

**Family:** *Sapindaceae*

**Taxon:** *Nephelium lappaceum*

**Synonym:** *Dimocarpus crinita* Lour.  
*Euphoria glabra* Blume  
*Euphoria nephelium* Poir.  
*Nephelium glabrum* (Blume) Cambess.  
*Nephelium mutabile* var. *pallens* Hiern  
*Nephelium xanthioides* Radlk.

**Common Name:** Rambutan  
Litchi chevelu

Questionnaire :	current 20090513	Assessor:	Patti Clifford	Designation: L
Status:	Assessor Approved	Data Entry Person:	Patti Clifford	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	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)	n	
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	n	
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	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	y
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	
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	
805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	y=-1, n=1	

Designation: L

WRA Score -5

## Supporting Data:

101	2012. WRA Specialist. Personal Communication.	[Is the species highly domesticated? No] No evidence of domestication that reduces invasive traits.
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. <i>Nephelium lappaceum</i> L. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland <a href="http://www.ars-grin.gov/cgi-bin/npgs/html/taxon.p">http://www.ars-grin.gov/cgi-bin/npgs/html/taxon.p</a>	[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 distribution: Temperate: China - Hainan, Yunnan; Tropical: Cambodia; Laos; Thailand; Vietnam; Indonesia - Celebes, Java, Kalimantan, Sumatra; Malaysia; Philippines.
202	2012. USDA, ARS, National Genetic Resources Program. <i>Nephelium lappaceum</i> L. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland <a href="http://www.ars-grin.gov/cgi-bin/npgs/html/taxon.p">http://www.ars-grin.gov/cgi-bin/npgs/html/taxon.p</a>	[Quality of climate match data? 2-High] Native distribution: Temperate: China - Hainan, Yunnan; Tropical: Cambodia; Laos; Thailand; Vietnam; Indonesia - Celebes, Java, Kalimantan, Sumatra; Malaysia; Philippines.
203	1987. Morton, J.. Fruits of warm climates. J.F. Morton, Miami, FL <a href="http://www.hort.purdue.edu/newcrop/morton">http://www.hort.purdue.edu/newcrop/morton</a>	[Broad climate suitability (environmental versatility)? No] "The rambutan flourishes from sea-level to 1,600 or even 1,800 ft (500-600 m), in tropical, humid regions having well-distributed rainfall. In the ideal environment of Oriental Mindora Philippines, the average temperature year-round is about 81° F (27.3° C), relative humidity is 82%, rainfall 71 in (180 cm)-about 165 rainy days. The dry season should not last much over 3 months."
203	1995. Zee, F.T.. Rambutan - New Crop FactSHEET. USDA-ARS, National Clonal Germplasm Repository, Hilo, Hawaii <a href="http://www.hort.purdue.edu/newcrop/cropfactsheets/Rambutan.html">http://www.hort.purdue.edu/newcrop/cropfactsheets/Rambutan.html</a>	[Broad climate suitability (environmental versatility)? No] "Rambutan is a tropical fruit tree best grown in the temperature range between 22C to 35C, with 2000 to 3000 mm of well distributed rainfall. It is intolerant to frost, especially during the juvenile stage. Mature trees may survive a brief period of temperatures as low as 4C but with severe defoliation."
204	2012. USDA, ARS, National Genetic Resources Program. <i>Nephelium lappaceum</i> L. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland <a href="http://www.ars-grin.gov/cgi-bin/npgs/html/taxon.p">http://www.ars-grin.gov/cgi-bin/npgs/html/taxon.p</a>	[Native or naturalized in regions with tropical or subtropical climates? Yes] Native distribution: Temperate: China - Hainan, Yunnan; Tropical: Cambodia; Laos; Thailand; Vietnam; Indonesia - Celebes, Java, Kalimantan, Sumatra; Malaysia; Philippines.
205	1987. Morton, J.. Fruits of warm climates. J.F. Morton, Miami, FL <a href="http://www.hort.purdue.edu/newcrop/morton">http://www.hort.purdue.edu/newcrop/morton</a>	[Does the species have a history of repeated introductions outside its natural range? Yes] "The rambutan is native to Malaysia and commonly cultivated throughout the archipelago and southeast Asia. Many years ago, Arab traders introduced it into Zanzibar and Pemba. There are limited plantings in India, a few trees in Surinam, and in the coastal lowlands of Colombia, Ecuador, Honduras, Costa Rica, Trinidad and Cuba. Some fruits are being marketed in Costa Rica. The rambutan was taken to the Philippines from Indonesia in 1912. Further introductions were made in 1920 (from Indonesia) and 1930 (from Malaya), but until the 1950's its distribution was rather limited. Then popular demand brought about systematic efforts to improve the crop and resulted in the establishment of many commercial plantations in the provinces of Batangas, Cavite, Davan, Iloilo, Laguna, Oriental Mindoro and Zamboanga."
205	1995. Zee, F.T.. Rambutan - New Crop FactSHEET. USDA-ARS, National Clonal Germplasm Repository, Hilo, Hawaii <a href="http://www.hort.purdue.edu/newcrop/cropfactsheets/Rambutan.html">http://www.hort.purdue.edu/newcrop/cropfactsheets/Rambutan.html</a>	[Does the species have a history of repeated introductions outside its natural range? Yes] "A perennial tree cultivated extensively in S.E. Asia for its edible fruits. The approximate areas under cultivation in 1987/88 were reported to be 71,150 hectares in Thailand (448,500 tonnes); 43,000 plus hectares in Indonesia (199,200 tonnes); 20,000 hectares in Malaysia (57,000 tonnes) and 500 hectares in the Philippines."
301	2005. USDA APHIS. Pest lists for fresh Litchi chinensis (lychee or litchi), Dimocarpus longan (longan), Mangifera indica (mango), Garcinia mangostana L. (mangosteen), <i>Nephelium lappaceum</i> L. (rambutan), and Ananas comosus (pineapple) fruit from Thailand. U	[Naturalized beyond native range? No] According to USDA pest list for fresh <i>Nephelium lappaceum</i> L., it exhibits no invasive behavior based research in the following references: Geographical Atlas of World Weeds (Holm et al., 1979), World's Worst Weeds (Holm et al., 1977) or World Weeds: Natural Histories and Distribution (Holm et al., 1997), Report of the Technical Committee to Evaluate Noxious Weeds; Exotic Weeds for Federal Noxious Weed Act (Gunn and Ritchie, 1982). Economically Important Foreign Weeds (Reed, 1977). Weed Science Society of America list (WSSA, 1989). Is there any literature reference indicating weed potential, (e.g., AGRICOLA, CAB Biological Abstracts, AGRIS; search on "Podocarpus" combined with "weed").

301	2012. WRA Specialist. Personal Communication.	[Naturalized beyond native range? No] No evidence of naturalization beyond native range.
302	2007. Randall, R.. Global Compendium of Weeds - <i>Nephelium lappaceum</i> (Sapindaceae). <a href="http://www.hear.org/gcw/species/nephelium_lappaceum/">http://www.hear.org/gcw/species/nephelium_lappaceum/</a>	[Garden/amenity/disturbance weed? No] No evidence of weediness in these systems.
303	2007. Randall, R.. Global Compendium of Weeds - <i>Nephelium lappaceum</i> (Sapindaceae). <a href="http://www.hear.org/gcw/species/nephelium_lappaceum/">http://www.hear.org/gcw/species/nephelium_lappaceum/</a>	[Agricultural/forestry/horticultural weed? No] No evidence of weediness in these systems.
304	2007. Randall, R.. Global Compendium of Weeds - <i>Nephelium lappaceum</i> (Sapindaceae). <a href="http://www.hear.org/gcw/species/nephelium_lappaceum/">http://www.hear.org/gcw/species/nephelium_lappaceum/</a>	[Environmental weed? No] No evidence of <i>Nephelium lappaceum</i> as a weed that causes negative environmental impacts.
305	2007. Randall, R.P.. Global Compendium of Weeds - Index [Online Database]. <a href="http://www.hear.org/gcw/">http://www.hear.org/gcw/</a>	[Congeneric weed? No] No evidence of weediness in other species in this genus.
401	1987. Morton, J.. Fruits of warm climates. J.F. Morton, Miami, FL <a href="http://www.hort.purdue.edu/newcrop/morton">http://www.hort.purdue.edu/newcrop/morton</a>	[Produces spines, thorns or burrs? No] "The rambutan tree reaches 50 to 80 ft (15-25 m) in height, has a straight trunk to 2 ft (60 cm) wide, and a dense, usually spreading crown. The evergreen leaves are alternate, pinnately compound, 2 3/4 to 12 in (7-30 cm) long, with reddish rachis, hairy when young, and 1 to 4 pairs of leaflets, subopposite or alternate, elliptic to oblong-elliptic, or rather obovate, sometimes oblique at the base; slightly leathery; yellowish-green to dark-green and somewhat dull on the upper surface, yellowish or bluish-green beneath; 2 to 8 in (5-20 cm) long, 1 to 4 1/3 in (2.5-11 cm) wide, the 6 to 15 pairs of principal veins prominent on the underside."
402	2012. WRA Specialist. Personal Communication.	[Allelopathic? Unknown]
403	1987. Morton, J.. Fruits of warm climates. J.F. Morton, Miami, FL <a href="http://www.hort.purdue.edu/newcrop/morton">http://www.hort.purdue.edu/newcrop/morton</a>	[Parasitic? No] Sapindaceae.
403	2010. Nickrent, D.. The parasitic plant connection. Department of Plant Biology, Southern Illinois University, Carbondale <a href="http://www.parasiticplants.siu.edu/index.html">http://www.parasiticplants.siu.edu/index.html</a>	[Parasitic? No] Sapindaceae.
404	1994. Mele, P.V./Anthonysamy, S./Symoens, C./Beeckman, H.. Feeding time and botanical composition of diets selected by indigenous goats on native pastures in Malaysia. <i>Pertanika Journal of Tropical Agricultural Science</i> . 17: 229-237. <a href="http://www.agroinsight.c">http://www.agroinsight.c</a>	[Unpalatable to grazing animals? No] <i>Nephelium lappaceum</i> was found to be very palatable to goats in native pastures of Selangor State, West Malaysia.
405	2012. National Center for Biotechnology Information. PubMed. <a href="http://www.ncbi.nlm.nih.gov/sites/entrez">http://www.ncbi.nlm.nih.gov/sites/entrez</a>	[Toxic to animals? No] No evidence of toxicity.
405	2012. Specialized Information Services, U.S. National Library of Medicine. TOXNET toxicology data network [online database]. National Institutes of Health, <a href="http://toxnet.nlm.nih.gov/">http://toxnet.nlm.nih.gov/</a>	[Toxic to animals? No] No evidence of toxicity.
406	1987. Morton, J.. Fruits of warm climates. J.F. Morton, Miami, FL <a href="http://www.hort.purdue.edu/newcrop/morton">http://www.hort.purdue.edu/newcrop/morton</a>	[Host for recognized pests and pathogens? ] "Few pests or diseases have been reported by rambutan growers. Leaf-eating insects, the mealybug, <i>Pseudococcus lilacinus</i> , and the giant bug, <i>Tessaratomia longicorne</i> , may require control measures. The mango twig-borer, <i>Niphonoclea albata</i> , occasionally appears on rambutan trees. The Oriental fruit fly attacks very ripe fruits. Birds and flying foxes (fruit-eating bats) consume many of the fruits, probably considerably reducing yield figures. There are several pathogens that attack the fruits and cause rotting under warm, moist conditions. Powdery mildew, caused by <i>Oidium</i> sp., may affect the foliage or other parts of the tree. A serious disease, stem canker, caused by <i>Fomes lignosus</i> in the Philippines and <i>Ophioceras</i> sp. in Malaya, can be fatal to rambutan trees if not controlled at the outset."
407	1987. Morton, J.. Fruits of warm climates. J.F. Morton, Miami, FL <a href="http://www.hort.purdue.edu/newcrop/morton">http://www.hort.purdue.edu/newcrop/morton</a>	[Causes allergies or is otherwise toxic to humans? No] "There are traces of an alkaloid in the seed, and the testa contains saponin and tannin. The seeds are said to be bitter and narcotic. The fruit rind also is said to contain a toxic saponin and tannin." [medicinal, fruit]

407	2012. National Center for Biotechnology Information. PubMed. <a href="http://www.ncbi.nlm.nih.gov/sites/entrez">http://www.ncbi.nlm.nih.gov/sites/entrez</a>	[Causes allergies or is otherwise toxic to humans? No] No evidence of toxicity.
408	2012. WRA Specialist. Personal Communication.	[Creates a fire hazard in natural ecosystems? No] No evidence of biomass build-up that creates a fire-hazard. [no evidence in the literature]
409	2010. Nakashima, Y./Inoue, E./Inoue-Murayama, M./Sukor, J.R.A.. Functional uniqueness of a small carnivore as seed dispersal agents: a case study of the common civets in the Tabin Wildlife Reserve Sabah, Malaysia. <i>Oecologia</i> . 164: 721-730. <a href="http://www.springer">http://www.springer</a>	[Is a shade tolerant plant at some stage of its life cycle? Yes] Pioneer species that is shade tolerant.
409	2012. <a href="http://www.montosogardens.com">www.montosogardens.com</a> . <i>Nephelium lappaceum</i> (Sapindaceae). <a href="http://www.montosogardens.com/nephelium_lappaceum.htm">http://www.montosogardens.com/nephelium_lappaceum.htm</a>	[Is a shade tolerant plant at some stage of its life cycle? Yes] Young trees benefit from approximately 50% shade but can tolerate full sun when older.
410	1987. Morton, J.. <i>Fruits of warm climates</i> . J.F. Morton, Miami, FL <a href="http://www.hort.purdue.edu/newcrop/morton">http://www.hort.purdue.edu/newcrop/morton</a>	[Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)?] The tree does best on deep, clay-loam or rich sandy loam rich in organic matter, or in deep peat. It needs good drainage.
410	1995. Zee, F.T.. <i>Rambutan - New Crop FactSHEET</i> . USDA-ARS, National Clonal Germplasm Repository, Hilo, Hawaii <a href="http://www.hort.purdue.edu/newcrop/cropfactsheets/Rambutan.html">http://www.hort.purdue.edu/newcrop/cropfactsheets/Rambutan.html</a>	[Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)? Yes] "It prefers clay loam soil, pH 5 to 6.5, but can be grown in a wide range of soil types, even ones with poor drainage, but not water-logged."
411	1987. Morton, J.. <i>Fruits of warm climates</i> . J.F. Morton, Miami, FL <a href="http://www.hort.purdue.edu/newcrop/morton">http://www.hort.purdue.edu/newcrop/morton</a>	[Climbing or smothering growth habit? No]
412	2012. WRA Specialist. Personal Communication.	[Forms dense thickets? No] No evidence of thicket formation. [widely cultivated tree]
501	1987. Morton, J.. <i>Fruits of warm climates</i> . J.F. Morton, Miami, FL <a href="http://www.hort.purdue.edu/newcrop/morton">http://www.hort.purdue.edu/newcrop/morton</a>	[Aquatic? No] Terrestrial; tree.
502	1987. Morton, J.. <i>Fruits of warm climates</i> . J.F. Morton, Miami, FL <a href="http://www.hort.purdue.edu/newcrop/morton">http://www.hort.purdue.edu/newcrop/morton</a>	[Grass? No] Sapindaceae.
503	1987. Morton, J.. <i>Fruits of warm climates</i> . J.F. Morton, Miami, FL <a href="http://www.hort.purdue.edu/newcrop/morton">http://www.hort.purdue.edu/newcrop/morton</a>	[Nitrogen fixing woody plant? No] Sapindaceae.
503	2010. <a href="http://www.nationmaster.com">www.nationmaster.com</a> . Encyclopedia Nitrogen fixation. Nationmaster.com, <a href="http://www.nationmaster.com/encyclopedia/Nitrogen-fixation">http://www.nationmaster.com/encyclopedia/Nitrogen-fixation</a>	[Nitrogen fixing woody plant? No] Sapindaceae.
504	1987. Morton, J.. <i>Fruits of warm climates</i> . J.F. Morton, Miami, FL <a href="http://www.hort.purdue.edu/newcrop/morton">http://www.hort.purdue.edu/newcrop/morton</a>	[Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)? No] Tree; woody.
601	2012. WRA Specialist. Personal Communication.	[Evidence of substantial reproductive failure in native habitat? No] No evidence in the literature.
602	1987. Morton, J.. <i>Fruits of warm climates</i> . J.F. Morton, Miami, FL <a href="http://www.hort.purdue.edu/newcrop/morton">http://www.hort.purdue.edu/newcrop/morton</a>	[Produces viable seed? Yes] "Rambutan seeds, after removal from the fruit and thorough washing, should be planted horizontally with the flattened side downward in order that the seedling will grow straight and have a normal, strong root system. Seeds will germinate in 9 to 25 days, the earlier, the more vigor in the seedling."
602	1995. Zee, F.T.. <i>Rambutan - New Crop FactSHEET</i> . USDA-ARS, National Clonal Germplasm Repository, Hilo, Hawaii <a href="http://www.hort.purdue.edu/newcrop/cropfactsheets/Rambutan.html">http://www.hort.purdue.edu/newcrop/cropfactsheets/Rambutan.html</a>	[Produces viable seed? Yes] Propagate by seed or grafting.
604	2006. Vandame, J.. Conservation and management of pollinators for sustainable agriculture through an ecosystem approach - An in-depth review of existing information in Lao PDR and neighbouring countries. FAO.org, <a href="http://typo3.fao.org/fileadmin/templates/">http://typo3.fao.org/fileadmin/templates/</a>	[Self-compatible or apomictic? Yes] Self-compatible. Obligatory outcrossing, the pollen must be carried out by a vector.

605	2002. Siqueira de Castro, M.. Bee fauna of some tropical and exotic fruits: potencial pollinators and their conservation IN: Pollinating bees - the conservation link between agriculture and nature. Ministry of Environment/Brasilia, <a href="http://www.webbee.org">http://www.webbee.org</a>	[Requires specialist pollinators? No] <i>Nonnotrigona punctata</i> , <i>Trigona spinipes</i> , <i>Apis mellifera scutellata</i> , <i>Augochloropsis calicroa</i> , all stingless bees are considered to be possible pollinators of <i>Nephelium lappaceum</i> .
606	1987. Morton, J.. Fruits of warm climates. J.F. Morton, Miami, FL <a href="http://www.hort.purdue.edu/newcrop/morton">http://www.hort.purdue.edu/newcrop/morton</a>	[Reproduction by vegetative fragmentation? No] "Cuttings have been rooted experimentally under mist and with the use of growth-promoting hormones, but this technique is not being practiced. Air-layering may at first appear successful, but many air-layers die after being transplanted into 5-gal containers, or, later, in the field, long after separation from the mother tree."
606	1995. Zee, F.T.. Rambutan - New Crop FactSHEET. USDA-ARS, National Clonal Germplasm Repository, Hilo, Hawaii <a href="http://www.hort.purdue.edu/newcrop/cropfactsheets/Rambutan.html">http://www.hort.purdue.edu/newcrop/cropfactsheets/Rambutan.html</a>	[Reproduction by vegetative fragmentation? No] Reproduction by seed and grafting.
607	1987. Morton, J.. Fruits of warm climates. J.F. Morton, Miami, FL <a href="http://www.hort.purdue.edu/newcrop/morton">http://www.hort.purdue.edu/newcrop/morton</a>	[Minimum generative time (years)? 4+] Rambutan seedlings bear in 5-6 years.
701	1987. Morton, J.. Fruits of warm climates. J.F. Morton, Miami, FL <a href="http://www.hort.purdue.edu/newcrop/morton">http://www.hort.purdue.edu/newcrop/morton</a>	[Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)? No] "The fruit is ovoid, or ellipsoid, pinkish-red, bright-or deep-red, orange-red, maroon or dark-purple, yellowish-red, or all yellow or orange-yellow; 1 1/3 to 3 1/8 in (3.4-8 cm) long. Its thin, leathery rind is covered with tubercles from each of which extends a soft, fleshy, red, pinkish, or yellow spine 1/5 to 3/4 in (0.5-2 cm) long, the tips deciduous in some types.(...) Within is the white or rose-tinted, translucent, juicy, acid, subacid or sweet flesh, 1/6 to 1/3 in (0.4-0.8 cm) thick, adhering more or less to the ovoid or oblong, somewhat flattened seed, which is 1 to 1 1/3 in (2.5-3.4 cm) long and 2/5 to 3/5 in (1-1.5 cm) wide." [seeds encased in a large fruit]
702	1987. Morton, J.. Fruits of warm climates. J.F. Morton, Miami, FL <a href="http://www.hort.purdue.edu/newcrop/morton">http://www.hort.purdue.edu/newcrop/morton</a>	[Propagules dispersed intentionally by people? Yes] "The rambutan is native to Malaysia and commonly cultivated throughout the archipelago and southeast Asia. Many years ago, Arab traders introduced it into Zanzibar and Pemba. There are limited plantings in India, a few trees in Surinam, and in the coastal lowlands of Colombia, Ecuador, Honduras, Costa Rica, Trinidad and Cuba. Some fruits are being marketed in Costa Rica. The rambutan was taken to the Philippines from Indonesia in 1912. Further introductions were made in 1920 (from Indonesia) and 1930 (from Malaya), but until the 1950's its distribution was rather limited. Then popular demand brought about systematic efforts to improve the crop and resulted in the establishment of many commercial plantations in the provinces of Batangas, Cavite, Davao, Iloilo, Laguna, Oriental Mindoro and Zamboanga."
702	1995. Zee, F.T.. Rambutan - New Crop FactSHEET. USDA-ARS, National Clonal Germplasm Repository, Hilo, Hawaii <a href="http://www.hort.purdue.edu/newcrop/cropfactsheets/Rambutan.html">http://www.hort.purdue.edu/newcrop/cropfactsheets/Rambutan.html</a>	[Propagules dispersed intentionally by people? Yes] "Rambutan production is expanding in Indonesia, Malaysia, Australia, Philippines and Hawaii. In Thailand, due to over production and low prices, many rambutan farms are being replaced by durian, <i>Durio zibethinus</i> J. plantings."
703	1987. Morton, J.. Fruits of warm climates. J.F. Morton, Miami, FL <a href="http://www.hort.purdue.edu/newcrop/morton">http://www.hort.purdue.edu/newcrop/morton</a>	[Propagules likely to disperse as a produce contaminant? No] "The fruit is ovoid, or ellipsoid, pinkish-red, bright-or deep-red, orange-red, maroon or dark-purple, yellowish-red, or all yellow or orange-yellow; 1 1/3 to 3 1/8 in (3.4-8 cm) long. Its thin, leathery rind is covered with tubercles from each of which extends a soft, fleshy, red, pinkish, or yellow spine 1/5 to 3/4 in (0.5-2 cm) long, the tips deciduous in some types.(...) Within is the white or rose-tinted, translucent, juicy, acid, subacid or sweet flesh, 1/6 to 1/3 in (0.4-0.8 cm) thick, adhering more or less to the ovoid or oblong, somewhat flattened seed, which is 1 to 1 1/3 in (2.5-3.4 cm) long and 2/5 to 3/5 in (1-1.5 cm) wide."
703	2012. WRA Specialist. Personal Communication.	[Propagules likely to disperse as a produce contaminant? No] No evidence of spread as a contaminant of produce.
704	1987. Morton, J.. Fruits of warm climates. J.F. Morton, Miami, FL <a href="http://www.hort.purdue.edu/newcrop/morton">http://www.hort.purdue.edu/newcrop/morton</a>	[Propagules adapted to wind dispersal? No] "The fruit is ovoid, or ellipsoid, pinkish-red, bright-or deep-red, orange-red, maroon or dark-purple, yellowish-red, or all yellow or orange-yellow; 1 1/3 to 3 1/8 in (3.4-8 cm) long. Its thin, leathery rind is covered with tubercles from each of which extends a soft, fleshy, red, pinkish, or yellow spine 1/5 to 3/4 in (0.5-2 cm) long, the tips deciduous in some types.(...) Within is the white or rose-tinted, translucent, juicy, acid, subacid or sweet flesh, 1/6 to 1/3 in (0.4-0.8 cm) thick, adhering more or less to the ovoid or oblong, somewhat flattened seed, which is 1 to 1 1/3 in (2.5-3.4 cm) long and 2/5 to 3/5 in (1-1.5 cm) wide." [no adaptation that would facilitate wind dispersal]

705	1987. Morton, J.. Fruits of warm climates. J.F. Morton, Miami, FL <a href="http://www.hort.purdue.edu/newcrop/morton">http://www.hort.purdue.edu/newcrop/morton</a>	[Propagules water dispersed? Unknown] "The fruit is ovoid, or ellipsoid, pinkish-red, bright-or deep-red, orange-red, maroon or dark-purple, yellowish-red, or all yellow or orange-yellow; 1 1/3 to 3 1/8 in (3.4-8 cm) long. Its thin, leathery rind is covered with tubercles from each of which extends a soft, fleshy, red, pinkish, or yellow spine 1/5 to 3/4 in (0.5-2 cm) long, the tips deciduous in some types.(...) Within is the white or rose-tinted, translucent, juicy, acid, subacid or sweet flesh, 1/6 to 1/3 in (0.4-0.8 cm) thick, adhering more or less to the ovoid or oblong, somewhat flattened seed, which is 1 to 1 1/3 in (2.5-3.4 cm) long and 2/5 to 3/5 in (1-1.5 cm) wide."
706	1987. Morton, J.. Fruits of warm climates. J.F. Morton, Miami, FL <a href="http://www.hort.purdue.edu/newcrop/morton">http://www.hort.purdue.edu/newcrop/morton</a>	[Propagules bird dispersed? No] "The fruit is ovoid, or ellipsoid, pinkish-red, bright-or deep-red, orange-red, maroon or dark-purple, yellowish-red, or all yellow or orange-yellow; 1 1/3 to 3 1/8 in (3.4-8 cm) long. Its thin, leathery rind is covered with tubercles from each of which extends a soft, fleshy, red, pinkish, or yellow spine 1/5 to 3/4 in (0.5-2 cm) long, the tips deciduous in some types.(...) Within is the white or rose-tinted, translucent, juicy, acid, subacid or sweet flesh, 1/6 to 1/3 in (0.4-0.8 cm) thick, adhering more or less to the ovoid or oblong, somewhat flattened seed, which is 1 to 1 1/3 in (2.5-3.4 cm) long and 2/5 to 3/5 in (1-1.5 cm) wide." [Unlikely; large seed]
707	1987. Morton, J.. Fruits of warm climates. J.F. Morton, Miami, FL <a href="http://www.hort.purdue.edu/newcrop/morton">http://www.hort.purdue.edu/newcrop/morton</a>	[Propagules dispersed by other animals (externally)? No] "The fruit is ovoid, or ellipsoid, pinkish-red, bright-or deep-red, orange-red, maroon or dark-purple, yellowish-red, or all yellow or orange-yellow; 1 1/3 to 3 1/8 in (3.4-8 cm) long. Its thin, leathery rind is covered with tubercles from each of which extends a soft, fleshy, red, pinkish, or yellow spine 1/5 to 3/4 in (0.5-2 cm) long, the tips deciduous in some types.(...) Within is the white or rose-tinted, translucent, juicy, acid, subacid or sweet flesh, 1/6 to 1/3 in (0.4-0.8 cm) thick, adhering more or less to the ovoid or oblong, somewhat flattened seed, which is 1 to 1 1/3 in (2.5-3.4 cm) long and 2/5 to 3/5 in (1-1.5 cm) wide." [no means of external attachment]
708	2010. Mahmood-ul-Hassan, M./Gulraiz, T.L./Rana, S.A./Javid, A.. The diet of Indian flying-foxes ( <i>Pteropus giganteus</i> ) in urban habitats of Pakistan. Small Mammal Mail - Bi-Annual Newsletter of CCINSA & RISCINSA. 2: 30-36. <a href="http://www.zoosprint.org/ZoosPrintN">http://www.zoosprint.org/ZoosPrintN</a>	[Propagules survive passage through the gut? Yes] In this study on the diet of Indian flying-foxes ( <i>Pteropus giganteus</i> ) in urban habitats of Pakistan; the researchers found that seeds of <i>Nephelium lappaceum</i> were eaten by the bats. Seeds were viable after passing through the bat's gut.
708	2010. Nakashima, Y./Inoue, E./Inoue-Murayama, M./Sukor, J.R.A.. Functional uniqueness of a small carnivore as seed dispersal agents: a case study of the common civets in the Tabin Wildlife Reserve Sabah, Malaysia. <i>Oecologia</i> . 164: 721-730. <a href="http://www.springer">http://www.springer</a>	[Propagules survive passage through the gut?] The common palm civet, ( <i>Paradoxurus hermaphroditus</i> ) consumed <i>Nephelium lappaceum</i> seeds in the Tabin Wildlife Reserve. [possible dispersal agent]
801	1987. Morton, J.. Fruits of warm climates. J.F. Morton, Miami, FL <a href="http://www.hort.purdue.edu/newcrop/morton">http://www.hort.purdue.edu/newcrop/morton</a>	[Prolific seed production (>1000/m <sup>2</sup> )? No] "Generally, shoots that bear fruit one year will put out new growth and will bloom and fruit the next year, so that biennial bearing is rare in the rambutan. However, yield may vary from year to year. Individual trees 8 years old or older have borne as much as 440 lbs (200 kg) one season and only 132 lbs (60 kg) the next. In the Philippines, the average production per tree of 21 selections was 264 lbs (120 kg) over a 4-year period, while the general average is only 106 lbs (48 kg)." [abundant seed production but not >1000/m <sup>2</sup> ]
802	1995. Zee, F.T.. Rambutan - New Crop FactSHEET. USDA-ARS, National Clonal Germplasm Repository, Hilo, Hawaii <a href="http://www.hort.purdue.edu/newcrop/cropfactsheets/Rambutan.html">http://www.hort.purdue.edu/newcrop/cropfactsheets/Rambutan.html</a>	[Evidence that a persistent propagule bank is formed (>1 yr)? No] "Rambutan seeds are recalcitrant and short-lived, it should be sown directly after they are extracted and washed. An effective way to remove flesh that clings tightly to the seeds is by enzyme digestion using a commercially available, non-toxic food grade fungal pectinase enzyme derived from the fungus <i>Aspergillus niger</i> ."
802	2001. Baskin, C.C./Baskin, J.M.. Seeds ecology, biogeography, and evolution of dormancy and germination. Academic Press, San Francisco, CA	[Evidence that a persistent propagule bank is formed (>1 yr)?] Tests on the recalcitrant seeds of <i>Nephelium lappaceum</i> lost viability at 13%. "It is assume that recalcitrant seeds do not live very long, even on the forest floor, however longevity studies under natural conditions have not been done."
803	2012. WRA Specialist. Personal Communication.	[Well controlled by herbicides? Unknown]
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 (e.g. introduced biocontrol agents)? Unknown]

### Summary of risk traits:

Low Risk Traits: Although native to tropical regions and widely cultivated, *Nephelium lappaceum* is not naturalized or weedy in native and agricultural/forested systems. *Nephelium* seedlings take 5-6 years to bear fruit if grown from seed, (many trees are from cuttings). The seeds are recalcitrant (need to be planted soon after maturity), so there is no seed bank for this species. Also, the large fruit and seed size limit its dispersal mechanism to humans and mammals (possibly pigs).

High Risk Traits: All plants will have some high risk traits. These traits are adaptations to their environments. *Nephelium*'s main risk trait is its tolerance of many soil types (not water logged).