Key Words: Evaluate, Tropical Palm, Unarmed, Irritant Fruit Juice, Fleshy-fruited, Ornamental

Family: ***Arecaceae***

Taxon: ***Arenga tremula***

Synonym: *Arenga mindorensis Becc.*
Caryota tremula Blanco (basionym)
Saguerus mindorensis (Becc.) O. F. Cook
Wallichia tremula (Blanco) Mart.

Common Name: Philippines dwarf sugar palm

Questionaire : current 20090513 **Assessor:** Chuck Chimera **Designation:** EVALUATE
Status: Assessor Approved **Data Entry Person:** Chuck Chimera **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**	**n**
204	**Native or naturalized in regions with tropical or subtropical climates**	**y=1, n=0**	**y**
205	**Does the species have a history of repeated introductions outside its natural range?**	**y=-2, ?=-1, n=0**	**y**
301	**Naturalized beyond native range**	**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)**	
401	**Produces spines, thorns or burrs**	**y=1, n=0**	**n**
402	**Allelopathic**	**y=1, n=0**	
403	**Parasitic**	**y=1, n=0**	**n**
404	**Unpalatable to grazing animals**	**y=1, n=-1**	
405	**Toxic to animals**	**y=1, n=0**	
406	**Host for recognized pests and pathogens**	**y=1, n=0**	
407	**Causes allergies or is otherwise toxic to humans**	**y=1, n=0**	**y**
408	**Creates a fire hazard in natural ecosystems**	**y=1, n=0**	**n**
409	**Is a shade tolerant plant at some stage of its life cycle**	**y=1, n=0**	**y**

410	**Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)**	**y=1, n=0**	**y**
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**	
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**	
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**	**y**
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**	
802	**Evidence that a persistent propagule bank is formed (>1 yr)**	**y=1, n=-1**	
803	**Well controlled by herbicides**	**y=-1, n=1**	
804	**Tolerates, or benefits from, mutilation, cultivation, or fire**	**y=1, n=-1**	
805	**Effective natural enemies present locally (e.g. introduced biocontrol agents)**	**y=-1, n=1**	

Designation: EVALUATE **WRA Score** **1**

Supporting Data:

101	2001. Ellison, D./Ellison, A.. Cultivated palms of the world. UNSW Press, Sydney.	[Is the species highly domesticated? No] No evidence
102	2012. WRA Specialist. Personal Communication.	NA
103	2012. WRA Specialist. Personal Communication.	NA
201	2000. Huang, T.-C.. Flora of Taiwan Second Edition. Volume 5. Angiosperms · Monocotyledons [Alismataceae - Triuridaceae]. Department of Botany, National Taiwan University, Taipei, Taiwan	[Species suited to tropical or subtropical climate(s) 2-High] "Southern Japan (Kyushu, the Ryukyus and Yakushima) and tropical Asia. Taiwan, low elevations, thought the island."
201	2001. Ellison, D./Ellison, A.. Cultivated palms of the world. UNSW Press, Sydney.	[Species suited to tropical or subtropical climate(s) 2-High] "Endemic to the Philippines, this elegant clustering palm grows in thick clumps of small to medium height." … "Requiring a tropical to subtropical climate, it has moderate to high light and water needs."
202	2001. Ellison, D./Ellison, A.. Cultivated palms of the world. UNSW Press, Sydney.	[Quality of climate match data 2-High]
203	2005. ASEAN Tropical Plant Database. Arenga tremula (Blanco) Merr.. http://211.114.21.20/tropicalplant/html/print.jsp?rno=205	[Broad climate suitability (environmental versatility)? No] "Endemic to the Philippines (Luzon, Mindoro); in secondary forests and thickets at low altitudes."
203	2012. Dave's Gardern. PlantFiles: Philippine Dwarf Sugar Palm - Arenga tremula. http://davesgarden.com/guides/pf/go/62910/	[Broad climate suitability (environmental versatility)? No] "Hardiness: USDA Zone 9b: to -3.8 °C (25 °F) 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)"
204	2000. Huang, T.-C.. Flora of Taiwan Second Edition. Volume 5. Angiosperms · Monocotyledons [Alismataceae - Triuridaceae]. Department of Botany, National Taiwan University, Taipei, Taiwan	[Native or naturalized in regions with tropical or subtropical climates? Yes] "Southern Japan (Kyushu, the Ryukyus and Yakushima) and tropical Asia. Taiwan, low elevations, thought the island."
204	2001. Ellison, D./Ellison, A.. Cultivated palms of the world. UNSW Press, Sydney.	[Native or naturalized in regions with tropical or subtropical climates? Yes] "Endemic to the Philippines, this elegant clustering palm grows in thick clumps of small to medium height." … "Requiring a tropical to subtropical climate, it has moderate to high light and water needs."
205	2000. Meerow, A.W.. Salvaging Hurricane-Damaged Palms in the Nursery. ENH 106. Institute of Food & Agricultural Sciences, University of Florida, Gainesville, FL http://university.uog.edu/cals/people/PUBS/NURSERY/EP06400.pdf	[Does the species have a history of repeated introductions outside its natural range? Introduced in Florida]
205	2003. Starr, F./Starr, K.. Plants of Hawaii - Arenga tremula. http://www.hear.org/starr/images/species/?q=arenga+tremula&o=plants	[Does the species have a history of repeated introductions outside its natural range? Cultivated in Hawaii] "Habit Hilo, Hawaii"
205	2007. Randall, R.P.. The introduced flora of Australia & its weed status. CRC for Australian Weed Management, Glen Osmond, Australia	[Does the species have a history of repeated introductions outside its natural range? Introduced into Australia]
205	2008. Environmental Horticulture Program. Cultivated Plants of Palm Beach County. Palm Beach Community College, Palm Beach, FL http://floridagrasses.org/Manual%20MergedPDF.pdf	[Does the species have a history of repeated introductions outside its natural range? Yes] "Sugar Palm is just one of multiple Arenga species cultivated in South Florida. Dwarf Sugar Palm (Arenga tremula) from the Philippines is smaller (12‘ tall) with long leaves rising to 20‘, regrowing from basal suckers after the main trunk dies postflowering."
301	2007. Randall, R.P.. The introduced flora of Australia & its weed status. CRC for Australian Weed Management, Glen Osmond, Australia	[Naturalized beyond native range? No evidence]
301	2012. Wagner, W.L./Herbst, D.R./Khan, N./Flynn, T.. Hawaiian Vascular Plant Updates: A Supplement to the Manual of the Flowering Plants of Hawai`i & Hawai`i's Ferns & Fern Allies. http://botany.si.edu/pacificislandbiodiversity/hawaianflora/supplement.htm	[Naturalized beyond native range? No evidence in Hawaiian Islands]

302	2007. Randall, R.P.. Global Compendium of Weeds - Index. http://www.hear.org/gcw/	[Garden/amenity/disturbance weed? No evidence]
302	2007. Randall, R.P.. The introduced flora of Australia & its weed status. CRC for Australian Weed Management, Glen Osmond, Australia	[Garden/amenity/disturbance weed? No evidence]
303	2007. Randall, R.P.. Global Compendium of Weeds - Index. http://www.hear.org/gcw/	[Agricultural/forestry/horticultural weed? No evidence]
303	2007. Randall, R.P.. The introduced flora of Australia & its weed status. CRC for Australian Weed Management, Glen Osmond, Australia	[Agricultural/forestry/horticultural weed n=0, y = 2*multiplier (see Appendix 2)? No evidence]
304	2007. Randall, R.P.. Global Compendium of Weeds - Index. http://www.hear.org/gcw/	[Environmental weed? No evidence]
304	2007. Randall, R.P.. The introduced flora of Australia & its weed status. CRC for Australian Weed Management, Glen Osmond, Australia	[Environmental weed? No evidence]
305	2000. Binggeli, P.. The East Usambaras (Tanzania) - The Pearl of Africa. Aliena. 10: 14-15.	[Congeneric weed? Possibly A. pinnata] "Casual observations at two other locations indicate that other species, hitherto not thought to be invading, are also spreading into natural forest including two tree species, Castilla elastica and Arenga pinnata, and a bamboo."
305	2008. Dawson, W./Mndolwa, A.S./Burslem, D.F.R.P./Hulme, P.E.. Assessing the risks of plant invasions arising from collections in tropical botanical gardens. Biodiversity and Conservation. 17: 1979–1995.	[Congeneric weed? Possibly A. pinnata] "Table 5 Spreading species with known planting history in ABG...Arenga pinnata...Naturalised or Invasive elsewhere: Yes"
401	2000. Huang, T.-C.. Flora of Taiwan Second Edition. Volume 5. Angiosperms · Monocotyledons [Alismataceae - Triuridaceae]. Department of Botany, National Taiwan University, Taipei, Taiwan	[Produces spines, thorns or burrs? No] "Large evergreen shrubs, monoecious (dioecious?); trunks to 36 clustered, often bent in age, 1-3.5 m tall, 10-15 cm in diam. Leaves odd pinnate, 2 2.5 m long, 1-1.35 m wide; leaflet induplicate linear to lanceolate, 35-70 cm long, 2-4.5 cm across, thick papery, 38-41 pairs, evenly spaced, glaucous, black dots on lower surface, margins irregularly serrulate, with 1 oblique auricle at base; terminal leaflet connate with 2 or 3 lateral leaflets, resembling a fish tail at apex; rachis green with fine black dots; petiole green with black dots, 1-1.8 m long, 2 cm across, cross sections round apically, concave at base; margin of sheath with black fibrous netting."
401	2011. The StuartXchange.. Philippine Medicinal Plants - Gumayaka. http://www.stuartxchange.org/Gumayaka.html	[Produces spines, thorns or burrs? No] "Unlike the kaong, Gumayaka is a small, trunkless palm with thick and adventitious roots. Stems are not long, but relatively slender and occurring in clumps. Leaves are up to 5 to 8 meters long, spreading, with petioles 1 to 2 meters long, green, channeled along the base where the edges are fringede with black, ascending bristlelike fibers. The leaflets are linear, varying from 50 to 80 cm long and 1.5 to 4 cm wide, sometimes partially united at the apex, opposite or in alternating pairs, subglaucous underneath, the constricted base with a small lobe, truncate apex finely toothed, the midrib ridged beneath."
402	2012. WRA Specialist. Personal Communication.	[Allelopathic? Unknown]
403	2012. USDA ARS National Genetic Resources Program. Germplasm Resources Information Network - (GRIN). http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl	[Parasitic? No] Arecaceae
404	2011. The StuartXchange.. Philippine Medicinal Plants - Gumayaka. http://www.stuartxchange.org/Gumayaka.html	[Unpalatable to grazing animals? Unknown] "The bud (ubod), eaten in considerable quantity, is intoxicating followed by long periods of profound sleep." [Refers to human consumption]
405	2009. Dichoso, W.C.. Useful Plant Species with Toxic Substances (A Compilation). Research Information Series on Ecosystems 21(3). Department of Environment and Natural Resources, Laguna	[Toxic to animals? Possibly] "Plant parts with toxic substance: Fruit Active principle: Raphides are contained in the pericarp. Toxic effects Fruit juice produces irritation , and blisters upon contact with skin."
406	2000. Elliott, M.L./Broschat, T.K.. Ganoderma Butt Rot of Palms. Fact Sheet PP-54. Institute of Food and Agricultural Sciences, University of Florida, Gainesville, FL	[Host for recognized pests and pathogens? Possibly] "Palms are found throughout Florida in both natural and landscaped settings. One of the lethal diseases of palms is Ganoderma butt rot. In general, a plant disease has three requirements – the susceptible host, the virulent pathogen and an environment that is conducive for disease development." … "Table 1. Palms documented to have been infected with Ganoderma zonatum" [Includes Arenga tremula]

407	2009. Dichoso, W.C.. Useful Plant Species with Toxic Substances (A Compilation). Research Information Series on Ecosystems 21(3). Department of Environment and Natural Resources, Laguna	[Causes allergies or is otherwise toxic to humans? Yes] "Fruit juice produces irritation , and blisters upon contact with skin."
407	2011. The StuartXchange.. Philippine Medicinal Plants - Gumayaka. http://www.stuartxchange.org/Gumayaka.html	[Causes allergies or is otherwise toxic to humans? Yes] "Fruit is poisonous and contains irritating raphides in the pericarp."
407	2012. Betrock's Palm World. Arenga tremula. http://www.palmworld.net/Guide2.asp?PALMID=64	[Causes allergies or is otherwise toxic to humans? Yes] "The fruits of all Arenga species contain high concentrations of irritating calcium oxalate crystals."
407	2012. Dave's Gardern. PlantFiles: Philippine Dwarf Sugar Palm - Arenga tremula. http://davesgarden.com/guides/pf/go/62910/	[Causes allergies or is otherwise toxic to humans? Yes] "Danger: Seed is poisonous if ingested"
408	2012. Gray, M.. Palms: Arenga tremula. PACSOA (Palm and Cycad Society of Australia), http://www.pacsoa.org.au/palms/Arenga/tremula.html	[Creates a fire hazard in natural ecosystems? No] "Habitat: Philippine rainforest" [No evidence from native range that A. tremula contributes to fire frequency or is adapted to fire prone regimens]
409	2007. Chou, F.-S./Liao, C.-K./Yang, Y.-P.. Classification and Ordination of Evergreen Broad-Leaved Forest in the Middle and Upper Watershed of the Nan-Tze-Shian Stream in Southwestern Taiwan. Taiwania. 52(2): 127-144.	[Is a shade tolerant plant at some stage of its life cycle? Presumably Yes. Found in ground layer of multi-tiered forest] "This association is confined to hillsides or broad ridge with ranging altitudes from 900 to 1300 m. This is mainly indicated by Castanopsis formosana (Table 1). The canopy is primarily formed by tall Castanopsis formosana, Machilus philippinense, with some Beilschmiedia erythrophloia and Machilus kusanoi. The subcanopy layer is dominated by Turpinia formosana, Glycosmis citrifolia and Viburnum odoratissimum. The ground layer is mainly composed of Elatostema lineolatum, Calamus quiquesetinervius, Arenga tremula, Bolbitis contaminans, Lepidagathis formosensis, Alocasia odora and Colysis wrightii."
409	2012. Gray, M.. Palms: Arenga tremula. PACSOA (Palm and Cycad Society of Australia), http://www.pacsoa.org.au/palms/Arenga/tremula.html	[Is a shade tolerant plant at some stage of its life cycle? Yes] " Likes full sun, or light shade."
409	2012. South-Florida-Plant-Guide.com. Arenga Palm - Arenga engleri/Arenga tremula. http://www.south-florida-plant-guide.com/arenga-palm.html	[Is a shade tolerant plant at some stage of its life cycle? Yes] "Though full sun is fine - where it will grow slightly faster - the arenga keeps its best deep green color in partial to full shade."
410	2012. Betrock's Palm World. Arenga tremula. http://www.palmworld.net/Guide2.asp?PALMID=64	[Tolerates a wide range of soil conditions? Yes] "SOIL REQUIREMENTS: Widely adaptable"
411	2012. Gray, M.. Palms: Arenga tremula. PACSOA (Palm and Cycad Society of Australia), http://www.pacsoa.org.au/palms/Arenga/tremula.html	[Climbing or smothering growth habit? No] "A trunkless, clumping feather palm, to about 3m high. "
412	1957. Fosberg, F.R.. Notes on the Vegetation of Iriomote-Zima Ryukyu Islands. Science bulletin of Agriculture & Home Economics Division, University of the Ryukyus. 4: 123-130.	[Forms dense thickets? A component of thicket vegetation] "If the hills are of limestone, they are covered by dense thickets in which Ficus, Arenga, Pipturus, Hibiscus, Erythrina, Macaranga, Melanolepis, Pandanus, Mallotus, Pouteria, Cycas, Musa, and Alocasia. are prominent."
412	2012. Nickrent, D.L./Barcelona, J./Pelser, P./Molina, J.E./Callado, J.R.. Co's Digital Flora of the Philippines. http://www.philippineplants.org/	[Forms dense thickets? Part of thicket vegetation] "Low altitude thickets and secondary forests, occurring in large clumps."
501	2012. Nickrent, D.L./Barcelona, J./Pelser, P./Molina, J.E./Callado, J.R.. Co's Digital Flora of the Philippines. http://www.philippineplants.org/	[Aquatic? No] "Low altitude thickets and secondary forests, occurring in large clumps." [Terrestrial]
502	2012. USDA ARS National Genetic Resources Program. Germplasm Resources Information Network - (GRIN). http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl	[Grass? No] Arecaceae
503	2012. USDA ARS National Genetic Resources Program. Germplasm Resources Information Network - (GRIN). http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl	[Nitrogen fixing woody plant? No] Arecaceae
504	2005. ASEAN Tropical Plant Database. Arenga tremula (Blanco) Merr.. http://211.114.21.20/tropicalplant/html/print.jsp?rno=205	[Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)? No] "Habit Clustering, large shrubby palm to 4 m high, stems few, to 6 cm in diameter near the base, tapering; covered with old, shredded leaf sheaths."

601	2006. Palm & Cycad Societies of Florida, Inc.. Arenga tremula. http://www.plantapalm.com/vpe/photos/Species/arenga_tremula.htm	[Evidence of substantial reproductive failure in native habitat? No] "Conservation status: Not threatened"
602	2000. Meerow, A.W.. Salvaging Hurricane-Damaged Palms in the Nursery. ENH 106. Institute of Food & Agricultural Sciences, University of Florida, Gainesville, FL http://university.uog.edu/cals/people/PUBS/NURSERY/EP06400.pdf	[Produces viable seed? Yes] "Palm Seed Germination Time, Part 1 (compiled by A.W. Meerow)" … "Arenga tremula" … "Germination Time - Unevenly over many months"
602	2009. Dichoso, W.C.. Useful Plant Species with Toxic Substances (A Compilation). Research Information Series on Ecosystems 21(3). Department of Environment and Natural Resources, Laguna	[Produces viable seed? Yes] "Propagation: Seeds"
602	2012. Dave's Gardern. PlantFiles: Philippine Dwarf Sugar Palm - Arenga tremula. http://davesgarden.com/guides/pf/go/62910/	[Produces viable seed? Yes] "Propagation Methods: From seed; germinate in vitro in gelatin, agar or other medium"
603	1986. Utami, N.. Natural hybrid between Arenga pinnata and A. obtusifolia in Bogor Botanical Garden (Indonesia). Berita Biologi (Indonesia). 3: 296-299.	[Hybridizes naturally? Unknown] "The morphology and leaf anatomy of three collections of Arenga sp. of uncertain identity, grown in the Bogor Botanical Gardens (Indonesia) are investigated and compared with those of Arenga pinnata and Arenga obtusifolia. Results showed that the characteristics of those collection oscillate between A. pinnata and A. obtusifolia. It is suggested consequently that the plants represent a natural hybrid of these two latter species." [Other members of the genus may be able to hybridize]
604	2000. Huang, T.-C.. Flora of Taiwan Second Edition. Volume 5. Angiosperms · Monocotyledons [Alismataceae - Triuridaceae]. Department of Botany, National Taiwan University, Taipei, Taiwan	[Self-compatible or apomictic? Unknown] "Large evergreen shrubs, monoecious (dioecious?);"
604	2007. Hayasaka, D./Fujiwara, K.. Habitat Differences and Spatial Distribution Patterns of Maritime Strand Forest and Adjacent Inland Forest on Subtropical Iriomote Island, Southern Japan. Ecotropica. 13: 121-134.	[Self-compatible or apomictic? Possibly No] "TABLE 1. Numbers of individuals in each growth stage for each species in the study plot (0.14 ha), plus selected species characteristics." … "Arenga tremula" … "Flower type - Dioecious"
605	1986. Henderson, A.. A Review of Pollination Studies in the Palmae. Botanical Review. 52: 221-259.	[Requires specialist pollinators? No] "Fisher and Moore (1977) described inflorescence morphology and development of Arenga tremula (Blanco) Becc., an hapaxanthic protandrous species with multiple inflorescences. They reported honey bees visiting the staminate flowers which smelt like coriander. They also noted that sequential maturation of flowers and inflorescences prolonged the flowering period. Start and Marshall (1976) reported that bats in west Malaysia collected pollen of Arenga spp."
605	2001. Howard, F.W./Moore, D./Giblin-Davis, R.M./Abad, R.G.. Insects on Palms. CABI, Wallingford, UK	[Requires specialist pollinators? Presumably No] "Apis mellifera visit scented male flowers of Arenga tremula."
606	2012. Dave's Gardern. PlantFiles: Philippine Dwarf Sugar Palm - Arenga tremula. http://davesgarden.com/guides/pf/go/62910/	[Reproduction by vegetative fragmentation? No evidence] "Propagation Methods: From seed; germinate in vitro in gelatin, agar or other medium"
607	2000. Duke, J.A.. Handbook of nuts. CRC Press, Boca Raton, FL	[Minimum generative time (years)? Unknown for A. tremula. Related A. pinnata reaches maturity in 6+ years] "Trees reach reproductive maturity (flowering stage) in 6 to 12 years and continue to flower for about 15 years before replanting."
607	2012. J.D. Andersen Nursery. Arenga tremula. http://www.jdandersen.com/Info-A-Z/Palms/A/Arenga-tremula.html	[Minimum generative time (years)? Unknown. Probably >3-4 years] "Growth Rate: Very Slow"
607	2012. South-Florida-Plant-Guide.com. Arenga Palm - Arenga engleri/Arenga tremula. http://www.south-florida-plant-guide.com/arenga-palm.html	[Minimum generative time (years)? Unknown. Probably >3-4 years] "Arengas make excellent container palms because of their slow growth rate."
701	2005. ASEAN Tropical Plant Database. Arenga tremula (Blanco) Merr.. http://211.114.21.20/tropicalplant/html/print.jsp?rno=205	[Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)? Possibly, but unlikely] "Fruit globose, to 1.5 cm in diameter, smooth, with thin epidermis and scanty pulp, usually 2 seeded, ripening yellow then bright red." [Small fruit & seeds lack means of external attachment]

702	2009. Dichoso, W.C.. Useful Plant Species with Toxic Substances (A Compilation). Research Information Series on Ecosystems 21(3). Department of Environment and Natural Resources, Laguna	[Propagules dispersed intentionally by people? Yes] "It is used for ornamental purposes, and for landscaping parks and school campuses."
702	2012. Betrock's Palm World. Arenga tremula. http://www.palmworld.net/Guide2.asp?PALMID=64	[Propagules dispersed intentionally by people? Yes] "POPULAR USES: Shrub, screen, specimen plant" … "Arenga tremula and the related A. engleri are hardier and much more useful as landscape plants than the economically important A. pinnata. Though the individual stems die after fruiting, new stems continue to arise from the base. Both are clustering and low-growing, and can be utilized as screening plants."
703	2012. WRA Specialist. Personal Communication.	[Propagules likely to disperse as a produce contaminant? No] No evidence that this palm has become a seed contaminant of other produce
704	2011. The StuartXchange.. Philippine Medicinal Plants - Gumayaka. http://www.stuartxchange.org/Gumayaka.html	[Propagules adapted to wind dispersal? No] "Fruit is globose, smooth, thin-skinned, scanty pulp, dark red when ripe, and usually two seeded."
705	1957. Fosberg, F.R.. Notes on the Vegetation of Iriomote-Zima Ryukyu Islands. Science bulletin of Agriculture & Home Economics Division, University of the Ryukyus. 4: 123-130.	[Propagules water dispersed? Possibly] "The banks of tidal streams are lined with trees including Castanopsis luchuensis, Heritiera littoralis (Sterculiaceae), Pandanus, Arenga tremula…" [Seeds possibly moved by water along streams]
706	2000. Huang, T.-C.. Flora of Taiwan Second Edition. Volume 5. Angiosperms · Monocotyledons [Alismataceae - Triuridaceae]. Department of Botany, National Taiwan University, Taipei, Taiwan	[Propagules bird dispersed? Presumably Yes] "Drupe globose, 1.6-1.8 cm long, 1.6- 1.8 cm across, yellow, deep red or red black at maturity; seeds 3, black brown, fleshy, 1.2 cm long, 9 mm wide, 6 mm thick; perianth segments 3, persistent, 4 mm long, 8 mm wide, orange."
706	2001. Ellison, D./Ellison, A.. Cultivated palms of the world. UNSW Press, Sydney.	[Propagules bird dispersed? Yes] "The mature fruit is red and seed germination is sometimes erratic, taking from 8 to 20 weeks." [Fleshy-fruited]
707	2005. ASEAN Tropical Plant Database. Arenga tremula (Blanco) Merr.. http://211.114.21.20/tropicalplant/html/print.jsp?rno=205	[Propagules dispersed by other animals (externally)? No] "Fruit globose, to 1.5 cm in diameter, smooth, with thin epidermis and scanty pulp, usually 2 seeded, ripening yellow then bright red." [Small fruit & seeds lack means of external attachment]
708	2001. Ellison, D./Ellison, A.. Cultivated palms of the world. UNSW Press, Sydney.	[Propagules survive passage through the gut? Presumably Yes] "The mature fruit is red and seed germination is sometimes erratic, taking from 8 to 20 weeks." [Fleshy-fruited]
801	2000. Huang, T.-C.. Flora of Taiwan Second Edition. Volume 5. Angiosperms · Monocotyledons [Alismataceae - Triuridaceae]. Department of Botany, National Taiwan University, Taipei, Taiwan	[Prolific seed production (>1000/m2)? Unknown] "Large evergreen shrubs, monoecious (dioecious?); trunks to 36 clustered, often bent in age, 1-3.5 m tall, 10-15 cm in diam." … "Inflorescence 60 cm long, 40 cm wide. Staminate flowers: sepals 3, orange, 2 mm long, 4 mm across, petals 3, oblong, orange outside, deep orange inside, 1.5 cm long, 0.4 cm wide, thick, valvate; stamens many, yellowish orange; anthers linear; pistillate flowers: sepals 3, petals 3, triangular, 1 cm long, 1 cm across, ovary 3 celled, valvate. Drupe globose, 1.6-1.8 cm long, 1.6- 1.8 cm across, yellow, deep red or red black at maturity; seeds 3, black brown, fleshy, 1.2 cm long, 9 mm wide, 6 mm thick; perianth segments 3, persistent, 4 mm long, 8 mm wide, orange."
802	2012. WRA Specialist. Personal Communication.	[Evidence that a persistent propagule bank is formed (>1 yr)? Unknown]
803	2012. WRA Specialist. Personal Communication.	[Well controlled by herbicides? Unknown] No information on herbicide efficacy or chemical control of this species
804	2012. Rogers, G.K.. Landscape Plants for South Florida - Sugar Palm, Arenga pinnata. Palm Beach State College, Palm Beach Gardens, Florida http://www.plantbook.org/plantdata/arecaceae/arenga_pinnata.html	[Tolerates, or benefits from, mutilation, cultivation, or fire? Possibly. Can regrow from basal suckers] "Sugar Palm is just one of multiple Arenga species cultivated in South Florida. Dwarf Sugar Palm (Arenga tremula) from the Philippines is smaller (12' tall) with long leaves rising to 20', regrowing from basal suckers after the main trunk dies post flowering."
805	2012. WRA Specialist. Personal Communication.	[Effective natural enemies present locally (e.g. introduced biocontrol agents)? Unknown]

Summary of Risk Traits

High Risk / Undesirable Traits

- Native to the Philippines and thrives in tropical climates
- Fruit juice produces irritation , and blisters upon contact with skin
- Shade tolerant (may be able to invade forest understory)
- Tolerates many soil conditions (and potentially able to exploit man different habitat types)
- Fleshy-fruited & presumably bird and/or mammal dispersed

Low Risk / Desirable Traits

- No records of naturalization or negative impacts have been documented
- Unarmed
- Landscaping and ornamental value