Taxon: Moringa peregrina **Family:** Moringaceae

Common Name(s): bentree
wild drumsticktree
wispy-needle yasartree

Synonym(s): Hyperanthera peregrina Forssk.

Assessor: Chuck Chimera **Status:** Assessor Approved **End Date:** 18 May 2015

WRA Score: 0.0 **Designation:** L **Rating:** Low Risk

Keywords: Small Tree, Arid Climates, Seed Oil, Seed-propagated, Rapid Growth

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	y
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		
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
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		

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	y
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	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/m2)	y=1, n=-1	n
802	Evidence that a persistent propagule bank is formed (>1 yr)	y=1, n=-1	y
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**
	Olson, M.E. 2015. The International Moringa Germplasm Collection. Universidad Nacional Autónoma de México, México DF. http://www.moringaceae.org/. [Accessed 18 May 2015]	[Cultivated for millennia] "There is abundant archaeological evidence of the use of M. peregrina in Egypt and around the ancient Mediterranean." ... "Clapham and Rowley-Conwy (2007) give an interesting record of the presence of M. peregrina samples at Qasr Ibrim, once a major city in what is now Lake Nasser, Egypt. They show that traces of M. peregrina fruits are present over a period comprising as early as the 7th century BC to as late as 650 AD, a stunningly long period of documented use. "
	Munyanziza, E. & Yongabi, K.A., 2007. Moringa peregrina (Forssk.) Fiori. [Internet] Record from PROTA4U. van der Vossen, H.A.M. & Mkamilo, G.S. (Editors). PROTA (Plant Resources of Tropical Africa / Ressources végétales de l'Afrique tropicale), Wageningen, Netherlands. http://www.prota4u.org/search.asp. [Accessed 16 May 2015]	[No evidence to date] "Protection of Moringa peregrina and its vulnerable habitat is needed. Continued use of the seed for oil production and water clarification requires its domestication and cultivation. Initial results of experiments to achieve this are promising."

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**
	Munyanziza, E. & Yongabi, K.A., 2007. Moringa peregrina (Forssk.) Fiori. [Internet] Record from PROTA4U. van der Vossen, H.A.M. & Mkamilo, G.S. (Editors). PROTA (Plant Resources of Tropical Africa / Ressources végétales de l'Afrique tropicale), Wageningen, Netherlands. http://www.prota4u.org/search.asp. [Accessed 16 May 2015]	"Moringa peregrina occurs naturally in arid or semi-arid countries bordering the Red Sea, from Somalia and Yemen to Israel and on to Syria. In tropical Africa it is reported from Sudan, Ethiopia, Eritrea, Djibouti and Somalia. It is reported from Iran and Pakistan, but its occurrence there needs confirmation."

Qsn #	Question	Answer
202	**Quality of climate match data**	**High**
	Source(s)	**Notes**
	Munyanziza, E. & Yongabi, K.A., 2007. Moringa peregrina (Forssk.) Fiori. [Internet] Record from PROTA4U. van der Vossen, H.A.M. & Mkamilo, G.S. (Editors). PROTA (Plant Resources of Tropical Africa / Ressources végétales de l'Afrique tropicale), Wageningen, Netherlands. http://www.prota4u.org/search.asp. [Accessed 16 May 2015]	

203	**Broad climate suitability (environmental versatility)**	**y**
	Source(s)	**Notes**
	Munyanziza, E. & Yongabi, K.A., 2007. Moringa peregrina (Forssk.) Fiori. [Internet] Record from PROTA4U. van der Vossen, H.A.M. & Mkamilo, G.S. (Editors). PROTA (Plant Resources of Tropical Africa / Ressources végétales de l'Afrique tropicale), Wageningen, Netherlands. http://www.prota4u.org/search.asp. [Accessed 18 May 2015]	"Moringa peregrina occurs naturally in arid or semi-arid countries bordering the Red Sea, from Somalia and Yemen to Israel and on to Syria. In tropical Africa it is reported from Sudan, Ethiopia, Eritrea, Djibouti and Somalia."
	Dadamouny, M. A. (2009). Population Ecology of Moringa peregrina Growing in Southern Sinai, Egypt. M.Sc. Thesis. Suez Canal University, Ismailia, Egypt	"Ranging from subtropical dry to moist through tropical very dry to moist forest life zones, Moringa is reported to tolerate annual precipitation of 4.8 to 4.3 dm (mean of 53 cases =14.1) annual temperature of 18.7 to 28.5˚C (mean of 48 cases = 25.4) and pH of 4.5 to 8.0 (mean of 12 cases = 6.5) thrives in subtropical and tropical climates, flowering and fruiting freely and continuously." ... "It grows well from sea level to 1000 m in elevation. (VonMaydeU, 1986; and vonCarlowitz et al., 1991)."
	Padayachee, B., & Baijnath, H. (2012). An overview of the medicinal importance of Moringaceae. J. Med. Plants Res, 6(48): 5831-5839	[Broad geographic range, but primarily in arid, tropical climates] "M. peregrina has a wide geographic range, growing from the Dead Sea area along the Red Sea to Northern Somalia and around the Arabian Peninsula to the mouth of the Arabian Gulf."
	Mridha, M. A. U. (2015). Prospects of Moringa Cultivation in Saudi Arabia. Journal of Applied Environmental 5(3): 39-46	[Elevation range exceeds 1000 m, but restricted to arid climates] "M. peregrina growing in KSA is adapted to wide range of environmental conditions [28, 32[. The tree was found 0-300 m above sea level and on hillsides of upper escarpment areas (1600 2200 m above sea level) on hard sandy-silty and sandy stony soil, respectively. It was found together with Acacia asak and some succulent shrubs such as Aloe spp. and Euphorbia spp. [22]. According to Cossalter [33] M. peregrina is a drought resistant tree, may be due to its xerophytic characteristics and modification of its leaves and stem [34]. This drought tolerance was also observed in newly germinated M. peregrina [35]. The drought resistant characteristic of M. peregrina will facilitate these plants to grow in arid and semi-arid regions, where water deficiency is a major problem."

204	**Native or naturalized in regions with tropical or subtropical climates**	**y**
	Source(s)	**Notes**

Qsn #	Question	Answer
	Munyanziza, E. & Yongabi, K.A., 2007. Moringa peregrina (Forssk.) Fiori. [Internet] Record from PROTA4U. van der Vossen, H.A.M. & Mkamilo, G.S. (Editors). PROTA (Plant Resources of Tropical Africa / Ressources végétales de l'Afrique tropicale), Wageningen, Netherlands. http://www.prota4u.org/search.asp. [Accessed 16 May 2015]	"Moringa peregrina occurs naturally in arid or semi-arid countries bordering the Red Sea, from Somalia and Yemen to Israel and on to Syria. In tropical Africa it is reported from Sudan, Ethiopia, Eritrea, Djibouti and Somalia. It is reported from Iran and Pakistan, but its occurrence there needs confirmation."

205	Does the species have a history of repeated introductions outside its natural range?	n
	Source(s)	**Notes**
	Padayachee, B., & Baijnath, H. (2012). An overview of the medicinal importance of Moringaceae. J. Med. Plants Res, 6(48): 5831-5839	"M. peregrina has the potential to become one of the world's most valuable plants due to its broad economical and medicinal importance; however, its existence is currently threatened in its environment due to human activities, hence the protection and conservation of its vulnerable habitat is very much needed."
	Verdcourt, B. (1985). A synopsis of the Moringaceae. Kew Bulletin 40(1): 1-23	"There seem to be few records of the cultivation of M. peregrina."
	Bishop Museum. 2015. Online Natural Sciences Collections. http://nsdb.bishopmuseum.org/. [Accessed 18 May 2015]	No collections in the Bishop Museum herbarium
	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]	No records of cultivation in the Hawaiian Islands

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
	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 18 May 2015]	No evidence

302	Garden/amenity/disturbance weed	
	Source(s)	**Notes**
	Randall, R.P. 2012. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	Listed as a weed of unspecified impacts in Anon. (2000). Weeds of Egypt. Arasi Lawrence Company. URL: http://arasi.freeservers.com/. The link provided was no longer active, and no further information on this species as a weed was located

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	
	Source(s)	**Notes**
	Navie, S. & Csurhes, S. 2010. Weed Risk Assessment. Horseradish tree. Moringa oleifera. 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. Moringa oleifera 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**
	Munyanziza, E. & Yongabi, K.A., 2007. Moringa peregrina (Forssk.) Fiori. [Internet] Record from PROTA4U. van der Vossen, H.A.M. & Mkamilo, G.S. (Editors). PROTA (Plant Resources of Tropical Africa / Ressources végétales de l'Afrique tropicale), Wageningen, Netherlands. http://www.prota4u.org/search.asp. [Accessed 16 May 2015]	"Shrub or small tree up to 10 m tall, with tuberous rootstock; bole up to 40 cm in diameter; bark grey, purple-grey or bright brown; crown ovoid; branches terete, slender, young stems grey white or waxy blue-green; twigs brittle. Leaves alternate, in bunches at the ends of branches, 1 –40 cm long, 2–pinnate, with 2–5 pairs of pinnae; leaflets opposite or alternate, obovate, oblanceolate or spatulate, 3–20(–35) mm × 2–10(–13) mm, base cuneate to rounded, apex rounded or notched, grey or waxy green."

402	Allelopathic	
	Source(s)	**Notes**

Qsn #	Question	Answer
	Hossain, M. M., Miah, G., Ahamed, T., & Sarmin, N. S. (2012). Allelopathic effect of Moringa oleifera on the germination of Vigna radiata. Intl. J. Agri. Crop Sci, 4(3): 114-121	[Unknown for M. peregrina. Allelopathic properties documented in M. oleifera] "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 Moringa oleifera on the germination of Vigna radiate ... 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 M. oleifera impeded the rate of germination in laboratory condition."

403	Parasitic	n
	Source(s)	**Notes**
	Munyanziza, E. & Yongabi, K.A., 2007. Moringa peregrina (Forssk.) Fiori. [Internet] Record from PROTA4U. van der Vossen, H.A.M. & Mkamilo, G.S. (Editors). PROTA (Plant Resources of Tropical Africa / Ressources végétales de l'Afrique tropicale), Wageningen, Netherlands. http://www.prota4u.org/search.asp. [Accessed 16 May 2015]	"Shrub or small tree up to 10 m tall, with tuberous rootstock" [No evidence. Moringaceae]

404	Unpalatable to grazing animals	n
	Source(s)	**Notes**
	Munyanziza, E. & Yongabi, K.A., 2007. Moringa peregrina (Forssk.) Fiori. [Internet] Record from PROTA4U. van der Vossen, H.A.M. & Mkamilo, G.S. (Editors). PROTA (Plant Resources of Tropical Africa / Ressources végétales de l'Afrique tropicale), Wageningen, Netherlands. http://www.prota4u.org/search.asp. [Accessed 16 May 2015]	"In southern Sudan and Yemen Moringa peregrina is a bee plant and its leaves are used as fodder."

405	Toxic to animals	n
	Source(s)	**Notes**
	Munyanziza, E. & Yongabi, K.A., 2007. Moringa peregrina (Forssk.) Fiori. [Internet] Record from PROTA4U. van der Vossen, H.A.M. & Mkamilo, G.S. (Editors). PROTA (Plant Resources of Tropical Africa / Ressources végétales de l'Afrique tropicale), Wageningen, Netherlands. http://www.prota4u.org/search.asp. [Accessed 16 May 2015]	[No evidence] "In southern Sudan and Yemen Moringa peregrina is a bee plant and its leaves are used as fodder."
	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	

Qsn #	Question	Answer
	Source(s)	**Notes**
	Moniri, V. R. (2010). Survey of the key pests, diseases and associated natural enemies of Moringa peregerina in natural stands and Plantations in Hormozgan and Sistan & Balochestan Provinces. http://agris.fao.org/agris-search/search.do?recordID=IR2012070142. [Accessed 18 May 2015]	"Late Dr. Javanshir first sited Moringa peregrina Fiori in Iranian flora in 1993. Its occurence is also reported in Persian Gulf states, Saudi Arabia and occupied Palestine. Moringa grows over rough train of Makran and Bashagerd mount ranges in Baloochestan and Hormozgan Provinces. Major distribution areas of the species include Bashagerd mount in Nikshahr through south Jazmorian. The species does have great tolerance against lack of water. In a way, it can survive for years in the absence of a drop of rain. Moringa's root systems as well as the specific bedrock of the growing areas are the most important factors affecting the plant survival. The study was conducted in laboratory and field as well as nursery and natural stand conditions in Hormozgan and Balochestan provinces. Selected sites were surveyed and pests and disease associated with moringa were investigated. Based on the two years sampling procedures conducted on the different parts of the plant collected in Sistan and Baloochestan and Hormozgan Provinces, and except for a single species of scale insect from Chanoof area, there was not any specific insect, fungi or bacteria associated with Moringa tree... The species was identified as Parlatoria crypta of Diaspididae family by the plant protection- Research Institute. This is a polyphagous insect with a wide range of hosts in southern Iran. Meanwhile, there was not any pathogenic agent over rearing samples of root, stem and leaves of the Moringa in the laboratories. "
	Olson, M.E. 2015. The International Moringa Germplasm Collection. Universidad Nacional Autónoma de México, México DF. http://www.moringaceae.org/. [Accessed 18 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. " ... "Some species seem more susceptible than others. I haven't had mite trouble with M. peregrina, but M. concanensis and M. oleifera are susceptible."

407	Causes allergies or is otherwise toxic to humans	n
	Source(s)	**Notes**
	Munyanziza, E. & Yongabi, K.A., 2007. Moringa peregrina (Forssk.) Fiori. [Internet] Record from PROTA4U. van der Vossen, H.A.M. & Mkamilo, G.S. (Editors). PROTA (Plant Resources of Tropical Africa / Ressources végétales de l'Afrique tropicale), Wageningen, Netherlands. http://www.prota4u.org/search.asp. [Accessed 16 May 2015]	[No evidence. Multiple uses, including for food & medicine] "The main product derived from Moringa peregrina is seed oil, called 'ben oil'. The use of the oil goes back to antiquity and is already referred to in old Egyptian texts and the Bible. The oil is used for cooking, in cosmetics and in medicine. In Yemen the oil is used as a lubricant for small machinery. The seeds are also used as coagulant to purify water, e.g. in Sudan. In southern Sudan and Yemen Moringa peregrina is a bee plant and its leaves are used as fodder. The seeds are used in medicine in the Middle East and Sudan. The oil is used to treat abdominal pain. The tuber of the young plant is eaten in Yemen and Oman. The plant is grown as ornamental in Saudi Arabia and the Middle East. The wood is collected for fuel in the southern Sinai, but it has now become scarce."
	Arora, D. S., Onsare, J. G., & Kaur, H. (2013). Bioprospecting of Moringa (Moringaceae): microbiological perspective. Journal of Pharmacognosy and Phytochemistry 1(6): 193-215	[No evidence] "Recently, a few others like M. stenopetala, M. peregrine and M. concanensis have been discovered to be having equal potential such as nutritious vegetables, high-quality seed oil, antibiotics and water clarification agents just like the M. oleifera."

Qsn #	Question	Answer
	Padayachee, B., & Baijnath, H. (2012). An overview of the medicinal importance of Moringaceae. J. Med. Plants Res, 6(48): 5831-5839	[No evidence] "Traditional practice - Young seeds are eaten like peas and the mature seeds are fried or roasted like ground nuts. Prepared as infusions, tinctures, capsules and creams." ... "Use - Oil (cooking and cosmetics), medicinal plant, water coagulant, ornamental, building material (Jahn, 1986)."
	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**
	Munyanziza, E. & Yongabi, K.A., 2007. Moringa peregrina (Forssk.) Fiori. [Internet] Record from PROTA4U. van der Vossen, H.A.M. & Mkamilo, G.S. (Editors). PROTA (Plant Resources of Tropical Africa / Ressources végétales de l'Afrique tropicale), Wageningen, Netherlands. http://www.prota4u.org/search.asp. [Accessed 18 May 2015]	[Unknown] "Moringa peregrina grows on rocky slopes of wadis and gullies, up to 850 m altitude in Acacia - Commiphora woodland, sometimes on nearly bare rock with a strongly reduced root system."

409	Is a shade tolerant plant at some stage of its life cycle	
	Source(s)	**Notes**
	Top Tropicals. 2015. Moringa peregrine. https://toptropicals.com/catalog/uid/Moringa_peregrina.htm. [Accessed 18 May 2015]	"full sun"
	Dadamouny, M. A. (2009). Population Ecology of Moringa peregrina Growing in Southern Sinai, Egypt. M.Sc. Thesis. Suez Canal University, Ismailia, Egypt	"If planted out during the dry season half-shade should be provided and watering should be carried out regularly until the tree is established."

410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y
	Source(s)	**Notes**
	Dadamouny, M. A. (2009). Population Ecology of Moringa peregrina Growing in Southern Sinai, Egypt. M.Sc. Thesis. Suez Canal University, Ismailia, Egypt	"Moringa is adapted to a wide range of soil types but it does best in well-drained loam to clavoloam. It does not withstand prolonged waterlogging. It is observed to prefer a neutral to slightly acidic soil reaction, but it has recently been introduced with temperature ranges from 26 to 40c and annual rainfall at least at least 500 mm."

Qsn #	Question	Answer
411	**Climbing or smothering growth habit**	**n**
	Source(s)	**Notes**
	Munyanziza, E. & Yongabi, K.A., 2007. Moringa peregrina (Forssk.) Fiori. [Internet] Record from PROTA4U. van der Vossen, H.A.M. & Mkamilo, G.S. (Editors). PROTA (Plant Resources of Tropical Africa / Ressources végétales de l'Afrique tropicale), Wageningen, Netherlands. http://www.prota4u.org/search.asp. [Accessed 16 May 2015]	"Shrub or small tree up to 10 m tall, with tuberous rootstock; bole up to 40 cm in diameter"

Qsn #	Question	Answer
412	**Forms dense thickets**	
	Source(s)	**Notes**
	Munyanziza, E. & Yongabi, K.A., 2007. Moringa peregrina (Forssk.) Fiori. [Internet] Record from PROTA4U. van der Vossen, H.A.M. & Mkamilo, G.S. (Editors). PROTA (Plant Resources of Tropical Africa / Ressources végétales de l'Afrique tropicale), Wageningen, Netherlands. http://www.prota4u.org/search.asp. [Accessed 18 May 2015]	[No information on density] "Moringa peregrina grows on rocky slopes of wadis and gullies, up to 850 m altitude in Acacia - Commiphora woodland, sometimes on nearly bare rock with a strongly reduced root system."

Qsn #	Question	Answer
501	**Aquatic**	**n**
	Source(s)	**Notes**
	Munyanziza, E. & Yongabi, K.A., 2007. Moringa peregrina (Forssk.) Fiori. [Internet] Record from PROTA4U. van der Vossen, H.A.M. & Mkamilo, G.S. (Editors). PROTA (Plant Resources of Tropical Africa / Ressources végétales de l'Afrique tropicale), Wageningen, Netherlands. http://www.prota4u.org/search.asp. [Accessed 16 May 2015]	[Terrestrial] "Moringa peregrina grows on rocky slopes of wadis and gullies, up to 850 m altitude in Acacia - Commiphora woodland, sometimes on nearly bare rock with a strongly reduced root system."

Qsn #	Question	Answer
502	**Grass**	**n**
	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 16 May 2015]	Family: Moringaceae

Qsn #	Question	Answer
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 16 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."

Qsn #	Question	Answer
504	**Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)**	**n**
	Source(s)	**Notes**
	Munyanziza, E. & Yongabi, K.A., 2007. Moringa peregrina (Forssk.) Fiori. [Internet] Record from PROTA4U. van der Vossen, H.A.M. & Mkamilo, G.S. (Editors). PROTA (Plant Resources of Tropical Africa / Ressources végétales de l'Afrique tropicale), Wageningen, Netherlands. http://www.prota4u.org/search.asp. [Accessed 16 May 2015]	"Shrub or small tree up to 10 m tall, with tuberous rootstock; bole up to 40 cm in diameter; bark grey, purple-grey or bright brown; crown ovoid; branches terete, slender, young stems grey white or waxy blue-green; twigs brittle. Leaves alternate, in bunches at the ends of branches, 1 –40 cm long, 2–pinnate, with 2–5 pairs of pinnae; leaflets opposite or alternate, obovate, oblanceolate or spatulate, 3–20(–35) mm × 2–10(–13) mm, base cuneate to rounded, apex rounded or notched, grey or waxy green. "

601	Evidence of substantial reproductive failure in native habitat	n
	Source(s)	**Notes**
	Munyanziza, E. & Yongabi, K.A., 2007. Moringa peregrina (Forssk.) Fiori. [Internet] Record from PROTA4U. van der Vossen, H.A.M. & Mkamilo, G.S. (Editors). PROTA (Plant Resources of Tropical Africa / Ressources végétales de l'Afrique tropicale), Wageningen, Netherlands. http://www.prota4u.org/search.asp. [Accessed 16 May 2015]	"Although there is concern about the decline of Moringa peregrina stands especially where it is collected for firewood, it is not listed in the IUCN Red List 2006. It is endangered in the Sinai in Egypt. Efforts to restore the local vegetation by restoring the stand of the dominant species, including Acacia tortilis (Forssk.) Hayne, have resulted in an increase in the numbers of trees of Moringa peregrina as well. Moringa peregrina is included in a field genebank of fodder plants in Oman."
	Padayachee, B., & Baijnath, H. (2012). An overview of the medicinal importance of Moringaceae. J. Med. Plants Res, 6(48): 5831-5839	"M. peregrina has the potential to become one of the world's most valuable plants due to its broad economical and medicinal importance; however, its existence is currently threatened in its environment due to human activities, hence the protection and conservation of its vulnerable habitat is very much needed."

602	Produces viable seed	y
	Source(s)	**Notes**
	Dadamouny, M. A. (2009). Population Ecology of Moringa peregrina Growing in Southern Sinai, Egypt. M.Sc. Thesis. Suez Canal University, Ismailia, Egypt	"M. peregrina is easy to propagate by seeds."
	Munyanziza, E. & Yongabi, K.A., 2007. Moringa peregrina (Forssk.) Fiori. [Internet] Record from PROTA4U. van der Vossen, H.A.M. & Mkamilo, G.S. (Editors). PROTA (Plant Resources of Tropical Africa / Ressources végétales de l'Afrique tropicale), Wageningen, Netherlands. http://www.prota4u.org/search.asp. [Accessed 16 May 2015]	"Planting trials of Moringa peregrina have been done in Sudan. Both seeds and cuttings can be used for multiplying it in a nursery."

603	Hybridizes naturally	
	Source(s)	**Notes**
	National Research Council. 2006. Lost Crops of Africa: Volume II: Vegetables. National Academies Press, Washington, D.C.	"It may also be possible to increase the oil yield of M .oleifera by producing a hybrid with M. peregrina, whose seeds yield approximately 50 percent oil."

Qsn #	Question	Answer
	Sutherland, J. 2015. Cultivation of M.oleifera. University of Leicester, Leicester, UK. http://www.le.ac.uk/engineering/staff/Sutherland/moringa/moringa.htm. [Accessed 18 May 2015]	[Hybrids may be produced in cultivation. Unknown if natural hybrids could be produced where species coexist in cultivation] "It may be possible to increase the oil yield of M.oleifera by producing a hybrid with the higher yielding (approximately 50% oil) Moringa peregrina (Forsk) Fiori. The selection of clones and the development of hybrids is considered essential to maximise the full potential of M.oleifera."

604	Self-compatible or apomictic	
	Source(s)	**Notes**
	Munyanziza, E. & Yongabi, K.A., 2007. Moringa peregrina (Forssk.) Fiori. [Internet] Record from PROTA4U. van der Vossen, H.A.M. & Mkamilo, G.S. (Editors). PROTA (Plant Resources of Tropical Africa / Ressources végétales de l'Afrique tropicale), Wageningen, Netherlands. http://www.prota4u.org/search.asp. [Accessed 16 May 2015]	"Flowers bisexual, slightly zygomorphic"
	East, E. M. 1940. The distribution of self-sterility in the flowering plants. Proceedings of the American Philosophical Society 82: 449-518	[Unknown for M. peregrina] "Moringa oleifera Lam. is self-fertile though slightly protandrous."

605	Requires specialist pollinators	n
	Source(s)	**Notes**
	Gomaa, N. H., & Picó, F. X. (2011). Seed germination, seedling traits, and seed bank of the tree Moringa peregrina (Moringaceae) in a hyper-arid environment. American Journal of Botany, 98(6): 1024-1030	"Flowers (10 – 15 mm long) are generally pinkish white or pale yellow, hermaphroditic, and exhibit insect-pollination syndromes, e.g., large, showy, slightly scented, and zygomorphic."
	Munyanziza, E. & Yongabi, K.A., 2007. Moringa peregrina (Forssk.) Fiori. [Internet] Record from PROTA4U. van der Vossen, H.A.M. & Mkamilo, G.S. (Editors). PROTA (Plant Resources of Tropical Africa / Ressources végétales de l'Afrique tropicale), Wageningen, Netherlands. http://www.prota4u.org/search.asp. [Accessed 16 May 2015]	"In southern Sudan and Yemen Moringa peregrina is a bee plant ... ' ... "Flowers bisexual, slightly zygomorphic, 5-merous, white with purple heart or pink-flushed, sometimes scented; pedicel 2–9 mm long, jointed; sepals free, oblong to lanceolate, 7–9 mm × 1. –3 mm, acuminate, hairy on both surfaces; petals free, narrowly oblong, obovate or spatulate, –15 mm × 2–5 mm, hairy inside; stamens 5, free, 4.5–7 mm long, alternating with 5 staminodes, –5 mm long; ovary superior, shortly stalked, cylindrical, hairy, 1-celled, style slender."
	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	[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**
	Dadamouny, M. A. (2009). Population Ecology of Moringa peregrina Growing in Southern Sinai, Egypt. M.Sc. Thesis. Suez Canal University, Ismailia, Egypt	"M. peregrina is easy to propagate by seeds."

Qsn #	Question	Answer
	Munyanziza, E. & Yongabi, K.A., 2007. Moringa peregrina (Forssk.) Fiori. [Internet] Record from PROTA4U. van der Vossen, H.A.M. & Mkamilo, G.S. (Editors). PROTA (Plant Resources of Tropical Africa / Ressources végétales de l'Afrique tropicale), Wageningen, Netherlands. http://www.prota4u.org/search.asp. [Accessed]	[Grown from cuttings & seeds, but no evidence of vegetative spread] "Planting trials of Moringa peregrina have been done in Sudan. Both seeds and cuttings can be used for multiplying it in a nursery."

607	Minimum generative time (years)	3
	Source(s)	**Notes**
	Padayachee, B., & Baijnath, H. (2012). An overview of the medicinal importance of Moringaceae. J. Med. Plants Res, 6(48): 5831-5839	"It is an extremely fast growing tree or shrub that commonly reaches about 3 to 10 m in height just 10 months after the seed is planted (Abd El-Wahab, 1995)."
	Munyanziza, E. & Yongabi, K.A., 2007. Moringa peregrina (Forssk.) Fiori. [Internet] Record from PROTA4U. van der Vossen, H.A.M. & Mkamilo, G.S. (Editors). PROTA (Plant Resources of Tropical Africa / Ressources végétales de l'Afrique tropicale), Wageningen, Netherlands. http://www.prota4u.org/search.asp. [Accessed 16 May 2015]	"Moringa peregrina grows fast from both seeds and cuttings; 3–4 m annual growth in height is not unusual when adequate moisture is available. First fruits are produced about 3 years after planting."

701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	n
	Source(s)	**Notes**
	Munyanziza, E. & Yongabi, K.A., 2007. Moringa peregrina (Forssk.) Fiori. [Internet] Record from PROTA4U. van der Vossen, H.A.M. & Mkamilo, G.S. (Editors). PROTA (Plant Resources of Tropical Africa / Ressources végétales de l'Afrique tropicale), Wageningen, Netherlands. http://www.prota4u.org/search.asp. [Accessed]	[No evidence. Fruit & seeds lack means of external attachment] "Fruit an elongate capsule (10–)3 –39 cm × (1–)1.5–1.7 cm, somewhat trigonous, slightly narrowed between the seeds, with a beak, glabrous, dehiscent with 3 valves. Seeds globose to ovoid or trigonous, 10–12 mm × 10–12 mm, brown."

702	Propagules dispersed intentionally by people	y
	Source(s)	**Notes**
	eBay. 2015. Moringa Peregrina 50 seeds for arid and semi-arid regions Ready to Grow. http://www.ebay.com/. [Accessed 18 May 2015]	Seeds available for purchase

703	Propagules likely to disperse as a produce contaminant	n
	Source(s)	**Notes**
	WRA Specialist. 2015. Personal Communication	No evidence. Unlikely. Rare in cultivation & not grown with produce

704	Propagules adapted to wind dispersal	y
	Source(s)	**Notes**

Qsn #	Question	Answer
	Munyanziza, E. & Yongabi, K.A., 2007. Moringa peregrina (Forssk.) Fiori. [Internet] Record from PROTA4U. van der Vossen, H.A.M. & Mkamilo, G.S. (Editors). PROTA (Plant Resources of Tropical Africa / Ressources végétales de l'Afrique tropicale), Wageningen, Netherlands. http://www.prota4u.org/search.asp. [Accessed 16 May 2015]	"Fruit an elongate capsule (10–)32–39 cm × (1–)1.5–1.7 cm, somewhat trigonous, slightly narrowed between the seeds, with a beak, glabrous, dehiscent with 3 valves. Seeds globose to ovoid or trigonous, 10–12 mm × 10–12 mm, brown."
	Dadamouny, M. A. (2009). Population Ecology of Moringa peregrina Growing in Southern Sinai, Egypt. M.Sc. Thesis. Suez Canal University, Ismailia, Egypt	"The wind is another factor affect the existence of plants as it plays an important role in seed dispersal or as it destroys or uproots the plant individuals. The mean values of wind speed in Saint Catherine ranges from 8.2 to 8.8 m/s. The winds reach the maximum speed in February. It was 14 m/s in the year of 2004 and 13.7 m/s in 2007 (Table 3)."

705	Propagules water dispersed	
	Source(s)	**Notes**
	Navie, S. & Csurhes, S. 2010. Weed Risk Assessment. Horseradish tree. Moringa oleifera. The State of Queensland, Department of Employment, Economic Development and Innovation	[M. oleifera possibly water dispersed. Unknown if M. peregrina 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**
	Munyanziza, E. & Yongabi, K.A., 2007. Moringa peregrina (Forssk.) Fiori. [Internet] Record from PROTA4U. van der Vossen, H.A.M. & Mkamilo, G.S. (Editors). PROTA (Plant Resources of Tropical Africa / Ressources végétales de l'Afrique tropicale), Wageningen, Netherlands. http://www.prota4u.org/search.asp. [Accessed 16 May 2015]	[Not fleshy-fruited] "Fruit an elongate capsule (10–)32–39 cm × (1–)1.5–1.7 cm, somewhat trigonous, slightly narrowed between the seeds, with a beak, glabrous, dehiscent with 3 valves. Seeds globose to ovoid or trigonous, 10–12 mm × 10–12 mm, brown."

707	Propagules dispersed by other animals (externally)	n
	Source(s)	**Notes**
	Munyanziza, E. & Yongabi, K.A., 2007. Moringa peregrina (Forssk.) Fiori. [Internet] Record from PROTA4U. van der Vossen, H.A.M. & Mkamilo, G.S. (Editors). PROTA (Plant Resources of Tropical Africa / Ressources végétales de l'Afrique tropicale), Wageningen, Netherlands. http://www.prota4u.org/search.asp. [Accessed]	[Unlikely. No means of external attachment] "Fruit an elongate capsule (10–)32–39 cm × (1–)1. –1.7 cm, somewhat trigonous, slightly narrowed between the seeds, with a beak, glabrous, dehiscent with 3 valves. Seeds globose to ovoid or trigonous, 10–12 mm × 10–12 mm, brown."

708	Propagules survive passage through the gut	n
	Source(s)	**Notes**

Qsn #	Question	Answer
	Hegazy, A. K., Hammouda, O., Lovett-Doust, J., & Gomaa, N. H (2008). Population dynamics of Moringa peregrina along altitudinal gradient in the northwestern sector of the Red Sea. Journal of Arid Environments, 72(9): 1537-1551	[Seeds depredated] "The weak persistent seed bank of M. peregrina may be attributed to the intensive seed losses caused by post-dispersal seed predation by wild and domestic animals, in particular goats, and the collection of seeds by local people for medicinal and commercial purposes."

801	Prolific seed production (>1000/m2)	n
	Source(s)	**Notes**
	Munyanziza, E. & Yongabi, K.A., 2007. Moringa peregrina (Forssk.) Fiori. [Internet] Record from PROTA4U. van der Vossen, H.A.M. & Mkamilo, G.S. (Editors). PROTA (Plant Resources of Tropical Africa / Ressources végétales de l'Afrique tropicale), Wageningen, Netherlands. http://www.prota4u.org/search.asp. [Accessed 16 May 2015]	"A single tree may produce up to 1000 pods per year."
	Gomaa, N. H., & Picó, F. X. (2011). Seed germination, seedling traits, and seed bank of the tree Moringa peregrina (Moringaceae) in a hyper-arid environment. American Journal of Botany, 98(6): 1024-1030	"However, recent demographic studies on M. peregrina in the study area indicate that populations have a weak seed bank (range of estimated seed density in the soil: 0.12 – 0.50 seeds/m 2 ; Hegazy et al., 2008) and are exhibiting an overall declining trend"
	Hegazy, A. K., Hammouda, O., Lovett-Doust, J., & Gomaa, N. H (2008). Population dynamics of Moringa peregrina along altitudinal gradient in the northwestern sector of the Red Sea. Journal of Arid Environments, 72(9): 1537-1551	[Low seed densities in this study] "As shown in Appendix 1, the total seed output per population ranges from 1071 (0.6/m2) in population 8 (1000ma.s.l.) to 7828 (5.6/m2) in population 2 (600ma.s.l.). The persistent germinable seed bank of M. peregrina is generally weak, varying between 0.12 seeds/m2 in population 8 (1000ma.s.l.) and 0.50 seeds/m2 in populations 2 and 4 (600 and 670ma.s.l., respectively). On average, seed bank represents about 11.1% of the total seed output."

802	Evidence that a persistent propagule bank is formed (>1 yr)	y
	Source(s)	**Notes**
	Gomaa, N. H., & Picó, F. X. (2011). Seed germination, seedling traits, and seed bank of the tree Moringa peregrina (Moringaceae) in a hyper-arid environment. American Journal of Botany, 98(6): 1024-1030	"In early August 2008, we conducted seed burial experiments to study performance of seeds buried in the soil in field conditions." ... "Each group of four bags corresponding to each individual was buried with even spacing of 1 m between them. We retrieved one bag per individual and depth combination after 6 and 12 mo after burial in each population of study. These two time periods were selected to monitor seed viability and germination within the first year after seed dispersal and we assume that M. peregrina seed viability and germination decreases over time, although M. peregrina seeds can be viable up to several years (N. H. Gomaa, personal observation)." ... "In any case, M. peregrina seeds maintain very high germination rates among populations, between depths and over time. Overall, these results indicate that M. peregrina seeds can remain quiescent in the soil until conditions are right for germination. Our data show that germination rates are high immediately after being dispersed and after one year buried in the soil. In addition, seeds possess the means to react very quickly after imbibition, so seed after-ripening in this species can be quite short."

Qsn #	Question	Answer
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**
	Munyanziza, E. & Yongabi, K.A., 2007. Moringa peregrina (Forssk.) Fiori. [Internet] Record from PROTA4U. van der Vossen, H.A.M. & Mkamilo, G.S. (Editors). PROTA (Plant Resources of Tropical Africa / Ressources végétales de l'Afrique tropicale), Wageningen, Netherlands. http://www.prota4u.org/search.asp. [Accessed 16 May 2015]	"Pollarding or pruning following harvesting is recommended to promote branching. This increases pod production and facilitates harvesting as the tree is kept at a manageable height."

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 arid tropical climates
• Other Moringa species have weedy traits & tendencies
• Tolerates many soil types
• Reproduces by seeds
• Rapid growth rate
• Reaches maturity in 3+ years
• Seeds dispersed by wind, gravity & intentionally by people
• Seeds may persist in the soil for >1 year
• Tolerates pollarding & pruning
• 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
• Source of seed oil
• Medicinal uses
• Not reported to spread vegetatively