

**Family:** *Moraceae*

**Taxon:** *Brosimum alicastrum*

**Synonym:** *Alicastrum brownei* Kuntze  
*Brosimum uleanum* Mildbr.  
*Helicostylis bolivarensis* Pittier  
*Piratinera alicastrum* (Sw.) Baill.

**Common Name:** breadnut  
 Maya nut  
 cow tree  
 apompo  
 ramón

**Questionnaire :** current 20090513      **Assessor:** Assessor      **Designation:** EVALUATE  
**Status:** Assessor Approved      **Data Entry Person:** Assessor      **WRA Score** 2

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	n
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)	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	
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	>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	n
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	
802	Evidence that a persistent propagule bank is formed (>1 yr)	y=1, n=-1	n
803	Well controlled by herbicides	y=-1, n=1	
804	Tolerates, or benefits from, mutilation, cultivation, or fire	y=1, n=-1	y
805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	y=-1, n=1	

Designation: EVALUATE

WRA Score 2

## Supporting Data:

101	1982. Peters, C.M./Pardo-Tejeda, E.. <i>Brosimum alicastrum</i> (Moraceae): Uses and Potential in Mexico. <i>Economic Botany</i> . 36(2): 166-175P.	[Is the species highly domesticated? No. Used extensively, but no evidence that domestication has dramatically modified species] " <i>Brosimum alicastrum</i> has been used for over 2,000 yr, but only recently has its potential for easing the problems of diminishing food and forage been appreciated."
102	2013. WRA Specialist. Personal Communication.	NA
103	2013. WRA Specialist. Personal Communication.	NA
201	2002. Vozzo, J.A.. <i>Tropical Tree Seed Manual</i> . USDA Forest Service, Washington, D.C.	[Species suited to tropical or subtropical climate(s) 2-high] " <i>Brosimum alicastrum</i> is native to America. It is distributed naturally from Mexico across Central America to northern South America and in the West Indies."
201	2008. Janick, J./Paull, R.E.. <i>The Encyclopedia of Fruit &amp; Nuts</i> . Cabi Publishing, Wallingford, UK	[Species suited to tropical or subtropical climate(s) 2-High] " <i>Brosimum alicastrum</i> Swartz (Moraceae), is a canopy tree in tropical rainforests of Central America (Belize, Guatemala, El Salvador, Mexico, Nicaragua) and the larger Caribbean islands (Cuba, Dominican Republic, Jamaica, Puerto Rico)."
202	2008. Janick, J./Paull, R.E.. <i>The Encyclopedia of Fruit &amp; Nuts</i> . Cabi Publishing, Wallingford, UK	[Quality of climate match data 2-High]
203	2005. CAB International. <i>Forestry Compendium</i> . CAB International, Wallingford, UK	[Broad climate suitability (environmental versatility)? No] "Climatic amplitude (estimates) - Altitude range: 300 - 1000 m - Mean annual rainfall: 1000 - 2000 mm - Rainfall regime: bimodal - Dry season duration: > 4 months - Mean annual temperature: 15 - 35°C - Mean maximum temperature of hottest month: 20 - 40°C - Mean minimum temperature of coldest month: 12 - 18°C - Absolute minimum temperature: > 5°C"
204	2008. Janick, J./Paull, R.E.. <i>The Encyclopedia of Fruit &amp; Nuts</i> . Cabi Publishing, Wallingford, UK	[Native or naturalized in regions with tropical or subtropical climates? Yes] " <i>Brosimum alicastrum</i> Swartz (Moraceae), is a canopy tree in tropical rainforests of Central America (Belize, Guatemala, El Salvador, Mexico, Nicaragua) and the larger Caribbean islands (Cuba, Dominican Republic, Jamaica, Puerto Rico)."
205	2005. CAB International. <i>Forestry Compendium</i> . CAB International, Wallingford, UK	[Does the species have a history of repeated introductions outside its natural range? No]
205	2010. Nelson, G.. <i>The Trees of Florida. A Reference and Field Guide</i> . 2nd Edition. Pineapple Press Inc, Sarasota, FL	[Does the species have a history of repeated introductions outside its natural range? Florida] "Non native (tropical America)" ... Distribution: Tropical hammocks; southernmost tip of the peninsula and the Keys."
301	1976. Morton, J.F.. Pestiferous spread of many ornamental and fruit species in South Florida. <i>Proceedings of the Florida State Horticultural Society</i> . 89: 348-353.	[Naturalized beyond native range?] "Locally spontaneous from seeds."
301	2001-2013. Gann, G.D./Bradley, K.A./Woodmansee, S.W.. <i>The Floristic Inventory of South Florida Database Online</i> . The Institute for Regional Conservation, Delray Beach, FL <a href="http://www.regionalconservation.org">http://www.regionalconservation.org</a>	[Naturalized beyond native range? Yes] "SOUTH FLORIDA Native Status: Not Native, Naturalized "
301	2010. Nelson, G.. <i>The Trees of Florida. A Reference and Field Guide</i> . 2nd Edition. Pineapple Press Inc, Sarasota, FL	[Naturalized beyond native range? Yes] "Non native (tropical America)" ... Distribution: Tropical hammocks; southernmost tip of the peninsula and the Keys."
302	2012. Randall, R.P.. <i>A Global Compendium of Weeds</i> . 2nd Edition. Department of Agriculture and Food, Western Australia	[Garden/amenity/disturbance weed? No] No evidence
303	2012. Randall, R.P.. <i>A Global Compendium of Weeds</i> . 2nd Edition. Department of Agriculture and Food, Western Australia	[Agricultural/forestry/horticultural weed? No] No evidence
304	2012. Randall, R.P.. <i>A Global Compendium of Weeds</i> . 2nd Edition. Department of Agriculture and Food, Western Australia	[Environmental weed? No] No evidence
305	2012. Randall, R.P.. <i>A Global Compendium of Weeds</i> . 2nd Edition. Department of Agriculture and Food, Western Australia	[Congeneric weed? No] No evidence

401	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	[Produces spines, thorns or burrs? No] "A medium sized or large tree, with a dense and broad crown and a straight trunk that can reach one meter in diameter and with buttresses. The bark is grey with regular lenticels and longitudinal fine fissures at a young stage. Leaves entire, coriaceous, petiolate and bright green when fresh, mostly oblong-elliptic to elliptic, mainly 7-14 cm long and 3-5. 5 cm wide, acuminate or abruptly short acuminate, sometimes merely acute, obtuse or acute at the base, 14 pairs of lateral veins raised below with a conspicuous submarginal collecting veins and prominulous reticulate veins; petioles stout, 4-14 mm long, stipules nearly encircling stem, 5-15 mm long."
402	1989. Wickens, G.E./Hag, N./Day, P.R.. New Crops for Food and Industry. Chapman and Hall Ltd, London, UK	[Allelopathic? Unknown] "Brosimum alicastrum may be found in almost pure stands within the tropical forests."
403	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	[Parasitic? No] "A medium sized or large tree, with a dense and broad crown and a straight trunk that can reach one meter in diameter and with buttresses."
404	1982. Peters, C.M./Pardo-Tejeda, E.. Brosimum alicastrum (Moraceae): Uses and Potential in Mexico. Economic Botany. 36(2): 166-175P.	[Unpalatable to grazing animals? No] "Soon after the introduction of livestock into Mexico, it was discovered that B. alicastrum is a very good forage. Currently, this is the most widespread use of the tree. Wherever it is abundant the leaves, twigs and seeds are a highly valued stock feed. This is especially true in the more arid parts of its range where its evergreen leaves may furnish the only fresh forage available during the dry season." ... "Where dense stands occur, climbing is not necessary and cattle are allowed to graze freely on the seedlings, newly fallen leaves, and seeds."
404	2002. Vozzo, J.A.. Tropical Tree Seed Manual. USDA Forest Service, Washington, D.C.	[Unpalatable to grazing animals? No] "One of the most outstanding characteristics of this plant is that it remains green during the dry season, thus being the only existing source of forage in many places. The branches, leaves, fruits, and seeds are used to feed cattle. They also serve as a nutritional supplement for pigs and chickens."
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, ( <a href="http://www.worldagroforestry.org/af/treedb/">http://www.worldagroforestry.org/af/treedb/</a> )	[Unpalatable to grazing animals? No] "In B. alicastrum's native range mammals such as deer browse the seedlings."
405	1982. Peters, C.M./Pardo-Tejeda, E.. Brosimum alicastrum (Moraceae): Uses and Potential in Mexico. Economic Botany. 36(2): 166-175P.	[Toxic to animals? No evidence] "Brosimum alicastrum is a nutritious stock feed. The leaves contain an average of 10% crude protein on a dry weight basis (Fortum, 1911; Perez-Toro, 1950), and recent studies have shown that their digestibility is superior to that of the more widely utilized <i>Leucaena leucocephala</i> (Lam.) DeWit and buffelgrass ( <i>Cenchrus ciliaris</i> L.) (Yerena et al., 1978). Feeding trials using various mixtures of the seeds with sorghum resulted in excellent weight gains in cattle, sheep, hogs and goats (Pardo-Tejeda and Sanchez-Muñoz, 1980). As an additional benefit, B. alicastrum forage has been reported to increase milk production in dairy cattle by 1-2 liter/day (Gonzalez, 1939; Calvino, 1952)."
406	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	[Host for recognized pests and pathogens?] "Pests recorded Insects: <i>Anastrepha obliqua</i> (fruitfly, West Indian)"
407	1982. Peters, C.M./Pardo-Tejeda, E.. Brosimum alicastrum (Moraceae): Uses and Potential in Mexico. Economic Botany. 36(2): 166-175P.	[Causes allergies or is otherwise toxic to humans? No evidence] "Although the wood of B. alicastrum is soft compared to many other tropical hardwoods, it is easily worked and is used extensively in the manufacture of inexpensive furniture, beehives, packing crates and tool handles" ... "The fruits, leaves, latex and bark of B. alicastrum are all used pharmaceutically in various parts of Mexico. An extract of the fruits is "an admirable lactogen which stimulates the production of milk in humans and livestock" (Martinez, 1936), and preparations of this type are currently sold in Yucat'an and Jalisco. Leaf infusions are employed as cough suppressants and in the treatment of kidney ailments, and the diluted latex is used to aid the extraction of teeth. A tonic made from the bark is also used to treat chest pains and asthma." ... "Several beverages can be made from various parts of the tree."
407	2008. Janick, J./Paull, R.E.. The Encyclopedia of Fruit & Nuts. Cabi Publishing, Wallingford, UK	[Causes allergies or is otherwise toxic to humans? No] "Both the fruit mesocarp, which is sweet, and the chestnut-like seeds are eaten."
408	1978. Croat, T.B.. Flora of Barro Colorado Island. Stanford University Press, Stanford, CA	[Creates a fire hazard in natural ecosystems? No evidence] "In Panama, known from tropical moist forest in the Canal Zone..." ... "Reported from tropical wet forest in Costa Rica"
408	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	[Creates a fire hazard in natural ecosystems? No evidence] "B. alicastrum grows naturally in moist or wet forest, ascending to approximately 1000 m in altitude but mostly at 300 m or less." [Unlikely, given habitat]

409	2000. Dickinson, M.B./Whigham, D.F./Hermann, S.M.. Tree regeneration in felling and natural treefall disturbances in a semideciduous tropical forest in Mexico. <i>Forest Ecology and Management</i> . 134(1): 137-151.	[Is a shade tolerant plant at some stage of its life cycle? Yes] "Shade-tolerant timber species that recover effectively from coppice (e.g., <i>Brosimum alicastrum</i> ; Negreros, 1991; Dickinson, personal observation) or root sprouts (e.g., <i>Coccoloba spicata</i> and <i>Swartzia cubensis</i> , Table 3) are expected to be least sensitive to the understory disturbance in felling gaps."
409	2002. ontgomery, R./Chazdon, R.. Light gradient partitioning by tropical tree seedlings in the absence of canopy gaps. <i>Oecologia</i> . 131(2): 165-174.	[Is a shade tolerant plant at some stage of its life cycle? Yes] "While <i>B. alicastrum</i> and <i>D. panamensis</i> showed decreased survivorship in very low light, even in these sites, survival was greater than fifty percent."
409	2004. Sánchez-Velásquez, L.R./Quintero-Gradilla, S./Aragón-Cruz, F./Pineda-López, M.R.. Nurses for <i>Brosimum alicastrum</i> reintroduction in secondary tropical dry forest. <i>Forest Ecology and Management</i> . 198(1): 401-404.	[Is a shade tolerant plant at some stage of its life cycle? Yes] "Because of the characteristics of its seeds and its tolerance to shadow, <i>B. alicastrum</i> is considered a late successional species (Kammesheidt, 2000)."
409	2008. Janick, J./Paull, R.E.. <i>The Encyclopedia of Fruit &amp; Nuts</i> . Cabi Publishing, Wallingford, UK	[Is a shade tolerant plant at some stage of its life cycle? Yes] "It can stand short and light frosts, salt spray and shade."
410	2005. CAB International. <i>Forestry Compendium</i> . CAB International, Wallingford, UK	[Tolerates a wide range of soil conditions ?] "Soil descriptors - Soil texture: medium - Soil drainage: free - Soil types: alkaline soils; alluvial soils; tropical soils"
410	2008. Janick, J./Paull, R.E.. <i>The Encyclopedia of Fruit &amp; Nuts</i> . Cabi Publishing, Wallingford, UK	[Tolerates a wide range of soil conditions? Yes] "Tree growth occurs on various soil types having a pH from 6.8 to 8.2 and it adapts well to calcareous and rocky soils. There is a preference for fertile soils, rich in organic matter, with good drainage and not subjected to long flooding periods. It can grow in acid poor utisols poor in nutrients if they have adequate organic matter content."
411	2005. CAB International. <i>Forestry Compendium</i> . CAB International, Wallingford, UK	[Climbing or smothering growth habit? No] "A medium sized or large tree, with a dense and broad crown and a straight trunk that can reach one meter in diameter and with buttresses."
412	1982. Peters, C.M./Pardo-Tejeda, E.. <i>Brosimum alicastrum</i> (Moraceae): Uses and Potential in Mexico. <i>Economic Botany</i> . 36(2): 166-175P.	[Forms dense thickets? Possibly] "Nearly pure stands of <i>B. alicastrum</i> occur on the steep slopes and calcareous soils of the extreme northeastern part of its range (Rzedowski, 1963; Gomez-Pompa, 1973), but owing to its extensive pre-Hispanic use, it is unknown whether these forests are natural or have resulted from ancient land-use practices." ... "Where dense stands occur, climbing is not necessary and cattle are allowed to graze freely on the seedlings, newly fallen leaves, and seeds."
501	2008. Janick, J./Paull, R.E.. <i>The Encyclopedia of Fruit &amp; Nuts</i> . Cabi Publishing, Wallingford, UK	[Aquatic? No] "This tropical forest tree, mostly evergreen except under very dry conditions, is drought tolerant and is found in areas with an annual rainfall of 600 mm but it can also be found in areas with 4000 mm."
502	1972. Berg, C.C.. <i>Olmedieae Brosimeae</i> (Moraceae). <i>Flora Neotropica</i> . 7: 1-228.	[Grass? No] Moraceae
503	1972. Berg, C.C.. <i>Olmedieae Brosimeae</i> (Moraceae). <i>Flora Neotropica</i> . 7: 1-228.	[Nitrogen fixing woody plant? No] Moraceae
504	1972. Berg, C.C.. <i>Olmedieae Brosimeae</i> (Moraceae). <i>Flora Neotropica</i> . 7: 1-228.	[Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)? No] "Trees (always?) dioecious, up to 35 m tall, (sometimes?) with buttresses; latex white to yellow. Leafy twigs 1-4 mm thick, glabrous or sparsely puberulous. Leaves elliptic to oblong (to lanceolate), slightly or not inequilateral, often broadest above, but sometimes below the middle, (2-)4-18( 28) cm long, (1-)2-7(-ii) cm broad, coriaceous to chartaceous, acuminate, often nearly acute, sometimes caudate, at the base acute, obtuse, truncate or rarely emarginate to subcordate; margin entire or rarely denticulate; above glabrous, beneath glabrous or sparsely puberulous and sometimes also sparsely pubescent on the costa; vein slightly prominent to plane or sometimes slightly impressed above, prominent to nearly plane beneath, 12-16( 21) pairs of secondary veins, without or sometimes with a few parallel tertiary veins; petioles 2-8(-i4) mm long; stipules nearly fully amplexicaul, (3-)5-io(-i5) mm long, glabrous, puberulous, or sometimes pubescent."
601	1978. Croat, T.B.. <i>Flora of Barro Colorado Island</i> . Stanford University Press, Stanford, CA	[Evidence of substantial reproductive failure in native habitat? No] "Common in the forest"
601	1982. Peters, C.M./Pardo-Tejeda, E.. <i>Brosimum alicastrum</i> (Moraceae): Uses and Potential in Mexico. <i>Economic Botany</i> . 36(2): 166-175P.	[Evidence of substantial reproductive failure in native habitat? No] " <i>Brosimum alicastrum</i> (Moraceae) is a major component of the evergreen and semievergreen tropical forests of southern Mexico, growing on both the Pacific and Gulf Coasts at elevations of 50-800 m above sea level (Pennington and Sarukhan, 1968; Sosa et al., 1975; Rzedowski, 1978)."
602	2008. Janick, J./Paull, R.E.. <i>The Encyclopedia of Fruit &amp; Nuts</i> . Cabi Publishing, Wallingford, UK	[Produces viable seed? Yes] "The plant can be grown from its recalcitrant seed, fro cuttings or air layers that are field planted when about 50 cm tall."

603	1972. Berg, C.C.. Olmedieae Brosimeae (Moraceae). Flora Neotropica. 7: 1-228.	[Hybridizes naturally? Unknown. No evidence of hybridization]
604	1972. Berg, C.C.. Olmedieae Brosimeae (Moraceae). Flora Neotropica. 7: 1-228.	[Self-compatible or apomictic? Possibly No] "Trees (always?) dioecious, up to 35 m tall, (sometimes?) with buttresses"
604	1982. Peters, C.M./Pardo-Tejeda, E.. Brosimum alicastrum (Moraceae): Uses and Potential in Mexico. Economic Botany. 36(2): 166-175P.	[Self-compatible or apomictic? Possibly No] "it is important to note that natural populations in Mexico are dioecious (Berg, 1972; Peters, unpubl.); therefore not all trees bear fruit"
604	2005. Ghazoul, J.. Pollen and seed dispersal among dispersed plants. iological Reviews. 80(3): 413-443.	[Self-compatible or apomictic? Partially self-incompatible] "Table 1. A summary of impacts of population size, density, purity and patch size (fragmentation) on plant reproductive ecology." ... "BS refers to breeding system as self-compatible (C) or self-incompatible (I)." [Brosimum alicastrum = Partially I]
604	2008. Janick, J./Paull, R.E.. The Encyclopedia of Fruit & Nuts. Cabi Publishing, Wallingford, UK	[Self-compatible or apomictic? Possibly Yes] "This is a monoecious species with flower heads consisting of many yellow-coloured male flowers that have a rudimentary perianth without a corolla and one stamen, that surround one or two female flowers, green in colour, with an interior ovary (Flores-Paytan, 1997)."
604	2013. WRA Specialist. Personal Communication.	[Self-compatible or apomictic? Unknown] Both monoecious and dioecious forms of this tree exist. If dioecious, then the trees would be self-incompatible
605	2008. Janick, J./Paull, R.E.. The Encyclopedia of Fruit & Nuts. Cabi Publishing, Wallingford, UK	[Requires specialist pollinators? No] "The monoecious species is probably wind pollinated and the seeds are dispersed by birds."
606	2004. Gillespie, A.R./Bocanegra-Ferguson, D.M./Jimenez-Osornio, J.J.. The propagation of Ramon (Brosimum alicastrum Sw.; Moraceae) in Mayan homegardens of the Yucatan peninsula of Mexico. New Forests. 27(1): 25-38.	[Reproduction by vegetative fragmentation? No] "The main propagation technique used is seed. Attempts to propagate Ramo'n vegetatively exist, but there are no significant results or reports." [Reproduction by vegetative means is apparently not widely used in cultivation of this tree, suggesting that natural vegetative reproduction is rare or non-existent]
606	2008. Janick, J./Paull, R.E.. The Encyclopedia of Fruit & Nuts. Cabi Publishing, Wallingford, UK	[Reproduction by vegetative fragmentation? No] "The plant can be grown from its recalcitrant seed, fro cuttings or air layers that are field planted when about 50 cm tall." [No evidence of spread by natural vegetative means]
607	2002. Vozzo, J.A.. Tropical Tree Seed Manual. USDA Forest Service, Washington, D.C.	[Minimum generative time (years)? 4+] "The tree begins to yield flowers and fruits at 4 or 5 years of age. Because its geographic distribution is extensive, B. alicastrum blooms at different times, but especially January to June. Its fruits ripen between April and September, depending on geographic locations (Chavelas and Duvall 1988b). In southeastern Mexico, the plant blooms precociously and abundantly from April to July, and fruits from June to October (Juárez and others 1989)."
607	2008. Janick, J./Paull, R.E.. The Encyclopedia of Fruit & Nuts. Cabi Publishing, Wallingford, UK	[Minimum generative time (years)? 4+] "The juvenile period can last from 4 to 5 years. Flowering occurs from January to June and fruit ripen from April to September in Mexico."
701	2002. Vozzo, J.A.. Tropical Tree Seed Manual. USDA Forest Service, Washington, D.C.	[Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)? No. Unlikely as fruits and seeds lack means of external attachment] "The fruits are globose berries, 2 to 2.5 cm in diameter, pulpy, sweet, and yellow or orange when ripe. Each fruit contains one seed (Cabrera and others 1982, Pennington and Sarukhan 1968). Seeds range in shape from globose to subglobose, are slightly depressed, and are 1 to 2 cm in diameter. The seedcoat is yellowish brown, smooth, opaque, and membranous papyritious."
702	1982. Peters, C.M./Pardo-Tejeda, E.. Brosimum alicastrum (Moraceae): Uses and Potential in Mexico. Economic Botany. 36(2): 166-175P.	[Propagules dispersed intentionally by people? Yes] "Because B. alicastrum is an evergreen tree with beautiful symmetry, it is widely planted as an ornamental. It is used in southern Veracruz as a living fence and in several areas as a shade tree in coffee plantations."
702	2002. Vozzo, J.A.. Tropical Tree Seed Manual. USDA Forest Service, Washington, D.C.	[Propagules dispersed intentionally by people? Yes] "The tree is cultivated in numerous backyards, and it is planted as a shade and ornamental tree in streets, parks, and gardens (Barrera 1981, Cabrera and others 1982, Chavelas and González 1985, Chudnoff 1979, Echenique Manrique 1970, Flores 1993a, Lozano and others 1978, Miranda 1976, National Academy of Sciences 1975, Pardo-Tejeda and Sánchez 1980, Pardo-Tejeda and others 1976, Rico-Gray and others 1991)."
703	2002. Vozzo, J.A.. Tropical Tree Seed Manual. USDA Forest Service, Washington, D.C.	[Propagules likely to disperse as a produce contaminant? No] "The fruits are globose berries, 2 to 2.5 cm in diameter, pulpy, sweet, and yellow or orange when ripe. Each fruit contains one seed (Cabrera and others 1982, Pennington and Sarukhan 1968). Seeds range in shape from globose to subglobose, are slightly depressed, and are 1 to 2 cm in diameter. The seedcoat is yellowish brown, smooth, opaque, and membranous papyritious. A vascularized thickening in the hilar region is strongly attached to the embryo in fresh seeds, but is brittle and easily released in old seeds." [No evidence. Fruits and seeds are not particularly large, but would be unlikely to contaminate produce without notice]

704	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	[Propagules adapted to wind dispersal? No] "Fruit a false drupe almost globose, yellow or orange, about 1.5 cm in diameter, containing a single seed 12 mm in diameter."
705	1993. Hamrick, J.L./Murawski, D.A./Nason, J.D.. The Influence of Seed Dispersal Mechanisms on the Genetic Structure of Tropical Tree Populations. <i>Vegetatio</i> . 107/108: 281-297.	[Propagules water dispersed? No. Zoochorous] "Fruits mature from May to October and are eaten by a variety of arboreal mammals. Monkeys have been observed to eat the outer layers of the fruit and to drop the seeds, often leaving a large accumulation of seeds under the crown of the maternal tree. Bats are thought to play a principal role in long-distance seed dispersal."
706	2000. Ortiz-Pulido, R./Laborde, J./Guevara, S.. Frugivoria por Aves en un Paisaje Fragmentado: Consecuencias en la Dispersion de Semillas. <i>Biotropica</i> . 32(3): 473-488.	[Propagules bird dispersed? Yes] "Muchas de las especies registradas en la lluvia de semillas (e.g., <i>E. cotinifolia</i> , <i>B. simaruba</i> , <i>Achatocarpus nigricans</i> , <i>Brosimum alicastrum</i> , y <i>Coccoloba barbadensis</i> ) son consumidas por aves, y la mayoría de las aves registradas son dispersoras de semillas..." [Translation from Spanish: "Many of the species recorded in the seed rain (eg, <i>E. cotinifolia</i> , <i>B. simaruba</i> , <i>Achatocarpus nigricans</i> , <i>Brosimum alicastrum</i> , and <i>Coccoloba barbadensis</i> ) are eaten by birds, and most of the birds recorded are seed dispersers..."]
706	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	[Propagules bird dispersed? Yes] "Fruit a false drupe almost globose, yellow or orange, about 1.5 cm in diameter, containing a single seed 12 mm in diameter." [Fleshy-fruited, and adapted for consumption by frugivorous birds and other animals. Most references list primates and bats as the principal dispersers of this tree]
706	2008. Janick, J./Paull, R.E.. The Encyclopedia of Fruit & Nuts. Cabi Publishing, Wallingford, UK	[Propagules bird dispersed? Yes] "...the seeds are dispersed by birds."
707	1999. Brewer, S.W./Rejmanek, M.. Small rodents as significant dispersers of tree seeds in a Neotropical forest. <i>Journal of Vegetation Science</i> . 10: 165-174.	[Propagules dispersed by other animals (externally)? Possibly] "Table 5. A comparison of the fates of seeds handled by large and small rodents in experiments in Neotropical forests. Seeds dispersed beneath litter or soil ('Cached') or eaten ('Killed') are expressed as mean percent of removed seeds found by the authors." [Brosimum alicastrum seeds were both cached and killed by rodent. Thus, a percentage of seeds that are not eaten could be considered to be externally dispersed]
707	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	[Propagules dispersed by other animals (externally)? Possibly] "Fruit a false drupe almost globose, yellow or orange, about 1.5 cm in diameter, containing a single seed 12 mm in diameter." [Fruits may be carried without ingestion, for later consumption of pulp, or seeds, but the fruits appear to be primarily adapted for ingestion and internal dispersal]
708	1995. Gibson, J.P./Wheelwright, N.T.. Genetic structure in a population of a tropical tree <i>Ocotea tenera</i> (Lauraceae): influence of avian seed dispersal. <i>Oecologia</i> . 103(1): 49-54.	[Propagules survive passage through the gut? Yes] " <i>B. alicastrum</i> is a dioecious, canopy species whose seeds are dispersed by various arboreal animals."
708	1998. Sanchez-Cordero, V./Martinez-Gallardo, R.. Postdispersal Fruit and Seed Removal by Forest-Dwelling Rodents in a Lowland Rainforest in Mexico. <i>Journal of Tropical Ecology</i> . 14(02): 139-151.	[Propagules survive passage through the gut? Yes] "Massive fruit crops of <i>C. baillonii</i> , <i>B. alicastrum</i> , <i>N. ambigens</i> and <i>F. yoponensis</i> producing intensive fermented odours attracted other frugivorous mammals such as peccaries, pacas, and coatis even from long distances (Martinez-Gallardo & Sanchez Cordero 1997)."
708	2004. Sánchez-Velásquez, L.R./Quintero-Gradilla, S./Aragón-Cruz, F./Pineda-López, M.R.. Nurses for <i>Brosimum alicastrum</i> reintroduction in secondary tropical dry forest. <i>Forest Ecology and Management</i> . 198(1): 401-404.	[Propagules survive passage through the gut? Yes] "Its seeds are dispersed by bats, which habitually perch under tree crowns (Galindo-Gonzalez, 1998; Montgomery and Chazdon, 2002)."
708	2008. Janick, J./Paull, R.E.. The Encyclopedia of Fruit & Nuts. Cabi Publishing, Wallingford, UK	[Propagules survive passage through the gut? Presumably Yes] "...the seeds are dispersed by birds."
801	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	[Prolific seed production (>1000/m <sup>2</sup> )? Unlikely] "Fruit a false drupe almost globose, yellow or orange, about 1.5 cm in diameter, containing a single seed 12 mm in diameter." [Probably not given single-seeded fruit]
802	2002. Vozzo, J.A.. Tropical Tree Seed Manual. USDA Forest Service, Washington, D.C.	[Evidence that a persistent propagule bank is formed (>1 yr)? No] "Seeds remain viable for approximately 3 months when stored under ambient conditions (24 to 30 °C). With longer storage, seed viability diminishes quickly because of loss of moisture (Vega and others 1981)."
802	2008. Janick, J./Paull, R.E.. The Encyclopedia of Fruit & Nuts. Cabi Publishing, Wallingford, UK	[Evidence that a persistent propagule bank is formed (>1 yr)? No] "The seeds germinate in about 28 days and can stay viable for about 3 months at room temperature." [Unlikely, as seeds lose viability in 1/4 year's time]
803	2013. WRA Specialist. Personal Communication.	[Well controlled by herbicides? Unknown] No information on herbicide efficacy or chemical control of this species

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804	1982. Peters, C.M./Pardo-Tejeda, E.. <i>Brosimum alicastrum</i> (Moraceae): Uses and Potential in Mexico. <i>Economic Botany</i> . 36(2): 166-175P.	[Tolerates, or benefits from, mutilation, cultivation, or fire? Yes] "Forage is harvested by climbing the tree and lopping the branches. Between 25-50% of the crown is cut each year, but the repeated pruning does not appear to injure the tree seriously"
805	2013. WRA Specialist. Personal Communication.	[Effective natural enemies present locally (e.g. introduced biocontrol agents)? Unknown]

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## **Summary of Risk Traits**

### **High Risk / Undesirable Traits**

- Grows in tropical climates
- Naturalized or escaped in Florida
- Shade tolerant
- Tolerates many soil types
- Grows in almost pure stands in parts of its native range. Uncertain in natural or remnants of prehistoric cultivation
- Seeds dispersed by primates, bats, birds, and rodents
- Able to coppice and tolerates heavy pruning

### **Low Risk Traits**

- Despite naturalization in Florida, there are no reports of negative impacts of this tree there or anywhere else where it grows
- Unarmed (no spines, thorns or burrs)
- Important fodder and forage plant for cattle and other animals
- Edible pulp and seeds
- Ornamental and timber tree
- Seeds recalcitrant and tree will not form a long-lived seed bank