

Family: *Arecaceae*

Taxon: *Borassus aethiopum*

Synonym: NA

Common Name: African fan palm
black-rum palm
borassus palm
deleb palm

Questionnaire :	current 20090513	Assessor:	Patti Clifford	Designation: L
Status:	Assessor Approved	Data Entry Person:	Patti Clifford	WRA Score -1
101	Is the species highly domesticated?		y=-3, n=0	n
102	Has the species become naturalized where grown?		y=1, n=-1	
103	Does the species have weedy races?		y=1, n=-1	
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		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)	y
401	Produces spines, thorns or burrs		y=1, n=0	y
402	Allelopathic		y=1, n=0	
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		y=1, n=0	
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	
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	n

411	Climbing or smothering growth habit	y=1, n=0	n
412	Forms dense thickets	y=1, n=0	
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	
604	Self-compatible or apomictic	y=1, n=-1	n
605	Requires specialist pollinators	y=-1, n=0	n
606	Reproduction by vegetative fragmentation	y=1, n=-1	
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	y=1, n=-1	
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	y
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	y=-1, n=1	
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)	y=-1, n=1	

Designation: L

WRA Score -1

Supporting Data:

101	2012. WRA Specialist. Personal Communication. [Is the species highly domesticated? No] No evidence.	
102	2012. WRA Specialist. Personal Communication. [Has the species become naturalized where grown? NA]	
103	2012. WRA Specialist. Personal Communication. [Does the species have weedy races? NA]	
201	2012. USDA ARS National Genetic Resources Program. Germplasm Resources Information Network - (GRIN). http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl	[Species suited to tropical or subtropical climate(s) - If island is primarily wet habitat, then substitute "wet tropical" for "tropical or subtropical" ? 2 - High] Native range: Ethiopia; Sudan; Kenya; Tanzania; Uganda; Zaire; Ghana; Mali; Nigeria; Senegal; Mozambique, South Africa.
202	2012. USDA ARS National Genetic Resources Program. Germplasm Resources Information Network - (GRIN). http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl	[Quality of climate match data? 2 - High] Native range: Ethiopia; Sudan; Kenya; Tanzania; Uganda; Zaire; Ghana; Mali; Nigeria; Senegal; Mozambique, South Africa.
203	2012. Dave's Garden. PlantFiles: <i>Borassus aethiopum</i> [accessed 22 October 2012]. http://davesgarden.com/guides/pf/go/57272/	[Broad climate suitability (environmental versatility)?] Hardiness: USDA Zone 10a: to -1.1 °C (30 °F) USDA Zone 10b: to 1.7 °C (35 °F) USDA Zone 11: above 4.5 °C (40 °F)
203	2012. World Agroforestry Centre. Agroforestry tree database - <i>Borassus aethiopum</i> [accessed 22 October 2012]. Prosea, http://www.worldagroforestry.org/sea/Products/AFDbases/af/asp/SpeciesInfo.asp?SpID=346	[Broad climate suitability (environmental versatility)? Yes] Biophysical limits: Altitude: 0-1200 m; mean rainfall: 500-1,000 mm.
204	2012. USDA ARS National Genetic Resources Program. Germplasm Resources Information Network - (GRIN). http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl	[Native or naturalized in regions with tropical or subtropical climates? Yes] Native range: Ethiopia; Sudan; Kenya; Tanzania; Uganda; Zaire; Ghana; Mali; Nigeria; Senegal; Mozambique, South Africa.
205	2012. WRA Specialist. Personal Communication.	[Does the species have a history of repeated introductions outside its natural range? No] No evidence of repeated introductions.
301	2012. Randall, R.P.. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	[Naturalized beyond native range? No] No evidence.
302	2012. Randall, R.P.. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	[Garden/amenity/disturbance weed? No] No evidence.
303	2012. Randall, R.P.. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	[Agricultural/forestry/horticultural weed? No] No evidence.
304	2012. Randall, R.P.. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	[Environmental weed? No] No evidence.
305	2012. Sekar, K.C.. Invasive alien plants of Indian Himalayan Region - diversity and implication. American Journal of Plant Sciences. 3: 177-184.	[Congeneric weed? Yes] <i>Borassus flabellifer</i> is considered an invasive weed in the Indian Himalayan region.
401	2012. Dave's Garden. PlantFiles: <i>Borassus aethiopum</i> [accessed 22 October 2012]. http://davesgarden.com/guides/pf/go/57272/	[Produces spines, thorns or burrs? Yes] Plant has spines.
401	2012. World Agroforestry Centre. Agroforestry tree database - <i>Borassus aethiopum</i> [accessed 22 October 2012]. Prosea, http://www.worldagroforestry.org/sea/Products/AFDbases/af/asp/SpeciesInfo.asp?SpID=346	[Produces spines, thorns or burrs? Yes] <i>Borassus aethiopum</i> is an unbranched palm growing up to 20 m tall, characterized by a crown up to 8 m wide; young palms are covered with dry leaf stalks, showing gradually fading leaf scars; trees over 25 years old have a swelling of the trunk at 12-15 m above the ground (at 2/3 of the height); bark is pale grey in older palms and is more or less smooth. Leaves very large, fan shaped, bluish-green, 15-30, up to 3.5 m long, including petiole which is marked with sharp, black thorns; leaflets symmetric at the base.
402	2012. WRA Specialist. Personal Communication.	[Allelopathic? Unknown]
403	2009. Orwa, C./Mutua, A./Kindt, R./Jamnadass, R./Simons, A.. Agroforestry Database: a tree reference and selection guide version 4.0. World Agroforestry Centre, (http://www.worldagroforestry.org/af/treedb/)	[Parasitic? No] Areaceae.

403	2010. Nickrent, D.. The parasitic plant connection. Department of Plant Biology, Southern Illinois University, Carbondale http://www.parasiticplants.siu.edu/index.html	[Parasitic? No] Not parasitic.
404	2007. Bayton. A revision of <i>Borassus</i> L. (Arecaceae). Kew Bulletin. 62: 561-586.	[Unpalatable to grazing animals ? No] <i>Borassus aethiopum</i> is browsed by grazing animals.
404	2012. World Agroforestry Centre. Agroforestry tree database - <i>Borassus aethiopum</i> [accessed 22 October 2012]. Prosea, http://www.worldagroforestry.org/sea/Products/AFDbases/af/asp/SpeciesInfo.asp?SpID=346	[Unpalatable to grazing animals ? No] Fodder: Fruits and young leaves are sometimes browsed for fodder.
405	2007. Bayton. A revision of <i>Borassus</i> L. (Arecaceae). Kew Bulletin. 62: 561-586.	[Toxic to animals? No] Browsed by grazing animals.
405	2012. World Agroforestry Centre. Agroforestry tree database - <i>Borassus aethiopum</i> [accessed 22 October 2012]. Prosea, http://www.worldagroforestry.org/sea/Products/AFDbases/af/asp/SpeciesInfo.asp?SpID=346	[Toxic to animals? No] Used as a fodder.
406	2012. WRA Specialist. Personal Communication.	[Host for recognized pests and pathogens? Unknown]
407	2007. Bayton. A revision of <i>Borassus</i> L. (Arecaceae). Kew Bulletin. 62: 561-586.	[Causes allergies or is otherwise toxic to humans? No] The fruits, undeveloped endosperm and cotyledonary stalks are consumed.
407	2012. World Agroforestry Centre. Agroforestry tree database - <i>Borassus aethiopum</i> [accessed 22 October 2012]. Prosea, http://www.worldagroforestry.org/sea/Products/AFDbases/af/asp/SpeciesInfo.asp?SpID=346	[Causes allergies or is otherwise toxic to humans? No] Fruits, shoots and sap are used as a food or medicinal. The wood, leaves and fiber are used for a variety of construction or other purposes.
408	2007. Bayton. A revision of <i>Borassus</i> L. (Arecaceae). Kew Bulletin. 62: 561-586.	[Creates a fire hazard in natural ecosystems?] Well-adapted to fires.
408	2012. WRA Specialist. Personal Communication.	[Creates a fire hazard in natural ecosystems? Unknown]
409	2012. Amazonia. <i>Borassus aethiopum</i> [accessed 22 October 2012]. http://www.amazonia-online.com/Palm_Species/Palm_Species/Entradas/2008/2/14_Borassus_aethiopum.html	[Is a shade tolerant plant at some stage of its life cycle? No] Full sun.
409	2012. Dave's Garden. PlantFiles: <i>Borassus aethiopum</i> [accessed 22 October 2012]. http://davesgarden.com/guides/pf/go/57272/	[Is a shade tolerant plant at some stage of its life cycle? No] Full sun.
410	2012. Dave's Garden. PlantFiles: <i>Borassus aethiopum</i> [accessed 22 October 2012]. http://davesgarden.com/guides/pf/go/57272/	[Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)? No] Soil pH requirements: 6.6 to 7.5 (neutral), 7.6 to 7.8 (mildly alkaline).
410	2012. World Agroforestry Centre. Agroforestry tree database - <i>Borassus aethiopum</i> [accessed 22 October 2012]. Prosea, http://www.worldagroforestry.org/sea/Products/AFDbases/af/asp/SpeciesInfo.asp?SpID=346	[Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)?] Usually found in sandy, well-drained soils, but prefers alluvial soils near watercourses.
411	2009. Orwa, C./Mutua, A./Kindt, R./Jamnadass, R./Simons, A.. Agroforestree Database: a tree reference and selection guide version 4.0. World Agroforestry Centre, (http://www.worldagroforestry.org/af/treedb/)	[Climbing or smothering growth habit? No] Palm.
412	2012. WRA Specialist. Personal Communication.	[Forms dense thickets? Unknown]
501	2012. World Agroforestry Centre. Agroforestry tree database - <i>Borassus aethiopum</i> [accessed 22 October 2012]. Prosea, http://www.worldagroforestry.org/sea/Products/AFDbases/af/asp/SpeciesInfo.asp?SpID=346	[Aquatic? No] <i>Borassus aethiopum</i> is an unbranched palm growing up to 20 m tall.
502	2012. World Agroforestry Centre. Agroforestry tree database - <i>Borassus aethiopum</i> [accessed 22 October 2012]. Prosea, http://www.worldagroforestry.org/sea/Products/AFDbases/af/asp/SpeciesInfo.asp?SpID=346	[Grass? No] <i>Borassus aethiopum</i> is an unbranched palm growing up to 20 m tall

503	2012. World Agroforestry Centre. Agroforestry tree database - <i>Borassus aethiopum</i> [accessed 22 October 2012]. Prosea, http://www.worldagroforestry.org/sea/Products/AFDbases/af/asp/SpeciesInfo.asp?SpID=346	[Nitrogen fixing woody plant? No] <i>Borassus aethiopum</i> is an unbranched palm growing up to 20 m tall. <i>Arecaceae</i> .
504	2012. World Agroforestry Centre. Agroforestry tree database - <i>Borassus aethiopum</i> [accessed 22 October 2012]. Prosea, http://www.worldagroforestry.org/sea/Products/AFDbases/af/asp/SpeciesInfo.asp?SpID=346	[Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)? No] <i>Borassus aethiopum</i> is an unbranched palm growing up to 20 m tall.
601	2012. World Agroforestry Centre. Agroforestry tree database - <i>Borassus aethiopum</i> [accessed 22 October 2012]. Prosea, http://www.worldagroforestry.org/sea/Products/AFDbases/af/asp/SpeciesInfo.asp?SpID=346	[Evidence of substantial reproductive failure in native habitat? No] Distributed in the Guineo-Congolian and Sudanian savannahs, <i>B. aethiopum</i> is abundant and characteristic in all types of savannah of the region, occurring at low altitudes along rivers and in coastal woodlands. It can tolerate high temperatures and will grow in areas with rainfall less than 500 mm/yr if the groundwater table is high. It is often in dense stands.
602	2012. Dave's Garden. PlantFiles: <i>Borassus aethiopum</i> [accessed 22 October 2012]. http://davesgarden.com/guides/pf/go/57272/	[Produces viable seed? Yes] Propagate by seed.
602	2012. World Agroforestry Centre. Agroforestry tree database - <i>Borassus aethiopum</i> [accessed 22 October 2012]. Prosea, http://www.worldagroforestry.org/sea/Products/AFDbases/af/asp/SpeciesInfo.asp?SpID=346	[Produces viable seed? Yes] The seed can be sown without removing the surrounding pulp. Germination takes 1 month. Pretreatment is not necessary. However, removal of the seed coat by excision breaks the long and unpredictable dormancy and results in a higher germination percentage.
603	2011. Romanov, M.S./Bobrov, A.V.F.C./Wijesundara, D.S.A./Romanova, E.S.. Pericarp development and fruit structure in borassoid palms (<i>Arecaceae</i> - <i>Coryphoideae</i> - <i>Borasseae</i>). <i>Annals of Botany</i> . 108: 1489-1502.	[Hybridizes naturally?] <i>Borassus flabellifer</i> x <i>Borassus aethiopum</i> is a hybrid at the Fairchild Tropical Botanical Garden USA. [no mention of whether it is a naturally occurring hybrid]
603	2012. WRA Specialist. Personal Communication.	[Hybridizes naturally? Unknown]
604	2000. Barot, S./Gignoux, J./Vuattoux, R./Legendre, S.. Demography of a savanna palm tree in Ivory Coast (Lamto): population persistence and lifehistory. <i>Journal of Tropical Ecology</i> . 16: 637-655.	[Self-compatible or apomictic? No] <i>Borassus aethiopum</i> is dioecious and no case of sex switching or clonal reproduction is known.
605	2012. World Agroforestry Centre. Agroforestry tree database - <i>Borassus aethiopum</i> [accessed 22 October 2012]. Prosea, http://www.worldagroforestry.org/sea/Products/AFDbases/af/asp/SpeciesInfo.asp?SpID=346	[Requires specialist pollinators? No] Pollination is by insects.
606	2012. WRA Specialist. Personal Communication.	[Reproduction by vegetative fragmentation? Unknown]
607	2000. Barot, S./Gignoux, J./Vuattoux, R./Legendre, S.. Demography of a savanna palm tree in Ivory Coast (Lamto): population persistence and lifehistory. <i>Journal of Tropical Ecology</i> . 16: 637-655.	[Minimum generative time (years)? > 3] "The most striking feature is that, according to the assessed age-based parameters, reproduction is highly delayed (first reproduction on average at 114 y), while the reproductive period before death is quite short (about 22 y on average), and much shorter than expected."
607	2012. World Agroforestry Centre. Agroforestry tree database - <i>Borassus aethiopum</i> [accessed 22 October 2012]. Prosea, http://www.worldagroforestry.org/sea/Products/AFDbases/af/asp/SpeciesInfo.asp?SpID=346	[Minimum generative time (years)? > 3] Growth of the palms depends very much on site conditions. Three phases of growth are recognized. The 1st phase takes 6-8 years and involves leaf development, in which about 20 leaves grow in a wide crown (about 3 x 3 m). There is very little upward growth then. The 2nd phase involves rapid growth of the trunk above the ground and takes place from the 8th to about the 20th year. The bark of the tree will still be rough and have many leafstalks. The 3rd phase involves flowering and shedding of leafstalks. The trunk becomes smooth and swellings appear on it. Little care is required if palms are established on a good site.
701	2012. WRA Specialist. Personal Communication.	[Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)? No] No evidence.
702	2009. Orwa, C./Mutua, A./Kindt, R./Jamnadass, R./Simons, A.. Agroforestry Database: a tree reference and selection guide version 4.0. World Agroforestry Centre, (http://www.worldagroforestry.org/af/treedb/)	[Propagules dispersed intentionally by people? Yes] <i>Borassus aethiopum</i> is planted as an ornamental.

703	2012. WRA Specialist. Personal Communication.	[Propagules likely to disperse as a produce contaminant? No] Fruit a large drupe.
704	2012. World Agroforestry Centre. Agroforestry tree database - <i>Borassus aethiopum</i> [accessed 22 October 2012]. Prosea, http://www.worldagroforestry.org/sea/Products/AFDbases/af/asp/SpeciesInfo.asp?SpID=346	[Propagules adapted to wind dispersal? No] Fruit a drupe.
705	2012. World Agroforestry Centre. Agroforestry tree database - <i>Borassus aethiopum</i> [accessed 22 October 2012]. Prosea, http://www.worldagroforestry.org/sea/Products/AFDbases/af/asp/SpeciesInfo.asp?SpID=346	[Propagules water dispersed?] Usually found in sandy, well-drained soils, but prefers alluvial soils near watercourses.
705	2012. WRA Specialist. Personal Communication.	[Propagules water dispersed ? Unknown]
706	2007. Zona, S.. Additions to "A Review of Animal-mediated seed dispersal of Palms". Virtual Herbarium, http://www.virtualherbarium.org/palms/psdispersal.html	[Propagules bird dispersed? No] Dispersed by mammals.
707	2000. Barot, S./Gignoux, J./Vuattoux, R./Legendre, S.. Demography of a savanna palm tree in Ivory Coast (Lamto): population persistence and lifehistory. <i>Journal of Tropical Ecology</i> . 16: 637-655.	[Propagules dispersed by other animals (externally)? No] Elephants and baboons are seed dispersers.
707	2007. Zona, S.. Additions to "A Review of Animal-mediated seed dispersal of Palms". Virtual Herbarium, http://www.virtualherbarium.org/palms/psdispersal.html	[Propagules dispersed by other animals (externally)? No] <i>Pan troglodytes verus</i> and <i>Papio papio</i> are dispersal agents for <i>Borassus</i> . [mammal dispersal]
707	2012. World Agroforestry Centre. Agroforestry tree database - <i>Borassus aethiopum</i> [accessed 22 October 2012]. Prosea, http://www.worldagroforestry.org/sea/Products/AFDbases/af/asp/SpeciesInfo.asp?SpID=346	[Propagules dispersed by other animals (externally)? No] The fruit a large drupe, diameter about 15 cm, ovoid, orange to brown when ripe. [no means of external attachment]
708	2000. Barot, S./Gignoux, J./Vuattoux, R./Legendre, S.. Demography of a savanna palm tree in Ivory Coast (Lamto): population persistence and lifehistory. <i>Journal of Tropical Ecology</i> . 16: 637-655.	[Propagules survive passage through the gut? Yes] Elephants and baboons are seed dispersers.
708	2012. World Agroforestry Centre. Agroforestry tree database - <i>Borassus aethiopum</i> [accessed 22 October 2012]. Prosea, http://www.worldagroforestry.org/sea/Products/AFDbases/af/asp/SpeciesInfo.asp?SpID=346	[Propagules survive passage through the gut?] Elephants are fond of the fruit and are reputed to help in dispersing the seed.
801	2000. Barot, S./Gignoux, J./Vuattoux, R./Legendre, S.. Demography of a savanna palm tree in Ivory Coast (Lamto): population persistence and lifehistory. <i>Journal of Tropical Ecology</i> . 16: 637-655.	[Prolific seed production (>1000/m ²)? No] Females bear 50-100, 1-1.5 kg fresh weight fleshy fruits, with 2-3 seeds per fruit.
802	2012. World Agroforestry Centre. Agroforestry tree database - <i>Borassus aethiopum</i> [accessed 22 October 2012]. Prosea, http://www.worldagroforestry.org/sea/Products/AFDbases/af/asp/SpeciesInfo.asp?SpID=346	[Evidence that a persistent propagule bank is formed (>1 yr)? No] Seeds have a very short period of viability and should be sown directly after they are removed from the pulp. It has been suggested that this species may not show recalcitrant seed storage behavior.
803	2012. WRA Specialist. Personal Communication.	[Well controlled by herbicides? Unknown]
804	2007. Bayton. A revision of <i>Borassus</i> L. (<i>Arecaceae</i>). <i>Kew Bulletin</i> . 62: 561-586.	[Tolerates, or benefits from, mutilation, cultivation, or fire? Yes] <i>Borassus aethiopum</i> is well adapted to fire and herbivory and prospers in areas with frequent burning and browsing.
805	2012. WRA Specialist. Personal Communication.	[Effective natural enemies present locally (e.g. introduced biocontrol agents)? Unknown]

Summary of Risk Traits

High Risk:

- Native to tropical region
- Another species in the genus is invasive
- Armed (spines)
- Broad climate tolerance
- Mammal dispersal
- Tolerates fire

Low Risk:

- Not weed in other regions (not highly cultivated though)
- Palatable to browsing animals (fodder)
- Non-toxic
- Shade intolerant
- Limited soil tolerances
- Not self-compatible
- Delayed reproduction (first reproduction at about 114 years of age)
- Limited dispersal mechanisms (fruit is large drupe)
- Not a prolific seed producer
- Does not have a seed bank (seeds have a short viability period)