), as populations are sometimes found growing along waterways."
706	Propagules bird dispersed	n
	Source(s)	Notes
	South African National Biodiversity Institute. 2007. <i>Moringa ovalifolia</i> . http://www.plantzafrica.com/plantklm/moringoval.htm . [Accessed 15 May 2015]	[No evidence. Not fleshy-fruited] "The white flowers are borne in branched axillary sprays (panicles), each up to 3 mm in diameter with 4-5 petals. They are followed by grey-brown, three-angled pods, up to 400 mm long, which split along three valves, releasing the winged seeds."
707	Propagules dispersed by other animals (externally)	n
	Source(s)	Notes
	Curtis, B. & Mannheimer, C. 2005. Tree Atlas of Namibia. National Botanical Research Institute, Windhoek	[Unlikely. No means of external attachment] "FRUIT a long, light grey-brown, pendulous pod, triangular in cross section, swollen over the seeds, splitting into three sections. SEEDS with membranous wings."

Qsn #	Question	Answer
708	Propagules survive passage through the gut	n
	Source(s)	Notes
	South African National Biodiversity Institute. 2007. <i>Moringa ovalifolia</i> . http://www.plantzafrica.com/plantklm/moringoval.htm . [Accessed 15 May 2015]	"The winged seeds are released during the summer and autumn, when the greatest incidence of rain occurs and are dispersed by the wind."

801	Prolific seed production (>1000/m ²)	
	Source(s)	Notes
	South African National Biodiversity Institute. 2007. <i>Moringa ovalifolia</i> . http://www.plantzafrica.com/plantklm/moringoval.htm . [Accessed 15 May 2015]	[Densities unknown] "The winged seeds are released during the summer and autumn, when the greatest incidence of rain occurs and are dispersed by the wind. "

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 15 May 2015]	"Storage Behaviour: Orthodox Storage Conditions: 100 % viability following drying to mc's in equilibrium with 15 % RH and freezing for 13 weeks at -20C at RBG Kew, WP"

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	
	Source(s)	Notes
	CAB International, 2005. Forestry Compendium. CAB International, Wallingford, UK	[Unknown for <i>M. ovalifolia</i> . <i>M. oleifera</i> tolerates frequent pruning & is able to coppice] " <i>Moringa oleifera</i> " ... "Frequent pruning, lopping, coppicing or pollarding increases and maintains leaf production as the leaves sprout back profusely."

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

- Grows in tropical climates
- Other *Moringa* species have weedy traits & tendencies
- Has formed dense stands in native range
- Reproduces by seeds
- Rapid growth rate
- Reaches maturity in 3+ years
- Seeds dispersed by wind, gravity & intentionally by people
- Limited ecological information may limit 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)
- Palatable to browsing & grazing animals
- Medicinal uses
- Light demanding
- Not reported to spread vegetatively