

Taxon: <i>Eucomis autumnalis</i> (Mill.) Chitt.	Family: Asparagaceae
Common Name(s): pineapple flower pineapple lily	Synonym(s): Basilaea undulata (Aiton) Mirb. Eucomis undulata Aiton Fritillaria autumnalis Mill. Fritillaria longifolia Hill Ornithogalum undulatum (Aiton)

Assessor: Chuck Chimera	Status: Assessor Approved	End Date: 19 Feb 2020
WRA Score: 1.0	Designation: L	Rating: Low Risk

Keywords: Perennial Geophyte, Naturalized Elsewhere, Toxic Bulbs, Self-Incompatible, Wind-Dispersed

Qsn #	Question	Answer Option	Answer
101	Is the species highly domesticated?	y=-3, n=0	n
102	Has the species become naturalized where grown?		
103	Does the species have weedy races?		
201	Species suited to tropical or subtropical climate(s) - If island is primarily wet habitat, then substitute "wet tropical" for "tropical or subtropical"	(0-low; 1-intermediate; 2-high) (See Appendix 2)	High
202	Quality of climate match data	(0-low; 1-intermediate; 2-high) (See Appendix 2)	High
203	Broad climate suitability (environmental versatility)	y=1, n=0	y
204	Native or naturalized in regions with tropical or subtropical climates	y=1, n=0	y
205	Does the species have a history of repeated introductions outside its natural range?	y=-2, ?=-1, n=0	y
301	Naturalized beyond native range	y = 1*multiplier (see Appendix 2), n= question 205	y
302	Garden/amenity/disturbance weed	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)	n
401	Produces spines, thorns or burrs	y=1, n=0	n
402	Allelopathic		
403	Parasitic	y=1, n=0	n
404	Unpalatable to grazing animals		
405	Toxic to animals		
406	Host for recognized pests and pathogens		
407	Causes allergies or is otherwise toxic to humans		

Qsn #	Question	Answer Option	Answer
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	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	y=1, n=-1	n
605	Requires specialist pollinators	y=-1, n=0	y
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	>3
701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	y=1, n=-1	n
702	Propagules dispersed intentionally by people	y=1, n=-1	y
703	Propagules likely to disperse as a produce contaminant	y=1, n=-1	n
704	Propagules adapted to wind dispersal	y=1, n=-1	y
705	Propagules water dispersed		
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)		
803	Well controlled by herbicides		
804	Tolerates, or benefits from, mutilation, cultivation, or fire		
805	Effective natural enemies present locally (e.g. introduced biocontrol agents)		

Supporting Data:

Qsn #	Question	Answer
101	Is the species highly domesticated?	n
	Source(s)	Notes
	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 of domestication] "Malawi, S. Africa. Perennial bulbous herbs, deciduous, big ovoid bulbs, rosette of broad fleshy wavy-edged leaves, inflorescence a dense cylindrical raceme on a stout stalk, stary yellowish-green flowers with a tuft of leaf-like bracts at the tip, trilocular capsule, shiny black rounded seeds, bulb geophyte, in grassland, forest, swamps and river banks"

102	Has the species become naturalized where grown?	
	Source(s)	Notes
	WRA Specialist. (2020). Personal Communication	NA

103	Does the species have weedy races?	
	Source(s)	Notes
	WRA Specialist. (2020). 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
	USDA, Agricultural Research Service, National Plant Germplasm System. (2020). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/ . [Accessed 17 Feb 2020]	"Native Africa SOUTHERN AFRICA: Botswana, Eswatini, Lesotho, South Africa [KwaZulu-Natal, Free State, Eastern Cape, Northern Cape, Gauteng, Limpopo, Mpumalanga, North-West]"

202	Quality of climate match data	High
	Source(s)	Notes
	USDA, Agricultural Research Service, National Plant Germplasm System. (2020). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/ . [Accessed 17 Feb 2020]	

203	Broad climate suitability (environmental versatility)	y
	Source(s)	Notes
	Hoblyn, A. (2009). Green Flowers: Unexpected Beauty for the Garden, Container Or Vase. Timber Press, Portland, OR	"Hardiness - USDA Zones 7–10"

Qsn #	Question	Answer
	Dave's Garden. (2020). Pineapple Flower, Pineapple Lily - <i>Eucomis autumnalis</i> . https://davesgarden.com/guides/pf/go/59560/ . [Accessed 18 Feb 2020]	"Hardiness: USDA Zone 7a: to -17.7 °C (0 °F) USDA Zone 7b: to -14.9 °C (5 °F) 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)"

204	Native or naturalized in regions with tropical or subtropical climates	y
	Source(s)	Notes
	USDA, Agricultural Research Service, National Plant Germplasm System. (2020). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/ . [Accessed 17 Feb 2020]	"Native Africa SOUTHERN AFRICA: Botswana, Eswatini, Lesotho, South Africa [KwaZulu-Natal, Free State, Eastern Cape, Northern Cape, Gauteng, Limpopo, Mpumalanga, North-West]"

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	"naturalized in S India."
	Dave's Garden. (2020). Pineapple Flower, Pineapple Lily - <i>Eucomis autumnalis</i> . https://davesgarden.com/guides/pf/go/59560/ . [Accessed 17 Feb 2020]	"Regional This plant has been said to grow in the following regions: Calistoga, California Folsom, California Merced, California Richmond, California San Leandro, California Bartow, Florida Brooksville, Florida Ocala, Florida Trenton, Florida Zephyrhills, Florida Divernon, Illinois Louisville, Kentucky Easton, Maryland Cleveland, Mississippi Elba, New York Elizabeth City, North Carolina Greenville, North Carolina Salem, Oregon Conway, South Carolina Greenville, South Carolina Murfreesboro, Tennessee Copperas Cove, Texas Fort Worth, Texas Richmond, Texas Bryn Mawr-Skyway Washington CHIMACUM, Washington Cathcart, Washington Kalama, Washington Lakewood, Washington Maltby, Washington"
	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	"sold in local garden shops in the spring." [Hawaiian Islands]

301	Naturalized beyond native 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	" <i>Eucomis autumnalis</i> ... South Africa, naturalized in S India."

Qsn #	Question	Answer
	Imada, C. (2019). Hawaiian Naturalized Vascular Plants Checklist (February 2019 update). Bishop Museum Technical Report 69. Bishop Museum, Honolulu, HI	No evidence to date

302	Garden/amenity/disturbance weed	n
	Source(s)	Notes
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	No evidence

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

304	Environmental weed	n
	Source(s)	Notes
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	No evidence

305	Congeneric weed	n
	Source(s)	Notes
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	[Naturalized and possibly weedy] "Eucomis comosa (Houtt) Wehrh Liliaceae Total N° of Refs: 6 Habit: perennial Herb Major Pathway/s: Ornamental Dispersed by: Humans References: Australia-N-198, New Zealand-N-15, New Zealand-U-919, New Zealand-N-1543, New Zealand-U-2048, India-W-1977"

401	Produces spines, thorns or burrs	n
	Source(s)	Notes
	Quattrocchi, U. 2012. CRC World Dictionary of Medicinal and Poisonous Plants: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	"Perennial bulbous herbs, deciduous, big ovoid bulbs, rosette of broad fleshy wavy-edged leaves, inflorescence a dense cylindrical raceme on a stout stalk, stary yellowish-green flowers with a tuft of leaf-like bracts at the tip, trilocular capsule, shiny black rounded seeds, bulb geophyte, in grassland, forest, swamps and river banks"

402	Allelopathic	n
	Source(s)	Notes
	WRA Specialist. (2020). Personal Communication	Unknown

Qsn #	Question	Answer
403	Parasitic	n
	Source(s)	Notes
	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] "Perennial bulbous herbs, deciduous, big ovoid bulbs, rosette of broad fleshy wavy-edged leaves, inflorescence a dense cylindrical raceme on a stout stalk, starry yellowish-green flowers with a tuft of leaf-like bracts at the tip, trilocular capsule, shiny black rounded seeds, bulb geophyte, in grassland, forest, swamps and river banks"

404	Unpalatable to grazing animals	
	Source(s)	Notes
	WRA Specialist. (2020). Personal Communication	Unknown. No evidence found

405	Toxic to animals	
	Source(s)	Notes
	Gardenersworld.com (2020). <i>Eucomis autumnalis</i> . https://www.gardenersworld.com/plants/eucomis-autumnalis/ . [Accessed 19 Feb 2020]	"No reported toxicity to: No reported toxicity to Birds No reported toxicity to Cats No reported toxicity to Dogs No reported toxicity to Horses No reported toxicity to Livestock No reported toxicity to People"
	Quattrocchi, U. 2012. CRC World Dictionary of Medicinal and Poisonous Plants: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	"The bulb is toxic." [Although reported to be toxic, no evidence that animals consume bulbs, and may be unlikely to come into contact with them]

406	Host for recognized pests and pathogens	
	Source(s)	Notes
	The Royal Horticultural Society. (2020). <i>Eucomis</i> . https://www.rhs.org.uk/advice/profile?pid=104 . [Accessed 19 Feb 2020]	"Watch out for slugs, snails and aphids."
	Notten, A. (2002). <i>Eucomis autumnalis</i> . PlantZAfrica. SANBI. http://pza.sanbi.org/eucomis-autumnalis . [Accessed 19 Feb 2020]	Unknown. None specified

407	Causes allergies or is otherwise toxic to humans	
	Source(s)	Notes
	Gardenersworld.com (2020). <i>Eucomis autumnalis</i> . https://www.gardenersworld.com/plants/eucomis-autumnalis/ . [Accessed 19 Feb 2020]	"No reported toxicity to: No reported toxicity to Birds No reported toxicity to Cats No reported toxicity to Dogs No reported toxicity to Horses No reported toxicity to Livestock No reported toxicity to People"

Qsn #	Question	Answer
	Quattrocchi, U. 2012. CRC World Dictionary of Medicinal and Poisonous Plants: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	[Bulbs toxic, but humans may be unlikely to contact them] "Herb infusion good for healing sexually transmitted diseases, piles. The bulb is toxic. Bulb blood purifier, a decoction used for urinary diseases, stomachache, fevers, colic, flatulence, hangovers and syphilis, and to facilitate childbirth; also used against inflammation and pains, in post-operative recovery, low backache, in healing fractures. Cyclooxygenase inhibiting activity."
	Notten, A. (2002). <i>Eucomis autumnalis</i> . PlantZAfrica. SANBI. http://pza.sanbi.org/eucomis-autumnalis . [Accessed 18 Feb 2020]	[Toxic, but used medicinally] "Although the bulb is toxic, <i>Eucomis autumnalis</i> is used medicinally in South Africa. Decoctions of the bulb in water or milk are usually administered as enemas for the treatment of low backache, to assist in post-operative recovery, and to aid in healing fractures. Decoctions are also used for a variety of ailments, including urinary diseases, stomach ache, fevers, colic, flatulence, hangovers and syphilis, and to facilitate childbirth. The subspecies <i>clavata</i> is also used for coughs and respiratory ailments, biliousness, lumbago, blood disorders, venereal diseases and to prevent premature childbirth. Several homoisoflavones are found in <i>Eucomis autumnalis</i> , and flavonoids are known for their anti-inflammatory and antispasmodic action. It also contains some steroidal triterpenoids and they are known to be beneficial in wound therapy."

408	Creates a fire hazard in natural ecosystems	n
	Source(s)	Notes
	Burrows, J.E. & Willis, C.K. (eds). 2005. Plants of the Nyika Plateau: an account of the vegetation of the Nyika National Parks of Malawi and Zambia. Southern African Botanical Diversity Network Report No. 31. SABONET, Pretoria	"Bulbous plant to 500 mm tall; leaves in a rosette," ... "in montane grassland, often among rocks, and on forest margins. South Africa to Malawi." [No evidence, and unlikely given habit and habitat]
	Little, I. T., Hockey, P. A., & Jansen, R. (2015). Impacts of fire and grazing management on South Africa's moist highland grasslands: A case study of the Steenkampsberg Plateau, Mpumalanga, South Africa. <i>Bothalia</i> , 45(1), 1-15	[No evidence. <i>Eucomis autumnalis</i> affected by, rather than contributing to, fire and other disturbance] "Intensive grazing and burning have a detrimental impact on plant species diversity and structure." ... " <i>Eucomis autumnalis</i> , a popular plant for use in traditional medicine, is confined to the conserved area, suggesting that it is sensitive to disturbance."

Qsn #	Question	Answer
409	Is a shade tolerant plant at some stage of its life cycle	n
	Source(s)	Notes
	Notten, A. (2002). <i>Eucomis autumnalis</i> . PlantZAfrica. SANBI. http://pza.sanbi.org/eucomis-autumnalis . [Accessed 18 Feb 2020]	"Aspect: Full Sun"
	Hoblyn, A. (2009). <i>Green Flowers: Unexpected Beauty for the Garden, Container Or Vase</i> . Timber Press, Portland, OR	"Position: sun" ... "Grow in fertile, well-drained soil in full sun, and mulch during severe winters." ... "Grow in a sunny, sheltered border or at the base of a warm wall."
	Powrie, F. (1998). <i>Grow South African Plants</i> . National Botanical Institute, Kirstenbosch	"Suitable for semi-shade or full-sun, long-lasting, good for flower arrangements"
	Dave's Garden. (2020). <i>Pineapple Flower, Pineapple Lily - Eucomis autumnalis</i> . https://davesgarden.com/guides/pf/go/59560/ . [Accessed 18 Feb 2020]	"Sun Exposure: Full Sun"

410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y
	Source(s)	Notes
	Notten, A. (2002). <i>Eucomis autumnalis</i> . PlantZAfrica. SANBI. http://pza.sanbi.org/eucomis-autumnalis . [Accessed 19 Feb 2020]	"Soil type: Sandy, Loam" ... "PH: Acid, Neutral"
	Gardenersworld.com (2020). <i>Eucomis autumnalis</i> . https://www.gardenersworld.com/plants/eucomis-autumnalis/ . [Accessed 19 Feb 2020]	"Soil type: Well drained / light / sandy / clay / heavy / moist / acidic "

411	Climbing or smothering growth habit	n
	Source(s)	Notes
	Quattrocchi, U. 2012. <i>CRC World Dictionary of Medicinal and Poisonous Plants: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology</i> . CRC Press, Boca Raton, FL	"Perennial bulbous herbs, deciduous, big ovoid bulbs, rosette of broad fleshy wavy-edged leaves, inflorescence a dense cylindrical raceme on a stout stalk, stary yellowish-green flowers with a tuft of leaf-like bracts at the tip, trilocular capsule, shiny black rounded seeds, bulb geophyte, in grassland, forest, swamps and river banks"

Qsn #	Question	Answer
412	Forms dense thickets	n
	Source(s)	Notes
	Goldblatt, P., & Manning, J. (2000). Cape plants: a conspectus of the Cape flora of South Africa. National Botanical Institute, Cape Town	"Rocky, grassy slopes, SE (Knysna northwards throughout E southern Africa)," [No evidence]
	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	"Under Hawaiian conditions, the bulbs sprout, flower for one year, then usually die." [No evidence]
	Burrows, J.E. & Willis, C.K. (eds). 2005. Plants of the Nyika Plateau: an account of the vegetation of the Nyika National Parks of Malawi and Zambia. Southern African Botanical Diversity Network Report No. 31. SABONET, Pretoria	[No evidence] "in montane grassland, often among rocks, and on forest margins. South Africa to Malawi."

501	Aquatic	n
	Source(s)	Notes
	Goldblatt, P., & Manning, J. (2000). Cape plants: a conspectus of the Cape flora of South Africa. National Botanical Institute, Cape Town	[Terrestrial] "Bulbous geophyte, 6—30 cm. Leaves suberect, oblong-lanceolate, uniformly green, margins undulate. Flowers white to greenish, spike leafy above, pedicels 3—9 mm long. Dec.—Feb. Rocky, grassy slopes, SE (Knysna northwards throughout E southern Africa),"

502	Grass	n
	Source(s)	Notes
	USDA, Agricultural Research Service, National Plant Germplasm System. (2020). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/ . [Accessed 17 Feb 2020]	Family: Asparagaceae Subfamily: Scilloideae Tribe: Hyacintheae Subtribe: Massoniinae

503	Nitrogen fixing woody plant	n
	Source(s)	Notes
	USDA, Agricultural Research Service, National Plant Germplasm System. (2020). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/ . [Accessed 17 Feb 2020]	Family: Asparagaceae Subfamily: Scilloideae Tribe: Hyacintheae Subtribe: Massoniinae

504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	y
	Source(s)	Notes
	Goldblatt, P., & Manning, J. (2000). Cape plants: a conspectus of the Cape flora of South Africa. National Botanical Institute, Cape Town	"autumnalis (Mill.) Chitt. Bulbous geophyte, 6—30 cm. Leaves suberect, oblong-lanceolate, uniformly green, margins undulate."

Qsn #	Question	Answer
	Quattrocchi, U. 2012. CRC World Dictionary of Medicinal and Poisonous Plants: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	"bulb geophyte, in grassland, forest, swamps and river banks"

601	Evidence of substantial reproductive failure in native habitat	n
	Source(s)	Notes
	Notten, A. (2002). <i>Eucomis autumnalis</i> . PlantZAfrica. SANBI. http://pza.sanbi.org/eucomis-autumnalis . [Accessed 18 Feb 2020]	[No evidence] " <i>Eucomis autumnalis</i> is divided into three subspecies, most clearly distinguishable by the structure of the peduncle (stalk of the inflorescence) which is either club-shaped or cylindrical: <i>Eucomis autumnalis</i> subsp. <i>autumnalis</i> , (cylindrical) syn. <i>Fritillaria autumnalis</i> , <i>Eucomis undulata</i> , which occurs on mountain slopes, in open grassland and forest margins in the Eastern Cape, Limpopo Province, Zimbabwe and Malawi; <i>Eucomis autumnalis</i> subsp. <i>clavata</i> , (club-shaped or clavate) syn. <i>Eucomis robusta</i> , <i>E. clavata</i> , which grows in open grassland and marshes in KwaZulu-Natal, Lesotho, eastern Free State, Mpumalanga, Gauteng, Limpopo Province, North West Province and Botswana; and <i>Eucomis autumnalis</i> subsp. <i>amaryllidifolia</i> , (linear leaves, club-shaped peduncle) syn. <i>Eucomis amaryllidifolia</i> , which grows between rocks on mountain slopes of the western Free State and Eastern Cape."

602	Produces viable seed	y
	Source(s)	Notes
	Notten, A. (2002). <i>Eucomis autumnalis</i> . PlantZAfrica. SANBI. http://pza.sanbi.org/eucomis-autumnalis . [Accessed 18 Feb 2020]	"Flowers are produced in mid to late summer (December to February). After pollination, whilst the seeds are developing inside the swelling ovaries, the flowers turn green and the inflorescence remains decorative into autumn. The fruit is a trilocular capsule containing shiny black rounded seeds." ... "Propagation is by offsets, seed, leaf cuttings and tissue culture. Seed is sown in spring, in deep (± 10 cm) containers in a well-drained seedling mix. Seed germinates readily in 4-6 weeks."

603	Hybridizes naturally	
	Source(s)	Notes
	Taylor, J. L. S. (1999). An investigation into the biology and medicinal properties of <i>Eucomis</i> species. PhD Dissertation. University of Natal, Pietermaritzburg	[Unknown. Artificial hybridization may be possible] "Further experimental work is necessary to distinguish the relationships between species, and in particular, to establish the relationship between the hybrid specimen and particular individual species. Morphogenetically, the hybrid resembles <i>E. autumnalis</i> and <i>E. comosacomosa</i> . Although some primers produced common bands for these species and the hybrid, no conclusions could be drawn from the data reported here."

604	Self-compatible or apomictic	n

Qsn #	Question	Answer
	Source(s)	Notes
	Shuttleworth, A., & Johnson, S. D. (2009). A key role for floral scent in a wasp-pollination system in <i>Eucomis</i> (Hyacinthaceae). <i>Annals of Botany</i> , 103(5), 715-725	"Experimental hand-pollinations showed that both <i>E. autumnalis</i> and <i>E. comosa</i> are genetically self-incompatible and thus reliant on pollinators for seed set."

605	Requires specialist pollinators	y
	Source(s)	Notes
	Johannsmeier, M.F. (2016). Beeplants of South Africa. Sources of nectar, pollen, honeydew and propolis for honeybees. <i>Strelitzia</i> 37. South African National Biodiversity Institute, Pretoria	" <i>Eucomis autumnalis</i> ... Beeplant Value = N0-1; P?" [nectar (N) 0 = no nectar/pollen is available to, or collected by, honeybees; 1 = poor or minor source]
	Shuttleworth, A., & Johnson, S. D. (2009). A key role for floral scent in a wasp-pollination system in <i>Eucomis</i> (Hyacinthaceae). <i>Annals of Botany</i> , 103(5), 715-725	"This study showed that <i>E. autumnalis</i> and <i>E. comosa</i> are specialized for pollination by pompilid wasps in the genus <i>Hemipepsis</i> and achieve specialization through cryptic colouring and the use of scent as a selective floral attractant."

606	Reproduction by vegetative fragmentation	y
	Source(s)	Notes
	Staples, G.W. & Herbst, D.R. 2005. <i>A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places</i> . Bishop Museum Press, Honolulu, HI	"Under Hawaiian conditions, the bulbs sprout, flower for one year, then usually die." [Apparently do not spread vegetatively in the Hawaiian Islands, as they may elsewhere]
	Hoblyn, A. (2009). <i>Green Flowers: Unexpected Beauty for the Garden, Container Or Vase</i> . Timber Press, Portland, OR	[May be able to spread vegetatively under certain conditions, which may be suboptimal in the Hawaiian Islands] "Good in a tub or large pot set out for summer display; allow bulbs in the tub to increase from year to year to make generous colonies."

607	Minimum generative time (years)	>3
	Source(s)	Notes
	Notten, A. (2002). <i>Eucomis autumnalis</i> . PlantZAfrica. SANBI. http://pza.sanbi.org/eucomis-autumnalis . [Accessed 18 Feb 2020]	"Young bulbs can be planted into the garden in their third year when well-grown specimens may flower for the first time, although this species can take 4 to 5 seasons to flower. "

701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	n
	Source(s)	Notes
	Kubitzki, K. (ed.). 1998. <i>The Families and genera of vascular plants. Volume III. Flowering plants, Monocotyledons: Liliaceae (except Orchidaceae)</i> . Springer-Verlag, Berlin, Heidelberg, New York	"Capsule papery, ± tri-lobate. Seeds ovoid, brown." [No evidence. Presumably wind-dispersed]
	Staples, G.W. & Herbst, D.R. 2005. <i>A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places</i> . Bishop Museum Press, Honolulu, HI	"Under Hawaiian conditions, the bulbs sprout, flower for one year, then usually die." [No evidence]

702	Propagules dispersed intentionally by people	y
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Qsn #	Question	Answer
	Source(s)	Notes
	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	"Bulbs of <i>Eucomis</i> L'Heritier, Pineapple Flowers or Pineapple Lilies, are sold in local garden shops in the spring."
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	"Major Pathway/s: Ornamental Dispersed by: Humans"

703	Propagules likely to disperse as a produce contaminant	n
	Source(s)	Notes
	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	"Under Hawaiian conditions, the bulbs sprout, flower for one year, then usually die." [No evidence]

704	Propagules adapted to wind dispersal	y
	Source(s)	Notes
	Weberling, F. (1992). Morphology of Flowers and Inflorescences. Cambridge University Press, Cambridge, UK	"According to Pascher (1959) the winged capsules of <i>Eucomis</i> and <i>Veltheimia</i> are "very frequently removed in their entirety, and in doing this gradually lose their seeds as they are driven before the wind"."
	Kubitzki, K. (ed.). 1998. The Families and genera of vascular plants. Volume III. Flowering plants, Monocotyledons: Liliae (except Orchidaceae). Springer-Verlag, Berlin, Heidelberg, New York	"Capsule papyraceous, ± trialate. Seeds ovoid, brown."

705	Propagules water dispersed	
	Source(s)	Notes
	Quattrocchi, U. 2012. CRC World Dictionary of Medicinal and Poisonous Plants: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	"bulb geophyte, in grassland, forest, swamps and river banks" [Unknown. Presence along river banks and near swamps suggests water may facilitate dispersal]

706	Propagules bird dispersed	n
	Source(s)	Notes
	Kubitzki, K. (ed.). 1998. The Families and genera of vascular plants. Volume III. Flowering plants, Monocotyledons: Liliae (except Orchidaceae). Springer-Verlag, Berlin, Heidelberg, New York	"Capsule papyraceous, ± trialate. Seeds ovoid, brown." [No evidence. Presumably wind-dispersed]

707	Propagules dispersed by other animals (externally)	n
	Source(s)	Notes
	Weberling, F. (1992). Morphology of Flowers and Inflorescences. Cambridge University Press, Cambridge, UK	"According to Pascher (1959) the winged capsules of <i>Eucomis</i> and <i>Veltheimia</i> are "very frequently removed in their entirety, and in doing this gradually lose their seeds as they are driven before the wind"." [No evidence]

Qsn #	Question	Answer
	Kubitzki, K. (ed.). 1998. The Families and genera of vascular plants. Volume III. Flowering plants, Monocotyledons: Liliaceae (except Orchidaceae). Springer-Verlag, Berlin, Heidelberg, New York	"Capsule papery, ± trilobate. Seeds ovoid, brown." [No evidence. Presumably wind dispersed]
708	Propagules survive passage through the gut	n
	Source(s)	Notes
	Kubitzki, K. (ed.). 1998. The Families and genera of vascular plants. Volume III. Flowering plants, Monocotyledons: Liliaceae (except Orchidaceae). Springer-Verlag, Berlin, Heidelberg, New York	"Capsule papery, ± trilobate. Seeds ovoid, brown." [No evidence. Presumably wind-dispersed]
801	Prolific seed production (>1000/m²)	n
	Source(s)	Notes
	Shuttleworth, A., & Johnson, S. D. (2009). A key role for floral scent in a wasp-pollination system in <i>Eucomis</i> (Hyacinthaceae). <i>Annals of Botany</i> , 103(5), 715-725	"TABLE 5. Natural seed set for <i>Eucomis autumnalis</i> and <i>E. comosa</i> measured at different sites" [For <i>Eucomis autumnalis</i> , seed set ranges from 1.4+1.15 (mean+s.d) to 5.0+3.02 seeds per flower per plant]
802	Evidence that a persistent propagule bank is formed (>1 yr)	
	Source(s)	Notes
	Baskin, C.C. & Baskin, J.M. 2014. <i>Seeds Ecology, Biogeography, and Evolution of Dormancy and Germination</i> . Second Edition. Academic Press, San Francisco, CA	"TABLE 10.4 Dormancy in seeds of herbaceous species of matorral vegetation. *=type of dormancy is inferred." [<i>Eucomis autumnalis</i> inferred to have MPD (morphophysiological dormancy), but longevity in soil seed bank unknown]
803	Well controlled by herbicides	
	Source(s)	Notes
	WRA Specialist. (2020). Personal Communication	Unknown. No evidence on herbicide efficacy or chemical control of this species
804	Tolerates, or benefits from, mutilation, cultivation, or fire	
	Source(s)	Notes
	WRA Specialist. (2020). Personal Communication	Unknown
805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	
	Source(s)	Notes
	Staples, G.W. & Herbst, D.R. 2005. <i>A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places</i> . Bishop Museum Press, Honolulu, HI	[Unknown] "Under Hawaiian conditions, the bulbs sprout, flower for one year, then usually die."

Summary of Risk Traits:

High Risk / Undesirable Traits

- Broad climate suitability (able to grow in 5 hardiness zones)
- Able to grow, and potentially spread, in tropical climates
- Naturalized in India
- Toxic bulbs
- Tolerates many soil types
- Geophyte (bulbs persist in soil)
- Reproduces by seeds and vegetatively by bulbs
- Seeds dispersed by wind and intentionally by people

Low Risk Traits

- No reports of negative impacts outside native range
- In the Hawaiian Islands, bulbs reported to not persist after flowering
- Unarmed (no spines, thorns, or burrs)
- Requires full sun (dense shade may limit ability to spread)
- Self-incompatible
- Adapted for specialized pollination by pompilid wasps in the genus *Hemipepsis*
- Typically flowers after 4-5 years

Second Screening Results for Herbs or Low Stature Shrubby Life Forms

(A) Reported as a weed of cultivated lands? No

Outcome = Accept (Low Risk)