

Taxon: *Crocoshia ×crocoshiiiflora* (Lemoine) N. E. Br.

Family: Iridaceae

Common Name(s): autumn gold
crocoshia
garden montbretia
montbretia

Synonym(s): Montbretia ×crocoshiiiflora Lemoine
Tritonia ×crocoshiiiflora (Lemoine) G.

Assessor: Chuck Chimera

Status: Assessor Approved

End Date: 29 Jul 2022

WRA Score: 12.0

Designation: H(Hawai'i)

Rating: High Risk

Keywords: Hybrid Origin, Environmental Weed, Geophyte, Rarely Seeds, Spreads Vegetatively

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		
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		
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		
405	Toxic to animals		
406	Host for recognized pests and pathogens		
407	Causes allergies or is otherwise toxic to humans		
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	y
410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y=1, n=0	y
411	Climbing or smothering growth habit	y=1, n=0	n
412	Forms dense thickets	y=1, n=0	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	y
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		
605	Requires specialist pollinators	y=-1, n=0	n
606	Reproduction by vegetative fragmentation	y=1, n=-1	y
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	y
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	n
707	Propagules dispersed by other animals (externally)	y=1, n=-1	n
708	Propagules survive passage through the gut	y=1, n=-1	n
801	Prolific seed production (>1000/m ²)	y=1, n=-1	n
802	Evidence that a persistent propagule bank is formed (>1 yr)	y=1, n=-1	n
803	Well controlled by herbicides	y=-1, n=1	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
	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.	[Not domesticated, although not naturally occurring] "Of horticultural origin, now widely naturalized along roadsides and thickets in tropical and subtropical areas of the Americas; in Hawai'i naturalized along trails and roadsides primarily in mesic to wet forest, 170-1,200 m, on Kaua'i, O'ahu, Maui, and Hawai'i"

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.	"Of horticultural origin, now widely naturalized along roadsides and thickets in tropical and subtropical areas of the Americas; in Hawai'i naturalized along trails and roadsides primarily in mesic to wet forest, 170-1,200 m, on Kaua'i, O'ahu, Maui, and Hawai'i."

202	Quality of climate match data	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.	"Of horticultural origin, now widely naturalized along roadsides and thickets in tropical and subtropical areas of the Americas; in Hawai'i naturalized along trails and roadsides primarily in mesic to wet forest, 170-1,200 m, on Kaua'i, O'ahu, Maui, and Hawai'i"

Qsn #	Question	Answer
203	Broad climate suitability (environmental versatility)	y
	Source(s)	Notes
	Gardenia. (2022). <i>Crocosmia x crocosmiiflora</i> 'Star of the East' (Montbretia). https://www.gardenia.net/plant/crocosmia-crocosmiiflora-star-of-the-east . [Accessed 26 Jul 2022]	"Hardiness 5 – 9 Heat Zones 4 – 9 Climate Zones 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, H1, H2"
	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.	[Elevation range >1000 m] "in Hawai'i naturalized along trails and roadsides primarily in mesic to wet forest, 170-1,200 m, on Kaua'i, O'ahu, Maui, and Hawai'i."

204	Native or naturalized in regions with tropical or subtropical climates	y
	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.	"Of horticultural origin, now widely naturalized along roadsides and thickets in tropical and subtropical areas of the Americas; in Hawai'i naturalized along trails and roadsides primarily in mesic to wet forest, 170-1,200 m, on Kaua'i, O'ahu, Maui, and Hawai'i."

205	Does the species have a history of repeated introductions outside its natural range?	y
	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.	"Of horticultural origin, now widely naturalized along roadsides and thickets in tropical and subtropical areas of the Americas; in Hawai'i naturalized along trails and roadsides primarily in mesic to wet forest, 170-1,200 m, on Kaua'i, O'ahu, Maui, and Hawai'i."

301	Naturalized beyond native range	y
	Source(s)	Notes

Qsn #	Question	Answer
	<p>USDA, Agricultural Research Service, National Plant Germplasm System. (2022). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/. [Accessed 29 Jul 2022]</p>	<p>"Naturalized Africa MACARONESIA: Portugal [Madeira Islands] WESTERN INDIAN OCEAN: Madagascar, Mauritius, Reunion Asia-Tropical PAPUASIA: Papua New Guinea MALESIA: Indonesia, Malaysia Australasia AUSTRALIA: Australia [Tasmania, New South Wales, South Australia, Victoria] NEW ZEALAND: New Zealand Europe NORTHERN EUROPE: United Kingdom, Ireland SOUTHWESTERN EUROPE: Spain, Portugal Northern America WESTERN CANADA: Canada [British Columbia] NORTHWESTERN U.S.A.: United States [Oregon, Washington] SOUTHEASTERN U.S.A.: United States [Florida, North Carolina, South Carolina] SOUTH-CENTRAL U.S.A.: United States [Texas] SOUTHWESTERN U.S.A.: United States [California] REGION: Mexico Pacific NORTH-CENTRAL PACIFIC: United States [Hawaii] Southern America CARIBBEAN: Hispaniola, Jamaica, United States [Puerto Rico] CENTRAL AMERICA: Costa Rica, Guatemala, Honduras, Nicaragua, Panama, El Salvador NORTHERN SOUTH AMERICA: Venezuela WESTERN SOUTH AMERICA: Bolivia, Ecuador, Peru SOUTHERN SOUTH AMERICA: Argentina [Buenos Aires, Misiones, Salta], Chile"</p>
	<p>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.</p>	<p>"Of horticultural origin, now widely naturalized along roadsides and thickets in tropical and subtropical areas of the Americas; in Hawai'i naturalized along trails and roadsides primarily in mesic to wet forest, 170-1,200 m, on Kaua'i, O'ahu, Maui, and Hawai'i. First collected probably on O'ahu in 1909 (Rock 4010, BISH)."</p>
	<p>Oppenheimer, H. (2010). New Hawaiian plant records from Maui County for 2008. Bishop Museum Occasional Papers 107: 33-40</p>	<p>[Molokai] "A hybrid of horticultural origin naturalized in Hawai'i on Kaua'i, o'ahu, Maui, and Hawai'i (Wagner et al. 1999: 1446), this herb is also sparingly naturalized on Moloka'i. Material examined. MOLOKA'I: S rim of Kuhua'awi Gulch, near Forestry barracks, 650 m, 6 Jun 2008, Oppenheimer & Perlman H60802 (BISH)."</p>

302	Garden/amenity/disturbance weed	
	Source(s)	Notes

Qsn #	Question	Answer
	Cal-IPC. (2022). <i>Crocoshia x crocosmiiflora</i> . https://www.cal-ipc.org/plants/profile/crocoshia-x-crocosmiiflora-profile/ . [Accessed 29 Jul 2022]	[Spreads from cultivation and thrives in disturbed areas. Impacts native vegetation] " <i>Crocoshia x crocosmiiflora</i> (<i>crocoshia</i> or <i>montbretia</i>) is a perennial (family Iridaceae) found along the coast of California and in the San Francisco Bay region. <i>Crocoshia</i> is a commonly cultivated ornamental plant, and is most commonly found near urban areas. It prefers disturbed areas, including roadsides, coastal scrub, prairie and forests. <i>Crocoshia</i> is a superior competitor for water, light and nutrients, and it excludes native plants by growing in dense patches. It reproduces using seeds and underground corms. Upon introduction to a new area, <i>crocoshia</i> spreads slowly at first, then more rapidly as the species becomes established."

303	Agricultural/forestry/horticultural weed	n
	Source(s)	Notes
	CABI. (2022). <i>Invasive Species Compendium</i> . Wallingford, UK: CAB International. www.cabi.org/isc	" <i>Crocoshia x crocosmiiflora</i> is an environmental weed with the potential to invade moist grasslands, roadsides, forest remnants, coastal forests and riparian areas."
	Randall, R.P. (2017). <i>A Global Compendium of Weeds</i> . 3rd Edition. Perth, Western Australia. R.P. Randall	No evidence

304	Environmental weed	y
	Source(s)	Notes
	CABI. (2022). <i>Invasive Species Compendium</i> . Wallingford, UK: CAB International. www.cabi.org/isc	" <i>Crocoshia x crocosmiiflora</i> is an environmental weed with the potential to invade moist grasslands, roadsides, forest remnants, coastal forests and riparian areas. It competes strongly with native understorey vegetation and small native shrubs. When invading riparian areas, it moves rapidly along watercourses and outwards into natural forests. Dense infestations smother the native ground flora and impede the regeneration of other native vegetation by inhibiting the establishment of seedlings of native species (Wagner et al., 1999; Ensbey et al., 2011; Mir, 2012; PIER, 2016; <i>Weeds of Australia</i> , 2016, <i>Weeds of New Zealand</i> , 2016). Impact on Habitats. The weight of the mass of corms can cause the collapse of stream banks leading to erosion and sedimentation of natural riparian areas (Ensbey et al., 2011; <i>Weeds of the Blue Mountains</i> , 2016)."
	Gioria, M., O'Flynn, C., & Osborne, B. A. (2018). A review of the impacts of major terrestrial invasive alien plants in Ireland. <i>Biology and Environment: Proceedings of the Royal Irish Academy</i> , 118(3), 157–179	"In Ireland, it is assumed that invasive alien plants greatly reduce local plant species richness, based on observations that few species can coexist with them and a number, including <i>Carpobrotus edulis</i> , <i>Crocoshia x crocosmiiflora</i> , <i>Fallopia japonica</i> , <i>Heracleum mantegazzianum</i> , <i>Impatiens glandulifera</i> , <i>Prunus laurocerasus</i> , <i>Rhododendron ponticum</i> , and <i>Spartina anglica</i> , tend to form dense, virtually mono-specific stands (e.g., Cross 1975, 1981, 1982; Beerling et al. 1994; Caffrey 1990, 1994, 1999; Dehnen-Schmutz et al. 2004; Stokes et al. 2004; Gioria and Osborne 2010; NPWS 2013; Gioria et al. 2018)."

Qsn #	Question	Answer
	Queensland Government. (2022). Weeds of Australia. <i>Crocosmia x crocosmiiflora</i> . https://keyserver.lucidcentral.org/weeds . [Accessed 28 Jul 2022]	"Montbretia (<i>Crocosmia x crocosmiiflora</i>) is regarded as a significant environmental weed in Victoria and New South Wales, and a moderately important environmental weed in Queensland, Western Australia and Tasmania. In 2006, this species was listed as a priority environmental weed in two Natural Resource Management regions. It is invasive in moist forests, roadside remnants, drainage lines and along waterways in the coastal districts of southern Australia. It competes strongly with, and displaces, native riparian plants and moves rapidly along watercourses and outwards into sensitive bushland. Dense infestations crowd out the native ground flora and impede the regeneration of overstorey species, and can also significantly modify the habitat available to native animals."
	Esler, A. E. (1988). The naturalisation of plants in urban Auckland, New Zealand 6. Alien plants as weeds. <i>New Zealand journal of botany</i> , 26(4), 585-618	"Montbretia (<i>Crocosmia x crocosmiiflora</i>) is widespread and plentiful in waste places and in the shade of trees and hedges. It becomes more obvious during its peak of flowering in January. As the leaves wither in late autumn they are quickly replaced by a new set, there being very little dormancy in this mild climate. This feature reduces competition from other species and promotes the development of almost pure communities. Success is due in part also to the production of slender rhizomes and seeds as well as corms."
	OANRP Staff. (2018). 2018 Status Report for the Makua and Oahu Implementation Plans. United States Army Garrison, Hawai'i Directorate of Public Works Environmental Division, Schofield Barracks, Hawai'i	[Controlled in natural areas on Oahu, Hawaiian Islands to prevent impacts to sensitive habitat] "This year an informal trial for chemical treatment of <i>Crocosmia crocosmiiflora</i> was conducted at Kaala. This taxon mostly spreads via vegetative growth and is documented to have low seed set. Its vegetative clumps become extremely dense and can exclude all other species. It occurs at the edge of the forest at Kaala where it is treated in several ICAs. The Army natural resource program on Oahu (OANRP) aims to prevent further spread into forested areas and establishment on steep slopes where future control would be impossible. It is also treated in ICAs at Palikea MU. Handpulling has been the standard method of control. However investigations into chemical controls seemed worthwhile in order to address 1) huge patches with too many corms to dig out, where initial sprays could significantly reduce patch biomass both above and below ground (sites 1 and 3), and 2) small populations where hand-digging is likely leaving small corms behind but where chemicals may translocate to corms and result in total elimination (site 2)."

305	Congeneric weed	
	Source(s)	Notes
	Randall, R.P. (2017). <i>A Global Compendium of Weeds</i> . 3rd Edition. Perth, Western Australia. R.P. Randall	<i>Crocosmia aurea</i> , <i>Crocosmia masoniorum</i> , <i>Crocosmia paniculata</i> , and <i>Crocosmia pottsii</i> are listed as naturalized and/or weeds.
	WRA Specialist. (2022). Personal Communication	Unknown. Other <i>Crocosmia</i> species may be regarded as weedy or aggressive, but no significant negative impacts have been found for these taxa

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] "Plants 25-50 (-100) cm tall, with corms 2-3 cm in diameter and slender scaly stolons. Leaves narrowly lanceolate, 30-50 cm long, 0.8-2 cm wide. Spikes slightly flexuous, arching horizontally, with several branches, bracts 6-10 mm long; tepals orange, lanceolate, 15-25 mm long, 6-9 mm wide, subequal, spreading, the perianth tube slightly curved, 10-15 mm long; filaments 15-22 mm long; anthers 6-8 mm long. Capsules up to 7 mm long, ca. 9 mm wide. Seeds brown, wrinkled, usually not viable"

402	Allelopathic	
	Source(s)	Notes
	WRA Specialist. (2022). Personal Communication	Unknown. Excludes other vegetation through vegetation spread and formation of dense cover. No allelopathic properties have been reported that may contribute to this competitive exclusion

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.	"Plants 25-50 (-100) cm tall, with corms 2-3 cm in diameter and slender scaly stolons." [Iridaceae. No evidence]

404	Unpalatable to grazing animals	
	Source(s)	Notes
	Missouri Botanical Garden. (2022). <i>Crocoshmia ×crocoshmiiflora</i> . https://www.missouribotanicalgarden.org . [Accessed 29 Jul 2022]	"Tolerate: Rabbit, Deer, Drought" [Possibly unpalatable. Does not appear to be browsed by animals in areas where it is established]

405	Toxic to animals	
	Source(s)	Notes
	ZooAwesome. (2022). Is <i>Crocoshmia</i> Poisonous to Dogs? https://zooawesome.com/home-pets/is-crocoshmia-poisonous-to-dogs/ . [Accessed 29 Jul 2022]	[Possibly mildly toxic to dogs or other pets] "The <i>Crocoshmia</i> plant is not particularly fatal for your dog, but there are some light consequences of eating it. In addition to its light to moderate levels of toxicity, your dog may feel a collection of symptoms, including abdominal pain. If your pet eats excessive amounts of this plant, it may trigger kidney problems, digestive inflammations, liver problems, or even death."

406	Host for recognized pests and pathogens	
	Source(s)	Notes
	Missouri Botanical Garden. (2022). <i>Crocoshmia ×crocoshmiiflora</i> . https://www.missouribotanicalgarden.org . [Accessed 29 Jul 2022]	"Spider mites can cause significant damage to the foliage, and, if left unchecked, can impair normal flowering. Winter hardiness is a concern in the St. Louis area. Deer and rabbits tend to avoid this plant."

Qsn #	Question	Answer
407	Causes allergies or is otherwise toxic to humans	
	Source(s)	Notes
	Wagstaff, D.J. (2008). International poisonous plants checklist: an evidence-based reference. CRC Press, Boca Raton, FL	No evidence
	Quattrocchi, U. (2012). CRC World Dictionary of Medicinal and Poisonous Plants: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	No evidence. Other species with medicinal uses Could possibly be toxic if ingested, but direct evidence for humans is lacking

408	Creates a fire hazard in natural ecosystems	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.	"in Hawai'i naturalized along trails and roadsides primarily in mesic to wet forest, 170-1,200 m" [No evidence. Does not occur in fire-prone areas]
	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	"Montbretia requires ample moisture, a fertile soil in a sunny or partially shaded site, but no other special care." [No evidence. Does not occur in fire-prone areas]
	Weedbusters. (2022). Montbretia - Crocosmia x crocosmiiflora. https://www.weedbusters.org.nz/what-are-weeds/weed-list/montbretia/ . [Accessed 28 Jul 2022]	"Thrives on disturbance as corms and rhizomes readily resprout. Resists fire."

409	Is a shade tolerant plant at some stage of its life cycle	y
	Source(s)	Notes
	New Zealand Plant Conservation Network. (2022). <i>Crocoshmia xcrocosmiiflora</i> . https://www.nzpcn.org.nz/flora/species/crocoshmia-crocosmiiflora/ . [Accessed 29 Jul 2022]	"Moderate to highly tolerant of shade; tolerant of frost and moderately dry conditions (Fromont and King, 1992)."
	Esler, A. E. (1988). The naturalisation of plants in urban Auckland, New Zealand 6. Alien plants as weeds. New Zealand journal of botany, 26(4), 585-618	"Montbretia (<i>Crocoshmia x crocosmiiflora</i>) is widespread and plentiful in waste places and in the shade of trees and hedges."
	Whistler, W.A. (2000). Tropical Ornamentals: A Guide. Timber Press, Portland, OR	"Well-drained soils in sunny places are preferred."
	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	[Partial shade] "Montbretia requires ample moisture, a fertile soil in a sunny or partially shaded site, but no other special care."

410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y
	Source(s)	Notes
	Weedbusters. (2022). Montbretia - Crocosmia x crocosmiiflora. https://www.weedbusters.org.nz/what-are-weeds/weed-list/montbretia/ . [Accessed 29 Jul 2022]	"Tolerates frost and heat, damage and grazing, damp, most soils, and moderate shade."

Qsn #	Question	Answer
411	Climbing or smothering growth habit	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.	"Plants 25-50 (-100) cm tall, with corms 2-3 cm in diameter and slender scaly stolons."

412	Forms dense thickets	y
	Source(s)	Notes
	Esler, A. E. (1988). The naturalisation of plants in urban Auckland, New Zealand 6. Alien plants as weeds. New Zealand journal of botany, 26(4), 585-618	"Montbretia (<i>Crocosmia x crocosmiiflora</i>) is widespread and plentiful in waste places and in the shade of trees and hedges. It becomes more obvious during its peak of flowering in January. As the leaves wither in late autumn they are quickly replaced by a new set, there being very little dormancy in this mild climate. This feature reduces competition from other species and promotes the development of almost pure communities. Success is due in part also to the production of slender rhizomes and seeds as well as corms."
	Whistler, W.A. (2000). Tropical Ornamentals: A Guide. Timber Press, Portland, OR	"sometimes escapes to form large patches, as in Hawaii."
	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	"The wiry stolons creep through the soil and produce new corms, often at some distance from the original plant. In this way a single corm can give rise to a dense population of plants, all linked by an underground network of stolons and roots; in some forested settings, naturalized montbretia forms a dense carpet on the forest floor."

501	Aquatic	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.	[Terrestrial] "now widely naturalized along roadsides and thickets in tropical and subtropical areas of the Americas; in Hawai'i naturalized along trails and roadsides primarily in mesic to wet forest, 170-1,200 m"

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. https://npgsweb.ars-grin.gov/ . [Accessed 27 Jul 2022]	"Family: Iridaceae Subfamily: Crocoideae Tribe: Freesieae"

503	Nitrogen fixing woody plant	n
	Source(s)	Notes

Qsn #	Question	Answer
	USDA, Agricultural Research Service, National Plant Germplasm System. (2022). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/ . [Accessed 27 Jul 2022]	"Family: Iridaceae Subfamily: Crocoideae Tribe: Freesieae"

504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	y
	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.	"Plants 25-50 (-100) cm tall, with corms 2-3 cm in diameter and slender scaly stolons." ... "It spreads solely vegetatively by stolons and corms."

601	Evidence of substantial reproductive failure in native habitat	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.	[A horticultural creation with limited seed set, but no problems spreading through vegetative means] "Of horticultural origin, now widely naturalized along roadsides and thickets in tropical and subtropical areas of the Americas; in Hawai'i naturalized along trails and roadsides primarily in mesic to wet forest, 170-1,200 m, on Kaua'i, O'ahu, Maui, and Hawai'i. First collected probably on O'ahu in 1909 (Rock 4010, BISH).-P/ate 213. <i>Crocoshmia x crocoshmiiflora</i> originated through hybridization between <i>C. pottsii</i> Baker and <i>C. aurea</i> (Pappe ex Hook.) Planch., both native to eastern South Africa. It spreads solely vegetatively by stolons and corms."

602	Produces viable seed	y
	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.	"Capsules up to 7 mm long, ca. 9 mm wide. Seeds brown, wrinkled, usually not viable."
	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 spreads almost exclusively by vegetative means, since viable seed is rarely produced."
	Esler, A. E. (1988). The naturalisation of plants in urban Auckland, New Zealand 6. Alien plants as weeds. New Zealand journal of botany, 26(4), 585-618	"Montbretia (<i>Crocoshmia x crocoshmiiflora</i>) is widespread and plentiful in waste places and in the shade of trees and hedges." ... "Success is due in part also to the production of slender rhizomes and seeds as well as corms."

Qsn #	Question	Answer
	Kurkova, I., & Stokoz, S. (2021). Study of <i>Crocoshmia × Crocoshmiiflora</i> (Lemoine) NE Br. in the Agrometeorological Conditions of the Southern Zone of the Amur Region for the Prospects of Use in Landscaping. In Int. Scientific Conf. Fundamental & Applied Scientific Research in the Development of Agriculture in the Far East (pp. 563-572). Springer, Cham	"The plant has bright orange-red flowers on a branching inflorescence that appear in their natural habitat from January to June, after which a fleshy seed capsule containing purple-black" ... seeds develop. The plant is widely distributed in the eastern parts of South Africa, and is found mainly in humid areas from the coast to 2000 m above sea level [8]. Under natural conditions, it reproduces vegetatively through tubers or rhizomes, and less often generatively due to its poor ability to set seeds [7, 9].
	Esler, A. E. (1988). The naturalisation of plants in urban Auckland, New Zealand 4. The nature of the naturalised species. <i>New Zealand Journal of Botany</i> , 26(3), 345-385	[Does not have a large seed output, but this reference implies that some seeds may form] " <i>Freesia refracta</i> , with cormlets, cormils, and seeds, is quite widespread, but unlike the very plentiful <i>Crocoshmia × crocoshmiiflora</i> occurs mainly near gardens. It is not clear why <i>Crocoshmia</i> should be so widespread and plentiful. It does not have a large seed output and its corms are not transported in great numbers in soil."

603	Hybridizes naturally	
	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.	" <i>Crocoshmia × crocoshmiiflora</i> originated through hybridization between <i>C. pottsii</i> Baker and <i>C. aurea</i> (Pappe ex Hook.) Planch., both native to eastern South Africa. It spreads solely vegetatively by stolons and corms." [Unknown. No evidence that this hybrid crosses with other species]

604	Self-compatible or apomictic	
	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.	[Unknown, but rarely sets viable seed] "Spikes slightly flexuous, arching horizontally, with several branches, bracts 6-10 mm long; tepals orange, lanceolate, 15-25 mm long, 6-9 mm wide, subequal, spreading, the perianth tube slightly curved, 10-15 mm long; filaments 15-22 mm long; anthers 6- 8 mm long. Capsules up to 7 mm long, ca. 9 mm wide. Seeds brown, wrinkled, usually not viable." ... "It spreads solely vegetatively by stolons and corms."

605	Requires specialist pollinators	n
	Source(s)	Notes
	Buxton, M. N., Anderson, B. J., & Lord, J. M. (2022). Moths can transfer pollen between flowers under experimental conditions. <i>New Zealand Journal of Ecology</i> , 46(1), 1-5	"Neither moth species was found to have pollen tracker on their bodies in trials using the putatively bird-pollinated <i>Crocoshmia</i> , despite one <i>I. plena</i> individual being observed to visit the flowers through chance observation. However, whether this visit was to feed or perch is unclear, and it is uncertain whether <i>Wiseana</i> visited these flowers. <i>Crocoshmia × crocoshmiiflora</i> flowers have extremely exerted anthers, which moth bodies would likely not contact, potentially explaining why no pollen tracker was removed. This result demonstrates that the accidental movement of pollen tracker from these flowers is unlikely."

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.	[Spreads vegetatively. Limited seed set appears to be due to hybrid origin, rather than pollinator limitation] "Spikes slightly flexuous, arching horizontally, with several branches, bracts 6-10 mm long; tepals orange, lanceolate, 15-25 mm long, 6-9 mm wide, subequal, spreading, the perianth tube slightly curved, 10-15 mm long; filaments 15-22 mm long; anthers 6- 8 mm long. Capsules up to 7 mm long, ca. 9 mm wide. Seeds brown, wrinkled, usually not viable." ... "It spreads solely vegetatively by stolons and corms."

606	Reproduction by vegetative fragmentation	y
	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.	"It spreads solely vegetatively by stolons and corms."
	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	"The wiry stolons creep through the soil and produce new corms, often at some distance from the original plant. In this way a single corm can give rise to a dense population of plants, all linked by an underground network of stolons and roots; in some forested settings, naturalized montbretia forms a dense carpet on the forest floor."

607	Minimum generative time (years)	2
	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.	"It spreads solely vegetatively by stolons and corms." [Likely able to spread by vegetative means within first or second year of growth]

701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	y
	Source(s)	Notes
	Esler, A. E. (1988). The naturalisation of plants in urban Auckland, New Zealand 5. Success of the alien species. New Zealand Journal of Botany, 26(4), 565-584	"Dumping of garden refuse promotes the increase of aliens with bulbs and corms (<i>Allium triquetrum</i> , <i>Crocoshmia ×crocoshmiiflora</i> , <i>Freesia refracta</i> , <i>Ixia maculata</i> , <i>Nothoscordum inodorum</i> , <i>Oxalis incarnata</i> , <i>O. latifolia</i> , <i>O. pes-caprae</i>), also of many aggressive, creeping species."
	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.	"now widely naturalized along roadsides and thickets in tropical and subtropical areas of the Americas"

702	Propagules dispersed intentionally by people	y
	Source(s)	Notes

Qsn #	Question	Answer
	Queensland Government. (2022). Weeds of Australia. <i>Crocosmia x crocosmiiflora</i> . https://keyserver.lucidcentral.org/weeds . [Accessed 27 Jul 2022]	"Infestations spread laterally via the growth of underground rhizomes while long-range dispersal of the corms and seeds occurs via water, machinery, contaminated soil or dumped garden waste."
	Whistler, W.A. (2000). <i>Tropical Ornamentals: A Guide</i> . Timber Press, Portland, OR	"widely grown, often as a border plant, for its orange, long-lasting flowers that are commonly used commercially as cut flowers."

703	Propagules likely to disperse as a produce contaminant	y
	Source(s)	Notes
	Queensland Government. (2022). Weeds of Australia. <i>Crocosmia x crocosmiiflora</i> . https://keyserver.lucidcentral.org/weeds . [Accessed 27 Jul 2022]	"Infestations spread laterally via the growth of underground rhizomes while long-range dispersal of the corms and seeds occurs via water, machinery, contaminated soil or dumped garden waste."

704	Propagules adapted to wind dispersal	n
	Source(s)	Notes
	Wagner, W.L., Herbst, D.R. & Sohmer, S.H. (1999). <i>Manual of the flowering plants of Hawaii</i> . Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"Capsules up to 7 mm long, ca. 9 mm wide. Seeds brown, wrinkled, usually not viable." ... "It spreads solely vegetatively by stolons and corms."
	Queensland Government. (2022). Weeds of Australia. <i>Crocosmia x crocosmiiflora</i> . https://keyserver.lucidcentral.org/weeds . [Accessed 29 Jul 2022]	"Infestations spread laterally via the growth of underground rhizomes while long-range dispersal of the corms and seeds occurs via water, machinery, contaminated soil or dumped garden waste."

705	Propagules water dispersed	y
	Source(s)	Notes
	Queensland Government. (2022). Weeds of Australia. <i>Crocosmia x crocosmiiflora</i> . https://keyserver.lucidcentral.org/weeds . [Accessed 27 Jul 2022]	"Infestations spread laterally via the growth of underground rhizomes while long-range dispersal of the corms and seeds occurs via water, machinery, contaminated soil or dumped garden waste."
	Kern, L. (2006). Long distance dispersal of environmental weeds: potential lessons for community education. <i>Plant Protection Quarterly</i> , 21(4), 141-145	"Table 2. Overview of environmental weeds described in brochures.' [Crocosmia x crocosmiiflora - Methods of dispersal - Long distance = Water; Short distance = Vegetative]

706	Propagules bird dispersed	n
	Source(s)	Notes

Qsn #	Question	Answer
	Queensland Government. (2022). Weeds of Australia. <i>Crocosmia x crocosmiiflora</i> . https://keyserver.lucidcentral.org/weeds . [Accessed 28 Jul 2022]	[No evidence] "The fruit are three-lobed capsules (5-10 mm long) that turn from green to brown, and become shrivelled, as they mature. Seeds are usually not produced, but when present they are brown or reddish-brown in colour and flattened or triangular in shape (about 3 mm long and 1-2 mm wide). Reproduction and Dispersal. New plants develop from the tips of the creeping underground stems (i.e. rhizomes), which are produced by the 'bulbs' (i.e. corms) and grow up to 30 cm long. The 'bulbs' (10-35 mm across) are rounded or flattened (i.e. globose or compressed) and covered in several brown fibrous layers. Infestations spread laterally via the growth of underground rhizomes while long-range dispersal of the corms and seeds occurs via water, machinery, contaminated soil or dumped garden waste."

707	Propagules dispersed by other animals (externally)	n
	Source(s)	Notes
	Queensland Government. (2022). Weeds of Australia. <i>Crocosmia x crocosmiiflora</i> . https://keyserver.lucidcentral.org/weeds . [Accessed 28 Jul 2022]	[No evidence] "The fruit are three-lobed capsules (5-10 mm long) that turn from green to brown, and become shrivelled, as they mature. Seeds are usually not produced, but when present they are brown or reddish-brown in colour and flattened or triangular in shape (about 3 mm long and 1-2 mm wide). Reproduction and Dispersal. New plants develop from the tips of the creeping underground stems (i.e. rhizomes), which are produced by the 'bulbs' (i.e. corms) and grow up to 30 cm long. The 'bulbs' (10-35 mm across) are rounded or flattened (i.e. globose or compressed) and covered in several brown fibrous layers. Infestations spread laterally via the growth of underground rhizomes while long-range dispersal of the corms and seeds occurs via water, machinery, contaminated soil or dumped garden waste."

708	Propagules survive passage through the gut	n
	Source(s)	Notes
	Queensland Government. (2022). Weeds of Australia. <i>Crocosmia x crocosmiiflora</i> . https://keyserver.lucidcentral.org/weeds . [Accessed 28 Jul 2022]	[No evidence] "The fruit are three-lobed capsules (5-10 mm long) that turn from green to brown, and become shrivelled, as they mature. Seeds are usually not produced, but when present they are brown or reddish-brown in colour and flattened or triangular in shape (about 3 mm long and 1-2 mm wide). Reproduction and Dispersal. New plants develop from the tips of the creeping underground stems (i.e. rhizomes), which are produced by the 'bulbs' (i.e. corms) and grow up to 30 cm long. The 'bulbs' (10-35 mm across) are rounded or flattened (i.e. globose or compressed) and covered in several brown fibrous layers. Infestations spread laterally via the growth of underground rhizomes while long-range dispersal of the corms and seeds occurs via water, machinery, contaminated soil or dumped garden waste."

801	Prolific seed production (>1000/m2)	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.	"Capsules up to 7 mm long, ca. 9 mm wide. Seeds brown, wrinkled, usually not viable." ... "It spreads solely vegetatively by stolons and corms."
	Esler, A. E. (1988). The naturalisation of plants in urban Auckland, New Zealand 4. The nature of the naturalised species. New Zealand Journal of Botany, 26(3), 345-385	"It is not clear why <i>Crocoshmia</i> should be so widespread and plentiful. It does not have a large seed output and its corms are not transported in great numbers in soil."
	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 spreads almost exclusively by vegetative means, since viable seed is rarely produced."

802	Evidence that a persistent propagule bank is formed (>1 yr)	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.	[Persists from corms, rather than seeds] "Seeds brown, wrinkled, usually not viable." ... "It spreads solely vegetatively by stolons and corms."

803	Well controlled by herbicides	y
	Source(s)	Notes
	Cusens, J. (2019). Ecological Restoration Plan for Waiparuru Stream, Grafton Gully. Contract Report No. 4879. Prepared for: Auckland Council. Wildland Consultants, Auckland, NZ	"Recommended Herbicide Treatments" [Montbretia (<i>Crocoshmia xrocoshmiiflora</i>) - Control Method(s) = Knapsack - foliar spray; Chemical(s) = Metsulfuron; Application Rate = 5g/10 litres water + 20ml surfactant; Timing = October-February; Remarks = Follow-up control will be necessary.]
	Santos, G.L., Kageler, D., Gardner, D.E., Cuddihy, L.W. & Stone, C.P. (1992). Herbicidal Control of Selected Alien Plant Species in Hawai'i Volcanoes National Park. Pp. 341-375 in Stone, C.P. et al. (eds.) Alien Plant Invasions in Native Ecosystems of Hawai'i. University of Hawaii CPSU, Honolulu, HI	"Table 10. Responses of nontarget native and introduced plants to herbicide treatments to control blackberry (<i>Rubus argutus</i>)." [<i>Crocoshmia xrocoshmiiflora</i> (Montbretia) - GARLON 4 40% = + = exposed to treatment, no adverse effects]
	Weedbusters. (2022). Montbretia - <i>Crocoshmia xrocoshmiiflora</i> . https://www.weedbusters.org.nz/what-are-weeds/weed-list/montbretia/ . [Accessed 28 Jul 2022]	"What can I do to get rid of it? Work downstream when controlling. 1. Dig out very small sites. Usually futile in large spots as corms resprout. Dispose of corms at a refuse transfer station, or by burning or by deep burial. 2. Spray (full leaf stage): glyphosate (10ml/L) + metsulfuron-methyl 600g/kg (4g/10L + penetrant)."

Qsn #	Question	Answer
	<p>OANRP Staff. (2018). 2018 Status Report for the Makua and Oahu Implementation Plans. United States Army Garrison, Hawai'i Directorate of Public Works Environmental Division, Schofield Barracks, Hawai'i</p>	<p>[Herbicides somewhat effective but may require repeated treatments and could have non-target effects] "Informal Herbicide Control Trial Conducted on <i>Crocoshmia xrocoshmiiflora</i> at Kaala MU" ... "Purpose: to test efficacy of glyphosate 10ml/L (1%) + Escort XP 0.4g/L + surfactant: 4ml/L (0.4%) in controlling <i>C. xrocoshmiiflora</i>." ... "At 16 months post-treatment, staff were shocked to see the sheer amount of corms present in the soil. Without the vegetative cover, the chain-like growth as seen in Figure 5, became very evident on the original treatment slope at site 2. Hardly any corms had shoots at this time, but there was a range of how plump and fleshy remaining corms looked. Many were shriveled and turning black and were more obviously dead, whereas others were still plump and fleshy. The latter group was difficult to assess if were in the process of dying, or were merely dormant without further detailed study. Based on the presence of black and shriveling corms on corm 'chains', staff ultimately suspect that the herbicide control is effective at killing the corms from which vegetative sprigs were emergent and treated during sprays.. It is likely that new shoots are emerging from corms that did not have vegetative material at the time of control. Therefore, repeated visits will be necessary, but waiting at least 6-12 months between control efforts is best to ensure vegetation has emerged from dormant corms. This trial was very limited in obtaining quantitative data such as: 1) how effective is the herbicide at killing a single corm, 2) to how many corms in a chain can the herbicide translocate, 3) how long can a corm remain dormant? However, while the efficacy of the herbicide to reduce belowground biomass remains unknown, based on the initial knockdown of aboveground biomass and length of suppression, it has been determined that the trialed treatment of Escort and Glyphosate is worthwhile to pursue operationally. Chemical sprays are much quicker to implement than hand-pulling, and do not require removal/disposal of huge amounts of biomass; in contrast, hand-pulled corms are bagged and taken to the baseyard where they are later sent to H-Power for incineration. Furthermore, chemical control may also be useful for small populations where the majority of the corms have been removed, but remaining ones have been difficult to eradicate because hand-pulling is likely to disrupt chains of corms and leave live ones behind. Total elimination of all associated corms may be more readily achieved by this chemical control. Escort is an herbicide known for potential of non-target effects, so any control efforts should be closely monitored after treatment. In sensitive areas where there is absolute zero tolerance for non target effects, handpulling may be the better option. Additionally, staff are currently only able to use this product at Kaala where it occurs at allowable sites according to the label such as utility rights-of way. This would include the sites that occur along the fenceline and on the Landing Zone."</p>

Qsn #	Question	Answer
	Cook et al. (2018). New South Wales Weed Control Handbook – A guide to weed control in non-crop, aquatic and bushland situations 7th Edition. State of New South Wales through Department of Industry	<p>Montbretia - <i>Crocoshmia xrocoshmiiflora</i> Non-chemical options: A member of the bulb group of plants. Physical removal will be difficult because of the number of bulblets attached to the main bulb. Chemical and Concentration - PER9907 Glyphosate 360 g/L Roundup® Rate - 1.0 L in 50 L of water Comments - Spray between flowering and fruiting. Chemical and Concentration - PER9907 Glyphosate 360 g/L Roundup® Rate - 1 part glyphosate per 1 part water Comments - Weed wand application.</p>

804	Tolerates, or benefits from, mutilation, cultivation, or fire	y
	Source(s)	Notes
	Weedbusters. (2022). Montbretia - <i>Crocoshmia xrocoshmiiflora</i> . https://www.weedbusters.org.nz/what-are-weeds/weed-list/montbretia/ . [Accessed 28 Jul 2022]	<p>[Corms resprout and tolerates fire] "What can I do to get rid of it? Work downstream when controlling. 1. Dig out very small sites. Usually futile in large spots as corms resprout. Dispose of corms at a refuse transfer station, or by burning or by deep burial. 2. Spray (full leaf stage): glyphosate (10ml/L) + metsulfuron-methyl 600g/kg (4g/10L + penetrant). What can I do to stop it coming back? Thrives on disturbance as corms and rhizomes readily resprout. Resists fire. Sites regenerating to canopy over 2 m can normally be left alone, and may benefit from thinning where the weed is dense. Follow up 6-monthly. Replant with dense groundcover where appropriate."</p>

805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	
	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.	[No evidence] "in Hawai'i naturalized along trails and roadsides primarily in mesic to wet forest, 170-1,200 m, on Kaua'i, O'ahu, Maui, and Hawai'i. First collected probably on O'ahu in 1909 (Rock 4010, BISH)."

Summary of Risk Traits:

High Risk / Undesirable Traits

- Thrives and spreads in regions with temperate to tropical climates
- Naturalized on Kauai, Oahu, Molokai, Maui and Hawaii (Hawaiian Islands) and widely naturalized elsewhere
- An environmental weed in Australia, New Zealand, and certain natural areas in the Hawaiian Islands
- Tolerant of deer and rabbits (may be unpalatable)
- May be toxic to pets if ingested
- Shade tolerant
- Tolerates many soil types
- Forms dense cover that excludes other vegetation
- Geophyte
- Reproduces by seeds (rarely, if ever, in Hawaii) and vegetatively by corms and stolons
- Corms and seeds (rarely) dispersed by water, machinery, contaminated soil or dumped garden waste
- Fire-resistant and regrows after cutting

Low Risk Traits

- Unarmed (no spines, thorns, or burrs)
- Limited or absent seed production may limit long-distance dispersal
- Herbicides may provide effective control