

Taxon: *Muntingia calabura* L.

Family: Flacourtiaceae

Common Name(s): calabur tree  
capulin  
Jamaica cherry  
Panama berry  
strawberry tree

Synonym(s): *Muntingia calabura* var. *trinitensis* Griseb.  
*Muntingia glabra* Spreng.  
*Muntingia rosea* H.Karst.

Assessor: Chuck Chimera

Status: Approved

End Date: 1 Sep 2023

WRA Score: 14.0

Designation: H(HPWRA)

Rating: High Risk

Keywords: Tropical Tree, Disturbance Weed, Edible Fruit, Self-Compatible, Bird-Dispersed

Qsn #	Question	Answer Option	Answer
101	Is the species highly domesticated?	y = -3, n = 0	n
102	Has the species become naturalized where grown?		
103	Does the species have weedy races?		
201	Species suited to tropical or subtropical climate(s) - If island is primarily wet habitat, then substitute "wet tropical" for "tropical or subtropical"	0 = low, 1 = intermediate, 2 = high (see Appendix 2)	High
202	Quality of climate match data	0 = low, 1 = intermediate, 2 = high (see Appendix 2)	High
203	Broad climate suitability (environmental versatility)	y = 1, n = 0	y
204	Native or naturalized in regions with tropical or subtropical climates	y = 1, n = 0	y
205	Does the species have a history of repeated introductions outside its natural range?	y = -2, ? = -1, n = 0	y
301	Naturalized beyond native range	y = 1*multiplier (see Appendix 2), n = question 205	y
302	Garden/amenity/disturbance weed	y = 1*multiplier (see Appendix 2), n = 0	y
303	Agricultural/forestry/horticultural weed	y = 2*multiplier (see Appendix 2), n = 0	n
304	Environmental weed		
305	Congeneric weed	y = 1*multiplier (see Appendix 2), n = 0	n
401	Produces spines, thorns or burrs	y = 1, n = 0	n
402	Allelopathic		
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	y
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

Qsn #	Question	Answer Option	Answer
409	Is a shade tolerant plant at some stage of its life cycle	y = 1, n = 0	n
410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y = 1, n = 0	y
411	Climbing or smothering growth habit	y = 1, n = 0	n
412	Forms dense thickets	y = 1, n = 0	y
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	n
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	2
701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)		
702	Propagules dispersed intentionally by people	y = 1, n = -1	y
703	Propagules likely to disperse as a produce contaminant	y = 1, n = -1	y
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)		
708	Propagules survive passage through the gut	y = 1, n = -1	y
801	Prolific seed production (>1000/m <sup>2</sup> )	y = 1, n = -1	y
802	Evidence that a persistent propagule bank is formed (>1 yr)	y = 1, n = -1	y
803	Well controlled by herbicides	y = -1, n = 1	y
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)		

**Supporting Data:**

Qsn #	Question	Answer
101	Is the species highly domesticated?	n
	<b>Source(s)</b>	<b>Notes</b>
	Lim, T.K. (2012). Edible Medicinal and Non-Medicinal Plants. Volume 3, Fruits. Springer, New York	"It is native to southern Mexico, Central America, tropical South America to Peru and Bolivia, the Greater Antilles, St. Vincent and Trinidad. The plant has been widely introduced to almost all tropical regions." [No evidence of domestication]

102	Has the species become naturalized where grown?	
	<b>Source(s)</b>	<b>Notes</b>
	WRA Specialist. (2023). Personal Communication	NA

103	Does the species have weedy races?	
	<b>Source(s)</b>	<b>Notes</b>
	WRA Specialist. (2023). Personal Communication	NA

201	Species suited to tropical or subtropical climate(s) - If island is primarily wet habitat, then substitute "wet tropical" for "tropical or subtropical"	High
	<b>Source(s)</b>	<b>Notes</b>
	Lim, T.K. (2012). Edible Medicinal and Non-Medicinal Plants. Volume 3, Fruits. Springer, New York	"It is native to southern Mexico, Central America, tropical South America to Peru and Bolivia, the Greater Antilles, St. Vincent and Trinidad. The plant has been widely introduced to almost all tropical regions."

202	Quality of climate match data	High
	<b>Source(s)</b>	<b>Notes</b>
	Lim, T.K. (2012). Edible Medicinal and Non-Medicinal Plants. Volume 3, Fruits. Springer, New York	"It is native to southern Mexico, Central America, tropical South America to Peru and Bolivia, the Greater Antilles, St. Vincent and Trinidad. The plant has been widely introduced to almost all tropical regions."

Qsn #	Question	Answer
203	<b>Broad climate suitability (environmental versatility)</b>	<b>y</b>
	<b>Source(s)</b>	<b>Notes</b>
	CAB International. (2005). Forestry Compendium. CAB International, Wallingford, UK	"Climatic amplitude (estimates) - Altitude range: 0 - 1300 m - Mean annual rainfall: 1000 - 2000 mm - Rainfall regime: bimodal; uniform - Dry season duration: 0 - 6 months - Mean annual temperature: 15 - 35°C - Mean maximum temperature of hottest month: 23 - 37°C - Mean minimum temperature of coldest month: 14 - 26°C - Absolute minimum temperature: > 0°C"
	Lim, T.K. (2012). Edible Medicinal and Non-Medicinal Plants. Volume 3, Fruits. Springer, New York	" <i>M. calabura</i> is a tropical species. It colonizes open disturbed sites in tropical lowlands."
	Janick, J.& Paull, R.E. (2008). The Encyclopedia of Fruit and Nuts. CABI Publishing, Wallingford, UK	"This tropical to near tropical tree grows up to 1200 m in elevation and can withstand occasional low night temperatures, although it does better in a warm, humid climate. It needs at least 1000 mm annual rainfall."

204	<b>Native or naturalized in regions with tropical or subtropical climates</b>	<b>y</b>
	<b>Source(s)</b>	<b>Notes</b>
	Bose, T. K., Das, P., & Maiti, G. G. (1998). Trees of the world: Volume 1. Regional Plant Resource Centre, Orissa, India	"In India, the tree is found growing in thickets in urban and rural areas from the seeds dispersed by birds."
	Lim, T.K. (2012). Edible Medicinal and Non-Medicinal Plants. Volume 3, Fruits. Springer, New York	"It is native to southern Mexico, Central America, tropical South America to Peru and Bolivia, the Greater Antilles, St. Vincent and Trinidad. The plant has been widely introduced to almost all tropical regions."
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. (1999). Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	" <i>Muntingia calabura</i> L., Panama berry or calabura, a tree with unequal-sided, oblong-lanceolate leaves, densely tomentose lower leaf surfaces, white to pink petals, and globose, red to yellow berries 8-12 mm in diameter, has been cultivated in Hawai'i at least since the early 1920s. We have seen one collection from Halawa Valley, O'ahu (Kerr I-A, BISH), that may represent a naturalized occurrence."

205	<b>Does the species have a history of repeated introductions outside its natural range?</b>	<b>y</b>
	<b>Source(s)</b>	<b>Notes</b>
	Lim, T.K. (2012). Edible Medicinal and Non-Medicinal Plants. Volume 3, Fruits. Springer, New York	"It is native to southern Mexico, Central America, tropical South America to Peru and Bolivia, the Greater Antilles, St. Vincent and Trinidad. The plant has been widely introduced to almost all tropical regions."
	Janick, J.& Paull, R.E. (2008). The Encyclopedia of Fruit and Nuts. CABI Publishing, Wallingford, UK	"Jamaica cherry, <i>Muntingia calabura</i> L. (Elaeocarpaceae), is a minor fruit species indigenous to southern Mexico, Central America, northern South America and the Greater Antilles, that has become distributed in South-east Asia and many other places where due to its good adaptation and number of trees found, people think it is a native."

301	<b>Naturalized beyond native range</b>	<b>y</b>
	<b>Source(s)</b>	<b>Notes</b>
	Bose, T. K., Das, P., & Maiti, G. G. (1998). Trees of the world: Volume 1. Regional Plant Resource Centre, Orissa, India	"In India, the tree is found growing in thickets in urban and rural areas from the seeds dispersed by birds."

Qsn #	Question	Answer
	Hanelt, P. (ed.). (2001). Mansfeld's Encyclopedia of Agricultural and Horticultural Crops, Volume 3. Springer-Verlag, Berlin, Heidelberg, New York	"It is naturalized in SE Asia and the Philippines and cultivated in tropical regions all over the world."
	Staples, G.W. & Herbst, D.R. (2005). A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI	"It is probably fortunate that <i>M. calabura</i> is not much cultivated in Hawaii because of its potential to become a noxious arboreal weed here, much as it already has in other tropical places, including many Pacific islands. Birds eat the sweer fruit and disperse the tiny seeds in their droppings."
	Christenhusz, M. J., Fay, M. F., & Chase, M. W. (2017). Plants of the World: An Illustrated Encyclopedia of Vascular Plants. Royal Botanic Gardens, Kew	" <i>Muntingia calabura</i> is cultivated and naturalised throughout the tropics."
	Queensland Government. (2023). Weeds of Australia. <i>Muntingia calabura</i> . <a href="https://keyserver.lucidcentral.org/weeds/data/media/Html/muntingia_calabura.htm">https://keyserver.lucidcentral.org/weeds/data/media/Html/muntingia_calabura.htm</a> . [Accessed 1 Sep 2023]	"Naturalised in northern and central Queensland and on some offshore islands (i.e. Christmas Island and the Cocos Islands). Also naturalised in some parts of southern USA (i.e. California and Florida) and on several Pacific islands (i.e. French Polynesia, Nauru, Palau and Hawaii)."
	Nelson, G. (2010). The Trees of Florida. A Reference and Field Guide. 2nd Edition. Pineapple Press Inc, Sarasota, FL	[Florida] "Distribution: Hammocks and pinelands; planted and naturalized in the southern peninsula fro111 about Hendry and Palm Beach counties southward."
	Gallaher, T.J., Brock, K., Kennedy, B.H., Imada, C.T., Imada, K., & Walvoord, N. (2023). Plants of Hawai'i. <a href="http://www.plantsofhawaii.org..">http://www.plantsofhawaii.org..</a> [Accessed 31 Aug 2023]	[Kauai, Oahu] " Potentially Naturalizing"

302	Garden/amenity/disturbance weed	y
	Source(s)	Notes
	Lim, T.K. (2012). Edible Medicinal and Non-Medicinal Plants. Volume 3, Fruits. Springer, New York	"In some areas it is deemed as a noxious weed because of its rapid establishment and growth on all soil types."
	Green, P. T., Hart, R., JANTAN, J. B., Metcalfe, D. J., O'Dowd, D. J., & Lake, P. S. (1999). Red crabs in rainforest on Christmas Island, Indian Ocean: No effect on the soil seed bank. <i>Australian Journal of Ecology</i> , 24(1), 90-94	"It is paradoxical that despite the occurrence of gaps of this size at Murray Hill (Green 1996), and the existence of a substantial seed bank (this study), we have never seen <i>Muntingia</i> seedlings or saplings in any natural light gaps at our study site, or anywhere else in natural disturbances in rainforest on the island (P. T. Green & R. Hart pers. obs. 1989-1998). It is apparently restricted to roadsides, abandoned mined fields and areas of habitation, with just two records from roadside locations within the forest (P. T. Green & D. J. O'Dowd pers. obs. 1997; P. Meek & H. Rumpff pers. comm. 1996)."
	Staples, G.W. & Herbst, D.R. (2005). A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI	"It is probably fortunate that <i>M. calabura</i> is not much cultivated in Hawaii because of its potential to become a noxious arboreal weed here, much as it already has in other tropical places, including many Pacific islands. Birds eat the sweer fruit and disperse the tiny seeds in their droppings."
	Areces-Berazain, F. (2016). <i>Muntingia calabura</i> (Jamaica cherry). CABI Compendium. <a href="https://doi.org/10.1079/cabicompendium.35164">https://doi.org/10.1079/cabicompendium.35164</a> . [Accessed 1 Sep 2023]	[Invades disturbed sites. A potential environmental weed] " <i>M. calabura</i> is a fast growing tree of disturbed lowland neotropical forests that has been introduced as an ornamental and fruit tree in many Old World countries. It is now widespread and naturalized in Southeast Asia, Australia, and in islands of the Pacific Ocean, in part due to its ability to disperse by bats and birds. It is often regarded as an environmental weed, but has not yet become a severe widespread problem (Werren, 2001; Randall, 2012). Listed as invasive in Puerto Rico (Haysom and Murphy, 2003; Rojas-Sandoval and Acevedo-Rodríguez, 2015), Singapore (Nghiem et al., 2015), Papua New Guinea (Orapa, 2006), Republic of Palau (Space et al., 2009), Nauru (Meyer, 2000) and the Federated States of Micronesia (Haysom and Murphy, 2003). Listed as potentially invasive in Guam and the Northern Mariana Islands (Meyer, 2000)."

303	Agricultural/forestry/horticultural weed	n
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Qsn #	Question	Answer
	Source(s)	Notes
	CAB International. (2005). Forestry Compendium. CAB International, Wallingford, UK	[May impact agriculture through indirect effects, rather than direct competition with crops] "Because the seeds can be found in imported gardening substrates, the seedlings might be a nuisance in greenhouses (Ferrer Gallego and Laguna Lumbreras, 2013). This species is a host of several species of insects that are considered serious pests of many tropical and subtropical fruits. Among the most damaging are <i>Bactrocera correcta</i> (guava fruit fly), <i>Bactrocera dorsalis</i> (Oriental fruit fly), <i>Eudocima fullonia</i> (fruit-piercing moth), and <i>Helopeltis antonii</i> (tea mosquito bug) (White and Elson-Harris, 1992; Davis et al., 2005; Srikumar and Bhat, 2013)."

304	Environmental weed	
	Source(s)	Notes
	Swarbrick, J. T., & Hart, R. (2001). Environmental weeds of Christmas Island (Indian Ocean) and their management. <i>Plant Protection Quarterly</i> , 16(2), 54-57	"Minor environmental weeds of the island include <i>Antigonon leptopus</i> , <i>Barringtonia asiatica</i> , <i>Ceiba pentandra</i> , <i>Imperata cylindrica</i> , <i>Leucaena leucocephala</i> , <i>Muntingia calabura</i> , <i>Nephrolepis biserrata</i> , <i>Nephrolepis multiflora</i> , <i>Pluchea indica</i> , <i>Psidium guajava</i> , <i>Ricinus communis</i> , <i>Senna sulfurea</i> and <i>Syzygium</i> spp." ... "Muntingia calabura is probably ubiquitous throughout the island by now as dormant seeds in the soil, but since the seedlings are grazed by crabs and it requires sunlight for growth it is mainly found on roadsides and in gardens and industrial areas. Surviving seedlings in light gaps in the rainforest are quickly smothered by taller and more vigorous native rainforest pioneers." [Considered a "minor" weed on Christmas Island, not subject to control. The plant is considered a disturbance weed (q 3.02 above) rather than an environmental weed because of the specific types of sites that it has colonized after naturalizing.]
	Queensland Government. (2023). Weeds of Australia. <i>Muntingia calabura</i> . <a href="https://keyserver.lucidcentral.org/weeds/data/media/Html/muntingia_calabura.htm">https://keyserver.lucidcentral.org/weeds/data/media/Html/muntingia_calabura.htm</a> . [Accessed 1 Sep 2023]	"Strawberry tree ( <i>Muntingia calabura</i> ) is regarded as an environmental weed in northern Queensland and on Christmas Island. It is also reported to be moderately invasive on Nauru." [Possibly, although detrimental impacts have not been specified.]
	Areces-Berazain, F. (2016). <i>Muntingia calabura</i> (Jamaica cherry). CABI Compendium. <a href="https://doi.org/10.1079/cabicompendium.35164">https://doi.org/10.1079/cabicompendium.35164</a> . [Accessed 1 Sep 2023]	[Invades disturbed sites. A potential environmental weed] " <i>M. calabura</i> is a fast growing tree of disturbed lowland neotropical forests that has been introduced as an ornamental and fruit tree in many Old World countries. It is now widespread and naturalized in Southeast Asia, Australia, and in islands of the Pacific Ocean, in part due to its ability to disperse by bats and birds. It is often regarded as an environmental weed, but has not yet become a severe widespread problem (Werren, 2001; Randall, 2012). Listed as invasive in Puerto Rico (Haysom and Murphy, 2003; Rojas-Sandoval and Acevedo-Rodríguez, 2015), Singapore (Nghiem et al., 2015), Papua New Guinea (Orapa, 2006), Republic of Palau (Space et al., 2009), Nauru (Meyer, 2000) and the Federated States of Micronesia (Haysom and Murphy, 2003). Listed as potentially invasive in Guam and the Northern Mariana Islands (Meyer, 2000)."

305	Congeneric weed	n
	Source(s)	Notes
	Staples, G.W. & Herbst, D.R. (2005). <i>A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places</i> . Bishop Museum Press, Honolulu, HI	" <i>Muntingia</i> Linnaeus comprises a single species, <i>Muntingia calabura</i> Linnaeus ..."
	Randall, R.P. (2017). <i>A Global Compendium of Weeds</i> . 3rd Edition. Perth, Western Australia. R.P. Randall	No evidence

401	Produces spines, thorns or burrs	n
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Qsn #	Question	Answer
	Source(s)	Notes
	Lim, T.K. (2012). Edible Medicinal and Non-Medicinal Plants. Volume 3, Fruits. Springer, New York	[No evidence] "A fast growing small, evergreen tree reaching heights of 3-12 m, with spreading branches pendent towards the tip. Leaves are simple, alternate, pubescent, sticky, distichous, oblong-ovate to broadly oblong-lanceolate, 4-15 cm long by 1-6 cm wide, with serrulate margins, pointed apex and asymmetrical base, one side rounded and the other acute (Plates 1 - 3). Stipules are linear, 5 mm long and caduceus. Flowers are bisexual, 2 cm in diameter, white, extra-axillary, solitary or in pairs with 5, green, reflexed, lanceolate, 1 cm long sepals, white, obovate, 1 cm long spreading rotate petals with many stamens with slender filaments and yellow anthers; ovaries stipitate, glabrous and 5-celled, crowned by a persistent, capitate, 5-ridge stigma (Plates 2, 3). The berry fruit is subglobose, about 1.5 cm wide, baccate, smooth, pale green turning red on ripening (Plates 1 and 2), fleshy, sweet and musky flavoured with many small, 1-2 mm, elliptic greyish yellow seeds."

402	Allelopathic	
	Source(s)	Notes
	Jayalath, D. U. K. L., Ranawana, S. R. W. M. C. J. K., Kaliyadasa, P. E., & Jeewanthi, P. W. (2021). Allelopathic Effect of Zea mays, Senna spectabilis and Muntingia calabura on Weeds: Potential Implication for Controlling Weeds in Tea Lands. Pp. 82 in Proceedings of 7th International Conference on Dry Zone Agriculture. University of Jaffna, Jaffna, Sri Lanka	[Possibly, Extracts demonstrate allelopathic effects] "Identification of eco-friendly weed control measures is imperative due to the adverse effects of excessive use of synthetic herbicides. Thus, a series of bioassays and field studies were conducted to evaluate the allelopathic potential of three plant spp., namely, Maize ( <i>Zea mays</i> ), Kaha-kona ( <i>Senna spectabilis</i> ) and Jam ( <i>Muntingia calabura</i> ) in tea lands. The specific objectives were to identify the most phytotoxic extract, its effective concentration and effective extraction method, synergistic/antagonistic effects, allelochemical releasing mode and field efficacy to control weeds. Plant extracts for bioassays were prepared with dry powders of leaves/husk in four concentrations (4, 6, 8 and 10% w/v) using hot and cold- distilled water. Synergistic/antagonistic effects were tested using cocktails of different extracts mixed at different ratios. Allelochemical releasing mode (decomposition, volatilization and leaching) was identified by pot bioassay, dish- pack and sandwich methods, respectively. These treatments were evaluated on lettuce as an indicator plant. Meanwhile, the three most allelopathic extracts/materials were tested in the field by spraying/mulching. Results revealed no significant difference among hot and cold-water extraction ( $p>0.05$ ). 10% concentration showed the highest phytotoxicity (lowest germination of lettuce). Jam and Kaha-kona showed the highest phytotoxicity evidenced by the lowest germination (22-23%), followed by Maize (44%). Germination was inhibited at 100% in all cocktails indicating their synergistic effect. Leaching was prominent in Kaha-kona evidenced by the lowest germination (61%) and the highest inhibitory effect on radical (77%) and hypocotyl (71%) elongation. Volatilization was prominent in Kaha-kona and Jam while decomposition was notable in Maize (leaves) and Kaha-kona. Mulching was effective compared to spraying (10%, 450 ml m <sup>-2</sup> ), where maize mulching recorded the lowest weed emergence, followed by Jam (77-84% weed dry weight reduction). In conclusion, <i>S. spectabilis</i> and <i>M. calabura</i> demonstrate high allelopathic potential, followed by <i>Z. mays</i> highlighting its potential implication for eco-friendly weed control. Further investigations are needed to evaluate the field efficacy of these botanicals in controlling different weed species."



Qsn #	Question	Answer
403	Parasitic	n
	Source(s)	Notes
	Janick, J.& Paull, R.E. (2008). The Encyclopedia of Fruit and Nuts. CABI Publishing, Wallingford, UK	"This is a rapidly growing pioneer tree of forest gaps that can reach from 5 to 12 m in height with spreading, nearly horizontal, fan-like branches." [No evidence]
404	Unpalatable to grazing animals	n
	Source(s)	Notes
	Calub, B.M. (2003). Indigenous fodder trees for rehabilitation. Leisa Magazine December: 22-23	"Some trees, such as <i>Leucaena</i> , <i>Gliricidia</i> , <i>Muntingia calabura</i> , <i>Erythrina orientali</i> can start producing fodder as soon as six months after planting." ... " <i>Trema orientalis</i> , <i>Muntingia calabura</i> and <i>Macaranga tanarius</i> can be cut every 90 days during the rainy season and every 120 days during the dry season."
405	Toxic to animals	n
	Source(s)	Notes
	Calub, B.M. (2003). Indigenous fodder trees for rehabilitation. Leisa Magazine December: 22-23	[No evidence] "Some trees, such as <i>Leucaena</i> , <i>Gliricidia</i> , <i>Muntingia calabura</i> , <i>Erythrina orientali</i> can start producing fodder as soon as six months after planting." ... " <i>Trema orientalis</i> , <i>Muntingia calabura</i> and <i>Macaranga tanarius</i> can be cut every 90 days during the rainy season and every 120 days during the dry season."
406	Host for recognized pests and pathogens	y
	Source(s)	Notes
	Janick, J.& Paull, R.E. (2008). The Encyclopedia of Fruit and Nuts. CABI Publishing, Wallingford, UK	"DISEASES, PESTS AND WEEDS No serious diseases or pests have been described. The fruit is a fruit fly host. Leaf spot and crown gall have been reported."
	Morton, J. (1987). Jamaica Cherry. p. 65-69. In: Fruits of warm climates. Julia F. Morton, Miami, FL. <a href="https://www.hort.purdue.edu">https://www.hort.purdue.edu</a> . [Accessed 1 Sep 2023]	"In Florida, in recent years, the fruits are infested with the larvae of the Caribbean fruit fly and are accordingly rarely fit to eat. The foliage is subject to leaf spot caused by <i>Phyllosticta</i> sp. and <i>Pseudocercospora muntingiae</i> (formerly <i>Cercospora muntingiae</i> ), and the tree is subject to crown gall caused by <i>Agrobacterium tumefaciens</i> ."
	CAB International. (2005). Forestry Compendium. CAB International, Wallingford, UK	"Pests recorded Insects: <i>Anastrepha suspensa</i> (caribbean fruit fly) <i>Bactrocera correcta</i> (guava fruit fly) <i>Bactrocera dorsalis</i> (Oriental fruit fly) <i>Bactrocera dorsalis</i> species complex (Oriental fruit fly species complex) <i>Bactrocera neohumeralis</i> <i>Bactrocera papayae</i> (papaya fruit fly) <i>Ceratitis capitata</i> (mediterranean fruit fly) <i>Eudocima fullonia</i> (fruit-piercing moth) Fungus diseases: <i>Marasmiellus scandens</i> (white thread blight) Pests recorded at the generic level ( <i>Muntingia</i> ): Insects: <i>Dasychira inclusa</i> "
407	Causes allergies or is otherwise toxic to humans	n



Qsn #	Question	Answer
	<b>Source(s)</b>	<b>Notes</b>
	Quattrocchi, U. (2012). CRC World Dictionary of Medicinal and Poisonous Plants: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	"Relaxant, used for anxiety and irritability, fevers, colds, and flu, restores the nerves, reduces muscle tension and spasm, controls low blood pressure, induces sweating." [Used medicinally. No evidence]
	Lim, T.K. (2012). Edible Medicinal and Non-Medicinal Plants. Volume 3, Fruits. Springer, New York	[No evidence] "The sweet ripe fruit is eaten fresh. In Mexico, the fruits are eaten and sold in local markets. The fruits can be processed into jams or cooked in tarts. The leaf infusion is drunk as a tea-like beverage."

408	Creates a fire hazard in natural ecosystems	n
	<b>Source(s)</b>	<b>Notes</b>
	Janick, J.& Paull, R.E. (2008). The Encyclopedia of Fruit and Nuts. CABI Publishing, Wallingford, UK	[No evidence. Unlikely given relatively wet growing conditons] "This tropical to near tropical tree grows up to 1200 m in elevation and can withstand occasional low night temperatures, although it does better in a warm, humid climate. It needs at least 1000 mm annual rainfall. The tree tends to grow in cliffs or river banks, but does not tolerate salt or waterlogged conditions, preferring good drainage."

409	Is a shade tolerant plant at some stage of its life cycle	n
	<b>Source(s)</b>	<b>Notes</b>
	Swarbrick, J. T., & Hart, R. (2001). Environmental weeds of Christmas Island (Indian Ocean) and their management. Plant Protection Quarterly, 16(2), 54-57	"Muntingia calabura was introduced for its edible fruit, and is widely planted as a nurse crop for rainforest rehabilitation. The minute seeds are distributed by birds but only germinate in light gaps, where the seedlings are unlikely to survive later competition for light from rainforest trees."
	Fleming, T. H., Williams, C. F., Bonaccorso, F. J., & Herbst, L. H. (1985). Phenology, Seed Dispersal, and Colonization in Muntingia calabura, a Neotropical Pioneer Tree. American Journal of Botany, 72(3), 383-391	"Results of our germination trials and the distribution of its seedlings along open portions of the park road indicate that M. calabura is a large-gap specialist "whose seeds germinate only in the high temperature and light conditions of large gaps and whose seedlings are highly shade intolerant" (Denslow, 1980)."
	Janick, J.& Paull, R.E. (2008). The Encyclopedia of Fruit and Nuts. CABI Publishing, Wallingford, UK	"Seedlings do not tolerate shade."

410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y
	<b>Source(s)</b>	<b>Notes</b>
	Janick, J.& Paull, R.E. (2008). The Encyclopedia of Fruit and Nuts. CABI Publishing, Wallingford, UK	"It can grow on poor, including rocky, soils, preferring light soils with a pH of 5.5-6.5. It does not do well in calcareous soils."
	CAB International. (2005). Forestry Compendium. CAB International, Wallingford, UK	"It self-seeds freely, regenerates rapidly under most soil conditions, including alkaline and saline soils ... "

411	Climbing or smothering growth habit	n
	<b>Source(s)</b>	<b>Notes</b>
	Woodson, R. E., Schery, R. W., & Smith, C. E. (1965). Flora of Panama. Part VI. Family 113. Elaeocarpaceae. Annals of the Missouri Botanical Garden, 52(4), 487-495	"Tree to ca 10 m tall or shrub; trunk usually slender, the bark black."

412	Forms dense thickets	y
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Qsn #	Question	Answer
	<b>Source(s)</b>	<b>Notes</b>
	Bose, T. K., Das, P., & Maiti, G. G. (1998). Trees of the world: Volume 1. Regional Plant Resource Centre, Orissa, India	"In India, the tree is found growing in thickets in urban and rural areas from the seeds dispersed by birds."
	Fleming, T. H., Williams, C. F., Bonaccorso, F. J., & Herbst, L. H. (1985). Phenology, Seed Dispersal, and Colonization in <i>Muntingia calabura</i> , a Neotropical Pioneer Tree. American Journal of Botany, 72(3), 383-391	"Near the north end of Section I a large number of <i>M. calabura</i> became established in late 1979 after a former 1-ha shallow pond formed by the new roadbed was drained. In July 1980 the area was a dense thicket of 2-3-m tall <i>Muntingia</i> saplings. By 1982, plants had thinned to a density of about 4,500 flowering stems/ha. Bats and birds began to feed in this new <i>Muntingia</i> patch in 1981."

501	<b>Aquatic</b>	<b>n</b>
	<b>Source(s)</b>	<b>Notes</b>
	Janick, J.& Paull, R.E. (2008). The Encyclopedia of Fruit and Nuts. CABI Publishing, Wallingford, UK	[Terrestrial] "This tropical to near tropical tree grows up to 1200 m in elevation and can withstand occasional low night temperatures, although it does better in a warm, humid climate. It needs at least 1000 mm annual rainfall. The tree tends to grow in cliffs or river banks, but does not tolerate salt or waterlogged conditions, preferring good drainage."

502	<b>Grass</b>	<b>n</b>
	<b>Source(s)</b>	<b>Notes</b>
	Lim, T.K. (2012). Edible Medicinal and Non-Medicinal Plants. Volume 3, Fruits. Springer, New York	"Muntingiaceae, also placed in Elaeocarpaceae, Tiliaceae"

503	<b>Nitrogen fixing woody plant</b>	<b>n</b>
	<b>Source(s)</b>	<b>Notes</b>
	Lim, T.K. (2012). Edible Medicinal and Non-Medicinal Plants. Volume 3, Fruits. Springer, New York	"Muntingiaceae, also placed in Elaeocarpaceae, Tiliaceae"

504	<b>Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)</b>	<b>n</b>
	<b>Source(s)</b>	<b>Notes</b>
	Janick, J.& Paull, R.E. (2008). The Encyclopedia of Fruit and Nuts. CABI Publishing, Wallingford, UK	"This is a rapidly growing pioneer tree of forest gaps that can reach from 5 to 12 m in height with spreading, nearly horizontal, fan-like branches."

601	<b>Evidence of substantial reproductive failure in native habitat</b>	<b>n</b>
	<b>Source(s)</b>	<b>Notes</b>
	Lim, T.K. (2012). Edible Medicinal and Non-Medicinal Plants. Volume 3, Fruits. Springer, New York	"It is native to southern Mexico, Central America, tropical South America to Peru and Bolivia, the Greater Antilles, St. Vincent and Trinidad. The plant has been widely introduced to almost all tropical regions."

602	<b>Produces viable seed</b>	<b>y</b>
	<b>Source(s)</b>	<b>Notes</b>

Qsn #	Question	Answer
	Staples, G.W. & Herbst, D.R. (2005). A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI	"Little selective breeding has been done to improve <i>M. calabura</i> , and it is usually propagated by seed or root suckers."
	Fleming, T. H., Williams, C. F., Bonaccorso, F. J., & Herbst, L. H. (1985). Phenology, Seed Dispersal, and Colonization in <i>Muntingia calabura</i> , a Neotropical Pioneer Tree. American Journal of Botany, 72(3), 383-391	"Results of our germination trials and the distribution of its seedlings along open portions of the park road indicate that <i>M. calabura</i> is a large-gap specialist "whose seeds germinate only in the high temperature and light conditions of large gaps and whose seedlings are highly shade intolerant" (Denslow, 1980)."
	Lim, T.K. (2012). Edible Medicinal and Non-Medicinal Plants. Volume 3, Fruits. Springer, New York	"This species can be sown directly from seed and can be air layered. Seed germination can be enhanced by passage through bats and birds. High temperature and light are required for germination."

603	Hybridizes naturally	n
	Source(s)	Notes
	Kubitzki, K. & Bayer, C. (eds.). (2003). The Families and genera of vascular plants. Volume V. Flowering Plants. Dicotyledons: Capparales, Malvales and Non-betalain Caryophyllales. Springer Verlag, Berlin, Heidelberg, New York	"A single species, <i>M. calabura</i> L., widely distributed throughout the Neotropics, cultivated and escaped from cultivation also in the eastern tropics." [No evidence of intergeneric hybridization found]

604	Self-compatible or apomictic	y
	Source(s)	Notes
	Fleming, T. H., Williams, C. F., Bonaccorso, F. J., & Herbst, L. H. (1985). Phenology, Seed Dispersal, and Colonization in <i>Muntingia calabura</i> , a Neotropical Pioneer Tree. American Journal of Botany, 72(3), 383-391	"Its self-compatible flowers last one day and are visited by many species of bees and butterflies (Haber et al., 1981)."
	Janick, J. & Paull, R.E. (2008). The Encyclopedia of Fruit and Nuts. CABI Publishing, Wallingford, UK	"The flower opens before dawn and lasts for only a day. Bees are the main pollinators. The species is self-compatible with the flowers opening sequentially at intervals of from 4 to 9 days along the shoot."
	Kubitzki, K. & Bayer, C. (eds.). (2003). The Families and genera of vascular plants. Volume V. Flowering Plants. Dicotyledons: Capparales, Malvales and Non-betalain Caryophyllales. Springer Verlag, Berlin, Heidelberg, New York	"The self-compatible flowers are visited by various insects, but the flower shape, the successive dehiscence of anthers within a flower, and the nectar composition suggest that <i>Muntingia</i> is mainly pollinated by bees (Bawa and Webb 1983; Webb 1984; Fleming et al. 1985)."

605	Requires specialist pollinators	n
	Source(s)	Notes
	Janick, J. & Paull, R.E. (2008). The Encyclopedia of Fruit and Nuts. CABI Publishing, Wallingford, UK	"Flower buds are raised into the flowering position for bee pollination by elongation of the pedicel and lowered to hang down for bat dispersal and birds (Webb, 1984). The flower opens before dawn and lasts for only a day. Bees are the main pollinators. The species is self-compatible with the flowers opening sequentially at intervals of from 4 to 9 days along the shoot."
	Kubitzki, K. & Bayer, C. (eds.). (2003). The Families and genera of vascular plants. Volume V. Flowering Plants. Dicotyledons: Capparales, Malvales and Non-betalain Caryophyllales. Springer Verlag, Berlin, Heidelberg, New York	"The self-compatible flowers are visited by various insects, but the flower shape, the successive dehiscence of anthers within a flower, and the nectar composition suggest that <i>Muntingia</i> is mainly pollinated by bees (Bawa and Webb 1983; Webb 1984; Fleming et al. 1985)."

606	Reproduction by vegetative fragmentation	n
	Source(s)	Notes

Qsn #	Question	Answer
	Janick, J.& Paull, R.E. (2008). The Encyclopedia of Fruit and Nuts. CABI Publishing, Wallingford, UK	"PROPAGATION This species can be sown directly from seed and can be air layered. Seed germination can be enhanced by passage through bats and birds. High temperature and light are required for germination. Seedlings grow very fast and begin to flower in as short as 1.5-2 years, when they can be 4 m tall. Cuttings can also be used."
	CAB International. (2005). Forestry Compendium. CAB International, Wallingford, UK	"Vegetative propagation by cuttings"

607	Minimum generative time (years)	2
	Source(s)	Notes
	Fleming, T. H., Williams, C. F., Bonaccorso, F. J., & Herbst, L. H. (1985). Phenology, Seed Dispersal, and Colonization in <i>Muntingia calabura</i> , a Neotropical Pioneer Tree. <i>American Journal of Botany</i> , 72(3), 383-391	"In open sites growth rate of <i>M. calabura</i> is rapid. Along the park road, one-year individuals were 2-3 m tall, and 2-yr-olds were 3-5 m tall. Old individuals are seldom greater than 10 m tall. Roadside plants flowered by the age of two years."
	Janick, J.& Paull, R.E. (2008). The Encyclopedia of Fruit and Nuts. CABI Publishing, Wallingford, UK	"Seedlings grow very fast and begin to flower in as short as 1.5-2 years, when they can be 4 m tall."

701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	
	Source(s)	Notes
	Areces-Berazain, F. (2016). <i>Muntingia calabura</i> (Jamaica cherry). CABI Compendium. <a href="https://doi.org/10.1079/cabicompendium.35164">https://doi.org/10.1079/cabicompendium.35164</a> . [Accessed 1 Sep 2023]	"In the Seychelles, it most probably arrived with the machinery used for the dredging and reclamation of the east coast of Mahé (Gerlach, 1996)."
	Swarbrick, J. T., & Hart, R. (2001). Environmental weeds of Christmas Island (Indian Ocean) and their management. <i>Plant Protection Quarterly</i> , 16(2), 54-57	" <i>Muntingia calabura</i> is probably ubiquitous throughout the island by now as dormant seeds in the soil, but since the seedlings are grazed by crabs and it requires sunlight for growth it is mainly found on roadsides and in gardens and industrial areas." [Occurs in heavily trafficked areas due to light. May facilitate accidental dispersal.]
	Janick, J.& Paull, R.E. (2008). The Encyclopedia of Fruit and Nuts. CABI Publishing, Wallingford, UK	"The sweet, sticky and sometimes slightly astringent berries are consumed fresh and as preserves and jam." [Sticky pulp may aid in accidental dispersal by vehicles, equipment, or footwear.]

702	Propagules dispersed intentionally by people	y
	Source(s)	Notes
	Lim, T.K. (2012). <i>Edible Medicinal and Non-Medicinal Plants</i> . Volume 3, Fruits. Springer, New York	"It is native to southern Mexico, Central America, tropical South America to Peru and Bolivia, the Greater Antilles, St. Vincent and Trinidad. The plant has been widely introduced to almost all tropical regions."
	Janick, J.& Paull, R.E. (2008). The Encyclopedia of Fruit and Nuts. CABI Publishing, Wallingford, UK	"Jamaica cherry, <i>Muntingia calabura</i> L. (Elaeocarpaceae), is a minor fruit species indigenous to southern Mexico, Central America, northern South America and the Greater Antilles, that has become distributed in South-east Asia and many other places where due to its good adaptation and number of trees found, people think it is a native."

Qsn #	Question	Answer
703	Propagules likely to disperse as a produce contaminant	y
	<b>Source(s)</b>	<b>Notes</b>
	Areces-Berazain, F. (2016). <i>Muntingia calabura</i> (Jamaica cherry). CABI Compendium. <a href="https://doi.org/10.1079/cabicompendium.35164">https://doi.org/10.1079/cabicompendium.35164</a> . [Accessed 1 Sep 2023]	"Because the seeds can be found in imported gardening substrates, the seedlings might be a nuisance in greenhouses (Ferrer Gallego and Laguna Lumbreras, 2013)."
704	Propagules adapted to wind dispersal	n
	<b>Source(s)</b>	<b>Notes</b>
	Lim, T.K. (2012). <i>Edible Medicinal and Non-Medicinal Plants. Volume 3, Fruits</i> . Springer, New York	"Its seeds are dispersed by birds and fruit bats."
705	Propagules water dispersed	y
	<b>Source(s)</b>	<b>Notes</b>
	Fleming, T. H., Williams, C. F., Bonaccorso, F. J., & Herbst, L. H. (1985). Phenology, Seed Dispersal, and Colonization in <i>Muntingia calabura</i> , a Neotropical Pioneer Tree. <i>American Journal of Botany</i> , 72(3), 383-391	"Although vertebrates are responsible for moving seeds away from <i>M. calabura</i> trees, final seed and seedling distributions appear to be strongly influenced by rainfall drainage patterns at Santa Rosa. Along the park road, density of <i>M. calabura</i> seedlings in 1980 and saplings in later years was highest in areas of slowly draining water. Their tiny size makes <i>M. calabura</i> seeds good candidates for water transportation from points of initial deposition to areas of concentration (e.g., in slowly draining pools). Recently drained pools of water in open sunny locations apparently represent ideal germination and establishment sites for <i>M. calabura</i> ."
706	Propagules bird dispersed	y
	<b>Source(s)</b>	<b>Notes</b>
	Fleming, T. H., Williams, C. F., Bonaccorso, F. J., & Herbst, L. H. (1985). Phenology, Seed Dispersal, and Colonization in <i>Muntingia calabura</i> , a Neotropical Pioneer Tree. <i>American Journal of Botany</i> , 72(3), 383-391	"At <i>M. calabura</i> 's fruiting peak, dozens of fruit and thousands of seeds are removed daily from each tree by birds, monkeys, and bats."
	Janick, J. & Paull, R.E. (2008). <i>The Encyclopedia of Fruit and Nuts</i> . CABI Publishing, Wallingford, UK	"Seed germination can be enhanced by passage through bats and birds."
	Swarbrick, J. T., & Hart, R. (2001). Environmental weeds of Christmas Island (Indian Ocean) and their management. <i>Plant Protection Quarterly</i> , 16(2), 54-57	"Several species of <i>Syzigium</i> (lilly pillies) have been planted in previous rehabilitation areas, where they are now in fruit. Their seeds and those of <i>Muntingia calabura</i> are dispersed by the Christmas Island Imperial Pigeon ( <i>Ducula whartoni</i> ) and possibly the Christmas Island Fruit Bat ( <i>Pteropus melanotus natalis</i> ), and seedlings are being noticed near parent trees."

Qsn #	Question	Answer
	<p>Areces-Berazain, F. (2016). <i>Muntingia calabura</i> (Jamaica cherry). CABI Compendium. <a href="https://doi.org/10.1079/cabicompendium.35164">https://doi.org/10.1079/cabicompendium.35164</a>. [Accessed 1 Sep 2023]</p>	<p>"The seeds of <i>M. calabura</i> are dispersed by vertebrates that ingest the sweet juicy fruits. In a Costa Rican dry forest, at least 16 species (six species of birds, six of phyllostomid bats, two species of monkeys, one squirrel and one coati) are known to eat the fruits (Fleming et al., 1985). The bats <i>Carollia perspicillata</i> and <i>Glosophaga soricina</i> are the main nocturnal seed dispersers, along with the diurnal orange-chinned parakeet (<i>Brotogeris jugularis</i>). In an urban area in Southeastern Brazil, 14 species of birds were observed consuming the fruits. The most frequent consumers were the sayaca tanager (<i>Thraupis sayaca</i>) and the plain parakeet (<i>Brotogeris tirica</i>) (Figueiredo et al., 2008). In urban Hong Kong, four species of birds, including the Japanese white-eyes (<i>Zosterops japonicus</i>) were recorded as fruit consumers (Corlett, 2005). In India, Thailand, peninsular Malaysia and Borneo, <i>Muntingia</i> fruits are commonly ingested by <i>Cynopterus</i> bats (Tan et al., 1998; Singaravelan and Marimuthu, 2006; Bumrungsri et al., 2007; Phillipps and Phillipps, 2016). Bats and green pigeons (<i>Treron</i> spp.) are thought to be primarily responsible for the presence of <i>M. calabura</i> in vacant building lots in Borneo (Phillipps and Phillipps, 2016)."</p>

707	Propagules dispersed by other animals (externally)	
	Source(s)	Notes
	<p>Areces-Berazain, F. (2016). <i>Muntingia calabura</i> (Jamaica cherry). CABI Compendium. <a href="https://doi.org/10.1079/cabicompendium.35164">https://doi.org/10.1079/cabicompendium.35164</a>. [Accessed 1 Sep 2023]</p>	<p>[Possibly] "In addition to vertebrates, fungus-growing ants may also possibly act as dispersers. In Southeastern Brazil, these ants were observed collecting the tiny seeds from fallen fruits and from bats and birds droppings (Figueiredo et al., 2008)."</p>

708	Propagules survive passage through the gut	y
	Source(s)	Notes
	<p>Fleming, T. H., Williams, C. F., Bonaccorso, F. J., &amp; Herbst, L. H. (1985). Phenology, Seed Dispersal, and Colonization in <i>Muntingia calabura</i>, a Neotropical Pioneer Tree. <i>American Journal of Botany</i>, 72(3), 383-391</p>	<p>"Results of the germination tests (Table 5) indicate that a lower proportion of seeds in the "green, non-bat passed" class germinated than in the other three classes (<math>\chi^2 = 39.0, P = 0.000</math>). From this we conclude 1) bat passage only "enhances" immediate seed germination in fruits that are removed before they are fully ripe, and 2) plants are not being "penalized" by reduced probabilities of seed germination by having their fruits removed by bats before they are fully ripe. We also fed ripe fruits to two captive Orangechinned Parakeets, which sucked pulp and seeds out of the fruit without mandibulating the seeds, and collected seeds from their feces. After 22 days of the same sunlight treatment given to bat-passed seeds, 41 of 59 (69.5%) of the seeds had germinated. Thus, passage through a seed-eating bird is not necessarily detrimental to <i>M. calabura</i> seeds (cf. Janzen, 1981). Parakeets apparently are legitimate dispersers of these seeds."</p>
	<p>Janick, J. &amp; Paull, R.E. (2008). <i>The Encyclopedia of Fruit and Nuts</i>. CABI Publishing, Wallingford, UK</p>	<p>"Seed germination can be enhanced by passage through bats and birds."</p>

801	Prolific seed production (>1000/m2)	y
	Source(s)	Notes
	<p>Green, P. T., Hart, R., JANTAN, J. B., Metcalfe, D. J., O'Dowd, D. J., &amp; Lake, P. S. (1999). Red crabs in rainforest on Christmas Island, Indian Ocean: No effect on the soil seed bank. <i>Australian Journal of Ecology</i>, 24(1), 90-94</p>	<p>"Averaged across blocks and treatments, <i>Muntingia calabura</i> was most abundant, occurring at almost 3200 seeds/0.19m2 and accounting for 92% of all seeds in the seed bank."</p>



Qsn #	Question	Answer
	Fleming, T. H., Williams, C. F., Bonaccorso, F. J., & Herbst, L. H. (1985). Phenology, Seed Dispersal, and Colonization in <i>Muntingia calabura</i> , a Neotropical Pioneer Tree. <i>American Journal of Botany</i> , 72(3), 383-391	"Germinable <i>M. calabura</i> seeds accumulate in the forest soil in relatively high density in areas of high frugivore activity." ... "At <i>M. calabura</i> 's fruiting peak, dozens of fruit and thousands of seeds are removed daily from each tree by birds, monkeys, and bats. Given the relatively wide-ranging foraging movements of these animals, <i>M. calabura</i> 's seeds should be widely distributed in the forest and grassland habitats of Santa Rosa."

802	Evidence that a persistent propagule bank is formed (>1 yr)	y
	<b>Source(s)</b>	<b>Notes</b>
	Green, P. T., Hart, R., JANTAN, J. B., Metcalfe, D. J., O'Dowd, D. J., & Lake, P. S. (1999). Red crabs in rainforest on Christmas Island, Indian Ocean: No effect on the soil seed bank. <i>Australian Journal of Ecology</i> , 24(1), 90-94	"The consistently high density of seeds in our study suggests that <i>Muntingia</i> is quite long-lived in the soil, a view consistent with Fleming et al. (1985), but at odds with the laboratory studies of Laura et al. (1994)."
	Fleming, T. H., Williams, C. F., Bonaccorso, F. J., & Herbst, L. H. (1985). Phenology, Seed Dispersal, and Colonization in <i>Muntingia calabura</i> , a Neotropical Pioneer Tree. <i>American Journal of Botany</i> , 72(3), 383-391	"These data indicate that forest soil in an area of low <i>M. calabura</i> density (< 2 per ha) contains a relatively high density of that species' seeds. This high soil seed density probably represents an accumulation of dormant seeds over several years because the rate of deposition of seeds on the soil surface by vertebrates is low in this forest (D. Thomas, pers. comm.; T.H.F., unpubl. data)."

803	Well controlled by herbicides	y
	<b>Source(s)</b>	<b>Notes</b>
	Areces-Berazain, F. (2016). <i>Muntingia calabura</i> (Jamaica cherry). CABI Compendium. <a href="https://doi.org/10.1079/cabicompendium.35164">https://doi.org/10.1079/cabicompendium.35164</a> . [Accessed 1 Sep 2023]	" <i>M. calabura</i> can be successfully controlled by spraying the foliage with 41% glyphosate solution, but this method requires extensive safety measures and can affect non-targeted plants. Stem cutting combined with the application of 41% glyphosate solution on the stump sapwood is a better alternative, as well as the stem injection with 41% glyphosate solution (Koh et al., 2012)."

804	Tolerates, or benefits from, mutilation, cultivation, or fire	y
	<b>Source(s)</b>	<b>Notes</b>
	CAB International. (2005). <i>Forestry Compendium</i> . CAB International, Wallingford, UK	"It self-seeds freely, regenerates rapidly under most soil conditions, including alkaline and saline soils, coppices well, and tolerates drought, shade and weeds."

805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	
	<b>Source(s)</b>	<b>Notes</b>
	Staples, G.W. & Herbst, D.R. (2005). <i>A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places</i> . Bishop Museum Press, Honolulu, HI	[Unknown] "It is probably fortunate that <i>M. calabura</i> is not much cultivated in Hawaii because of its potential to become a noxious arboreal weed here, much as it already has in other tropical places, including many Pacific islands."



**Summary of Risk Traits:**

*Muntingia calabura* (Jamaican cherry) is a small tree or shrub native to tropical regions of the Americas, including parts of Central and South America. It is reported to be widely cultivated and naturalized throughout the tropics and is as “potentially naturalizing” in the Hawaiian Islands on Kauai and Oahu. Although it is grown and valued for its edible fruit, it is also regarded as a disturbance weed in several locations worldwide due to its ability to prolifically self-seed, spread by birds and other animals, and form dense thickets that may exclude desirable vegetation.

**High Risk / Undesirable Traits**

- Thrives and spreads in regions with tropical climates
- “Potentially naturalizing” on Kauai and Oahu (Hawaiian Islands) and widely naturalized in the wet tropics
- A disturbance adapted weed, rapidly invading light gaps and potentially impacting other desirable vegetation
- Regarded as a minor environmental weed on Christmas Island (Indian Ocean) and an environmental weed of unspecified impacts in Australia
- Potentially allelopathic
- Alternate host of fruit flies and other plant pests
- Tolerates many soil types
- Capable of forming dense thickets
- Reproduces by seed
- Self-compatible
- Able to reach reproductive maturity in 1.5 to 2 years
- Seeds dispersed by birds, other fruit eating animals, water, and both accidentally as a produce contaminant and through intentional cultivation.
- Prolific seed production
- Reported to form a persistent seed bank (longevity unspecified)
- Able to coppice and resprout repeatedly following cutting

**Low Risk Traits**

- Cultivated and valued as a fruit tree
- Unarmed (no spines, thorns, or burrs)
- Palatable and used as a fodder plant
- Non-toxic
- Seedlings are highly shade intolerant (dense shade may inhibit spread)
- Not reported to spread vegetatively
- Herbicides may provide effective control

