

<b>Taxon:</b> <i>Passiflora laurifolia</i> L.	<b>Family:</b> Passifloraceae
<b>Common Name(s):</b> bell apple Jamaica honeysuckle passion fruit sweetcup water lemon yellow granadilla yellow water lemon	<b>Synonym(s):</b> Granadilla laurifolia Medik. <i>Passiflora laurifolia</i> var. <i>tinifolia</i> Bois <i>Passiflora oblongifolia</i> Pulle <i>Passiflora tinifolia</i> Juss.

<b>Assessor:</b> Chuck Chimera	<b>Status:</b> Assessor Approved	<b>End Date:</b> 26 Jul 2022
<b>WRA Score:</b> 9.0	<b>Designation:</b> H(Hawai'i)	<b>Rating:</b> High Risk

**Keywords:** Naturalized Vine, Environmental Weed, Toxic Properties, Self-Incompatible, Animal-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	n
204	Native or naturalized in regions with tropical or subtropical climates	y=1, n=0	y
205	Does the species have a history of repeated introductions outside its natural range?	y=-2, ?=-1, n=0	y
301	Naturalized beyond native range	y = 1*multiplier (see Appendix 2), n= question 205	y
302	Garden/amenity/disturbance weed		
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)	y
305	Congeneric weed	n=0, y = 1*multiplier (see Appendix 2)	y
401	Produces spines, thorns or burrs	y=1, n=0	n
402	Allelopathic		
403	Parasitic	y=1, n=0	n
404	Unpalatable to grazing animals		

Qsn #	Question	Answer Option	Answer
405	Toxic to animals		
406	Host for recognized pests and pathogens		
407	Causes allergies or is otherwise toxic to humans	y=1, n=0	y
408	Creates a fire hazard in natural ecosystems	y=1, n=0	n
409	Is a shade tolerant plant at some stage of its life cycle		
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	y
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		
604	Self-compatible or apomictic	y=1, n=-1	n
605	Requires specialist pollinators	y=-1, n=0	n
606	Reproduction by vegetative fragmentation		
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)	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		
706	Propagules bird dispersed	y=1, n=-1	y
707	Propagules dispersed by other animals (externally)	y=1, n=-1	n
708	Propagules survive passage through the gut	y=1, n=-1	y
801	Prolific seed production (>1000/m <sup>2</sup> )		
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	y
804	Tolerates, or benefits from, mutilation, cultivation, or fire		
805	Effective natural enemies present locally (e.g. introduced biocontrol agents)		

**Supporting Data:**

Qsn #	Question	Answer
101	Is the species highly domesticated?	n
	Source(s)	Notes
	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.	"Cultivated prior to 1871 (Hillebrand, 1888)." [Although cultivated for an extensive period of time, no evidence of being subjected to substantial human selection for at least 20 generations]

102	Has the species become naturalized where grown?	
	Source(s)	Notes
	WRA Specialist. (2022). Personal Communication	NA

103	Does the species have weedy races?	
	Source(s)	Notes
	WRA Specialist. (2022). 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
	Source(s)	Notes
	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.	"Native to the West Indies, Guianas, and South America from Venezuela to eastern Brazil, where it is widely cultivated"
	USDA, Agricultural Research Service, National Plant Germplasm System. (2022). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. <a href="https://npgsweb.ars-grin.gov/">https://npgsweb.ars-grin.gov/</a> . [Accessed 22 Jul 2022]	"Native Southern America CARIBBEAN: Antigua and Barbuda, Barbados, Cuba, Dominica, Guadeloupe, Grenada, St. Lucia, Montserrat, Martinique, United States [Puerto Rico], St. Vincent and Grenadines NORTHERN SOUTH AMERICA: French Guiana, Guyana, Suriname, Venezuela WESTERN SOUTH AMERICA: Peru"

202	Quality of climate match data	High
	Source(s)	Notes
	USDA, Agricultural Research Service, National Plant Germplasm System. (2022). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. <a href="https://npgsweb.ars-grin.gov/">https://npgsweb.ars-grin.gov/</a> . [Accessed 22 Jul 2022]	

203	Broad climate suitability (environmental versatility)	n
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Qsn #	Question	Answer
	<b>Source(s)</b>	<b>Notes</b>
	Trade Winds Fruit. (2022). Water Lemon - <i>Passiflora laurifolia</i> . <a href="https://www.tradewindsfruit.com/content/water-lemon.htm">https://www.tradewindsfruit.com/content/water-lemon.htm</a> . [Accessed 25 Jul 2022]	"Hardiness - Tropical, will not stand any frost."
	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.	"in Hawai'i naturalized in mesic to wet, disturbed areas, climbing over vegetation, 0-280 m"
	Plants for a Future. (2022). <i>Passiflora laurifolia</i> . <a href="https://pfaf.org/user/Plant.aspx?LatinName=Passiflora+laurifolia">https://pfaf.org/user/Plant.aspx?LatinName=Passiflora+laurifolia</a> . [Accessed 25 Jul 2022]	"USDA hardiness - 10-12"

<b>204</b>	<b>Native or naturalized in regions with tropical or subtropical climates</b>	<b>y</b>
	<b>Source(s)</b>	<b>Notes</b>
	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.	"Native to the West Indies, Guianas, and South America from Venezuela to eastern Brazil, where it is widely cultivated; in Hawai'i naturalized in mesic to wet, disturbed areas, climbing over vegetation, 0-280 m, on Kaua'i, a'ahu, Moloka'i, and Hawai'i."

<b>205</b>	<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>
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	Introduced and naturalized in a number of locations worldwide

<b>301</b>	<b>Naturalized beyond native range</b>	<b>y</b>
	<b>Source(s)</b>	<b>Notes</b>
	Starr, F., Martz, K. & Loope, L.L. (1999). New plant records from East Maui for 1998. Bishop Museum Occasional Papers 59(2): 11-15	[East Maui] <i>Passiflora laurifolia</i> L. Range extension <i>Passiflora laurifolia</i> , a native of Central and South America, is reported by Wagner et al. (1990: 1011) from Kaua'i, O'ahu, Moloka'i, and Hawai'i. Meidell et al. (1998: 7) reported <i>P. laurifolia</i> from West Maui as a new island record. This collection represents the range extension of <i>P. laurifolia</i> to East Maui. The collection was made from a forested thicket of <i>Hibiscus tiliaceus</i> , <i>Psidium guajava</i> , <i>Ardisia elliptica</i> , and <i>Pandanus tectorius</i> . Material examined. MAUI: Häna District, East Maui, Wailua, Häna Hwy., Wailua Valley lookout park, 480 ft [145 m], 4 Aug 1998, Starr & Martz 980807-22."
	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.	[Kauai, Oahu, Molokai and Hawaii] "in Hawai'i naturalized in mesic to wet, disturbed areas, climbing over vegetation, 0- 280 m, on Kaua'i, O'ahu, Moloka'i, and Hawai'i. Cultivated prior to 1871 (Hillebrand, 1888)."

Qsn #	Question	Answer
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	[Listed as naturalized and/or weedy in a number of locations worldwide] References: United States of America-CE-233, southeast Asia-W-191, Australia-N-368, United States of America-CE-617, Singapore-N-196, Pacific-W-3, Australia-C-401, Pacific-E-621, Australia-N-310, United States of America-N-301, United States of America-E-151, United States of America-N-839, Australia-N-864, Australia-N-354, Australia-I-1088, Australia-Q-1134, Singapore-N-1290, United States of America-N-1292, New Caledonia-I-1507, French Polynesia-N-1514, Global-CD-1611, United States of America-W-1719, United States of America-E-1736, Taiwan-W-1748, North America-N-1760, Singapore-N-1839, -I-Australia-W-1977, Cook Islands-W-1977, Fiji-W-1977, India-W-1977, Malaysia-W-1977, Marshall Islands-W-1977, Niue-W-1977, Palau-W-1977, Samoa-W-1977, Singapore-W-1977, Tonga-W-1977."
	Meidell, J. S., Oppenheimer, H. L. & Bartlett, R. T. (1998). New plant records from West Maui. Bishop Museum Occasional Papers. 56: 6-8	[West Maui] "Passiflora laurifolia L. New island record Wagner et al. (1990: 1011) cited the naturalized range of this taxon in Hawai'i as Kaua'i, O'ahu, Moloka'i and Hawai'i. Surveys of the ridges between Alaeloa Gulch and Honokohau Valley, West Maui, revealed at least 10 apparently naturalized individuals occupying alien dominated Lowland Mesic Forest at an elevation of 378 m. Material examined: MAUI: Lahaina District, West Maui, Honokahua, 378 m, 31 Oct 1996, Meidell & Oppenheimer 129 (BISH)."

302	Garden/amenity/disturbance weed	
	Source(s)	Notes
	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.	"in Hawai'i naturalized in mesic to wet, disturbed areas, climbing over vegetation, 0-280 m" [Impacts may be minimal if occurring in disturbed habitats]
	Meidell, J. S., Oppenheimer, H. L. & Bartlett, R. T. (1998). New plant records from West Maui. Bishop Museum Occasional Papers. 56: 6-8	"Surveys of the ridges between Alaeloa Gulch and Honokohau Valley, West Maui, revealed at least 10 apparently naturalized individuals occupying alien dominated Lowland Mesic Forest at an elevation of 378 m." [Impacts may be negligible in disturbed habitats]
	Starr, F., Starr, K. & Loope, L. (2003). <i>Passiflora laurifolia</i> . <a href="http://www.starrenvironmental.com/publications/species_reports/pdf/passiflora_laurifolia.pdf">http://www.starrenvironmental.com/publications/species_reports/pdf/passiflora_laurifolia.pdf</a> . [Accessed 26 Jul 2022]	[No specific impacts described at time of publication] "P. laurifolia is well established on Maui. It is only occasionally cultivated, and doesn't yet cover vast acreage, but is found in many widely scattered patches in remote, virtually inaccessible areas. At this time, it would be difficult to locate and control all the individuals of this species on Maui. Perhaps it could be put on a list of plants known to escape from gardens."
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	Cited as a weed in a number of locations

303	Agricultural/forestry/horticultural weed	n
	Source(s)	Notes
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	No evidence

304	Environmental weed	y
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Qsn #	Question	Answer
	<b>Source(s)</b>	<b>Notes</b>
	Meidell, J. S., Oppenheimer, H. L. & Bartlett, R. T. (1998). New plant records from West Maui. Bishop Museum Occasional Papers. 56: 6-8	"Surveys of the ridges between Alaeloa Gulch and Honokohau Valley, West Maui, revealed at least 10 apparently naturalized individuals occupying alien dominated Lowland Mesic Forest at an elevation of 378 m."
	US Fish and Wildlife Service. (2015). Endangered and Threatened Wildlife and Plants; Endangered Status for 49 Species From the Hawaiian Islands; Proposed Rule. Federal Register Vol. 80, No. 189: 58820-58909	[Identified as a threat to the endangered plant <i>Kadua haupuensis</i> ] "Nonnative plants such as <i>Caesalpinia decapetala</i> (wait-a-bit) and <i>Passiflora laurifolia</i> (yellow granadilla), and various grasses that modify and destroy native habitat and outcompete native plants are found at the last known location of <i>K. haupuensis</i> ."
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	Cited as naturalized or weedy in a number of locations

305	Congeneric weed	y
	<b>Source(s)</b>	<b>Notes</b>
	Smith, C.W. (1985). Impact of Alien Plants on Hawaii's Native Biota. Pp. 180-250 in Stone & Scott (eds.). Hawaii's terrestrial ecosystems: preservation & management. CPSU, Honolulu, HI	[ <i>Passiflora tarminiana</i> - Synonyms: <i>Passiflora mollissima</i> (Misapplied)] "This light-loving vine can rapidly reach and smother the forest canopy when the sub-canopy vegetation is disturbed either naturally, by hurricanes and other high winds, or by man or feral pigs (La Rosa 1983). Feral pigs are the principal short-distance dispersal agents (Warshauer et al. 1983). Alien frugivorous and granivorous birds as well as man act as long distance dispersal agents."

Qsn #	Question	Answer
	<p>LaRosa, A. M. (1992). The status of banana poka in Hawaii. Pp. 271-299 in Stone, C.P. et al. Alien Plant Invasions in Native Ecosystems of Hawaii. University of Hawaii Press, Honolulu</p>	<p>[<i>Passiflora tarminiana</i> = Synonyms: <i>Passiflora mollissima</i> (Misapplied)] "Banana poka (<i>Passiflora mollissima</i>), a weedy, perennial liana from the Andean highlands, has invaded many of the major upland wet and mesic koa-`ohi`a (<i>Acacia koa</i>-<i>Metrosideros polymorpha</i>) forests on the islands of Hawai`i and Kaua`i. Small, isolated populations have also been found on Maui. Infestations range from scattered individuals with low cover to areas of 100% cover, the latter often inhibiting growth and reproduction of native forest species. According to recent assessments of distribution and abundance in Hawai`i, approximately 200 mi (520 km ) are infested with this species. As with many tropical lianas, banana poka exhibits an efficient pattern of resource allocation, including staggered germination, rapid growth rates, early reproductive maturity, continuous growth and reproduction, and high seed output. These adaptations and effective dissemination through a number of alien mammals and birds that eat the fruit and seeds have led to the rapid spread of the species in Hawai`i. Annual rainfall in excess of 177-200 in. (4,500-5,100 mm), extremes of elevation, and intensive agriculture appear to limit the distribution of banana poka; very low light levels may check the rate of spread and extent of cover. Establishment and proliferation of the species in low light areas is accomplished through the mechanism of "gap-phase" replacement. Control efforts must address biological and sociopolitical factors. Although banana poka has no known economic value and is a noxious plant in Hawai`i, its close relationship to the edible passion fruit, <i>P. edulis</i>, has led to resistance by certain local groups to its control. Control of introduced mammals (especially the feral pig, <i>Sus scrofa</i>) and birds that disseminate seeds and often increase the rates of spread and establishment is a necessary adjunct to banana poka control. Deliberate practices that open up closed-canopy forests should also be discouraged, as spread of this climber is tied to disturbance."</p>
	<p>Weber, E. (2017). Invasive Plant Species of the World, 2nd Edition: A Reference Guide to Environmental Weeds. CABI Publishing, Wallingford, UK</p>	<p>[<i>Passiflora tripartita</i> var. <i>mollissima</i>] "Where invasive, the plant forms dense curtains of trailing and climbing stems, completely smothering trees, shrubs and understorey plants. The altered structure and reduced species richness of invaded forests prevents forest regeneration and affects wildlife by reducing abundance of food plants. Pieces of stems easily root and the plant also spreads by stem layering. The vine resprouts from cut stumps (Blood, 2001). Fruits are abundantly produced and seeds are dispersed by birds and mammals. In its native range, natural pollinators of this plant are hummingbirds. In New Zealand, fruit set is nevertheless high because introduced honeybees and bumblebees successfully pollinate the flowers (Beavon and Kelly, 2012). Seeds may remain viable in the soil for more than 1 year (Muyt, 2001). Seedlings are shade tolerant and reach high densities, growing rapidly if a canopy gap is formed. This enables the vine to invade even closed forests (Williams and Buxton, 1995)."</p>

401	Produces spines, thorns or burrs	n
	Source(s)	Notes

Qsn #	Question	Answer
	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.	[No evidence] "Lianas. Leaves coriaceous, blades oblong, 6.5-14 cm long, 4.5-6.5 cm wide, glabrous, margins entire, petioles with 2 rounded, sessile nectaries ca. 1 mm long at apex, stipules linear-lanceolate, up to ca.10 mm long, deciduous. Flowers pendent, campanulate, 6-7 cm in diameter, peduncles solitary, bracts obovate to elliptic, 3.5-4.3 cm long, 2-2.8 cm wide; hypanthium 0.4-0.8 cm long; sepals and petals white or spotted with purple; corona purple-banded, filamentous, ca. 2 cm long. Berries yellow, ovate to globose, 5-6.3 cm long, 3-4.5 cm in diameter, aril white, edible"

402	Allelopathic	
	Source(s)	Notes
	Khanh, T. D., Hong, N. H., Xuan, T. D., & Chung, I. M. (2005). Paddy weed control by medicinal and leguminous plants from Southeast Asia. <i>Crop Protection</i> , 24(5), 421-431	[No information on allelopathy of <i>Passiflora laurifolia</i> , but extracts of two members of the genus are documented to have allelopathic properties under experimental conditions] "Dry extracts: Three plant species...and <i>P. incarnata</i> , showed the strongest inhibition percentages, with extracts from their plant parts completely inhibiting the germination and growth of radish (100% inhibition):
	Khanh, T. D., Chung, I. M., Tawata, S., & Xuan, T. D. (2006). Weed suppression by <i>Passiflora edulis</i> and its potential allelochemicals. <i>Weed Research</i> , 46(4), 296-303	[No information on allelopathy of <i>Passiflora laurifolia</i> , but extracts of two members of the genus are documented to have allelopathic properties under experimental conditions] "Our study revealed that the plant contains a strong allelopathic potential. In a bioassay, aqueous extracts of <i>P. edulis</i> strongly suppressed germination and growth of lettuce, radish and two major paddy rice weeds"

403	Parasitic	n
	Source(s)	Notes
	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.	"Lianas. Leaves coriaceous, blades oblong, 6.5-14 cm long, 4.5-6.5 cm wide, glabrous, margins entire, petioles with 2 rounded, sessile nectaries ca. 1 mm long at apex, stipules linear-lanceolate, up to ca.10 mm long, deciduous." [Passifloraceae. No evidence]

404	Unpalatable to grazing animals	
	Source(s)	Notes
	WRA Specialist. (2022). Personal Communication	Unknown

405	Toxic to animals	
	Source(s)	Notes
	Morton, J. (1987). Water Lemon. p. 331–332. In: <i>Fruits of warm climates</i> . Julia F. Morton, Miami, FL. <a href="https://hort.purdue.edu/newcrop/morton/water_lemon.html">https://hort.purdue.edu/newcrop/morton/water_lemon.html</a> . [Accessed ]	"The rind, leaves and seeds contain a cyanogenic glycoside. On the other hand, the leaves possess 387 mg, per 100 g, ascorbic acid. The leaf decoction is taken as a vermifuge. The seeds have a sedative action on the nervous system and heart and, in strong doses, are hypnotic. The root acts as a very potent vermifuge." [Unknown. No specific mention of toxicity to grazing animals]

406	Host for recognized pests and pathogens	



Qsn #	Question	Answer
	<b>Source(s)</b>	<b>Notes</b>
	Morton, J. (1987). Water Lemon. p. 331–332. In: Fruits of warm climates. Julia F. Morton, Miami, FL. <a href="https://hort.purdue.edu/newcrop/morton/water_lemon.html">https://hort.purdue.edu/newcrop/morton/water_lemon.html</a> . [Accessed 26 Jul 2022]	" Pests - Trials have shown that the vine is fairly resistant to rootknot nematodes in Florida."
	Crop Knowledge Master. (1994). Colletotrichum Primer. <a href="http://www.extento.hawaii.edu/kbase/crop/Type/col_pri_m.htm">http://www.extento.hawaii.edu/kbase/crop/Type/col_pri_m.htm</a> . [Accessed 26 Jul 2022]	"?Colletotrichum crassipes Found on Leaves and Fruit: passion fruit ( <i>Passiflora edulis</i> ) yellow granadilla ( <i>Passiflora laurifolia</i> )"
	CABI. (2022). Invasive Species Compendium. Wallingford, UK: CAB International. <a href="http://www.cabi.org/isc">www.cabi.org/isc</a>	[ <i>Passiflora laurifolia</i> ] "Minor host of: <i>Spodoptera frugiperda</i> (fall armyworm)"

407	Causes allergies or is otherwise toxic to humans	y
	<b>Source(s)</b>	<b>Notes</b>
	Khare, C. (2007) <i>Passiflora laurifolia</i> Linn.. In: Khare C. (eds) <i>Indian Medicinal Plants</i> . Springer, New York, NY	"Leaves—anthelmintic. Seeds—hypnodil. Fruit—edible. Plant—poisonous (the foliage produces hydrocyanic acid)."
	Morton, J. (1987). Water Lemon. p. 331–332. In: Fruits of warm climates. Julia F. Morton, Miami, FL. <a href="https://hort.purdue.edu/newcrop/morton/water_lemon.html">https://hort.purdue.edu/newcrop/morton/water_lemon.html</a> . [Accessed 26 Jul 2022]	"Toxicity - The rind, leaves and seeds contain a cyanogenic glycoside. On the other hand, the leaves possess 387 mg, per 100 g, ascorbic acid. The leaf decoction is taken as a vermifuge. The seeds have a sedative action on the nervous system and heart and, in strong doses, are hypnotic. The root acts as a very potent vermifuge."
	Wiart, C. (2006). <i>Medicinal plants of Asia and the Pacific</i> . CRC Press, Boca Raton, FL	"Yellow Granadilla, Belle Apple, Yellow Water-Lemon, also known as pomme-liane, pomme d'or (French), bua susu (Malay), pasio vao (Samoa), and vaine 'ae kuma (Tonga), is known to be toxic in Cambodia, Laos, and Vietnam. The pharmacology of this plant is unexplored. Cyanogenetic glycosides are most likely responsible for the toxicity of the plant."

408	Creates a fire hazard in natural ecosystems	n
	<b>Source(s)</b>	<b>Notes</b>
	WRA Specialist. (2022). Personal Communication	A tropical vine growing in wetter conditions with no documented evidence of promoting or otherwise creating fire hazards in natural ecosystems.

409	Is a shade tolerant plant at some stage of its life cycle	
	<b>Source(s)</b>	<b>Notes</b>
	Plants for a Future. (2022). <i>Passiflora laurifolia</i> . <a href="https://pfaf.org/user/Plant.aspx?LatinName=Passiflora+laurifolia">https://pfaf.org/user/Plant.aspx?LatinName=Passiflora+laurifolia</a> . [Accessed 26 Jul 2022]	"It can grow in semi-shade (light woodland) or no shade."
	Flora Fauna Web. (2022). <i>Passiflora laurifolia</i> . <a href="https://www.nparks.gov.sg/florafaunaweb/flora/1/4/1467">https://www.nparks.gov.sg/florafaunaweb/flora/1/4/1467</a> . [Accessed 26 Jul 2022]	"It tolerates semi-shaded conditions, but it produces more fruit under full sun."

410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y
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Qsn #	Question	Answer
	<b>Source(s)</b>	<b>Notes</b>
	Trade Winds Fruit. (2022). Water Lemon - <i>Passiflora laurifolia</i> . <a href="https://www.tradewindsfruit.com/content/water-lemon.htm">https://www.tradewindsfruit.com/content/water-lemon.htm</a> . [Accessed 26 Jul 2022]	"Subtropical, grows in most soil types, provided they are well draining."
	Morton, J. (1987). Water Lemon. p. 331–332. In: Fruits of warm climates. Julia F. Morton, Miami, FL. <a href="https://hort.purdue.edu/newcrop/morton/water_lemon.html">https://hort.purdue.edu/newcrop/morton/water_lemon.html</a> . [Accessed 26 Jul 2022]	"The vine has grown and flowered well on sand and on limestone in Florida."

411	Climbing or smothering growth habit	y
	<b>Source(s)</b>	<b>Notes</b>
	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.	"in Hawai'i naturalized in mesic to wet, disturbed areas, climbing over vegetation, 0-280 m"
	Acevedo-Rodríguez, P. (2005). Vines and Climbing Plants of Puerto Rico and the Virgin Islands. Contributions from the United States National Herbarium Volume 51: 1-483. Smithsonian Institution, Washington, D.C.	"Woody vine, glabrous, attaining 2-5(-10) m in length and climbs by means of axillary tendrils."

412	Forms dense thickets	n
	<b>Source(s)</b>	<b>Notes</b>
	Acevedo-Rodríguez, P. (2005). Vines and Climbing Plants of Puerto Rico and the Virgin Islands. Contributions from the United States National Herbarium Volume 51: 1-483. Smithsonian Institution, Washington, D.C.	[Occurs in thickets] "In the Virgin Islands (St. Croix, St. John, St. Thomas and Tortola) it is found in disturbed areas, thickets, and secondary forests at low elevation."
	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.	[Potentially smothering, but no evidence that this vine forms thickets] "in Hawai'i naturalized in mesic to wet, disturbed areas, climbing over vegetation, 0-280 m"

501	Aquatic	n
	<b>Source(s)</b>	<b>Notes</b>
	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.	[Terrestrial] "in Hawai'i naturalized in mesic to wet, disturbed areas, climbing over vegetation, 0-280 m"

Qsn #	Question	Answer
502	Grass	n
	Source(s)	Notes
	USDA, Agricultural Research Service, National Plant Germplasm System. (2022). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. <a href="https://npgsweb.ars-grin.gov/">https://npgsweb.ars-grin.gov/</a> . [Accessed 25 Jul 2022]	Family: Passifloraceae Subfamily: Passifloroideae Tribe: Passifloreae

503	Nitrogen fixing woody plant	n
	Source(s)	Notes
	USDA, Agricultural Research Service, National Plant Germplasm System. (2022). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. <a href="https://npgsweb.ars-grin.gov/">https://npgsweb.ars-grin.gov/</a> . [Accessed 25 Jul 2022]	Family: Passifloraceae Subfamily: Passifloroideae Tribe: Passifloreae

504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	n
	Source(s)	Notes
	Acevedo-Rodríguez, P. (2005). Vines and Climbing Plants of Puerto Rico and the Virgin Islands. Contributions from the United States National Herbarium Volume 51: 1-483. Smithsonian Institution, Washington, D.C.	"Woody vine, glabrous, attaining 2-5(-10) m in length and climbs by means of axillary tendrils."

601	Evidence of substantial reproductive failure in native habitat	n
	Source(s)	Notes
	Acevedo-Rodríguez, P. (2005). Vines and Climbing Plants of Puerto Rico and the Virgin Islands. Contributions from the United States National Herbarium Volume 51: 1-483. Smithsonian Institution, Washington, D.C.	[No evidence] "In the Virgin Islands (St. Croix, St. John, St. Thomas and Tortola) it is found in disturbed areas, thickets, and secondary forests at low elevation. Also throughout the Antilles and South America, extensively cultivated for its flowers and fruits."

602	Produces viable seed	y
	Source(s)	Notes

Qsn #	Question	Answer
	<p>Rezazadeh, A., &amp; Stafne, E. T. (2018). Comparison of Seed Treatments on the Germination of Seven Passion Fruit Species. <i>International Journal of Current Microbiology and Applied Sciences</i>, 7(11), 3074-3083</p>	<p>"Passiflora is a large genus in the family Passifloraceae Juss. ex DC. Many <i>Passiflora</i> species are propagated by seed. However, seeds are often slow to germinate and have low germination rates due to seed dormancy factors. This study was conducted to evaluate four different pre-germination treatments on enhancing germination potential in seven <i>Passiflora</i> spp. Germination was monitored every 3 days for 90 days. Germination started after two weeks and then, a gradual increase was observed in germination in most species. <i>Passiflora laurifolia</i> L. showed maximal germination percentage (75%) with scarification plus fermentation; thus, it is the recommended treatment for this species. The highest germination rate was obtained for <i>Passiflora maliformis</i> L. at 0.23 in scarification plus GA3. For <i>P. maliformis</i>, scarification in combination with GA3 was the most effective treatment, resulting in a germination percentage of 40%. <i>Passiflora tripartita</i> var. <i>Mollissima</i> showed highest germination percentage when soaked in water or scarified plus GA3 (30%). Scarification alone resulted in the best germination percentage in <i>Passiflora ligularis</i> Juss. (30%). No unique pre-germination treatment resulted in complete germination for all species. When compared to results from previous research, <i>Passiflora edulis</i> f. <i>edulis</i> Sims. and <i>Passiflora incarnata</i> L. did not germinate at acceptable levels, whereas similar germination percentages in <i>P. tripartita</i> var. <i>mollissima</i>, <i>P. maliformis</i>, and <i>P. ligularis</i> depended on treatment. Further research is needed to determine dormancy types present in these species and the best treatment to overcome them."</p>
	<p>Morton, J. (1987). Water Lemon. p. 331–332. In: <i>Fruits of warm climates</i>. Julia F. Morton, Miami, FL. <a href="https://hort.purdue.edu/newcrop/morton/water_lemon.html">https://hort.purdue.edu/newcrop/morton/water_lemon.html</a>. [Accessed 25 Jul 2022]</p>	<p>"Propagation. The water lemon grows readily from seeds or cuttings."</p>

603	Hybridizes naturally	
	Source(s)	Notes
	<p>Yockteng, R., d'Eeckenbrugge, G. C., &amp; Souza-Chies, T. T. (2011). <i>Passiflora</i>. In <i>Wild Crop Relatives: Genomic and Breeding Resources</i> (pp. 129-171). Springer, Berlin, Heidelberg</p>	<p>[Unknown. Artificial hybrids possible] "Recently, 17 interspecific F1 hybrids were generated from the crosses <i>P. laurifolia</i> x <i>P. nitida</i>, <i>P. edulis</i> f. <i>flavicarpa</i> x <i>P. coccinea</i>, <i>P. caerulea</i> x <i>P. amethystina</i> J.C. Mikan, <i>P. glandulosa</i> Cav. x <i>P. galbana</i> Mast., <i>P. coccinea</i> x <i>P. actinia</i>, <i>P. glandulosa</i> x <i>P. edulis</i> f. <i>flavicarpa</i>, <i>P. sidaefolia</i> M. Roemer x <i>P. actinia</i>, <i>P. galbana</i> x <i>P. actinia</i>, F1 (<i>P. coccinea</i> x <i>P. setacea</i> x <i>P. coccinea</i>), F1 (<i>P. coccinea</i> x <i>P. setacea</i>) x <i>P. mucronata</i> Lam., <i>P. eichleriana</i> x <i>P. gibertii</i> N.E. Br., <i>P. galbana</i> x <i>P. edulis</i> f. <i>flavicarpa</i>, <i>P. glandulosa</i> x <i>P. edulis edulis</i>, <i>P. glandulosa</i> x <i>P. sidaefolia</i>, <i>P. coccinea</i> x <i>P. setacea</i>. Their success was confirmed using RAPD markers (Junqueira et al. 2008)."</p>

604	Self-compatible or apomictic	n
	Source(s)	Notes
	<p>Roubik, D.W. (1995). <i>Pollination of cultivated plants in the tropics</i>. FAO Services Bulletin 118. FAO, Rome, Italy</p>	<p>"Appendix I." [<i>Passiflora laurifolia</i> - Breed. Sys. - OC = obligately outcrossing]</p>

Qsn #	Question	Answer
	Holttum, R.E. & Enoch, I. (1992). Gardening in the Tropics. Timber Press, Portland, OR	"If fruit is needed, two or more plants must be grown so that cross-pollination can occur."
	Morton, J. (1987). Water Lemon. p. 331–332. In: Fruits of warm climates. Julia F. Morton, Miami, FL. <a href="https://hort.purdue.edu/newcrop/morton/water_lemon.html">https://hort.purdue.edu/newcrop/morton/water_lemon.html</a> . [Accessed 26 Jul 2022]	"The water lemon flowers open only in the afternoon, and apparently are not self-pollinated, or only slightly so. Cross-pollination is required for good crops. If carpenter bees are not present at the right time, the pollen must be transferred by hand."

605	Requires specialist pollinators	n
	Source(s)	Notes
	Morton, J. (1987). Water Lemon. p. 331–332. In: Fruits of warm climates. Julia F. Morton, Miami, FL. <a href="https://hort.purdue.edu/newcrop/morton/water_lemon.html">https://hort.purdue.edu/newcrop/morton/water_lemon.html</a> . [Accessed ]	"If carpenter bees are not present at the right time, the pollen must be transferred by hand."
	Roubik, D.W. (1995). Pollination of cultivated plants in the tropics. FAO Services Bulletin 118. FAO, Rome, Italy	"Pollinators - bee, Xylocopa, wasp, bird"

606	Reproduction by vegetative fragmentation	
	Source(s)	Notes
	Morton, J. (1987). Water Lemon. p. 331–332. In: Fruits of warm climates. Julia F. Morton, Miami, FL. <a href="https://hort.purdue.edu/newcrop/morton/water_lemon.html">https://hort.purdue.edu/newcrop/morton/water_lemon.html</a> . [Accessed 26 Jul 2022]	"The water lemon grows readily from seeds or cuttings."
	WRA Specialist. (2022). Personal Communication	No information on reproduction by vegetative fragmentation without the assistance of humans, although species can be propagated by cuttings.

607	Minimum generative time (years)	2
	Source(s)	Notes
	Flora Fauna Web. (2022). <i>Passiflora laurifolia</i> . <a href="https://www.nparks.gov.sg/florafaunaweb/flora/1/4/1467">https://www.nparks.gov.sg/florafaunaweb/flora/1/4/1467</a> . [Accessed 26 Jul 2022]	"Plant Growth Rate - Fast"
	Daleys Fruit Tree Nursery. (2022). Passionfruit - Water Lemon. <a href="https://www.daleysfruit.com.au/buy/passionfruit-water-lemon-tree.htm">https://www.daleysfruit.com.au/buy/passionfruit-water-lemon-tree.htm</a> . [Accessed 26 Jul 2022]	"Time to Fruit/Flower/Harvest 2-3 Years"

701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	n
	Source(s)	Notes
	Acevedo-Rodríguez, P. (2005). Vines and Climbing Plants of Puerto Rico and the Virgin Islands. Contributions from the United States National Herbarium Volume 51: 1-483. Smithsonian Institution, Washington, D.C.	"Fruit a coriaceous berry, ellipsoid, 4-6 cm long, green, with numerous yellow dots, with the involucre persistent at the base. Seeds numerous, elliptic-triangular, foveate, cream-colored, covered by a juicy yellow matrix." [Adapted for vertebrate dispersal]
	WRA Specialist. (2022). Personal Communication	No evidence of unintentional dispersal by people in literature cited.

702	Propagules dispersed intentionally by people	y
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Qsn #	Question	Answer
	<b>Source(s)</b>	<b>Notes</b>
	Morton, J. (1987). Water Lemon. p. 331–332. In: Fruits of warm climates. Julia F. Morton, Miami, FL. <a href="https://hort.purdue.edu/newcrop/morton/water_lemon.html">https://hort.purdue.edu/newcrop/morton/water_lemon.html</a> . [Accessed 26 Jul 2022]	"The water lemon is native to tropical America and common, wild and cultivated from southern Venezuela, Surinam, Guyana and French Guiana down through the Amazon region of Brazil to Peru. In the dry season, the fruits are regularly sold in local markets. The vine is cultivated and naturalized from Trinidad and Barbados to Jamaica, Puerto Rico, Hispaniola and Cuba. In Bermuda, it is only occasionally grown. It was introduced into Malaya in the 18th Century; is commonly cultivated in the lowlands and naturalized in Singapore and Penang. According to Petelot, the water lemon is grown in Thailand and throughout the southern half of Vietnam. In India, Ceylon and Hawaii, the vine is grown as an ornamental but rarely fruits except in hot, dry situations where the pollen is dry enough to be naturally transmitted. There are only a few specimens in Florida."

703	Propagules likely to disperse as a produce contaminant	n
	<b>Source(s)</b>	<b>Notes</b>
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	[No evidence] "Major Pathway/s: Crop, Herbal, Ornamental Dispersed by: Humans, Escapee"

704	Propagules adapted to wind dispersal	n
	<b>Source(s)</b>	<b>Notes</b>
	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.	"Berries yellow, ovate to globose, 5-6.3 cm long, 3-4.5 cm in diameter, aril white, edible."

705	Propagules water dispersed	
	<b>Source(s)</b>	<b>Notes</b>
	Forget, P. M., & Hammond, D. S. (2005). Rainforest vertebrates and food plant diversity in the Guiana Shield. Tropical Rainforest of the Guiana Shield (DS Hammond, ed.). CABI Publishing, 233-294	[Fish dispersed in South America. Fruits falling in streams or rivers may potentially be dispersed by water] "The vegetarian diet of Amazonian fish is well-documented and examples of ichthyochory abound." ... "However, only the small seeds of the common climber, <i>Passiflora laurifolia</i> , were found wholly intact in stomachs from individuals caught in the Approuague and Sinnamary Rivers in French Guiana (Boujard et al., 1990)."

706	Propagules bird dispersed	y
	<b>Source(s)</b>	<b>Notes</b>
	Starr, F., Starr, K. & Loope, L. (2003). <i>Passiflora laurifolia</i> . <a href="http://www.starrenvironmental.com/publications/species_reports/pdf/passiflora_laurifolia.pdf">http://www.starrenvironmental.com/publications/species_reports/pdf/passiflora_laurifolia.pdf</a> . [Accessed 26 Jul 2022]	"Dispersal: Jacobi and Warshaeur (1992) note the primary dispersal agents of a related species, <i>P. mollissima</i> , are "believed to be several species of birds, rodents, feral pigs ( <i>Sus scrofa</i> ), and humans." <i>P. laurifolia</i> is likely dispersed by similar agents."

Qsn #	Question	Answer
	Acevedo-Rodríguez, P. (2005). Vines and Climbing Plants of Puerto Rico and the Virgin Islands. Contributions from the United States National Herbarium Volume 51: 1-483. Smithsonian Institution, Washington, D.C.	"Fruit a coriaceous berry, ellipsoid, 4-6 cm long, green, with numerous yellow dots, with the involucre persistent at the base. Seeds numerous, elliptic-triangular, foveate, cream-colored, covered by a juicy yellow matrix."
	Hails, C. J., Kavanagh, M., Kumari, K., & Ariffin, I. (2013). Bring back the birds. The Raffles Bulletin of Zoology, Supplement No. 29: 245-260	"Table 8. Plants which bear fruits attractive to birds." [Includes <i>Passiflora laurifolia</i> ]

707	Propagules dispersed by other animals (externally)	n
	Source(s)	Notes
	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.	"Berries yellow, ovate to globose, 5-6.3 cm long, 3-4.5 cm in diameter, aril white, edible." [Fruit and seeds with no means of external attachment]

708	Propagules survive passage through the gut	y
	Source(s)	Notes
	Starr, F., Starr, K. & Loope, L. (2003). <i>Passiflora laurifolia</i> . <a href="http://www.starrenvironmental.com/publications/species_reports/pdf/passiflora_laurifolia.pdf">http://www.starrenvironmental.com/publications/species_reports/pdf/passiflora_laurifolia.pdf</a> . [Accessed 26 Jul 2022]	"Dispersal: Jacobi and Warshaeur (1992) note the primary dispersal agents of a related species, <i>P. mollissima</i> , are "believed to be several species of birds, rodents, feral pigs ( <i>Sus scrofa</i> ), and humans." <i>P. laurifolia</i> is likely dispersed by similar agents."
	Kwan, F. T. (2016). Feeding Ecology and Seed Dispersal of the Common Palm Civet <i>Paradoxurus hermaphroditus</i> (Pallas, 1777) (Mammalia: Carnivora: Viverridae) in Pulau Ubin, Singapore. Masters Thesis. National University of Singapore	"Gut passage effect was largely neutral on seed germination percentage and speed, although some positive and negative impacts were also documented. Viability for egested seeds was high between 51.6% ( <i>Nephelium lappacum</i> ) to 93.0% ( <i>Passiflora laurifolia</i> ). This study also revealed that gut passage of the common palm civet can have positive, neutral or negative effect on seedling establishment speed depending on the plant species."
	Lucas, P. W., & Corlett, R. T. (1998). Seed dispersal by long-tailed macaques. <i>American Journal of Primatology</i> , 45(1), 29-44	"Table 1. Mean Seed Sizes, the Characteristics of Fruits That House Them, the Frequency of These Fruits in the Diet of Long-Tailed Macaques at Bukit Timah, and Seed Fates" [ <i>Passiflora laurifolia</i> - Seed fate = some W, swallowed.]
	Forget, P. M., & Hammond, D. S. (2005). Rainforest vertebrates and food plant diversity in the Guiana Shield. <i>Tropical Rainforest of the Guiana Shield</i> (DS Hammond, ed.). CABI Publishing, 233-294	[Fish dispersed] "The vegetarian diet of Amazonian fish is well-documented and examples of ichthyochory abound." ... "However, only the small seeds of the common climber, <i>Passiflora laurifolia</i> , were found wholly intact in stomachs from individuals caught in the Approuague and Sinnamary Rivers in French Guiana (Boujard et al., 1990)."

Qsn #	Question	Answer
801	<b>Prolific seed production (&gt;1000/m2)</b>	
	<b>Source(s)</b>	<b>Notes</b>
	Acevedo-Rodríguez, P. (2005). Vines and Climbing Plants of Puerto Rico and the Virgin Islands. Contributions from the United States National Herbarium Volume 51: 1-483. Smithsonian Institution, Washington, D.C.	[Unlikely, but no information on fruit or seed density per m2 of plant cover] "Fruit a coriaceous berry, ellipsoid, 4-6 cm long, green, with numerous yellow dots, with the involucre persistent at the base. Seeds numerous, elliptic-triangular, foveate, cream-colored, covered by a juicy yellow matrix."

802	<b>Evidence that a persistent propagule bank is formed (&gt;1 yr)</b>	<b>n</b>
	<b>Source(s)</b>	<b>Notes</b>
	Passiflora Online. (2022). Passiflora Passion flowers– Seed storage. <a href="https://www.passionflow.co.uk/seed-storage/">https://www.passionflow.co.uk/seed-storage/</a> . [Accessed 26 Jul 2022]	"In contrast some Passiflora seed are thought not to keep for long at all, a year is seen as old, with reduced chances of germination. So do not store seed unless you have to. Jay Anderson (Queensland Department of Primary Industries) reports however, that refrigerated P. edulis seed up to 20 years old has been known to germinate. P. edulis may be a special case as its seed are quite big & it has been selected repeatedly for thousands of years. It is important to realise that Passiflora seed are alive & respire with water freely moving in & out of the seed through the seed coat. To keep seed dormant but viable, low temperature, moisture & a minimal opportunity to exchange gases will maximise longevity. Bottom line, sow them the moment you get them."

803	<b>Well controlled by herbicides</b>	<b>y</b>
	<b>Source(s)</b>	<b>Notes</b>
	Mathew, M., Potty, S. N., & Punnoose, K. I. (1977). Report on the results of chemical weed control experiments the rubber plantations in South India. Journal of the Rubber Research Institute of Sri Lanka 54:478-488	"Passiflora sp. was controlled by Gramoxone at 4.2 litres/ha". [species unknown]
	Tu, M., Hurd, C., & Randall, J. M. (2001). Weed control methods handbook: tools & techniques for use in natural areas. The Nature Conservancy	"TNC preserves in Hawaii have successfully used triclopyr to control corksystem passionflower" ( <i>Passiflora suberosa</i> ).
	Santos, G. L., Cuddihy, L. W., & Stone, C. P. (1991). A test of two herbicides for use on banana poka ( <i>Passiflora mollissima</i> (Kunth) LH Bailey) in Hawaii Volcanoes National Park. Technical Report 79. Cooperative National Park Resources Studies Unit, University of Hawaii at Manoa, Honolulu	[Herbicides to control other invasive <i>Passiflora</i> species would likely be effective] "The 5% dilution of Roundup is recommended as an effective cut-stump treatment for banana poka, with no observed negative impacts on surrounding native vegetation."

804	<b>Tolerates, or benefits from, mutilation, cultivation, or fire</b>	
	<b>Source(s)</b>	<b>Notes</b>
	WRA Specialist. (2022). Personal Communication	Unknown. A vine, so probably can tolerate and regrow after cutting

805	<b>Effective natural enemies present locally (e.g. introduced biocontrol agents)</b>	



Qsn #	Question	Answer
	Source(s)	Notes
	Starr, F., Starr, K. & Loope, L. (2003). <i>Passiflora laurifolia</i> . <a href="http://www.starrenvironmental.com/publications/species_reports/pdf/passiflora_laurifolia.pdf">http://www.starrenvironmental.com/publications/species_reports/pdf/passiflora_laurifolia.pdf</a> . [Accessed 26 Jul 2022]	"Biological control: There have been many attempts at bio-control of the related <i>P. mollissima</i> . We found no information on bio-control for <i>P. laurifolia</i> ."

**Summary of Risk Traits:**

## High Risk / Undesirable Traits

- Thrives and spreads in regions with tropical climates
- Naturalized on Kauai, Oahu, Molokai, Maui and Hawaii (Hawaiian Islands) and elsewhere in the wet tropics
- Threatens habitat of at least one endangered plant species in the Hawaiian Islands (*Kadua haupuensis*)
- Other *Passiflora* species are invasive weeds
- Toxic properties to people and possibly animals
- Climbing and smothering growth habit
- Tolerates many soil types
- Reproduces by seeds
- Fast growing. Reaches maturity in 2-3 years.
- Seeds dispersed by birds, and other fruit-eating animals (possibly pigs in the Hawaiian Islands) and through intentional cultivation

## Low Risk Traits

- Primarily occurs in disturbed, low-elevation habitats. Impacts to natural resources in the Hawaiian Islands currently only reported for one endangered plant species
- Unarmed (no spines, thorns, or burrs)
- Edible fruit
- Grows best in high light environments (dense shade may inhibit spread)
- Cross-pollination required for seed set
- Seeds not reported to form a persistent seed bank
- Herbicides may provide effective control