

Taxon: Curcuma australasica Hook.f.

Family: Zingiberaceae

Common Name(s): Cape York lily
native turmeric

Synonym(s):

Assessor: Chuck Chimera

Status: Assessor Approved

End Date: 7 Jul 2016

WRA Score: 3.0

Designation: L

Rating: Low Risk

Keywords: Rhizomatous, Herb, Ornamental, Arillate Seeds, Shade-Tolerant

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	n
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		
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	y=1, n=0	n
406	Host for recognized pests and pathogens		
407	Causes allergies or is otherwise toxic to humans	y=1, n=0	n
408	Creates a fire hazard in natural ecosystems	y=1, n=0	n
409	Is a shade tolerant plant at some stage of its life cycle	y=1, n=0	y

Qsn #	Question	Answer Option	Answer
410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y=1, n=0	n
411	Climbing or smothering growth habit	y=1, n=0	n
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	y
603	Hybridizes naturally		
604	Self-compatible or apomictic		
605	Requires specialist pollinators		
606	Reproduction by vegetative fragmentation	y=1, n=-1	y
607	Minimum generative time (years)		
701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)		
702	Propagules dispersed intentionally by people	y=1, n=-1	y
703	Propagules likely to disperse as a produce contaminant	y=1, n=-1	n
704	Propagules adapted to wind dispersal	y=1, n=-1	n
705	Propagules water dispersed		
706	Propagules bird dispersed		
707	Propagules dispersed by other animals (externally)		
708	Propagules survive passage through the gut		
801	Prolific seed production (>1000/m2)		
802	Evidence that a persistent propagule bank is formed (>1 yr)		
803	Well controlled by herbicides		
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
	Smith, R.M. (1987). <i>Curcuma</i> . Flora of Australia Online. Australian Biological Resources Study, Canberra. http://www.environment.gov.au/biodiversity/abrs/online-resources/flora/main/index.html . [Accessed 7 Jul 2016]	[Cultivated, but no evidence of domestication] "Occurs in tropical N.T. and Qld, including the islands of Torres Strait; also in New Guinea. Grows in shady rainforest margins, often on rocky terrain."

102	Has the species become naturalized where grown?	
	Source(s)	Notes
	WRA Specialist. 2016. Personal Communication	Unknown

103	Does the species have weedy races?	
	Source(s)	Notes
	WRA Specialist. 2016. Personal Communication	Unknown

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
	CSIRO. 2010. Australian Tropical Rainforest Plants Edition 6 - <i>Curcuma australasica</i> . http://keys.trin.org.au/ . [Accessed 7 Jul 2016]	"Occurs in the NT and NEQ as far south as Cairns. Altitudinal range from near sea level to 550 m. Grows at the edges of rainforest, in Eucalypt forest, vine forest and in woodland."

202	Quality of climate match data	High
	Source(s)	Notes
	CSIRO. 2010. Australian Tropical Rainforest Plants Edition 6 - <i>Curcuma australasica</i> . http://keys.trin.org.au/ . [Accessed 7 Jul 2016]	

Qsn #	Question	Answer
203	Broad climate suitability (environmental versatility)	n
	Source(s)	Notes
	Dave's Garden. 2016. Aussie Plume Ginger - <i>Curcuma australasica</i> . http://davesgarden.com/guides/pf/go/114854/ . [Accessed 7 Jul 2016]	"Hardiness: USDA Zone 8a: to -12.2 °C (10 °F) USDA Zone 8b: to -9.4 °C (15 °F) USDA Zone 9a: to -6.6 °C (20 °F) USDA Zone 9b: to -3.8 °C (25 °F) USDA Zone 10a: to -1.1 °C (30 °F) USDA Zone 10b: to 1.7 °C (35 °F) USDA Zone 11: above 4.5 °C (40 °F)"
	CSIRO. 2010. Australian Tropical Rainforest Plants Edition 6 - <i>Curcuma australasica</i> . http://keys.trin.org.au/ . [Accessed 7 Jul 2016]	"Occurs in the NT and NEQ as far south as Cairns. Altitudinal range from near sea level to 550 m."

204	Native or naturalized in regions with tropical or subtropical climates	y
	Source(s)	Notes
	CSIRO. 2010. Australian Tropical Rainforest Plants Edition 6 - <i>Curcuma australasica</i> . http://keys.trin.org.au/ . [Accessed 7 Jul 2016]	"Occurs in the NT and NEQ as far south as Cairns. Altitudinal range from near sea level to 550 m. Grows at the edges of rainforest, in Eucalypt forest, vine forest and in woodland."

205	Does the species have a history of repeated introductions outside its natural range?	y
	Source(s)	Notes
	Hanelt, P. (ed.). 2001. Mansfeld's Encyclopedia of Agricultural and Horticultural Crops, Volume 4. Springer-Verlag, Berlin, Heidelberg, New York	"Cultivated in Cuba. The rhizomes are used as a spice."
	Fosberg, F. R., Falanruw, M. V., & Sachet, M. H. (1975). Vascular flora of the northern Marianas Islands. Smithsonian Institution Press, Washington, D.C.	" <i>Curcuma australasica</i> Hooker f.? Growing about graveyard and near house. Probably native to Micronesia or of very early introduction. Anatahan: Northwestern corner of island, below 200 ft [60 m], Falanruw 1713 (US); below 200 ft [60 m], 1642 (US) (both collections sterile)."
	Imada, C.T., Staples, G.W. & Herbst, D.R. 2005. Annotated Checklist of Cultivated Plants of Hawai'i. http://www2.bishopmuseum.org/HBS/botany/cultivatedplants/ . [Accessed 7 Jul 2016]	" <i>Curcuma australasica</i> J. D. Hooker Locations: Harold L. Lyon Arboretum"

Qsn #	Question	Answer
	Dave's Garden. 2016. Aussie Plume Ginger - <i>Curcuma australasica</i> . http://davesgarden.com/guides/pf/go/114854/ . [Accessed 7 Jul 2016]	"This plant has been said to grow in the following regions: Fort Pierce, Florida Pompano Beach, Florida Port Orange, Florida Honolulu, Hawaii Baton Rouge, Louisiana Clemmons, North Carolina Alvin, Texas Deer Park, Texas Dickinson, Texas Galveston, Texas Houston, Texas (2 reports) Round Rock, Texas San Antonio, Texas Santa Fe, Texas"

301	Naturalized beyond native range	n
	Source(s)	Notes
	Randall, R.P. 2012. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	No evidence
	Wagner, W.L., Herbst, D.R.& Lorence, D.H. 2016. Flora of the Hawaiian Islands. Smithsonian Institution, Washington, D.C. http://botany.si.edu/ . [Accessed 7 Jul 2016]	No evidence

302	Garden/amenity/disturbance weed	n
	Source(s)	Notes
	Randall, R.P. 2012. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	No evidence

303	Agricultural/forestry/horticultural weed	n
	Source(s)	Notes
	Randall, R.P. 2012. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	No evidence

304	Environmental weed	n
	Source(s)	Notes
	Randall, R.P. 2012. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	No evidence

305	Congeneric weed	

Qsn #	Question	Answer
	Source(s)	Notes
	Randall, R.P. 2012. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	[Included in references of weeds, but thus far, evidence of impacts have not been documented] "Curcuma longa L. Zingiberaceae See: Curcuma domestica Valetton Cultivated, Crop Refs: 10 945-N, 943-nc, 876-N, 869-W, 850-N, 839-N, 760-W, 518-N, 261-CW, 101-N"

401	Produces spines, thorns or burrs	n
	Source(s)	Notes
	CSIRO. 2010. Australian Tropical Rainforest Plants Edition 6 - Curcuma australasica. http://keys.trin.org.au/ . [Accessed 7 Jul 2016]	"Stem Plant 50 cm tall. Rhizome round to oblong, yellow within. Leaves tufted. Leaf blades ovate-lanceolate, glabrous, 16-45 x 9-19 cm, petioles 3-21.5 cm long. Stipules 7-9 cm long. Leaf sheaths prominent with winged margins."

402	Allelopathic	n
	Source(s)	Notes
	WRA Specialist. 2016. Personal Communication	Unknown

403	Parasitic	n
	Source(s)	Notes
	Smith, R.M. (1987). Curcuma. Flora of Australia Online. Australian Biological Resources Study, Canberra. http://www.environment.gov.au/biodiversity/abrs/online-resources/flora/main/index.html . [Accessed 7 Jul 2016]	"Rhizome not elongating, yellow within. Leaves tufted; lamina ovate-lanceolate, acuminate, rounded at base, glabrous, to 45 cm long and 19 cm wide; petiole to 15 cm long." [Zingiberaceae. No evidence]

404	Unpalatable to grazing animals	n
	Source(s)	Notes
	Lim, T.K. 2015. Edible Medicinal And Non-Medicinal Plants. Volume 9, Modified Stems, Roots, Bulbs. Springer, Dordrecht	[Palatability of foliage and/or flowers to animals unknown] "Curcuma australasica ... Tuberos roots are roasted and eaten by aborigines"

405	Toxic to animals	n
	Source(s)	Notes
	Useful Tropical Plants Database. 2016. Curcuma australasica. http://tropical.theferns.info/viewtropical.php?id=Curcuma+australasica . [Accessed 7 Jul 2016]	"Known Hazards None known"
	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

Qsn #	Question	Answer
	Wagstaff, D.J. 2008. International poisonous plants checklist: an evidence-based reference. CRC Press, Boca Raton, FL	No evidence

406	Host for recognized pests and pathogens	
	Source(s)	Notes
	Ravindran, P. N., Babu, K. N., & Sivaraman, K. (Eds.). (2007). Turmeric: the genus <i>Curcuma</i> . CRC Press, Boca Raton, FL	[None specified for <i>C. australasica</i> , but may be susceptible to pests & diseases of other <i>Curcuma</i> species] "The turmeric (<i>Curcuma longa</i> L.) crop is infested by over 70 species of insects among which the shoot borer (<i>Conogethes punctiferalis</i> Guen.) and rhizome scale (<i>Aspidiella hartii</i> Sign.) are major ones in the field and storage, respectively. In addition to these two major insect pests, various sap feeders, leaf feeders, and rhizome borers also occasionally infest the crop causing serious damage in localized areas. The cigarette beetle (<i>Lasioderma serricornis</i> Fab.), drugstore beetle (<i>Stegobium paniceum</i> L.), and coffee bean weevil (<i>Araecerus fasciculatus</i> DeG.) are serious insect pests of dry turmeric rhizomes. Information on insect pests of turmeric is available mainly from India and has been previously reviewed by Jacob (1980), Butani (1985), Koya et al . (1991), and Premkumar et al . (1994). The distribution, damage, life history, seasonal incidence, host plants, resistant sources, natural enemies, and management of insect pests of turmeric have been consolidated in this chapter. A list of insects recorded on turmeric in the world has also been tabulated (Table 7.1)."

407	Causes allergies or is otherwise toxic to humans	n
	Source(s)	Notes
	Hanelt, P. (ed.). 2001. Mansfeld's Encyclopedia of Agricultural and Horticultural Crops, Volume 4. Springer-Verlag, Berlin, Heidelberg, New York	"Cultivated in Cuba. The rhizomes are used as a spice." [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
	Wagstaff, D.J. 2008. International poisonous plants checklist: an evidence-based reference. CRC Press, Boca Raton, FL	No evidence, although some <i>Curcuma</i> species are reported to cause contact dermatitis

408	Creates a fire hazard in natural ecosystems	n
	Source(s)	Notes
	Smith, R.M. (1987). <i>Curcuma</i> . Flora of Australia Online. Australian Biological Resources Study, Canberra. http://www.environment.gov.au/biodiversity/abrs/online-resources/flora/main/index.html . [Accessed 7 Jul 2016]	[Herbaceous, & occurs in areas not prone to wildfires] "Occurs in tropical N.T. and Qld, including the islands of Torres Strait; also in New Guinea. Grows in shady rainforest margins, often on rocky terrain."

409	Is a shade tolerant plant at some stage of its life cycle	y
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Qsn #	Question	Answer
	Source(s)	Notes
	Oakman, H.1995. Harry Oakman's what flowers when: the complete guide to flowering times in tropical and subtropical gardens. Univ. of Queensland Press, St. Lucia, Australia	"Hardy, best in moist soil in shade"

410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	n
	Source(s)	Notes
	Gardening With Angus. 2016. <i>Curcuma australasica</i> – Native Turmeric. http://www.gardeningwithangus.com.au/curcuma-australasica-cape-york-lily/ . [Accessed 7 Jul 2016]	"Ph Level: Neutral Soil Type: Sandy, Loamy, Sandy loam, Clay loam, Potting mix"
	Useful Tropical Plants Database. 2016. <i>Curcuma australasica</i> . http://tropical.theferns.info/viewtropical.php?id=Curcuma+australasica . [Accessed 7 Jul 2016]	"Plants in this genus generally prefer a humus-rich, moist but well-drained soil in partial shade"

411	Climbing or smothering growth habit	n
	Source(s)	Notes
	Smith, R.M. (1987). <i>Curcuma</i> . Flora of Australia Online. Australian Biological Resources Study, Canberra. http://www.environment.gov.au/biodiversity/abrs/online-resources/flora/main/index.html . [Accessed 7 Jul 2016]	"Rhizome not elongating, yellow within. Leaves tufted; lamina ovate-lanceolate, acuminate, rounded at base, glabrous, to 45 cm long and 19 cm wide; petiole to 15 cm long."

412	Forms dense thickets	n
	Source(s)	Notes
	Smith, R.M. (1987). <i>Curcuma</i> . Flora of Australia Online. Australian Biological Resources Study, Canberra. http://www.environment.gov.au/biodiversity/abrs/online-resources/flora/main/index.html . [Accessed 7 Jul 2016]	[No evidence from native range] "Occurs in tropical N.T. and Qld, including the islands of Torres Strait; also in New Guinea. Grows in shady rainforest margins, often on rocky terrain."

501	Aquatic	n
	Source(s)	Notes
	Ravindran, P. N., Babu, K. N., & Sivaraman, K. (Eds.). (2007). <i>Turmeric: the genus Curcuma</i> . CRC Press, Boca Raton, FL	[Terrestrial] "A pretty, large species (up to 1.3 m), this is the only native representative of the genus from Australia, where it grows in disturbed areas, generally near roadsides."

502	Grass	n
	Source(s)	Notes
	USDA, ARS, Germplasm Resources Information Network, 2016. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html . [Accessed 7 Jul 2016]	Family: Zingiberaceae Subfamily: Zingiberoideae Tribe: Zingibereae

Qsn #	Question	Answer
503	Nitrogen fixing woody plant	n
	Source(s)	Notes
	USDA, ARS, Germplasm Resources Information Network, 2016. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html . [Accessed 7 Jul 2016]	Family: Zingiberaceae Subfamily: Zingiberoideae Tribe: Zingibereae

504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	y
	Source(s)	Notes
	Kubitzki, K. (ed.). 1998. The Families and genera of vascular plants. Volume IV. Flowering plants, Monocotyledons: Alismatanae and Commelinanae (except Gramineae). Springer-Verlag, Berlin, Heidelberg, New York	"Genera with a small rhizome often develop globose or fusiform starch-filled tuberous roots, as in Globba, Siphonochilus, Kaempferia, Roscoea, or the roots are ending in tubers (Curcuma, Gagnepainia)."
	Smith, R.M. (1987). Curcuma. Flora of Australia Online. Australian Biological Resources Study, Canberra. http://www.environment.gov.au/biodiversity/abrs/online-resources/flora/main/index.html . [Accessed 7 Jul 2016]	"Rhizome not elongating, yellow within. Leaves tufted; lamina ovate-lanceolate, acuminate, rounded at base, glabrous, to 45 cm long and 19 cm wide; petiole to 15 cm long."

601	Evidence of substantial reproductive failure in native habitat	n
	Source(s)	Notes
	Smith, R.M. (1987). Curcuma. Flora of Australia Online. Australian Biological Resources Study, Canberra. http://www.environment.gov.au/biodiversity/abrs/online-resources/flora/main/index.html . [Accessed 7 Jul 2016]	[No evidence] "Occurs in tropical N.T. and Qld, including the islands of Torres Strait; also in New Guinea. Grows in shady rainforest margins, often on rocky terrain."

602	Produces viable seed	y
	Source(s)	Notes
	Oakman, H.1995. Harry Oakman's what flowers when: the complete guide to flowering times in tropical and subtropical gardens. Univ. of Queensland Press, St. Lucia, Australia	"raised from seed"
	Useful Tropical Plants Database. 2016. Curcuma australasica. http://tropical.theferns.info/viewtropical.php?id=Curcuma+australasica . [Accessed 7 Jul 2016]	"Seed - best sown as soon as it is ripe[200]. Germinates best at temperatures around 20°C[200]. Division of the rhizome when the plant is dormant."

603	Hybridizes naturally	
	Source(s)	Notes
	Ravindran, P. N., Babu, K. N., & Sivaraman, K. (Eds.). (2007). Turmeric: the genus Curcuma. CRC Press, Boca Raton, FL	Unknown. Hybridization documented in genus

604	Self-compatible or apomictic	
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Qsn #	Question	Answer
	Source(s)	Notes
	Fukai, S. & Udomdee, W. (2005). Inflorescence and flower initiation and development in <i>Curcuma alismatifolia</i> Gagnep (Zingiberaceae). <i>Japanese Journal of Tropical Agriculture</i> 49(1): 14-20	" <i>C. alismatifolia</i> is self incompatible (Fukai unpublished)." [Unknown for <i>Curcuma australasica</i>]
	Daleys Fruit Tree Nursery. 2016. Cape York Turmeric. <i>Curcuma australasica</i> . http://www.daleysfruit.com.au/Cape-York-Turmeric-Curcuma-australasica.htm . [Accessed 7 Jul 2016]	"Pollination: Self Pollination" [Possibly. Pollination information provided by customer feedback]

605	Requires specialist pollinators	
	Source(s)	Notes
	Pharmacognogy. (2015). Pollination and dispersal. http://www.epharmacognosy.com/2015/03/pollination-and-dispersal.html . [Accessed 7 Jul 2016]	[Specific pollinators unknown] "In several genera e.g. <i>Curcuma</i> , <i>Roscoea</i> , and <i>Cautleya</i> , the anther is provided with basal spurs. This, combined with a versatile anther, suggests bee pollination. When a bee visits the flower, it will hit the basal spurs which force the anther to tip forward and place pollen on the back of the bee. When visiting the next flower the anther, with the stigma placed on top, will touch on the same place of the insect and pollination will occur."
	Plant Delights Nursery. (2016). <i>Curcuma</i> - Hidden Cone Gingers for the Temperate Garden. http://www.plantdelights.com/Article/Curcuma-Hidden-Cone-Ginger . [Accessed 7 Jul 2016]	[Specific pollinators unknown] "In the wild, specific <i>Curcuma</i> pollinators are also present that are not present in the temperate garden. Thus <i>Curcuma</i> will not set seed in the garden unless you hand pollinate them during the summer. If you manage to actually get seed, they are relatively easy to germinate"

606	Reproduction by vegetative fragmentation	y
	Source(s)	Notes
	Dave's Garden. 2016. Aussie Plume Ginger - <i>Curcuma australasica</i> . http://davesgarden.com/guides/pf/go/114854/ . [Accessed 7 Jul 2016]	"Propagation Methods: By dividing rhizomes, tubers, corms or bulbs (including offsets)"
	Kubitzki, K. (ed.). 1998. The Families and genera of vascular plants. Volume IV. Flowering plants, Monocotyledons: Alismatanae and Commelinanae (except Gramineae). Springer-Verlag, Berlin, Heidelberg, New York	[Presumably Yes. Generic description] "The rhizome is sympodial, varying in size and degree of branching; in the genus <i>Curcuma</i> , among others, the rhizome is repeatedly branched."

607	Minimum generative time (years)	
	Source(s)	Notes
	Gardening123. 2016. <i>Curcuma australasica</i> . http://cibj.gardening123.com/GardenGuide/Plant_Desc.a.sp?MS=1&SS=10&ID=106241&plant_cat_id=11&group_id=10 . [Accessed 7 Jul 2016]	"Growth Rate Moderate" [Moderate growth rate. May be able to reproduce by rhizomes prior to flowering]

701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	

Qsn #	Question	Answer
	Source(s)	Notes
	Ravindran, P. N., Babu, K. N., & Sivaraman, K. (Eds.). (2007). <i>Turmeric: the genus Curcuma</i> . CRC Press, Boca Raton, FL	"A pretty, large species (up to 1.3 m), this is the only native representative of the genus from Australia, where it grows in disturbed areas, generally near roadsides." [Distribution along roads suggests unintentional dispersal may be possible]

702	Propagules dispersed intentionally by people	y
	Source(s)	Notes
	Dave's Garden. 2016. Aussie Plume Ginger - <i>Curcuma australasica</i> . http://davesgarden.com/guides/pf/go/114854/ . [Accessed 7 Jul 2016]	Cultivated as an ornamental

703	Propagules likely to disperse as a produce contaminant	n
	Source(s)	Notes
	Plant Delights Nursery. (2016). <i>Curcuma</i> - Hidden Cone Gingers for the Temperate Garden. http://www.plantdelights.com/Article/Curcuma-Hidden-Cone-Ginger . [Accessed 7 Jul 2016]	[Seed set may be limited in cultivation] "In the wild, specific <i>Curcuma</i> pollinators are also present that are not present in the temperate garden. Thus <i>Curcuma</i> will not set seed in the garden unless you hand pollinate them during the summer. If you manage to actually get seed, they are relatively easy to germinate"

704	Propagules adapted to wind dispersal	n
	Source(s)	Notes
	Smith, R.M. (1987). <i>Curcuma</i> . Flora of Australia Online. Australian Biological Resources Study, Canberra. http://www.environment.gov.au/biodiversity/abrs/online-resources/flora/main/index.html . [Accessed 7 Jul 2016]	"Fruit a thin-walled capsule."
	Kubitzki, K. (ed.). 1998. The Families and genera of vascular plants. Volume IV. Flowering plants, Monocotyledons: Alismatanae and Commelinanae (except Gramineae). Springer-Verlag, Berlin, Heidelberg, New York	[Propagated by rhizomes, or seeds, if produced, which are arillate] "The rhizome is sympodial, varying in size and degree of branching; in the genus <i>Curcuma</i> , among others, the rhizome is repeatedly branched." ... "Capsule ellipsoid, liberating the seeds into the mucilage of the bract pouches; seeds with lacerate aril."

705	Propagules water dispersed	
	Source(s)	Notes
	WRA Specialist. 2016. Personal Communication	Unknown. Possible that rhizome fragments or seeds could be moved by water if grown in proximity to water

Qsn #	Question	Answer
706	Propagules bird dispersed	
	Source(s)	Notes
	Kubitzki, K. (ed.). 1998. The Families and genera of vascular plants. Volume IV. Flowering plants, Monocotyledons: Alismatanae and Commelinanae (except Gramineae). Springer-Verlag, Berlin, Heidelberg, New York	[Seeds, if produced, are arillate & may be bird or ant-dispersed] "The rhizome is sympodial, varying in size and degree of branching; in the genus <i>Curcuma</i> , among others, the rhizome is repeatedly branched." ... "Capsule ellipsoid, liberating the seeds into the mucilage of the bract pouches; seeds with lacerate aril."

707	Propagules dispersed by other animals (externally)	
	Source(s)	Notes
	Kubitzki, K. (ed.). 1998. The Families and genera of vascular plants. Volume IV. Flowering plants, Monocotyledons: Alismatanae and Commelinanae (except Gramineae). Springer-Verlag, Berlin, Heidelberg, New York	[Seeds, if produced, are arillate & may be bird or ant-dispersed] "The rhizome is sympodial, varying in size and degree of branching; in the genus <i>Curcuma</i> , among others, the rhizome is repeatedly branched." ... "Capsule ellipsoid, liberating the seeds into the mucilage of the bract pouches; seeds with lacerate aril."

708	Propagules survive passage through the gut	
	Source(s)	Notes
	Kubitzki, K. (ed.). 1998. The Families and genera of vascular plants. Volume IV. Flowering plants, Monocotyledons: Alismatanae and Commelinanae (except Gramineae). Springer-Verlag, Berlin, Heidelberg, New York	[Seeds, if produced, are arillate & may be bird or ant-dispersed] "The rhizome is sympodial, varying in size and degree of branching; in the genus <i>Curcuma</i> , among others, the rhizome is repeatedly branched." ... "Capsule ellipsoid, liberating the seeds into the mucilage of the bract pouches; seeds with lacerate aril."

801	Prolific seed production (>1000/m²)	
	Source(s)	Notes
	WRA Specialist. 2016. Personal Communication	Unknown

802	Evidence that a persistent propagule bank is formed (>1 yr)	
	Source(s)	Notes
	Ravindran, P. N., Babu, K. N., & Sivaraman, K. (Eds.). (2007). Turmeric: the genus <i>Curcuma</i> . CRC Press, Boca Raton, FL	[Unknown for seeds. Rhizomes may be able to persist & serve as a propagule bank] "All <i>Curcuma</i> species have a natural dormancy, which makes them convenient to package and ship safely and which fortunately coincide with winter in the northern hemisphere."

803	Well controlled by herbicides	
	Source(s)	Notes
	WRA Specialist. 2016. Personal Communication	Unknown. No information on herbicide efficacy or chemical control of this species.

804	Tolerates, or benefits from, mutilation, cultivation, or fire	y
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Qsn #	Question	Answer
	Source(s)	Notes
	Oakman, H.1995. Harry Oakman's what flowers when: the complete guide to flowering times in tropical and subtropical gardens. Univ. of Queensland Press, St. Lucia, Australia	[Presumably Yes. Able to regenerate from rhizomes] "One of eighty-five species of rhizomatous perennial herbs." ... "the plant becomes dormant, to resume growth some weeks later in spring."

805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	
	Source(s)	Notes
	WRA Specialist. 2016. Personal Communication	Unknown

Summary of Risk Traits:

High Risk / Undesirable Traits

- Grows in tropical climates
- A geophyte capable of reproducing by rhizomes, & tubers.
- May also be propagated by seeds, if available
- Seeds have arils, and if produced, might be dispersed by birds or ants (vector unknown)
- May be able to regenerate from rhizomes
- Limited ecological information reduces accuracy of risk prediction

Low Risk Traits

- No reports of invasiveness or naturalization
- Unarmed (no spines, thorns or burrs)
- No reports of toxicity
- Ornamental

Second Screening Results for Herbs or Low Stature Shrubby Life Forms

(A) Reported as a weed of cultivated lands? No
Outcome = Accept (Low Risk)