

Family: *Arecaceae*

Taxon: *Caryota urens*

Synonym: NA

Common Name: Fishtail palm
Jaggery palm
Toddy palm
Wine Palm

Questionnaire : current 20090513 Assessor: Chuck Chimera Designation: EVALUATE
Status: Assessor Approved Data Entry Person: Assessor WRA Score 5

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	y
302	Garden/amenity/disturbance weed	n=0, y = 1*multiplier (see Appendix 2)	y
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)	
305	Congeneric weed	n=0, y = 1*multiplier (see Appendix 2)	y
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	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	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	

411	Climbing or smothering growth habit	y=1, n=0	n
412	Forms dense thickets	y=1, n=0	n
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	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	n
705	Propagules water dispersed	y=1, n=-1	y
706	Propagules bird dispersed	y=1, n=-1	y
707	Propagules dispersed by other animals (externally)	y=1, n=-1	
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	
803	Well controlled by herbicides	y=-1, n=1	y
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 5

Supporting Data:

101	2009. Henderson, A.. Palms of Southern Asia. Princeton University Press, Princeton, NJ	[Is the species highly domesticated? No] No evidence
102	2012. WRA Specialist. Personal Communication.	NA
103	2012. WRA Specialist. Personal Communication.	NA
201	1993. Flora of North America Editorial Committee. Flora of North America: North of Mexico, Volume 22. Oxford University Press, Oxford, UK	[Species suited to tropical or subtropical climate(s) 2-High] "native, India."
201	2009. Henderson, A.. Palms of Southern Asia. Princeton University Press, Princeton, NJ	[Species suited to tropical or subtropical climate(s) 2-High] "Range and habitat. Southern India (Goa, Karnataka, Kerala, Maharashtra, Tamil Nadu) and Sri Lanka; widely cultivated."
202	1993. Flora of North America Editorial Committee. Flora of North America: North of Mexico, Volume 22. Oxford University Press, Oxford, UK	[Quality of climate match data 2-High] "native, India."
203	2003. Riffle, R.L./Craft, P.. An encyclopedia of cultivated palms. Timber Press, Portland, OR.	[Broad climate suitability (environmental versatility)? No] "The species is adapted only to zones 10a and 11 and is marginal in 10a."
203	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/)	[Broad climate suitability (environmental versatility)? Potentially] "Altitude: Up to 1200 m" [Elevation range may exceed 1000 m; potential environmental versatility]
204	2009. Henderson, A.. Palms of Southern Asia. Princeton University Press, Princeton, NJ	[Native or naturalized in regions with tropical or subtropical climates? Yes] "Range and habitat. Southern India (Goa, Karnataka, Kerala, Maharashtra, Tamil Nadu) and Sri Lanka; widely cultivated."
205	1993. Flora of North America Editorial Committee. Flora of North America: North of Mexico, Volume 22. Oxford University Press, Oxford, UK	[Does the species have a history of repeated introductions outside its natural range? Yes] "introduced; Fla."
205	2005. Staples, G.W./Herbst, D.R.. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI	[Does the species have a history of repeated introductions outside its natural range? Yes] "Wine palm was once extensively cultivated in Honolulu, but as the trees matured, flowered, and began to die they were not replaced as frequently."
205	2009. Henderson, A.. Palms of Southern Asia. Princeton University Press, Princeton, NJ	[Does the species have a history of repeated introductions outside its natural range? Yes] "Range and habitat. Southern India (Goa, Karnataka, Kerala, Maharashtra, Tamil Nadu) and Sri Lanka; widely cultivated."
301	1993. Flora of North America Editorial Committee. Flora of North America: North of Mexico, Volume 22. Oxford University Press, Oxford, UK	[Naturalized beyond native range? Yes] "Two species of Caryota are commonly cultivated in southern Florida: C. urens and C. mitis. Both species have naturalized in Dade County, Florida."
301	2003. Wunderlin, R.P./Hansen, B.F.. Guide to the Vascular Plants of Florida. University Press of Florida, Gainesville, FL	[Naturalized beyond native range? Yes] "Disturbed tropical hammocks. Rare; Miami-Dade Co. Native to India. Escaped from cultivation."
301	2008. Foxcroft, L.C./Richardson, D.M./Wilson, J.R.U.. Ornamental Plants as Invasive Aliens: Problems and Solutions in Kruger National Park, South Africa. Environmental Management. 41: 32-51.	[Naturalized beyond native range? Not in Kruger N.P., South Africa] "Table 2 Ornamental alien plant species recorded per camp in the Kruger National Park, indicating the number of camps in which each species has been recorded, as well as mode of introduction" [Caryota urens: Evidence of naturalization? = No]
302	2001. Langeland, K.A./Stocker, R.K.. Control of Non-native Plants in Natural Areas of Florida. Institute of Food & Agricultural Sciences, University of Florida, Gainesville, FL http://mrec.ifas.ufl.edu/dspmgmt/Ldsp%20Turf%20Mgmt/PDFfiles/WG20900.pdf	[Garden/amenity/disturbance weed? Yes] "Comments: Unlike any other palm genus, the leaves are twice compound; on multiple-trunked (clumping) species, when one trunk is cut the plant will resprout; fruits abundantly and is a common invasive plant in hammocks;" [Potential environmental weed, but evidence of significant impacts not documented]
302	2006. Kato, H./Hata, K./Yamamoto, H./Yoshioka, T.. Effectiveness of the weed risk assessment system for the Bonin Islands. Pp 65-72 In Koike, F. et al. (eds), Assessment and Control of Biological Invasion Risks. IUCN, Gland, Switzerland	[Garden/amenity/disturbance weed? Yes] "Appendix 2 Results of weed risk assessment and expert survey for 130 non-native plant species in the Bonin Islands." [Caryota urens scored 7; designated a major pest by experts]

302	2012. Dave's Gardern. PlantFiles: Toddy Palm, Fishtail Wine Palm, Jaggery Palm - <i>Caryota urens</i> . http://davesgarden.com/guides/pf/go/56543/	[Garden/amenity/disturbance weed? Yes. Potential nuisance] "This is an impressive palm, and one of the more commonly grown <i>Caryotas</i> (Fishtail Palms) around Southern California... but it has its problems. The main problem being they are monocarpic. Once they flower, they croak, and then there is a monstrous dead tree to remove from your backyard, or wherever it is. And it's not a simple tree to remove. <i>Caryotas</i> are famous for having some of the hardest wood in the plant kingdom. Chainsaws will barely cut into one alive, and they seem to get harder once they die. On top of that, <i>Caryotas</i> have wimpy root systems. I guess where they're from (the Asian tropics usually) there is little wind and no need for large root systems. Anyway, a good Santa Ana wind will easily knock one of these trees over, and they can weigh several tons. Not good for the surrounding plants, not to mention homes. Lastly, and not least, these huge palms produce thousands of seed during their going away party, and this seed is highly toxic as well as irritating to the touch (full of stinging oxylates), making a slippery, gooey and marble like surface of irritating seeds all around their base. Sure they look great. But careful when they die or in the wind!" [Comment from a gardener]
303	2007. Randall, R.P.. Global Compendium of Weeds - <i>Caryota urens</i> [Online Database]. http://www.hear.org/gcw/species/caryota_urens/	[Agricultural/forestry/horticultural weed? No] No evidence
304	2000. Staples, G.W./Herbst, D.R/Imada, C.T.. Survey of invasive or potentially invasive cultivated plants in Hawai'i. Bishop Museum Occasional Papers. 65: 1-35.	[Environmental weed? Potentially] "Table 2. Annotated checklist of invasive or potentially invasive cultivated plants in Hawai'i with dispersal syndrome" [Includes <i>C. urens</i>]
304	2001. Langeland, K.A./Stocker, R.K.. Control of Non-native Plants in Natural Areas of Florida. Institute of Food & Agricultural Sciences, University of Florida, Gainesville, FL http://mrec.ifas.ufl.edu/ldspmgmt/Ldsp%20Turf%20Mgmt/PDFfiles/WG20900.pdf	[Environmental weed? Potentially] "Comments: Unlike any other palm genus, the leaves are twice compound; on multiple-trunked (clumping) species, when one trunk is cut the plant will resprout; fruits abundantly and is a common invasive plant in hammocks;" [Potential environmental weed, but evidence of significant impacts not documented]
305	2001. Langeland, K.A./Stocker, R.K.. Control of Non-native Plants in Natural Areas of Florida. Institute of Food & Agricultural Sciences, University of Florida, Gainesville, FL http://mrec.ifas.ufl.edu/ldspmgmt/Ldsp%20Turf%20Mgmt/PDFfiles/WG20900.pdf	[Congeneric weed? Yes] " <i>Caryota mitis</i> " ... "on multiple-trunked (clumping) species, when one trunk is cut the plant will resprout; fruits abundantly and is a common invasive plant in hammocks;"
305	2002. Smith, N.. Not from here: Plant invasions of Top End Aboriginal Land. Tropical Savannas CRC, Darwin	[Congeneric weed? Yes] "Appendix 3 Summary of recommended weed control methods Recommended control methods for high and medium priority weeds" ... " <i>Caryota mitis</i> " ... "Grubbing and hand pulling of seedlings. Larger trees need to be felled." [Regarded as a medium priority weed]
401	2009. Henderson, A.. Palms of Southern Asia. Princeton University Press, Princeton, NJ	[Produces spines, thorns or burrs? No] "Stems solitary, to 20 m tall and 65 cm diameter, columnar. Leaves borne along the upper third of the stems; primary leaflets to 20 per side of rachis, secondary leaflets with jagged margins and elongate apices." [No evidence]
401	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/)	[Produces spines, thorns or burrs? No] " <i>Caryota urens</i> is an unarmed, hapaxanthic, solitary or clustered, medium-sized palm up to 20 m tall; bole straight, unbranched, obscured at first by persistent fibrous leaf bases and sheaths, conspicuously ringed with narrow leaf scars, internodes elongated."
402	2012. WRA Specialist. Personal Communication.	[Allelopathic? Unknown] No evidence
403	2009. Henderson, A.. Palms of Southern Asia. Princeton University Press, Princeton, NJ	[Parasitic? No] "Stems solitary, to 20 m tall and 65 cm diameter, columnar. Leaves borne along the upper third of the stems; primary leaflets to 20 per side of rachis, secondary leaflets with jagged margins and elongate apices." [Arecaceae]
404	2009. Henderson, A.. Palms of Southern Asia. Princeton University Press, Princeton, NJ	[Unpalatable to grazing animals? No] "...the leaves are used for thatching and elephant fodder..."
404	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/)	[Unpalatable to grazing animals? No] "Fodder: In Sri Lanka, leaves of <i>C. urens</i> are traditionally used as a 'delicacy fodder' for domesticated elephants; in areas where the trees are not tapped, they are cut down to feed elephants. The leaves are used for fodder; they contain 2% crude protein and 9.3% crude fibre."
405	2009. Henderson, A.. Palms of Southern Asia. Princeton University Press, Princeton, NJ	[Toxic to animals? No] "...the leaves are used for thatching and elephant fodder..."

406	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/)	[Host for recognized pests and pathogens? Potentially] "Pest and Diseases: In Sri Lanka, only 2 major fruit predators are known. One is a fruit-boring coleopteran belonging to the family Scolytidae; 50-60% of prematurely falling fruit is infected with this beetle. The 2nd is the polecat, which eats ripe fruits. It feeds on the pericarp and the undigested seeds are released with faecal matter. Leaf sheath caterpillar, red weevil and stem borers cause minor damages to kitul palm. Young palms has been reported to have died due to red weevil damage followed by a secondary infestation of fungal into pith and root system. Crown rot under high humid forest conditions as a result of Phytophthora fungal infestation has been observed."
407	2001. Langeland, K.A./Stocker, R.K.. Control of Non-native Plants in Natural Areas of Florida. Institute of Food & Agricultural Sciences, University of Florida, Gainesville, FL http://mrec.ifas.ufl.edu/ldspmgmt/Ldsp%20Turf%20Mgmt/PDFfiles/WG20900.pdf	[Causes allergies or is otherwise toxic to humans? Yes] "fruit and sap are a skin, mouth, and eye irritant."
407	2005. Staples, G.W./Herbst, D.R.. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI	[Causes allergies or is otherwise toxic to humans? Yes] "The fruit pulp and juice are extremely irritant because of abundant stinging crystals of calcium-oxalate."
407	2006. Giesen, W./Wulffraat, S./Zieren, M./Scholten, L.. Mangrove Guidebook for Southeast Asia. Food and Agriculture Organization of the United Nations, Bangkok, Thailand	[Causes allergies or is otherwise toxic to humans? Yes] "Avoid contact with the red fruit produced by this palm: it contains oxalic acid which is toxic when ingested, and contact with skin may result in severe chemical burns."
407	2012. Dave's Gardern. PlantFiles: Toddy Palm, Fishtail Wine Palm, Jaggery Palm - Caryota urens. http://davesgarden.com/guides/pf/go/56543/	[Causes allergies or is otherwise toxic to humans? Yes] "Seed Collecting: Wear gloves to protect hands when handling seeds" [Because of
407	2012. Floridata. Caryota urens. http://www.floridata.com/ref/c/cary_ure.cfm	[Causes allergies or is otherwise toxic to humans? Yes] "Avoid contact with the red fruit produced by this palm. It contains oxalic acid which is toxic when ingested, and contact with skin may result in severe chemical burns."
408	1992. De Zoysa, N., Tapping Patterns of the Kitul Palm (Caryota urens) in the Sinharaja Area, Sri Lanka. Principes. 36(1): 28-33.	[Creates a fire hazard in natural ecosystems? No] "The kitul palm grows wild in the low country wet-zone of Sri Lanka and is a component of the rain forest understorey. It is found more often in cool shady valleys." [No evidence, and unlikely given wet forest habitat]
409	1992. De Zoysa, N., Tapping Patterns of the Kitul Palm (Caryota urens) in the Sinharaja Area, Sri Lanka. Principes. 36(1): 28-33.	[Is a shade tolerant plant at some stage of its life cycle? Yes] "The kitul palm grows wild in the low country wet-zone of Sri Lanka and is a component of the rain forest understorey. It is found more often in cool shady valleys. Because of its utility value, it is commonly found growing in home gardens, but rarely is it cultivated."
409	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/)	[Is a shade tolerant plant at some stage of its life cycle? Yes] "Ecologically it is found in monsoon climates and peri-humid regions. It prefers moist, shady, cool places. C. urens is a slow-growing, shade-tolerant or shade demanding species."
409	2012. Dave's Gardern. PlantFiles: Toddy Palm, Fishtail Wine Palm, Jaggery Palm - Caryota urens. http://davesgarden.com/guides/pf/go/56543/	[Is a shade tolerant plant at some stage of its life cycle? Yes] "Sun Exposure: Full Sun; Sun to Partial Shade; Light Shade; Partial to Full Shade"
410	2012. Dave's Gardern. PlantFiles: Toddy Palm, Fishtail Wine Palm, Jaggery Palm - Caryota urens. http://davesgarden.com/guides/pf/go/56543/	[Tolerates a wide range of soil conditions ? Possibly No] "Soil pH requirements: 5.6 to 6.0 (acidic); 6.1 to 6.5 (mildly acidic); 6.6 to 7.5 (neutral)"
410	2012. Floridata. Caryota urens. http://www.floridata.com/ref/c/cary_ure.cfm	[Tolerates a wide range of soil conditions ? Possibly No] "Moisture: This palm prefers a rich, moist, but well drained soil."
411	2009. Henderson, A.. Palms of Southern Asia. Princeton University Press, Princeton, NJ	[Climbing or smothering growth habit? No] "Stems solitary, to 20 m tall and 65 cm diameter, columnar."
412	2006. Giesen, W./Wulffraat, S./Zieren, M./Scholten, L.. Mangrove Guidebook for Southeast Asia. Food and Agriculture Organization of the United Nations, Bangkok, Thailand	[Forms dense thickets? No] "Occurs as infrequent to frequent scattered individuals or small to large groups, apparently never forming stands."

412	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/)	[Forms dense thickets? No] "The species naturally inhabits the understorey tree stratum in moist lowland and submontane forests of tropical Asia. In lowland rainforests in Sri Lanka, its distribution was found to be less than 2 trees/ha, indicating its rarity in the wild."
501	2009. Henderson, A.. Palms of Southern Asia. Princeton University Press, Princeton, NJ	[Aquatic? No] "Stems solitary, to 20 m tall and 65 cm diameter, columnar." [Terrestrial]
502	2009. Henderson, A.. Palms of Southern Asia. Princeton University Press, Princeton, NJ	[Grass? No] Arecaceae
503	2009. Henderson, A.. Palms of Southern Asia. Princeton University Press, Princeton, NJ	[Nitrogen fixing woody plant? No] Arecaceae
504	2009. Henderson, A.. Palms of Southern Asia. Princeton University Press, Princeton, NJ	[Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)? No] "Stems solitary, to 20 m tall and 65 cm diameter, columnar. Leaves borne along the upper third of the stems; primary leaflets to 20 per side of rachis, secondary leaflets with jagged margins and elongate apices."
601	2009. Henderson, A.. Palms of Southern Asia. Princeton University Press, Princeton, NJ	[Evidence of substantial reproductive failure in native habitat? No] No evidence
602	1997. Murali, K.S.. Patterns of Seed Size, Germination and Seed Viability of Tropical Tree Species in Southern India. Biotropica. 29(3): 271-279.	[Produces viable seed? Yes] "Appendix I. The list of species describing the time of flowering, fruiting date, seed weight (g), seed viability and days to germination." [Caryota urens: Viability = 360 days; Days to germination = 13]
602	2012. Floridata. Caryota urens. http://www.floridata.com/ref/c/cary_ure.cfm	[Produces viable seed? Yes] "Propagation: Some seeds will germinate in about four months; others may take as long as a year. Keep them warm to hasten germination."
603	2008. Central Florida Palm & Cycad Society. Board index » General Palm & Cycad Forums » General Discussions - Caryota urens x mitis hybrid- flowering and fruiting. http://50.57.99.44/forum3/viewtopic.php?t=2635	[Hybridizes naturally? Unknown] "Caryota urens x mitis hybrid- flowering and fruiting" ... "I grew this specimen from seeds I collected at Cypress Gardens around 1981 or '82." [Purported hybrid of C. urens and C. mitis grown from seeds collected by a forum member from Florida. No other evidence of hybridization found]
604	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/)	[Self-compatible or apomictic? No] "C. urens is an obligate outbreeder."
605	2006. Giesen, W./Wulffraat, S./Zieren, M./Scholten, L.. Mangrove Guidebook for Southeast Asia. Food and Agriculture Organization of the United Nations, Bangkok, Thailand	[Requires specialist pollinators? No] "Pollination is by insects,..."
606	1997. Nellis, D.W.. Poisonous plants and animals of Florida and the Caribbean. Pineapple Press Inc., Sarasota, FL	[Reproduction by vegetative fragmentation? No] "The similar wine palm, Caryota urens, grows to 80 ft and does not produce suckers."
607	1992. De Zoysa, N.. Tapping Patterns of the Kitul Palm (Caryota urens) in the Sinharaja Area, Sri Lanka. Principes. 36(1): 28-33.	[Minimum generative time (years)? 15+] "Flowering. It is believed that a kitul palm growing in a relatively open area will bloom within a period of 10 to 15 years. However, when growing within the forest, it takes much longer, perhaps up to 15 to 20 years, to bloom, depending on the opportunity the palm has of reaching out to the sun."
607	2006. Giesen, W./Wulffraat, S./Zieren, M./Scholten, L.. Mangrove Guidebook for Southeast Asia. Food and Agriculture Organization of the United Nations, Bangkok, Thailand	[Minimum generative time (years)? 20+] "Caryota urens dies soon after flowering / fruiting, which is usually after 20-25 years of growth."
607	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/)	[Minimum generative time (years)? 15+] "C. urens flowers after about 15 years in a very conspicuous display from the crown to the base over a period of several years before it finally dies."
701	2009. Henderson, A.. Palms of Southern Asia. Princeton University Press, Princeton, NJ	[Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)? No] "fruits globose, to 2 cm diameter, purple." [No evidence, and unlikely given relatively large fruit]
702	2005. Staples, G.W./Herbst, D.R.. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI	[Propagules dispersed intentionally by people? Yes] "Wine palm was once extensively cultivated in Honolulu, but as the trees matured, flowered, and began to die they were not replaced as frequently."

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] "Apiculture: This palm is cultivated for its nectar for honey production." ... "Ornamental: As the only palm having bipinnate leaves with fishtail-like leaflets, both young and semi-adult plants are increasingly used as indoor as well as outdoor plants in households, large hotels and airport terminal buildings. The leaves are also used to enhance floral decorations. Unlike ornamental palms such as royal palm (<i>Roystonea</i>) and cabbage palm (<i>Oreodoxa oleracea</i>), however, <i>C. urens</i> is not a good candidate for avenue planting because of its relatively short stature and short life span."
703	2005. Staples, G.W./Herbst, D.R.. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI	[Propagules likely to disperse as a produce contaminant? No] "Frt ca 0.7" Ø, red. Seeds 1-2." [Unlikely. Fruit & seeds relatively large]
704	2003. Riffle, R.L./Craft, P.. An encyclopedia of cultivated palms. Timber Press, Portland, OR.	[Propagules adapted to wind dispersal? No] "The fruits are 0.5 inch wide, round, and red."
705	2006. Giesen, W./Wulffraat, S./Zieren, M./Scholten, L.. Mangrove Guidebook for Southeast Asia. Food and Agriculture Organization of the United Nations, Bangkok, Thailand	[Propagules water dispersed? Yes] "Fruits are round when ripe, reddish pink, 2-3.5 cm diameter with 1-3 smooth black seeds." ... "Pollination is by insects, seed dispersal by flood, birds or mammals."
706	2003. Riffle, R.L./Craft, P.. An encyclopedia of cultivated palms. Timber Press, Portland, OR.	[Propagules bird dispersed? Yes] "The fruits are 0.5 inch wide, round, and red." [Potentially. Fleshy-fruited]
706	2006. Giesen, W./Wulffraat, S./Zieren, M./Scholten, L.. Mangrove Guidebook for Southeast Asia. Food and Agriculture Organization of the United Nations, Bangkok, Thailand	[Propagules bird dispersed? Yes] "Fruits are round when ripe, reddish pink, 2 3.5 cm diameter with 1-3 smooth black seeds." ... "Pollination is by insects, seed dispersal by flood, birds or mammals."
707	2006. Giesen, W./Wulffraat, S./Zieren, M./Scholten, L.. Mangrove Guidebook for Southeast Asia. Food and Agriculture Organization of the United Nations, Bangkok, Thailand	[Propagules dispersed by other animals (externally)? Possibly] "Fruits are round when ripe, reddish pink, 2 3.5 cm diameter with 1-3 smooth black seeds." ... "Pollination is by insects, seed dispersal by flood, birds or mammals." [Potentially transported externally by animals intending to consume pulp, but adaptations are likely for internal dispersal]
708	1992. De Zoysa, N., Tapping Patterns of the Kitul Palm (<i>Caryota urens</i>) in the Sinharaja Area, Sri Lanka. <i>Principes</i> . 36(1): 28-33.	[Propagules survive passage through the gut? Yes] "It is also known that fruit bats, pole cats, and palm civets (<i>Viverridae</i>) aid in the dispersal and germination of the kitul seed. Whether any specialized relationships exist between the palm and its dispersal agents is not known."
708	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 survive passage through the gut? Yes] "In Sri Lanka, at maturity, fruits are eaten by the polecat (<i>Paradoxurus hermaphroditus hermaphroditus</i>), which disperses unharmed seeds far from the mother tree. Palm civets and polecats effectively disperse fruits." ... "In Sri Lanka, only 2 major fruit predators are known. One is a fruit-boring coleopteran belonging to the family Scolytidae; 50-60% of prematurely falling fruit is infected with this beetle. The 2nd is the polecat, which eats ripe fruits. It feeds on the pericarp and the undigested seeds are released with faecal matter."
801	2003. Riffle, R.L./Craft, P.. An encyclopedia of cultivated palms. Timber Press, Portland, OR.	[Prolific seed production (>1000/m ²)? Unlikely] "The fruits are 0.5 inch wide, round, and red." [Relatively large fruit]
801	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/)	[Prolific seed production (>1000/m ²)? Unlikely] "The smooth epicarp of the drupaceous and globose fruit turns dark scarlet red at maturity. Mesocarp is fleshy, filled with abundant, irritant, needlelike crystals. The endocarp is not differentiated. Each fruit has 2 large hemispherical seeds with ruminant endosperm." [Relatively large fruit]
802	1996. Johnson, D.V.. Palms: Their Conservation and Sustained Utilization. IUCN, Gland, Switzerland	[Evidence that a persistent propagule bank is formed (>1 yr)? Possibly] "Many more species are suffering from over-exploitation in significant parts of their range." ... "... <i>Caryota urens</i> in India." [[Natural reproduction and population demographics may be altered due to over-exploitation]
803	2001. Langeland, K.A./Stocker, R.K.. Control of Non-native Plants in Natural Areas of Florida. Institute of Food & Agricultural Sciences, University of Florida, Gainesville, FL http://mrec.ifas.ufl.edu/ldspmg/Ldsp%20Turf%20Mgmt/PDFfiles/WG20900.pdf	[Well controlled by herbicides? Yes] "Treatment: Cut palm below growing point and treat with 50% Garlon 3A or 10% Garlon 4. Alternatively, Garlon 4 can be applied to the apical bud."
804	2012. WRA Specialist. Personal Communication.	[Tolerates, or benefits from, mutilation, cultivation, or fire? Unknown]
805	2012. WRA Specialist. Personal Communication.	[Effective natural enemies present locally? Unknown]

