

Family: *Convolvulaceae*

Taxon: *Ipomoea batatas*

Synonym: *Convolvulus batatas* L. [= *Ipomoea batatas* v.] **Common Name:** sweet potato
Ipomoea apiculata M. Martens & Galeotti [= 'Uala
kumara

Questionnaire :	current 20090513	Assessor:	Chuck Chimera	Designation:	L(Hawai'i)
Status:	Assessor Approved	Data Entry Person:	Chuck Chimera	WRA Score	2
101	Is the species highly domesticated?		y=-3, n=0		y
102	Has the species become naturalized where grown?		y=1, n=-1		y
103	Does the species have weedy races?		y=1, n=-1		n
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		n=0, y = 1*multiplier (see Appendix 2)		n
303	Agricultural/forestry/horticultural weed		n=0, y = 2*multiplier (see Appendix 2)		n
304	Environmental weed		n=0, y = 2*multiplier (see Appendix 2)		n
305	Congeneric weed		n=0, y = 1*multiplier (see Appendix 2)		y
401	Produces spines, thorns or burrs		y=1, n=0		n
402	Allelopathic		y=1, n=0		y
403	Parasitic		y=1, n=0		n
404	Unpalatable to grazing animals		y=1, n=-1		n
405	Toxic to animals		y=1, n=0		n
406	Host for recognized pests and pathogens		y=1, n=0		
407	Causes allergies or is otherwise toxic to humans		y=1, n=0		n
408	Creates a fire hazard in natural ecosystems		y=1, n=0		n
409	Is a shade tolerant plant at some stage of its life cycle		y=1, n=0		n
410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)		y=1, n=0		y

411	Climbing or smothering growth habit	y=1, n=0	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	y
601	Evidence of substantial reproductive failure in native habitat	y=1, n=0	n
602	Produces viable seed	y=1, n=-1	
603	Hybridizes naturally	y=1, n=-1	n
604	Self-compatible or apomictic	y=1, n=-1	n
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	
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	n
704	Propagules adapted to wind dispersal	y=1, n=-1	n
705	Propagules water dispersed	y=1, n=-1	
706	Propagules bird dispersed	y=1, n=-1	n
707	Propagules dispersed by other animals (externally)	y=1, n=-1	n
708	Propagules survive passage through the gut	y=1, n=-1	n
801	Prolific seed production (>1000/m2)	y=1, n=-1	n
802	Evidence that a persistent propagule bank is formed (>1 yr)	y=1, n=-1	
803	Well controlled by herbicides	y=-1, n=1	
804	Tolerates, or benefits from, mutilation, cultivation, or fire	y=1, n=-1	y
805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	y=-1, n=1	

Designation: L(Hawai'i)

WRA Score 2

Supporting Data:

101	1999. Wagner, W.L./Herbst, D.R./Sohmer, S.H.. Manual of the flowering plants of Hawaii. Revised edition.. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[Is the species highly domesticated? Yes] "Early Hawaiians recognized about 230 cultivars of sweet potatoes, however, all but about 24 have been lost."
102	1999. Wagner, W.L./Herbst, D.R./Sohmer, S.H.. Manual of the flowering plants of Hawaii. Revised edition.. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[Has the species become naturalized where grown? Yes] "Pantropical, but of American origin, widely cultivated; in Hawaii a Polynesian introduction, escaping cultivation and persisting near abandoned homesites and dumps, probably on all of the inhabited main islands, but documented only from Kauai, Oahu, and Hawaii."
103	1992. Stone, C.P./Smith, C.W./Tunison, J.T. (eds.). Alien Plant Invasions in Native Ecosystems of Hawai'i: Management and Research. Cooperative National Park Resources Studies Unit, University of Hawaii, Manoa, Honolulu, HI	[Does the species have weedy races? No evidence from the Hawaiian Islands, despite a long history of cultivation]
103	1999. Wagner, W.L./Herbst, D.R./Sohmer, S.H.. Manual of the flowering plants of Hawaii. Revised edition.. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[Does the species have weedy races? Possibly, but no evidence from the Hawaiian Islands]
201	1999. Wagner, W.L./Herbst, D.R./Sohmer, S.H.. Manual of the flowering plants of Hawaii. Revised edition.. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[Species suited to tropical or subtropical climate(s) 2-high] "Pantropical, but of American origin, widely cultivated;"
202	1999. Wagner, W.L./Herbst, D.R./Sohmer, S.H.. Manual of the flowering plants of Hawaii. Revised edition.. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[Quality of climate match data? 2-high] "Pantropical, but of American origin, widely cultivated;"
203	1983. Duke, J.A.. Handbook of Energy Crops - Ipomoea batatas. http://www.hort.purdue.edu/newcrop/duke_energy/ipomoea_batatas.html	[Broad climate suitability (environmental versatility)? Yes] "Well-adapted to tropical and subtropical climates, sweet potato will grow successfully over a wide range of climatic conditions where the average frost-free growing season is at least 5 months. Freedom of frost is not enough. Days and nights must be fairly warm."
203	1991. Smith, A.C.. Flora Vitiensis Nova - A New Flora of Fiji (Spermatophytes Only). Volume 5. National Tropical Botanical Garden, Lawai, HI	[Broad climate suitability (environmental versatility)? Yes] "...cultivated at elevations from near sea level to about 800 m, and sometimes naturalized (up to 1,050 m.) near cultivated areas, along roadsides, and in thickets along rivers and streams..." [elevation distribution may exceed 1000 m]
204	1999. Wagner, W.L./Herbst, D.R./Sohmer, S.H.. Manual of the flowering plants of Hawaii. Revised edition.. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[Native or naturalized in regions with tropical or subtropical climates? Yes] "Pantropical, but of American origin, widely cultivated;"
205	1999. Wagner, W.L./Herbst, D.R./Sohmer, S.H.. Manual of the flowering plants of Hawaii. Revised edition.. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[Does the species have a history of repeated introductions outside its natural range? Yes] "Pantropical, but of American origin, widely cultivated;"
301	1988. Webb, C. J./Sykes, W.R./Garnock-Jones, P.J.. Flora of New Zealand, Volume IV: Naturalised pteridophytes, gymnosperms, dicotyledons. Botany Division, DSIR, Christchurch, New Zealand http://FloraSeries.LandcareResearch.co.nz	[Naturalized beyond native range? Questionably naturalized in NZ] "An occasional escape from cultivation."
301	1991. Smith, A.C.. Flora Vitiensis Nova - A New Flora of Fiji (Spermatophytes Only). Volume 5. National Tropical Botanical Garden, Lawai, HI	[Naturalized beyond native range? Yes] "...cultivated at elevations from near sea level to about 800 m, and sometimes naturalized (up to 1,050 m.) near cultivated areas, along roadsides, and in thickets along rivers and streams..."
301	1999. Wagner, W.L./Herbst, D.R./Sohmer, S.H.. Manual of the flowering plants of Hawaii. Revised edition.. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[Naturalized beyond native range? Yes] "Pantropical, but of American origin, widely cultivated; in Hawaii a Polynesian introduction, escaping cultivation and persisting near abandoned home sites and dumps, probably on all of the inhabited main islands, but documented only from Kauai, Oahu, and Hawaii."
301	2001. Tye, A.. Invasive plant problems and requirements for weed risk assessment in the Galapagos Islands. Pp. 153-175 in Groves, R.H. et al. (eds.) Weed risk assessment. Csiro Publishing, Collingwood, Australia	[Naturalized beyond native range? Yes] "Table 3. Naturalized species, which are either long-established and still rare, or which appear to have integrated into the natural ecosystem while causing less obvious damage than those in Tables 1 and 2. Some of these may be damaging aggressives in other parts of the world, and all require monitoring. Some may be better placed in Table 2." [Includes I. batatas]

301	2003. Oppenheimer, H.L.. New plant records from Maui and Hawai'i Counties. Bishop Museum Occasional Papers. 73: 3-30.	[Naturalized beyond native range? Yes] "Sweet potato escapes cultivation and persists near abandoned homesites and dumps, probably on all the main islands but documented only from Kaua'i, O'ahu, and Hawai'i (Wagner et al. 1990: 555). These sites are consistent with collections from West Maui. The Alaeloa site was recently (August 2001) bulldozed during construction of a residential subdivision. Ipomoea batatas was also noted to occur on Midway Atoll (Wagner et al., 1999: 1873); however, this species was not included in Bruegmann (1999: 1-2). Material examined: MAUI: West Maui, Lahaina Dist, Honolua Stream, near the intake, 244 m, 23 Jul 1998, Oppenheimer H79806 (BISH); 'Alaeloa, N of Ka'ōpala Gulch, 24 m, in dumpsite, 21 Jan 2001, Oppenheimer H10130."
302	1965. Neal, M.C. In Gardens of Hawaii. Bishop Museum Press, Honolulu, HI	[Garden/amenity/disturbance weed? No] "It is said to have been cultivated in Hawaii since A.D. 1000, having arrived with the taro, probably from Tahiti." [Long history of cultivation with no evidence of weedy impacts]
302	1992. Stone, C.P./Smith, C.W./Tunison, J.T. (eds.). Alien Plant Invasions in Native Ecosystems of Hawai'i: Management and Research. Cooperative National Park Resources Studies Unit, University of Hawaii, Manoa, Honolulu, HI	[Garden/amenity/disturbance weed? No] No evidence from the Hawaiian Islands
302	1999. Wagner, W.L./Herbst, D.R./Sohmer, S.H.. Manual of the flowering plants of Hawaii. Revised edition.. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[Garden/amenity/disturbance weed? No] No evidence from the Hawaiian Islands
303	1965. Neal, M.C. In Gardens of Hawaii. Bishop Museum Press, Honolulu, HI	[Agricultural/forestry/horticultural weed? No] "It is said to have been cultivated in Hawaii since A.D. 1000, having arrived with the taro, probably from Tahiti." [Long history of cultivation with no evidence of weedy impacts]
303	1992. Stone, C.P./Smith, C.W./Tunison, J.T. (eds.). Alien Plant Invasions in Native Ecosystems of Hawai'i: Management and Research. Cooperative National Park Resources Studies Unit, University of Hawaii, Manoa, Honolulu, HI	[Agricultural/forestry/horticultural weed? No] No evidence from the Hawaiian Islands
303	1999. Wagner, W.L./Herbst, D.R./Sohmer, S.H.. Manual of the flowering plants of Hawaii. Revised edition.. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[Agricultural/forestry/horticultural weed? No] No evidence in Hawaii
303	2007. Randall, R.P.. Global Compendium of Weeds - Ipomoea batatas [Online Database]. http://www.hear.org/gcw/species/ipomoea_batatas/	[Agricultural/forestry/horticultural weed? Potentially in other regions of the world]
304	1992. Stone, C.P./Smith, C.W./Tunison, J.T. (eds.). Alien Plant Invasions in Native Ecosystems of Hawai'i: Management and Research. Cooperative National Park Resources Studies Unit, University of Hawaii, Manoa, Honolulu, HI	[Environmental weed? No] No evidence from the Hawaiian Islands
304	1999. Wagner, W.L./Herbst, D.R./Sohmer, S.H.. Manual of the flowering plants of Hawaii. Revised edition.. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[Environmental weed? No] No evidence in Hawaii
304	2001. Tye, A.. Invasive plant problems and requirements for weed risk assessment in the Galapagos Islands. Pp. 153-175 in Groves, R.H. et al. (eds.) Weed risk assessment. Csiro Publishing, Collingwood, Australia	[Environmental weed? No] "Table 3. Naturalized species, which are either long-established and still rare, or which appear to have integrated into the natural ecosystem while causing less obvious damage than those in Tables 1 and 2. Some of these may be damaging aggressives in other parts of the world, and all require monitoring. Some may be better placed in Table 2." [Includes I. batatas]
305	2003. Weber, E.. Invasive Plant Species of the World. A Reference Guide to Environmental Weeds. CABI Publishing, Wallingford, UK	[Congeneric weed? Yes] "Ipomoea cairica ... invasive because its trailing and climbing stems can completely smother native shrubs and trees, impeding their growth and preventing their regeneration." [Ipomoea aquatica and I. indica also regarded as invasive by this book]
401	1999. Wagner, W.L./Herbst, D.R./Sohmer, S.H.. Manual of the flowering plants of Hawaii. Revised edition.. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[Produces spines, thorns or burrs? No] "Vines; stems erect, procumbent, or occasionally twining, often rooting at the nodes, usually somewhat succulent but sometimes slender and herbaceous, up to 4 m or more long, but often shorter in cultivars, glabrous or pubescent, from a tuberous root."

402	1991. Harrison, Jr., H.F./Peterson, J.K.. Evidence That Sweet Potato (<i>Ipomoea batatas</i>) Is Allelopathic to Yellow Nutsedge (<i>Cyperus esculentus</i>). <i>Weed Science</i> . 39(2): 308-312.	[Allelopathic? Yes] "Abstract. In field studies, 'Regal' sweet potato greatly reduced yellow nutsedge growth when the two species were grown together using standard cultural practices. At the end of the growing season, yellow nutsedge shoot dry weight per m ² in plots where the two species were planted together was less than 10% of shoot weight in plots where nutsedge was grown alone. Presence of yellow nutsedge did not markedly affect sweet potato growth. When grown together in a greenhouse experiment designed to minimize the competitive effects of sweet potato on yellow nutsedge, yellow nutsedge growth was reduced more than 50% by sweet potato 8 and 12 weeks after planting. The most polar fraction of serially extracted sweet potato periderm tissue was highly inhibitory to yellow nutsedge root growth. These results indicate that sweet potato interference with yellow nutsedge under field conditions is partially due to allelopathy."
403	1999. Wagner, W.L./Herbst, D.R./Sohmer, S.H.. Manual of the flowering plants of Hawaii. Revised edition.. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[Parasitic? No] "Vines; stems erect, procumbent, or occasionally twining, often rooting at the nodes, usually somewhat succulent but sometimes slender and herbaceous, up to 4 m or more long, but often shorter in cultivars, glabrous or pubescent, from a tuberous root."
404	1999. Wagner, W.L./Herbst, D.R./Sohmer, S.H.. Manual of the flowering plants of Hawaii. Revised edition.. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[Unpalatable to grazing animals? No] "The vines and leaves were used as pig food, or if old, as padding under floor mats. The tubers also were used as bait for opelu (mackerel scad) or to fatten hogs."
405	1999. Wagner, W.L./Herbst, D.R./Sohmer, S.H.. Manual of the flowering plants of Hawaii. Revised edition.. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[Toxic to animals? No] "The vines and leaves were used as pig food, or if old, as padding under floor mats. The tubers also were used as bait for opelu (mackerel scad) or to fatten hogs." [No evidence]
406	2005. Staples, G.W./Herbst, D.R.. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI	[Host for recognized pests and pathogens? Possibly] "Pests include sweet-potato weevils, stem borers, and spider mites, which can be controlled with applications of approved pesticides. Root-knot nematodes can be troublesome if sweet-potatoes are repeatedly planted in the same plot; pre-treatment of the soil with a nematicide controls them."
407	1999. Wagner, W.L./Herbst, D.R./Sohmer, S.H.. Manual of the flowering plants of Hawaii. Revised edition.. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[Causes allergies or is otherwise toxic to humans? No] "The sweet potato was of great value to the Hawaiians. The stem tips, young leaves, and tubers were eaten, or the tuber was mashed, mixed with water, and fermented to make a sweet potato beer. Various parts of the plant were used medicinally, and a lei of the vine, exuding its milky sap, was worn by nursing mothers to insure a good flow of milk."
408	1999. Wagner, W.L./Herbst, D.R./Sohmer, S.H.. Manual of the flowering plants of Hawaii. Revised edition.. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[Creates a fire hazard in natural ecosystems? No] "Vines; stems erect, procumbent, or occasionally twining, often rooting at the nodes, usually somewhat succulent but sometimes slender and herbaceous,..."
409	2005. Staples, G.W./Herbst, D.R.. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI	[Is a shade tolerant plant at some stage of its life cycle? No] "Full sun and a regular watering schedule are recommended..."
409	2011. Plants For A Future Database. <i>Ipomoea batatas</i> . http://www.pfaf.org/user/Plant.aspx?LatinName=Ipomoea+batatas	[Is a shade tolerant plant at some stage of its life cycle? No] "It cannot grow in the shade."
410	1983. Duke, J.A.. Handbook of Energy Crops - <i>Ipomoea batatas</i> . http://www.hort.purdue.edu/newcrop/duke_energy/Ipomoea_batatas.html	[Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)? Yes] "Soils rated good for sweet potatoes include moderately deep, very friable fine sandy loams, sandy loams, or loamy fine sands. Soils must be well-drained. Subsoils of clay are satisfactory unless they are tight and sticky. Some friable, well-drained loams and silt loams are highly productive. Excellent soils have surface layers more than 30 cm in depth, those from 15–30 cm are considered good. Slopes should be gentle, with little tendency to become eroded. If soils are too deep, tubers grow too deep for harvesting machines. "
411	1999. Wagner, W.L./Herbst, D.R./Sohmer, S.H.. Manual of the flowering plants of Hawaii. Revised edition.. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[Climbing or smothering growth habit? Yes] "Vines; stems erect, procumbent, or occasionally twining,..."
412	1999. Wagner, W.L./Herbst, D.R./Sohmer, S.H.. Manual of the flowering plants of Hawaii. Revised edition.. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[Forms dense thickets? No] "...in Hawaii a Polynesian introduction, escaping cultivation and persisting near abandoned home sites and dumps, probably on all of the inhabited main islands, but documented only from Kauai, Oahu, and Hawaii." [No evidence in Hawaii]

501	1999. Wagner, W.L./Herbst, D.R./Sohmer, S.H.. Manual of the flowering plants of Hawaii. Revised edition.. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[Aquatic? No] Terrestrial
502	1999. Wagner, W.L./Herbst, D.R./Sohmer, S.H.. Manual of the flowering plants of Hawaii. Revised edition.. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[Grass? No] Convolvulaceae
503	1999. Wagner, W.L./Herbst, D.R./Sohmer, S.H.. Manual of the flowering plants of Hawaii. Revised edition.. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[Nitrogen fixing woody plant? No] "Vines; stems erect, procumbent, or occasionally twining, often rooting at the nodes, usually somewhat succulent but sometimes slender and herbaceous, up to 4 m or more long, but often shorter in cultivars, glabrous or pubescent, from a tuberous root." [Convolvulaceae]
504	1999. Wagner, W.L./Herbst, D.R./Sohmer, S.H.. Manual of the flowering plants of Hawaii. Revised edition.. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)? Yes] "Vines; stems erect, procumbent, or occasionally twining, often rooting at the nodes, usually somewhat succulent but sometimes slender and herbaceous, up to 4 m or more long, but often shorter in cultivars, glabrous or pubescent, from a tuberous root."
601	1999. Wagner, W.L./Herbst, D.R./Sohmer, S.H.. Manual of the flowering plants of Hawaii. Revised edition.. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[Evidence of substantial reproductive failure in native habitat? Probably no] "Pantropical, but of American origin, widely cultivated;"
602	1988. Webb, C. J./Sykes, W.R./Garnock-Jones, P.J.. Flora of New Zealand, Volume IV: Naturalised pteridophytes, gymnosperms, dicotyledons. Botany Division, DSIR, Christchurch, New Zealand http://FloraSeries.LandcareResearch.co.nz	[Produces viable seed? Apparently not in New Zealand] "Capsule not seen ... Kuumara does not flower freely in N.Z., but can be easily recognised by the presence of tubers."
602	2005. Staples, G.W./Herbst, D.R.. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI	[Produces viable seed? Possibly] "Flowers are not (or only rarely) produced in some cultivars, and seed productions in likewise erratic."
603	1957. Ting, Y.C./Kehr, A.E./Miller, J.C.. A Cytological Study of the Sweet Potato Plant <i>Ipomoea Batatas</i> (L.) Lam. and its Related Species. The American Naturalist. 91(858): 197-203.	[Hybridizes naturally? No] "Despite the many pollinations made in two directions, only in the cross <i>Ipomoea batatas</i> x <i>I. pes-caprae</i> , did there seem to be any stimulation of the ovules of the sweet potato plant. Two non viable seeds were harvested from this cross. However, no true interspecific hybrid F1 plants involving the sweet potato as one parent were obtained from any combinations among the crosses."
604	1982. Stucky, J.M./Beckmann, R.L.. Pollination Biology, Self-Incompatibility, and Sterility in <i>Ipomoea pandurata</i> (L.) G. F. W. Meyer (Convolvulaceae). American Journal of Botany. 69(6): 1022-1031.	[Self-compatible or apomictic? No] "Previous studies of sweet potato, <i>I. batatas</i> (Martin, 1965a, b, 1967; Martin and Ortiz, 1966), and other species of <i>Ipomoea</i> (Martin, 1968, 1970; Williams and Cope, 1967) have demonstrated genetic self-incompatibility in the genus. In each instance, the failure of pollen germination following self-pollination was cited as evidence for sporophytic self-incompatibility."
605	1981. Real, L.A.. Nectar Availability and Bee-Foraging on <i>Ipomoea</i> (Convolvulaceae). Biotropica. 13(2): 64-69.	[Requires specialist pollinators? No] "The relationship between nectar scheduling and availability and the patterns of a pollinating guild's foraging on two species of co-occurring morning glory was investigated in disturbed habitats of the lower montane rain forests at Monteverde, Costa Rica. <i>Ipomoea indica</i> and <i>Ipomoea batatas</i> partition pollinating resources, presumably according to tongue length, with long tongued bees visiting <i>I. indica</i> . Bees visiting <i>I. batatas</i> show staggered visitation times with larger bees visiting in the early morning when nectar is most available and smaller bees visiting in the late morning and afternoon when nectar availability is at its minimum. The larger bee species of the early morning return in the late afternoon after nectar availability has increased from its early afternoon low. Since no aggression was observed between bee species, small bees may be pre-vented from foraging in the early morning by cold temperatures. The larger bees probably do not forage when there is very little nectar available. <i>I. indica</i> shows no such pattern. Due to the deeper effective corolla of <i>I. indica</i> , nectar may be inaccessible to most bees in the habitat, consequently, no pattern should be expected. However, lack of a pattern may also be the result of this plant's recent introduction to the area."
606	2009. Lebot, V.. Tropical root and tuber crops: cassava, sweet potato, yams and aroids. CABI, Wallingford, UK	[Reproduction by vegetative fragmentation? Yes] "The long, thin stems that creep on the surface produce roots where nodes make contact with the soil."
607	2009. Lebot, V.. Tropical root and tuber crops: cassava, sweet potato, yams and aroids. CABI, Wallingford, UK	[Minimum generative time (years)? Unknown. Generally propagated vegetatively] " <i>I. batatas</i> is a vine-like perennial herb, treated as an annual when cultivated."

701	1999. Wagner, W.L./Herbst, D.R./Sohmer, S.H.. Manual of the flowering plants of Hawaii. Revised edition.. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)? Yes] "...in Hawaii a Polynesian introduction, escaping cultivation and persisting near abandoned homesites and dumps, probably on all of the inhabited main islands,..."
702	1999. Wagner, W.L./Herbst, D.R./Sohmer, S.H.. Manual of the flowering plants of Hawaii. Revised edition.. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[Propagules dispersed intentionally by people? Yes] "Pantropical, but of American origin, widely cultivated;"
703	1999. Wagner, W.L./Herbst, D.R./Sohmer, S.H.. Manual of the flowering plants of Hawaii. Revised edition.. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[Propagules likely to disperse as a produce contaminant? No] "Capsules rarely formed, brown, ovoid, sparsely pubescent, becoming glabrate. Seeds 0-1(-4), orbicular, glabrous or with wings of short hairs." [No evidence]
704	1999. Wagner, W.L./Herbst, D.R./Sohmer, S.H.. Manual of the flowering plants of Hawaii. Revised edition.. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[Propagules adapted to wind dispersal? No] "Capsules rarely formed, brown, ovoid, sparsely pubescent, becoming glabrate. Seeds 0-1(-4), orbicular, glabrous or with wings of short hairs." [No evidence that plant is dispersed by wind, despite wings of short hairs]
705	1991. Smith, A.C.. Flora Vitiensis Nova - A New Flora of Fiji (Spermatophytes Only). Volume 5. National Tropical Botanical Garden, Lawai, HI	[Propagules water dispersed? Possibly] "...cultivated at elevations from near sea level to about 800 m, and sometimes naturalized (up to 1,050 m.) near cultivated areas, along roadsides, and in thickets along rivers and streams..." [Distribution suggests possibly water dispersal of tubers or stem fragments]
705	2009. Lebot, V.. Tropical root and tuber crops: cassava, sweet potato, yams and aroids. CABI, Wallingford, UK	[Propagules water dispersed? Yes. If indehiscent capsules of the wild type are produced, which is rare or absent in the Hawaiian Islands] "Living populations of <i>I. batatas</i> var. <i>apiculata</i> have been described in the state of Veracruz, Mexico. This botanical variety is distinguished from <i>I. batatas</i> by indehiscent capsules. Interestingly, these authors maintain that the indehiscent character is important for seed dispersal. The capsules have been floated in water for several days without opening and sinking. Apparently, their seeds are still viable after being in salt water for a week."
706	1999. Wagner, W.L./Herbst, D.R./Sohmer, S.H.. Manual of the flowering plants of Hawaii. Revised edition.. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[Propagules bird dispersed? No] "Capsules rarely formed, brown, ovoid, sparsely pubescent, becoming glabrate. Seeds 0-1(-4), orbicular, glabrous or with wings of short hairs." [Not fleshy-fruited]
707	1999. Wagner, W.L./Herbst, D.R./Sohmer, S.H.. Manual of the flowering plants of Hawaii. Revised edition.. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[Propagules dispersed by other animals (externally)? No] "Capsules rarely formed, brown, ovoid, sparsely pubescent, becoming glabrate. Seeds 0-1(-4), orbicular, glabrous or with wings of short hairs." [No evidence that short hairs allow for external attachment]
708	1965. Neal, M.C. In Gardens of Hawaii. Bishop Museum Press, Honolulu, HI	[Propagules survive passage through the gut? No] "Besides the use of tubers as food for human beings, horses, mules, and hogs, the tops are fed to stock and are cooked and eaten as greens." [No evidence of internal propagule dispersal in the Hawaiian Islands]
801	1988. Webb, C. J./Sykes, W.R./Garnock-Jones, P.J.. Flora of New Zealand, Volume IV: Naturalised pteridophytes, gymnosperms, dicotyledons. Botany Division, DSIR, Christchurch, New Zealand http://FloraSeries.LandcareResearch.co.nz	[Prolific seed production (>1000/m2)? No] "Capsule not seen."
801	1999. Wagner, W.L./Herbst, D.R./Sohmer, S.H.. Manual of the flowering plants of Hawaii. Revised edition.. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[Prolific seed production (>1000/m2)? No] "Capsules rarely formed, brown, ovoid, sparsely pubescent, becoming glabrate."
802	2005. Staples, G.W./Herbst, D.R.. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI	[Evidence that a persistent propagule bank is formed (>1 yr)? Probably not in Hawaii] "Flowers are not (or only rarely) produced in some cultivars, and seed productions in likewise erratic."
803	2011. WRA Specialist. Personal Communication.	[Well controlled by herbicides? Unknown] No information on herbicide efficacy or chemical control in the Hawaiian Islands
804	1997. Sihachakr, D./Haicour, R./Cavalcante Alves, J.M./Umboh, I./Nzoghe, D./Servaes, A./Ducreux, G.. Plant regeneration in sweet potato (<i>Ipomoea batatas</i> L., Convolvulaceae). Euphytica. 96: 143-152.	[Tolerates, or benefits from, mutilation, cultivation, or fire? Yes] "Cuttings of stem fragments, 20-50 cm long and having 3-5 nodes, are traditionally planted in family farms, while tuber roots bearing numerous adventitious buds are used as clonal propagation for commercial production. In addition, isolated leaf cuttings can easily be rooted, produce tubers and regenerate shoots at the petiole end (Sihachakr et al., 1982)."

805	2005. Staples, G.W./Herbst, D.R.. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI	[Effective natural enemies present locally (e.g. introduced biocontrol agents)? Probably No] "Pests include sweet-potato weevils, stem borers, and spider mites, which can be controlled with applications of approved pesticides. Root-knot nematodes can be troublesome if sweet-potatoes are repeatedly planted in the same plot; pre-treatment of the soil with a nematicide controls them." [Pests of I. batatas, but probably no specific agents present]
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